# Poster Presentations From the WORLD CONGRESS OF CARDIOLOGY Scientific Sessions 2012

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# WCC 2012 Poster Presentations

**P001**

## Systolic longitudinal left ventricular function in diabetic patients with pseudonormal mitral flow

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**Introduction:** Left ventricular (LV) diastolic dysfunction is prevalent in diabetic patients. Discrimination of normal from pseudonormal mitral flow is challenging in clinical practice. Subclinical LV systolic dysfunction can be prevalent too, but this recognition could often be missed. Isovolumic contraction velocity (IVCv) and acceleration during isovolumic contraction (IVA) has been proposed as indexes of global LV contractility. **Objectives:** The aim of this study was to distinguish parameters for early detection of left ventricular dysfunction in diabetic patients and for discrimination normal from pseudonormal mitral flow. **Methods:** 88 asymptomatic typ2 diabetic patients (EF=61± 5.8%) were divided into normal (n=58) and pseudonormal (n=30) groups, based on stratification criteria (transmitral E/A with Valsava, early Tissue Doppler velocity e (m/sec), E/e (septal), left atrial volue index-LAVI (ml/m$^2$), pulmonary vein S/D). Left atrial volume index (LAVI) and parameters of LV geometry were estimated by echocardiography. Maximal velocities of LV filling (E,A,E/A), deceleration E time and isovolumic relaxation time were measured from transmitral Doppler. Tissue Doppler velocities were measured from medial annulus (e, a, e/a, Sm) including IVCv, IVA, acceleration time (tIVA), E/e and Doppler tissue myocardial performance index (tMPI). Global longitudinal strain (GLS) was derived from two-dimensional speckle-tracking. **Results:** Close correlations were found between values of GLS and IVCv(r=-0.390, p=0.0009) and GLS and tIVA(r=-0.414, p=0.0001) with significantly lower values of GLS(-23.2±4.75% vs -18.6±4.35%;t=-4.44;p<0.001), Sm(0.081±0.018m/s vs 0.068±0.015m/s;t=3.45;p=0.001), IVCv(0.086±0.024m/s vs 0.065±0.018m/s; t=4.08;p<0.001 and tIVA(35.0±9.8ms vs 23.9±6.4ms;t=5.44;p<0.001) and significantly higher value of tMPI(0.46±0.098 vs 0.55±0.088; t=-4.18;p<0.001) in group of diabetic patients with pseudonormalizacion. **Conclusion:** In diabetic patients pseudonormal pattern of diastolic dysfunction is asociated with an impaired systolic longitudinal LV function. Global longitudinal strain, Sm, IVCv and tIVA can be useful parameters in early detection of left ventricular dysfunction in diabetic patients and in discrimination normal from pseudonormal mitral flow.

**P002**

## Assessment of left atrial volume and function in hypertensive patients with diastolic dysfunction

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**Introduction:** In hypertensive patients left ventricular diastolic dysfunction (LVDD) may result in left atrial (LA) morphophysiologic and functional changes. **Objectives:** The aim of this study was to investigate the impact of LVDD on left atrial volumetric remodelling and function. **Methods:** 106 hypertensive patients, with preserved ejection fraction, were divided in three groups according LVDD: normal (n=30), abnormal relaxation (Grade I, n=29) and pseudonormal (Grade II, n=31). Left atrial volume (LAV) was measured at three time points (maximal LAV, pre-atrial contraction volume and minimal LAV) and the following left atrial (LA) emptying volumes were then derived: LA passive emptying volume (LAPEV), LA conduit volume (LACV), LA active emptying volume (LAAEV) and LA total emptying volume (LATEV). All LA volumes were corrected for maximal LAV, which was indexed to body surface area (LAVI). We measured coresponding velocities from tissue Doppler at the level of the septal mitral annulus (e,a,s), including E/e. Global LA strain and strain rate parameters were assessed by two-dimensional speckle-tracking echocardiography as the average of six segmental values. Peak LA strain and strain rate during ventricular systole (S-LAs and SR-LAs), peak early diastolic LA strain and strain rate (S-LAe and SR-LAe), and peak LA strain and strain rate during atrial systole (S-LAa and SR-LAa, respectively) were measured as LA function parameters. **Results:** There was significant correlation between of LAVI and S-LAs(r=-0.547;p=0.006), S-LAe(r=-0.311;p=0.017), S-LAa(r=-0.375;p=0.003), SR-LAs (r=-0.326;p = 0.012),SR-LAe (r=0.363, p = 0.005) and SR-LAa (r=0.339, p = 0.009) and between E/e and LAPEV (r=-0.329;p=0.0001) and E/e and LATEV (r=-0.304;p=0.001). Significant diference of LAPEV(0.51±0.21 vs 0.37±0.18 vs 0.37±0.28;p=0.009), LACV(3.28±0.91 vs 2.86±0.78 vs 2.66±0.80;p=0.005), LAAEV(0.40±0.16 vs 0.40±0.14 vs 0.32±0.11;p=0.008) and LATEV (1.01±0.22 vs 0.93±0.25 vs 0.85±0.21;p=0.011) were found between groups, levels of atrial emptying volumes decreased from normal through Grade I and Grade II groups. **Conclusion:** In hypertensive patients left atrial volume was expression of left ventricular diastolic dysfunction and coused impaired LA function assessed by Speckle-tracking echocardiography, wich may be considered a promising tool for the early detection of LA functional abnormalities in these patients. Functional left ventricular changes resulting in lower atrial emptying volumes as expression of diastolic dysfunction severity.

**P003**

## Cardiotrophin-1 plasma levels increased in patients with diastolic heart failure

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**Introduction:** Cardiotrophin-1 (CT-1) is a member of the interleukin (IL-6) family of cytokines and is increased in various cardiovascular diseases including chronic heart failure. **Objectives:** The aim of the study was to evaluate if plasma CT-1 is associated with diastolic heart failure (DHF) and to investigate the relationship between CT-1 and echocardiographic parameters. **Methods:** Fifty-seven consecutive patients (mean age 57±8 years, 24 male) diagnosed with DHF in our clinic and 33 controls (mean age 55±7 years, 12 male) were included in the study. All study participants underwent echocardiographic evaluation and blood samples were obtained. **Results:** CT-1 and N terminal-probrain natriuretic peptide (NT-proBNP) values were significantly higher in DHF subjects than controls ($P$=0.017 and $P$=0.009, respectively) (Table 1). The mitral peak velocity of early diastolic filling (E), lateral, septal and mean ratio of E to early diastolic mitral annular velocity (E/Em) and the pulmonary capillary wedge pressure (PCWP) estimated from each of the E/Em measurements were all significantly higher, whereas the ratio of peak systolic velocity and peak anterograd diastolic velocity of pulmonary venous flow, lateral and septal Em and lateral and septal ratio of Em to late diastolic mitral annular velocity were significantly lower in the patient group (Table 1 and 2). CT-1 positively correlated with NT-proBNP ($P$=0.001), mean E/Em ($P$=0.003), and estimated mean PCWP ($P$=0.001).

**Table 1:** Laboratory and echocardiographic findings of patient and control groups

| | Control (n=33) | Patient (n=57) | *P* value |
|---|---|---|---|
| CT-1 (fmol/ml) | 11.30 [8.09-16.51] | 17.5 [8.95-28.74] | **0.017** |
| NT-proBNP (pg/mL) | 64 [27.5-95] | 82 [55.5-241] | **0.009** |
| E (cm/sec) | 62.27±14.69 | 75.67±18.85 | **0.001** |
| A (cm/sec) | 75.48±21.95 | 83.07±22.30 | 0.121 |
| E/A | 0.79 [0.65-1.04] | 0.85 [0.76-1.00] | 0.273 |
| Em lateral (cm/sec) | 10.69±1.87 | 8.69±2.00 | **<0.001** |
| Em/Am lateral | 0.87 [0.74-1.02] | 0.71 [0.63-0.86] | **0.006** |
| E/Em lateral | 5.70 [5.05-6.83] | 8.47 [6.96-10.47] | **<0.001** |

**Table 2:** Echocardiographic findings of patient and control group

| | Control (n=33) | Patient (n=57) | *P* value |
|---|---|---|---|
| PCWP lateral (mmHg) | 9.00 [8.00-10.50] | 12.00 [10.50-15.00] | **<0.001** |
| Em (cm/sec) | 8.91±1.22 | 6.65±1.58 | **<0.001** |
| Em/Am septal | 0.82 [0.70-0.91] | 0.63 [0.57-0.72] | **<0.001** |
| E/Em septal | 7.05±1.67 | 11.90±3.84 | **<0.001** |
| PCWP septal (mmHg) | 10.00 [9.00-12.00] | 16.00 [13.00-18.50] | **<0.001** |
| E/Em mean | 6.40±1.48 | 10.30±3.48 | **<0.001** |
| PCWP mean (mmHg) | 10.00 [9.00-11.00] | 14.00 [12.00-16.00] | **<0.001** |

**Conclusion:** CT-1 is elevated in patients with DHF and is associated with NT-proBNP and left ventricular filling pressures.

**P004**

## Influence of age and gender on assessment of diastolic function: a Doppler echocardiographic study in Chinese hypertension patients

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**Introduction:** Hypertension is a vital risk factor for cardiovascular disease. As previous studies shown, hypertension patients, especially female, have been found to suffer from diastolic dysfunction. As to women, heart failure tends to be correlated with impaired diastolic function or diastolic heart failure rather than systolic heart failure. Although diastolic function has been shown to become worse with increasing age in healthy subjects, the influence of age and gender on hypertension patients is still unknown. **Objectives:** The objectiveof this study was to explore age-and gender-specific changes in Doppler echocardiography– derived left ventricular diastolic index-E'. **Methods:** A total number of 334 hypertension patients, who don't have other known diseases (mean age, 58.60±15.68 years; range, 23 to 90; F/M, 182/152) were recruited and studied. Peak early mitral annular velocity (E'), E/E' ratios were measured with Doppler echocardiography of lateral mitral annulus. **Results:** The study showed that diastolic indices are highly correlated with age. Among those aged 20 to 29 and 50 to 59 years, E' was significantly higher in females than in males. In patients aged 30 to 39, 40 to 49, 60 to 69 and 70 to 79 years, E' was similar in both genders. Among those aged 80 to 89 years, E' was significantly lower in females than in males. Predictors of E' among patients aged >60 years old were age ($P$□0.01; odds ratio, 1.13; 95% CI, 1.108 to 1.147) and female gender ($P$□0.01; odds ratio, 1.78; 95% CI, 1.302 to 2.443).

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**Image/graph I:**

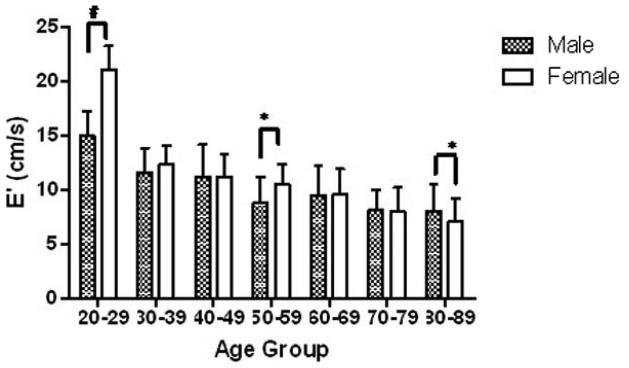


Figure 1. Comparison between men and women in each age group. E′ was significantly higher in females than in males among those aged 20 to 29 and 50 to 59 years. E′ was significantly lower in females than in males among those aged 80 to 89 years. Data are presented as mean±SD. *P < 0.05. # P < 0.01.

**Conclusion:** Age-related changes in diastolic indices had the relationship with gender among hypertension patients. Diastolic function deteriorated more obviously among elderly women than that among elderly men. The study may gave explanations on the increased incidence of diastolic heart failure in elderly women with hypertension.

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**P005**

## Left ventricular function in young adults with mitral valve prolapse

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**Introduction:** In some inherited connective tissue diseases with involving of the cardiovascular system, e.g. Marfan syndrome, has been reported early impairment of LV function, which have been described as Marfan-related cardiomyopathy. **Objectives:** Our aim was to evaluate the LV function in young adults with mitral valve prolapse (MVP) without significant mitral regurgitation (MR) using two-dimensional strain imaging. **Methods:** We studied 78 asymptomatic young subjects (mean age 19,7±1,6, 72% male) with MVP in comparison with 80 sex-and age-matched healthy subjects. Longitudinal strain and strain rate (SR) were determined from three standard apical views, using spackle tracking (Vivid 7 Dimension, EchoPAC'08) with grey-scale frame rate 50–55/sec. **Results:** During the k-means clustering we have identified two clusters of subjects with MVP: first cluster (17 subjects, 28% of the MVP group) and second cluster (61 subjects, 72%). In 1 cluster observed a significant reduction in global longitudinal systolic strain compared with the control group (-15,5±2,9% vs. -19,6±3,4%; p=0,00001) and the second cluster (-15,5±2,9% vs. -20,6±3,8%; p=0,00001). Diastolic global SR was also decreased compared with the control group (1,3±0,25/s vs. -1,62±0,25/s; p=0,0001) and the second cluster (1,3±0,25/s vs. 1,62±0,25/s; p=0,00001). Global strain in the second cluster did not differ significantly from the control group (p=0,1), but there are significant decrease of local longitudinal systolic strain (-17,1±3,2% vs. -20,7±3,1%; p=0,001) and diastolic SR (1,38±0,25/s vs. 1,55±0,22/s; p=0,00001) in interventricular septum. **Conclusion:** These changes of deformation may be the first signs of deterioration of the LV systolic function and existing of cardiomyopathy in MVP.

**P006**

## In patients with elevated LV filling pressure loop diuretics improve severity of heart failure and diastolic dysfunction, but torasemide does it somewhat better than furosemide

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**Introduction:** In patients with advanced heart failure (HF) diuretics is recommended for reducing left ventricular (LV) filling pressures. In such patients diuretics with additional properties (improving LV stiffness) should provide more pronounced clinical and hemodynamic effects. **Objectives:** to compare clinical and hemodynamic effects of loop diuretics torasemide (T) and furosemide (F) in patients with stable chronic (C) HF and elevated LV filling pressures. **Methods:** 63 euvolumic patients with II-III NYHA functional class of stable CHF (36 with LV ejection fraction ≥50%) and elevated mean left atrial pressure (pseudonoral or restrictive left ventricular filling pattern) were randomized to loop diuretics T (n=33) or F (n=30). Initial dose for T was 5 mg and for F was 10 mg a day. In case of failure of proper clinical and hemodynamic effects (failure to achieve I functional class or impaired LV relaxation filling pattern) doses were increased (T up to 10–20 mg; F up to 20–40 mg). Follow-up was 6 months. **Results:** At the end of follow-up there were comparable improvement of functional class in both groups (p<0.001 vs. baseline), but significant increase 6-min walk distance was revealed only in T group (+4612 m, p<0,05 vs. baseline; in F group +3412 m; ns). At the time of achievement of proper clinical and hemodynamic effects there were comparable significant decrease of left atrial minimal volume index ($iLA_{min}$) and significant improvement of Doppler diastolic parameters related with LV filling pressures (a decrease of E/A,/é and E/Vp ratios; a lengthening of IVRT, DT and time difference between duration of Ar and A velocities, an increase of Si-fraction of pulmonary venous flow; in all cases p<0.01 vs. baseline) in both groups; further treatment with loop diuretics were accompanied by some returning these parameters to baseline values in F group, while T continued to have a positive effect, albeit not as pronounced as in early (a similar pattern was valid for patients with low and with normal LV ejection fraction) . **Conclusion:** in patients with stable CHF and elevated LV filling pressure loop diuretics improve severity of heart failure and diastolic function, but torasemide does it somewhat better than furosemide.

**P007**

## Management of heart failure in a district general hospital, a prospective audit

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**Introduction:** This prospective audit assesses the treatment of inpatients with chronic heart failure in a district general hospital. **Objectives:** The aim is to assess whether the current NICE guidelines are being met with regards to referral to specialists, pharmacological and non-pharmacological management. **Methods:** 50 adult inpatients with a diagnosis of heart failure were assessed between January to February 2010. Patient's clinical features were evaluated; investigations performed and medications prescribed were also assessed. **Results:** Of the 50 patients, 26 were men and 24 were women. All patients were between the ages of 60 and 99. 44% of patients had clinical symptoms consistent with NYHA stage III. Most of the patients (90%) had a subsequent echocardiogram after admission to classify the type of heart failure; 54% had left ventricular systolic dysfunction and 36% had left ventricular diastolic dysfunction. All patients were prescribed furosemide to improve symptoms if needed and 66% of patients were on mortality decreasing drugs, either ACEI and/or ARB and/or beta-blockers and/or digoxin. Non-pharmacological treatment of patients were poor with none of the patients being offered cardiac rehabilitation and only 1 patient had their mental state and mood checked. **Conclusion:** In hospitalised patients with chronic heart failure, symptom control is excellent and mortality decreasing drugs are well-prescribed. Non-pharmacological treatment is however very poor and assessment by heart failure nurses, cardiac rehabilitation and mental health assessment must be performed as per the NICE guidelines/local guidelines.

**P008**

## Epidemiologic, diagnostic and therapeutic profile of acute cardiac failure at CHU Ibn rochd

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**Introduction:** The epidemiologic data on cardiac failure are rare in Morocco **Objectives:** The objective of our work is to study the clinical, biological, therapeutic, and epidemiologic characteristics of acute cardiac failure and compare them with the other epidemiologic registers **Methods:** This was a prospective study of 564 cases of acute heart failure at CHU Ibn Ruchd -Cardiology Department and Intensive Care Unit and Emergencies. **Results:** The average age was of 64 +/-4 years. 41.36% of patients were women while 58.64% were men. Acute heart failure represented 29.46% of all cases while decompensated chronic heart failure represented 44.14%. The main cardiovascular risks noted in the study were: Diabetes (35%), Smoking (35%). and Hypertension (27%). Clinical classification according to the guidelines was as follows: decompensated heart ,failure (36.22%), pulmonary oedema (57% ), acute coronary syndrome with heart failure (34%). hypertensive heart failure (6 %), cardiogenic shock (16.78%), and right heart failure (19.56). The drug treatment consisted of Diuretics (89.11%) ,oral nitrates (19.66 %)Inotropic agents (26.13%). ..28 patients underwent mitral valve replacement with mechanical prosthesis. Among patients with coronary artery disease, 14 were revascularized by coronary bypass and 91 by coronary angioplasty. 3 patients received an implantable automatic defibrillator. The mortality rate was 12.6%. **Conclusion:** In General, our results are consistent with most of the European and American registers (such as ADHERE, OPTIMIZE,..). However, Our population was relatively younger with male predominance. Ischemic heart disease was the leading cause. low rate of heart failure with preserved systolic function.

P009

## Acute heart failure: clinical presentation, six months mortality and prognostic factors

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**Introduction:** Acute heart failure (HF) is a common but ill-defined clinical entity. **Objectives:** We describe patients hospitalised with acute HF in regard of clinical presentation, mortality, and risk factors for an unfavourable outcome **Methods:** We conducted a prospective study including 612 consecutive patients from our university center of cardiology hospitalised with acute HF, defined as new onset or worsening of symptoms and signs of HF **Results:** The mean age was 64 years and 56% were men. Twenty-nine percent had de-novo acute HF and 71% a decompensation of chronic HF. Clinical classification according to the guidelines was as follows: decompensated heart ,failure (36%), pulmonary oedema (57% ), acute coronary syndrome with heart failure (34%). hypertensive heart failure (6 %), cardiogenic shock (16%), and right heart failure (19%). Thirty-day mortality (11%) was increased in the presence of shock or elevated troponin T levels. Six months all-cause mortality (18%) increased in the presence of shock, left ventricular dysfunction,severe renal insufficiency, and age. **Conclusion:** This prospective study shows that despite modern treatment, morbidity and mortality of patients hospitalised with acute HF remain high.

P010

## Women and the acute heart failure

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**Introduction:** Acute heart failure (AHF) is a major and growing cause of in-hospital mortality in developed countries. Differences between males and females hospitalized for AHF were observed in all registries and clinical studies. **Objectives:** In this study, which concerns a sample from the African population, we compare some data from European, American, and Asian registries to our findings. **Methods:** Our analysis evaluates the gender differences in patients hospitalised for acute heart failure (AHF) at the Cardiology Center of CHU ibn rochd in Casablanca between January 2010 and December 2010. **Results:** Out of 564 patients included in this study, 41.48% were women with a mean age of 56+/-4 years and 58.52% were men with a mean age of 65 +/-4 year. Women had more frequently new-onset AHF, hypertension and valvular disease and less frequently coronary heart disease or dilated cardiomyopathy compared with men. Diabetes and anaemia were significantly more frequent in women, but Smoking, chronic obstructive pulmonary disease, peripheral arterial disease and renal failure were less common Atrial fibrillation and preserved left ventricular function were also more common in women. There were some gender differences in prescription of HF medication. Men were more often non-compliant with medication. **Conclusion:** Women frequently present with new-onset AHF. A significant gender difference exists in aetiology, ventricular function and comorbidities. Women's use of HF medication has improved. These findings emphasize the importance of individualised management and need for more comprehensive recruitment of women in clinical trials.

P011

## Echocardiography in acute myocardial infarction: prediction of heart failure in short-term follow up of patients treated by primary percutanoeus coronary interventions

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**Introduction:** Echocardiography has shown to be very usefull prognostic tool in assessment of left ventricular function (LVF) recovery after primary percutaneous coronary intervention (PCI) for acute myocardial infarction, but the role of preprocedural echocardiographic examination still remained inclear. **Objectives:** To assess the role of echocardiography performed before primary PCI for ST-segemnt elevation AMI in prediction of heart failure during in-hospital follow up period. **Methods:** We evaluated 143 (108 male, 35 female, mean age 57±11 years) consecutive patients presented with ST-elevation AMI who all underwent echocardiographic examination before successful primary PCI. Clinical and echocardiographic variables before primary PCI were correlated with the presence of congestive heart failure (CHF) during in-hospital period. **Results:** Among clinical and echocardiographic variables maximal serum creatine kinase value ($p<0.0001$), anterior AMI ($p<0.0001$), LV end-diastolic and end-systolic dimensions ($p=0.044$, $p=0.006$) and LV end-diastolic and end-systolic volumes ($p=0.003$, $p<0.0001$), LV ejection fraction (LVEF; $p<0.0001$), WMSI ($p<0.0001$), mitral regurgitation severity ($p=0.023$) and myocardial performance index (MPI; $p<0.0001$) were significant univariate predictors of CHF during in-hospital recovery period. However, the only independent predictor of in-hospital CHF was MPI ($p<0.0001$) assessed by multivariate logistic regression analysis. **Conclusion:** MPI obtained before the primary PCI was strong predictors of development of congestive heart failure during short-term in-hospital follow up period. Thus preprocedural echocardiography gives very important prognostic information about recovery of LVF in patients treated with successful primary PCI for AMI.

P012

## Combined stress echocardiographic cardiopulmonary exercise test in detection of diastolic dysfunction

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**Introduction:** Cardiopulmonary exercise testing (CPET) is very important prognostic tool for evaluation of patients with systolic heart failure. It is well known that diastolic heart failure and diastolic dysfunction are common cause of exercional dyspnea in pts with preserved left ventricular ejection fraction (LV EF). However, relationship between diastolic function and CPET parameters. **Objectives:** To determine the usfulness of combined Stress echocardiographic CPET in evaluation of patients with hypertension, exertional dyspnea and normal baseline systolic and diastolic function. **Methods:** We studied 47 pts (28 male, mean age 51±14 years), with the history of essential hypertension, exertional dyspnea and normal baseline echo characteristics (including normal baseline systolic and diastolic function). They all underwent CPET with supine ergometer with incremental ramp protocol, with breath by breath gas analysis, in combination with simultaneous 2D echocardiographic monitoring during exercise. Diastolic function was assessed analyzing transmitral flow pattern using pulse Doppler and tissue Doppler (TDI) of mitral annulus. Mitral E wave/E wave of mitral annulus = 8 was cut off for diastolic function. **Results:** Worsening of diastolic function was found in 13 (38%) pts during combined CPET stress echo test. Patients with diastolic dysfunction were older ($p=0.001$), and had lower VO2max ($p=0.0001$), shorter time to VAT ($p=0.028$) and shorter total exercise time ($p=0.017$), and higher VE/VCO2 slope ($p=0.0001$). However multivariant analysis showed that only VE/VCO2 was independant predictor of diastolic dysfunction during CPET ($p=0.001$; RR 1.68; 95%CI : 1.24 -2.24). We also found the strong correlation between VE/VCO2 slope and E/Em ($r=0.60$; $p=0.0001$) which can be also used for stratification of pts with diastolic dysfunction. **Conclusion:** Combined CPET stress echocardiography as a new test improves clinical assessment of diastolic function in patients with exertional dyspnea and normal baseline LV function. It adds more information to echocardiography and to CPET as a single tests. The best predictor of development of diastolic dysfunction during CPET was VE/VCO2 slope, showing the strong relationship with E/Em as a measure of diastolic function.

P013

## We should think about diastole after myocardial infarction: predictors of diastolic disfunction in patients treated with primary percutaneous coronary intervention

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**Introduction:** Diastolic dysfunction is a common complication of myocardial infarction even after successful primary percutaneous coronary interventions (PCI). However, predictors of LV diastolic dysfunction after PCI still remained unknown. **Objectives:** To define significant predictors of LV diastolic dysfunction after 6 months follow-up periodof pts treated with primary PCI for ST-segment myocardial infarction (STEMI). **Methods:** We studied 202 pts (151 male, 51 female; mean age 56±14 years), treated with primary PCI for STEMI. They all underwent echocardiographic examination before PCI, and were without signs of diastolic dysfunction. There were 94 pts with one-vessel and 108 pts with multivessel coronary artery disease (CAD). TIMI 3 flow was achieved after PCI in 188 (93%) pts, while 14 (7%) pts had TIMI 2 flow after PCI. **Results:** After 6 months follow-up period after PCI, LV diastolic dysfunction was detected in 35 (17%) pts. Univariate logistic regression analysis showed strong correlation of peak creatine kinase level (CK;$p=0.003$), duration of ischemic chest pain before PCI ($p=0.002$), anterior AMI ($p=0.025$), transmural MI ($p=0.001$), LV end-diastolic and end-systolic dimensions ($p<0.0001$) and volumes ($p<0.0001$), LV ejection fraction ($p<0.0001$), wall motion score index (WMSI; $p<0.0001$), mitral E wave deceleration time ($p<0.0001$), and myocardial performance index (MPI;$p<0.0001$) with LV remodeling. However, multivariate predictors of LV diastolic dysfunction after PCI were MPI before PCI ($p<0.0001$) and development of transmural MI ($p=0.014$). **Conclusion:** High preprocedural MPI and the presence of transmural MI were the strongest predictors of development of diastolic dysfunction in patients treated with primary PCI for STEMI. Thus, MPI measured on admission, before PCI represents global LV function predicting amount of myocardium potentially irreversibly damaged by AMI which is determinant of progressive worsening of LV diastolic properties during 6 months follow-up period after PCI.

P014

## Early detection of imminent heart failure in an ambulant population by quantification of atrial function using strain imaging

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**Introduction:** Heart failure is the most important cause of cardiac morbidity. Ageing may lead to an increase in myocardial fibrosis, causing remodeling in the myocardium and resulting in deterioration of myocardial function. **Objectives:** Early detection of cardiac dysfunction and imminent heart failure is imperative. For an adequate pump function of the heart three

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components of the contractile function of left atrium (LA) are of crucial importance: reservoir function (RF), conduit function (CF) and booster pump function (BPF). **Methods:** A study group of 395 male healthy patients was equally divided in 5 age groups: I: 11–20years; II:21–40y; III:41–60y; IV:61–80y; V:81–100y. Echocardiographic data were obtained for radial motion from roof of LA and for longitudinal motion from septum and lateral wall of LA. At roof, at septum and at lateral wall LA we measured strain values by onset and peak atrial contraction, by end A-wave, by aortic valve opening and closure, by peak RF, by rapid emptying LA and by end E-wave. Maximal exercise tests were performed to calculate percentage maximal exercise capacity: maximal performed load/calculated expected load x100 in %(PL/EL). **Results:** No significant differences between the groups in PL/EL: group I:121; II:122; III:118; IV:111; V:107. Unchanged left ventricular ejection fraction: I:76; II:73; III:75; IV:73; V:70. No statistically significant differences in peak systolic strain left ventricular wall: I:-25; II: -24; III:-23; IV:-24; V:-19. Strain by peak RF decreases significantly with age at lateral wall LA: I:119; II:116; III:103; IV:93; V:76; at roof: I:107; II:98; III:90; IV:80; V:62; at septum: I:116; II:114; III:100; IV:84; V:70. Progressive decrease with age of CF by strain: I:84; II:82; III:61; IV:46; V:27. Progressive increase of strain lateral wall LA end E-wave: I:17; II:24; III:28; IV:33; V:39. BPF progressively increases with age: roof: I:22; II:29; III:33; IV:34; V:36; lateral wall: I:21; II:30; III:35; IV:38; V:39; septum: I:22; II:25; III:29; IV:31; V:32. **Conclusion:** Strain imaging permits us to quantify the contractile function of LA, resulting in early detection of LA dysfunction before significant alterations in systolic left ventricular function occur and before a significant decrease of exercise capacity is observed. LA function expressed earlier than left ventricular function the myocardial contractile reserve and provided a first warning for heart failure, arrhythmias and thrombo-embolic events.

## P015

## Changes in sodium and renal function may contribute to the beneficial effects of eplerenone on mortality and morbidity in the EPHESUS trial

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**Introduction:** In the EPHESUS trial, eplerenone significantly improved mortality and morbidity outcomes in patients post MI with left ventricular systolic dysfunction (LVSD) and heart failure (HF) or diabetes (DM) by unclear mechanismsr. Aldosterone alters potassium, sodium and magnesium that are regulated by the kidneys which aldosterone also affects. In animal studies, sodium exacerbates vascular inflammation and NO inactivation by aldosterone. Potassium is the predominant electrolye of concern with mineralcorticoid receptor antagonists. The role of sodium and magnesium has not been examined. **Objectives:** This post hoc analysis examines the effect of eplerenone on serum sodium, potassium, magnesium and GFR and their relationship to outcomes **Methods:** 6632 patients with signs and symptoms of HF or DM with LVSD received eplerenone (n=3319) or placebo (n=3313) 3–14 days after AMI. Serum sodium and potassium, and GFR were determined at baseline, during and end of study. Endpoints included all-cause death, CV death or CV hospitalization, CV death and sudden cardiac death. The effect of eplerenone was examined by comparing changes from baseline in both groups. Association of baseline electrolytes and GFR with endpoints was examined by Cox Regression stratified by geographical region including treatment, sodium, potassium, and GFR in the model. The effect of eplerenone on changes from baseline in electrolytes and GFR was examined by analysis of covariance with treatment group, geographical region, baseline sodium, potassium, and GFR in the model. **Results:** Changes from baseline are shown in Table 1. Cox Regression analysis shows that changes in sodium and GFR are significantly ($p<0.01$) related to all mortality/morbidity outcomes.

| | Observed Mean in Eplerenone (A) | | Observed Mean in Placebo (B) | | Difference in LS Means (A-B)† | |
|---|---|---|---|---|---|---|
| Lab Test | n | Change | n | change | (95% CI) | p-Value† |
| GFR mL/min/1.73 $m^2$ | 3065 | -3.54 (18.5) | 3026 | -1.72 (19.3) | -1.93 (-2.77, -1.09) | <0.001 |
| Potassium (mmol/L) | 3251 | 0.28 (0.6) | 3237 | 0.17 (0.6) | 0.12 (0.10, 0.15) | <0.001 |
| Sodium (mmol/L) | 3077 | 0.89 (5.5) | 3042 | 1.41 (4.9) | -0.49 (-0.69, -0.28) | <0.001 |

**Conclusion:** Eplerenone was associated with modest decrease in GFR and modest elevation in serum potassium and sodium. These changes may be markers of pharmacological action. In post MI with LVSD and HF, modest worsening of renal function does not preclude the favorable effect of eplerenone on mortality and morbidity outcomes. Potassium sparing could contribute to this clinical benefit.

## P016

## Effects of benazepril on cardiac function in Chinese patients with chronic heart failure: a meta-analysis of randomized controlled trials

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**Introduction:** Benazepril is one of the most prescribed angiotensin-converting enzyme inhibitors in China. The effect of Benazepril on cardiac function in Chinese chronic heart failure patients is unknown. **Objectives:** The objective of the meta-analysis was to evaluate the effects and tolerability of benazepril in Chinese patients with chronic systolic heart failure. **Methods:** We searched the Cochrane, PubMed, EMbase, CBM, and CNKI databases from January 1989 to November 2010 for relevant studies. Two investigators identified randomized controlled trials (RCTs) independently according to predefined inclusion and exclusion criteria, and extracted data. Statistical analysis was performed using the Stata 11 software. **Results:** 16 studies with 1,403 Chinese patients of chronic systolic heart failure fulfilled the inclusion criteria. The dose of Benazepril ranged from 10 to 40 mg daily. Compared with blank treatment, Benazepril treatment was associated with a significant improvement in left ventricular ejection fraction (LVEF) from baseline to follow-up (WMD=6.5%; 95% confidence interval [CI]:0.9%, 12.0%; P=0.022). Benazepril was similar to ARBs in improving LVEF (P=0.674), reducing left ventricular end-diastolic diameter (LVEDD) (P=0.511) and improving cardiac output (P=0.363). The combination therapy of Benazepril and ARB was superior to ARB monotherapy in reducing LVEDD (95%CI:0.82–3.37;P=0.001),but LVEF was comparable between patients with ACEI/ARB combination therapy and patients with ARB monotherapy(P=0.105). Cough is the most common side effect in patients after benazepril treatment, with a prevalence of 11.9%. Other side effects were rare. **Conclusion:** Benazepril is efficacious and safe in the treatment of chronic systolic heart failure in Chinese.

## P017

## Nobiletin, a citrus flavonoid, prevents systolic functional deterioration after myocardial infarction in rats

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**Introduction:** Heart failure continues to be associated with high morbidity and mortality. To establish a pharmacological therapy for heart failure, we screened a natural product library and found that nobiletin was a candidate of therapeutic agents for heart failure. Nobiletin is a poly-methoxy-flavonoid isolated from citrus peel and has a various activity including anti-tumor and anti-inflammation effects. **Objectives:** The purpose of this study was to examine the effect of nobiletin on hypertrophic responses in cardiomyocytes and heart failure after myocardial infarction (MI) in rats. **Methods:** Primarily cultured cardiomyocytes from neonatal rats were pre-incubatedwith nobiletin (10, 40, 150 nM) for 2 hours and then stimulated with saline or 30 $\mu$M phenylephrine (PE). After 48 hours, we stained these cells with a b-myosin heavy chain (b-MHC) antibody and measured myocardial cell surface areas. Furthermore, the relative endothelin-1 (ET-1) and atrial natriuretic factor (ANF) promoter activities were measured by reporter assay after the transient DNA transfection. Nine week-old rats were subjected to sham operation or MI. One week later, the rats with moderate-sized MI (left ventricular fractional shortening (LVFS) <40%) were randomly assigned to the treatment with vehicle (n=5) or nobiletin (20 mg/kg/day, n=5) for 6 weeks. After treatment, we evaluated the treatment effects by echocardiographic and histological examinations. **Results:** Immunocytochemistry analysis indicated that nobiletin significantly inhibitedthe PE-induced increase of cell surface areas. Nobiletin significantly repressed PE-induced ET-1 and ANF transcription in a dose-dependent manner. There were no differences between the 2 groups in all parameters examined by echocardiography at baseline. After treatment, LVFS was significantly higher in the nobiletin group (26 %, $p<0.01$) than the vehicle group (17 %). The LV posterior wall thickness was significantly thinner in the nobiletin group (1.3 mm, $p<0.01$) than the vehicle group (2.3 mm). The histological analysis showed that nobiletin significantly suppressed MI-induced increases in myocardial cell diameter and perivascular fibrosis compared with the vehicle group. **Conclusion:** Nobiletin represses hypertrophic responses in cardiomyocytes and prevents the deterioration of systolic function after MI *in vivo*. Thus, this non-toxic dietary compound may be applicable to heart failure therapy in the clinical setting.

## P018

## Balance of collagen at patients with chronic heart failure, normal LV ejection fraction depending on type of left ventricle filling and E/e ratios

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**Introduction:** High death rate of patients with diastolic heart failure (DHF) is partly connected with unreliability of noninvasive diagnostics. As it is known, a principal cause contributing to a high pressure of left ventricular (LV) filling and, accordingly to the appearance of symptomatic heart failure of patients with diastolic dysfunction (DD) is the presence of cardiac fibrosis as an important determinant of abnormal myocardial stiffness. **Objectives:** to assess severity of LV DD (by evaluating both Doppler and biochemical indexes) in patients with chronic heart failure (CHF), normal LV ejection fraction (EF) in different types of LV filing depending on type of left ventricle filling and/é ratios **Methods:** Plasma level of carboxy -terminal propeptide of procollagen type I (PIP, marker of collagen type I synthesis), carboxy-terminal telopeptide of collagen 1 (CITP), matrix regulatory proteins matrix metalloproteinase (MMP)-1, tissue inhibitors of matrix metalloproteinase (TIMP)-1, transforming growth factor (TGF)-$\beta$, N-terminal fragment of brain natriuretic peptide (NT-proBNP) and Doppler parameters (ratios of early mitral inow velocity [E] to early diastolic myocardial velocity[é] and of mitral E/A ratios were assessed in 51 patients with CHF and LVEF >50% . **Results:** Ranging of patients on type of filling LV (among 51 patients 35 had mild DD (or impaired relaxation) and 16 had severe DD (pseudonormal or restrictive LV lling pattern) hasn't allowed to reveal distinctions under the maintenance of biochemical markers of balance of collagen. Patients with a high pressure of LV filling (/é ≥13) (n=15) had higher mean NYHA class, NT-proBNP, ÒIMP-1 and TGF - $\beta$ and PIP/CITP (in all cases p <0,05), and lower level of CITP and P-1/ÒIMP-1(in both cases p <0,1) in comparison with patients with E/é <13 (n=36). **Conclusion:** Diastolic pressure of LV, but not a type of its filling, reflects expression of myocardial fibrosis.

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**P019**

## Influence of pacemaker implantation on cardiac function parameters in patients with an implanted percutaneous aortic valve

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**Introduction:** Percutaneous transaortic valve implantation (TAVI) improves mortality and morbidity in patients with symptomatic aortic stenosis, due to the decrease of transaortic valve gradient. AV block is common in these patients, and 20–30% will require definitive pacemaker implantation. It is well known the deleterious effect of pacemaker stimulation on cardiac function parameters. **Objectives:** The objective of the study was to analyze the effect of transaortic valve implantation (TAVI) on cardiac function parameters and the role of pacemaker implantation in this context. **Methods:** We analyzed data of 70 consecutive patients that underwent TAVI (45 women, mean age 83±5 years) with the CoreValve prosthesis in our Institution. Six month follow up echocardiogram was compared with an echocardiogram performed before valve implantation. The following parameters were studied: left ventricle ejection fraction (LVEF) and systolic (LVESD) and diastolic (LVEDD) left ventricle diameters, volume and atrial area, systolic pulmonary artery pressure (SPAP). **Results:** One third of the patients suffered complete AV block that required pacemaker implantation (23 patients, 33%). Table shows comparisons of cardiac function parameters in the whole group and according the presence/absence of pacemaker.
**Image/graph I:**

| | Total | | p | Pacemaker (n=23) | | p | Pacemaker free (n=47) | | p |
|---|---|---|---|---|---|---|---|---|---|
| | Before | 6 month | | Before | 6 month | | Before | 6 month | |
| LVEF, % | 60±11 | 61±8 | 0.1 | 61.3±12 | 61.6±8 | 0.87 | 59.2±11 | 61.3±9 | 0.03 |
| LVEDD, mm | 46±7 | 45±8 | 0.136 | 46.3±6 | 47.2±8 | 0.63 | 46.5±7 | 43.4±8 | 0.02 |
| LVESD, mm | 31±7 | 30±7 | 0.132 | 30.1±7 | 30.4±7 | 0.87 | 31.5±6 | 30.1±6 | 0.15 |
| LA area, $cm^2$ | 23.8±4 | 24±5 | 0.72 | 24±5 | 23.8±5 | 0.76 | 23.7±4 | 24±5 | 0.5 |
| LA volume, ml | 79.8±23 | 80±26 | 0.94 | 79.5±26 | 81.3±28 | 0.51 | 80±21 | 79±25 | 0.8 |
| SPAP, mmHg | 47.4±17 | 44±16 | 0.21 | 46±16 | 43±12 | 0.44 | 48±18 | 45.6±18 | 0.3 |

**Conclusion:** TAVI improves left ventricle function parameters in pacemaker free patients, but not in pacemaker dependent patients. Studies are needed addressing the indications for permanent pacemaker implantation in patients with the CoreValve prosthesis.

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**P020**

## Modulation of CaMKII expression by estrogen confers cardioprotection in isoproterenol-induced stress cardiomyopathy in mice

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**Introduction:** Stress cardiomyopathy (SCM) is characterized by a transient contractile dysfunction of the left ventricle with a typical contraction pattern. Recently published data could show a sympathoadrenergic overstimulation in SCM. So far, the increased incidence of SCM in postmenopausal females remains unclear. **Objectives:** The aim of this study was to investigate the impact of estrogens in a mouse model of SCM. **Methods:** For simulation of catecholamine overload, female wild-type mice (WT) and ovariectomized mice (OVX) received a single subcutaneous injection of isoproterenol (5 mg/kg BW). Healthy female mice served as control group. Functional parameters were investigated by echocardiography at baseline as well as 24 and 48 hours after isoproterenol injection. Morphological parameters were assessed by immunohistochemical staining of serial left-ventricular cross sections. Calcium-regulatory proteins were observed by western blot analysis and quantitative real-time PCR. **Results:** Isoproterenol led to a contractile dysfunction in both study groups after 24 hours (Ejection fraction WT: 50.94±2.16%, OVX: 50.52±1.32%, Control: 66.26±1.47%). The dysfunction was mainly due to a pronounced hypokinesia of the interventricular septum (IVS). WT mice revealed a normalization of the left ventricular function after 48 hours, while function was still affected in OVX (Ejection fraction WT: 61.29±2.50% vs. OVX: 52.58±1.95%, $p<0.05$). Structural alterations could not be observed either in WT or in OVX. Molecularbiological analysis revealed an increased expression and protein amount of the calcium/calmodulin-dependent protein kinase II (CaMKII) in OVX compared to WT ($p<0.05$) with a maximum in the IVS ($p<0.01$). In addition, an increased apoptosis-rate could be observed in OVX mainly in the IVS. Furthermore, WT mice showed a strong activation of the cardioprotective PI3K/Akt-pathway detected by an increased phosphorylation of Akt ($p<0.01$). In OVX, no significant differences in the protein amount of phosphorylated Akt could be observed. **Conclusion:** Excessive catecholamine stimulation causes a prolonged contractile dysfunction in estrogen-deficient mice. This is due to a significant upregulation of CaMKII, which leads to an increased number of apoptotic cells. Therefore, CaMKII represents a potential key target in the therapy of stress-induced cardiomyopathy.

**P021**

## Cardiac function at chronic heart failure patients with hepathopathy

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**Introduction:** There are few works on studying the association between ventricle function and systemic disorders **Objectives:** To studying of an association between hepatic and cardiac function at patients with chronic heart failure (CHF). **Methods:** 82 patients from 22 to 58 yrs (mean 44,2±1,8, males/females 61/21) are included. CHF has been caused by ischemic (n=25) and idiopathic dilated cardiomyopathies (DC, n=56). Echocardioscopy and biochemistry (aspartate (AsT) and alanine transaminase (AlT), total bilirubin (TB) measuring) were made. After initial investigation all patients are divided on two: I (with liver abnormalities, n=28; 43,7±2,1 yrs) and II (without hepatopathy, n=54, 41,4±1,9 yrs) groups. **Results:** The analysis of diseases severity showed that differences of NYHA class was comparable (3,1±0,4 vs 2,9±0,6, $p>0.05$), but I gr pts characterized by prevalence of right ventricle insufficiency: oedema, hepathomegaly, swollen jugular veins. The echocardioscopy results shown that I group pts were characterized rather by the worst LV function (LV ESV -188,2±8,4$mm^3$ vs 159,4±9,2 $mm^3$ accordingly, p=0,04 and LV EF - 36,8±2,2% vs 42,7±1,6%, p=0,03). The given changes were accompanied by increasing of right ventricle diameter at I gr pts on 15,8% (4,4±0,15mm vs 3,8±0,18, p=0,03) and RV EF decreasing on 6,4% (42,8±2,1% vs 49,2±1,9%, p=0,04). The revealed feature of patients with liver dysfunction also was tricuspid regurgitation of various degree, registered on 25% more versus II gr patients ($\chi^2=11,4$; p=0,000). **Conclusion:** The 37.2% ptswith various etiology CHF had signs of hepatic dysfunction. Hepatic tests abnormalities associated with right ventricle insufficiency symptoms increasing and worsening of left and right heart function.

**P022**

## Management of heart failure with preserved and impaired systolic function: the New Zealand heart failure registry

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**Introduction:** Heart failure with preserved systolic function (HFPSF) is common and to date, there is no evidence based treatment options to improve morbidity and mortality **Objectives:** The incidence and management of HFPSF is unknown in New Zealand. We report our experience with the New Zealand Heart Failure Registry (NZHFR). **Methods:** NZHFR is a national, prospective, observational, web-based registry. We compared characteristics, treatments and outcomes of HFPSF and heart failure with impaired systolic function, with EF<50% (HFISF). **Results:** A total of 1551 patients were enrolled, between July 2006 and Aug 2011 with 1173 patients who had echocardiograms performed included in this analysis with 90-day follow up data available in 91% (1071/1173). 870 patients had HFISF (mean age 67.6 years, 71% males) with 303 patients with HFPSF (mean age 78 years, 45% males). HFPSF had a higher prevalence of hypertension (62% vs. 49%, P=0.0002) and atrial fibrillation (62% vs. 51%, P=0.0006) and lower prevalence of Ischaemic heart disease (36% vs.47%, P=0.0016). Discharge medications and outcomes are shown in the table.

| Discharge Medications | HFPSF | HFISF | P value |
|---|---|---|---|
| Diuretics | 277/287 (97%) | 816/839 (97%) | 1.000 |
| ACE-I/ARBs | 209/287 (73%) | 734/839 (87%) | <0.0001 |
| Beta blockers | 211/287 (74%) | 687/839 (82%) | 0.0029 |
| Aldosterone antagonists | 62/287 (22%) | 323/839 (38%) | <0.0001 |

| Outcomes | HFPSF | HFISF | P value |
|---|---|---|---|
| Median length of stay | 7days | 7 days | |
| In-hospital mortality | 16/303 (5%) | 31/870 (4%) | 0.232 |
| Mortality at 90-day follow up | 32/270 (12%) | 88/801 (11%) | 0.738 |
| Hospital readmission at 90-days | 27/270 (10%) | 102/801 (13%) | 0.279 |

**Conclusion:** 1 in 4 heart failure admissions are with HFPSF in the NZHFR. When compared to HFISF, Heart failure patients with preserved systolic function are predominantly elderly and female, more likely to have Hypertension, Atrial fibrillation and Non-ischaemic aetiology and less likely to receive Beta Blockers, ACE-Inhibitors and Spironolactone. No difference is noted in short term mortality or readmissions.

**P023**

## Effects of thyroid function normalization on clinical, haemodynamic and neurohormonal statement in patients with congestive heart failure and subclinical hypothyroidism

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**Introduction:** There is no effective treatment of patients with congestive heart failure (CHF) without LV systolic dysfunction. Subclinical hypothyroidism (SH) is associated with an increased risk of CHF whereas levothyroxin(L-T(4)) replacement therapy of SH is not obligatory.

**Objectives:** Effects of L-T(4) replacement therapy on clinical statement, quality of life ,LV diastolic function, blood pressure,arterial stiffness, endothelial function, and NT-proBNP level in patients with SH and CHF with normal systolic function receiving standard baseline therapy of CHF. **Methods:** Forty-two patients (32 women,10 men; mean age 65+/-7,8 years) with SH and diastolic dysfunction by Doppler-echocardiography and NYHA functional class I-II (FC) stable CHF were randomized receive or not L-T(4)replacement therapy. TDI-derived early (Em) and late (Am) diastolic velocities, isovolumetric relaxation time (IVRT) and destilaration time (DT), 6-min walk distance(6MWD) and quality of life (Minnesota Living with Heart Failure Questionnaire, LHFQ and Visual Analogue Scale,VAS), baPWV, flow-mediated dilatation (FMD), mean blood pressure and NT-proBNP level were assessed initially and after 6 months in the group without L-T(4) therapy and 6–10 months in the group receivingL-T(4) therapy (after attaining euthyroidism, adjusted mean TSH=2,3±1U/mL). **Results:** The treatment with L-T(4) was associated with increase in 6-MWD ($p<0.001$ between groups) and improvement quality of life in LHFQ and VAS($p<0.001$ between groups).L-T(4) -treated patients in the subgroup with impaired relaxation (n=16) showed a significant increase in Em ($p<0.05$) and a subsequent increase in the Em/Am ratio ($p<0.05$), whereas DT significantly reduced ($p<0.05$). No significant change in any of these parameters was observed in the untreated SH subgroup with impired relaxation (n=15).L-T(4)treatment was associated with decrease in SBP (13215 to12113 mmHg, $p<0.01$), DBP (8110 to 759 mmHg, $p<0.01$) and baPWV (14,32,2 to 13,51,4м/с, $p<0.01$),improving EDV (3,14,2 to 7,84,1,%, $p<0.001$). No significant changes in any of these parameters were observed in the untreated SH group. There was a significant increase in NT pro-BNP level in L-T(4)treating group(227(156;348) to 94(151;418) ($p<0.01$), while no significant changes were observed in group without L-T(4) therapy. **Conclusion:** Our data shows that L-T(4) therapy canoptimize treatment of patients with CHFand normal systolic LV function and SH. L-T(4) therapy leads to increase of NT-proBNP level in those patients.

**P024**

## The differences in the ratio of noncompacted to compacted layers in normal subjects and patients with left ventricular noncompaction

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**Introduction:** Two-Dimensional (2-D) echocardiography (echo) is of great value for diagnosis of left ventricular noncompaction (LVNC). In 1990, Chin first diagnosed LVNC using 2-D echo. Now echo has become a major modality in LVNC diagnosis in developing countries. Nevertheless, so few have investigated the echo views of 2-layer structure of ventricular myocardium in normal subjects in comparison with LVNC patients (pts). **Objectives:** The objective of this study, therefore, was to investigate the wall thickness and the ratio differences of noncompacted to compacted layers of LV wall in a cohort of Chinese normal subjects with comparison of LVNC patients. **Methods:** Standard 2-D echo was performed in 72 Chinese normal subjects and 55 LVNC pts. Under the parasternal short axis view we evaluated the wall structure at the left ventricular papillary muscle level. The thickness and the ratio of left ventricular noncompacted and compacted layers were measured in end systolic phases. **Results:** In normal subjects, The ratio of noncompacted and compacted layers was <1 with normal LV size and ejection fraction. The contrary, LVNC pts had significantly reduced EF, enlarged left ventricle and the ratio of noncompacted/compaced layers >2. Chronic congestive heart failure was the primary clinical manifestation. see table1.

Table1.Echocardiographic features of Chinese LVNC cohort and normal subjects

| | patients with LVNC | Normal adults | *p Value* |
|---|---|---|---|
| No. | 55 | 72 | |
| Age (yr) | 58±15 | 39± 17 | <0.01 |
| Female | 25(45%) | 36(50%) | NS |
| LVEDD (mm) | 67±11 | 46± 5.0 | <0.05 |
| N/C (lateral wall) | 2.28±.62 | 0.60±0.16 | <0.01 |
| N/C (posterior wall) | 2.33±.74 | 0.59±0.14 | <0.05 |
| Ejection Fraction | 0.35±0.09 | 0.66±0.07 | <0.01 |

LVEDD: left ventricular end diastolic dimension; N/C: noncompaction layer/compaction layer;

**Conclusion:** Most of Chinese normal subjects have a ratio of noncompacted/compacted ratio <1. The measures of thickness and the ratio of noncompacted and compacted layers in normal subject can be used as the reference for the diagnosis of left ventricular noncompaction myocardium in Chinese.

**P025**

## Extracorporeal shockwave myocardial reperfusion (ESMR) therapy improves left ventricular dyssynchrony

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**Introduction:** Left ventricular (LV) dyssynchrony is frequently observed in patients with ischaemic myocardium and is recognized as an adverse predictor of clinical outcome. ESMR on the other hand, is a novel therapy for refractory angina in patients with severe coronary artery disease not amenable for conventional revascularization therapy (CABG or PCI). ESMR induces angiogenesis in the area of ischaemic myocardium which later translates into improvement in clinical angina symptoms. **Objectives:** The objective of this study is to analyse the impact of ESMR on LV dyssynchrony in patients with severe coronary artery disease. **Methods:** We examined 20 consecutive patients with refractory angina due to severe coronary artery disease which is deemed unsuitable for conventional revascularization. Echocardiography with tissue Doppler study was performed for all patients before undergoing ESMR therapy of 9 weeks duration and was repeated again 3 months after completion of ESMR therapy. The degree of left ventricular dyssynchrony was expressed as Yu index. Comparison of pre and post ESMR LV dyssynchrony was then compared using paired t-test. **Results:** Pre and post ESMR LV dyssynchrony in all 20 patients was 30.9 +/-19 (pre) vs 26.9 +/-11.5 (post), P-value = 0.385. However, comparative analysis of patients with initial (pre-ESMR) LV dyssynchrony with Yu index of 32 or more revealed pre and post ESMR mean values of 42.8 +/-15.6 (pre) vs 26.4 +/-8.6 (post), P value = 0.008. **Conclusion:** Our study suggests a potential beneficial effect of ESMR therapy in improving LV dyssynchrony in a sub-set of patients (Yu index of more than 32) with severe coronary artery disease not amenable for conventional revascularisation. Further study is warranted to gather more evidence in supporting this finding.

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**P026**

## The value of 99mTc-MIBI radionuclide myocardial perfusion imaging in diagnosis of ischemic and idiopathic dilative cardiomyopathies

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**Introduction:** Noninvasive differentiation of ischemic and nonischemic origin of heart failure with cardiomegaly is still problematic. **Objectives:** To evaluate radionuclide regional perfusion of the myocardium and to compare data with 2D echocardiography data in differentiating between ischemic and idiopathic dilative cardiomyopathies. **Methods:** In total data obtained from 60 patients (pts) with cardiomegaly (left ventricle end-diastolic dimension index more than 32mm/m$^2$ and ejection fraction less than 35%): Group I consisted of 30 patients with idiopathic dilative cardiomyopathy. Group II consisted of 30 patients with ischemic cardiomyopathy. 2D echocardiography examination and$^{99m}$Tc-MIBI radionuclide myocardial perfusion imaging have been performed for each patient before coronary angiography was done. **Results:** Wall motion score index in the area of the left anterior descending branch circulation for pts of the 2$^{nd}$ group was statistically significantly lower in comparison with pts of the 1$^{st}$ group. Such a parameters of the radionuclide myocardial perfusion imaging as an area of insufficient myocardial perfusion (AIMP) in right coronary artery area (RCA), and in anterior descending branch of the left coronary artery (LAD), degree of insufficient myocardial perfusion in anterior descending branch of the left coronary artery have been informative for prediction of coronary arteries lesions on coronary angiography. A multiple logistic regression model was created in order to evaluate the risk of possible coronary arteries lesions, and in this way determine the etiology of myocardial damage. A total score B, consisting of the findings of myocardial perfusion, enabled to make prognosis of more than 50 % narrowing of coronary arteries with high prognostic value of this model. The score B = AIMP-RCA + 2AIMP-LAD + 4DIMP-RCA. For those pts with score B less than 11, the coronary arteries were without significant lessions, thus was possible to exclude ischemic cardiomyopathy and make a diagnosis of idiopathic dilative cardiomyopathy. **Conclusion:** The differentiation of the etiology of cardiomyopathy is possible without performance of such an invasive instrumental investigation as coronary angiography when using the informative data from$^{99m}$Tc-MIBI radionuclide myocardial perfusion imaging by mean of the multiple logistic regression model with predictive value of 90 % sensitivity and 91,5 % specificity for patients with ischemic heart failure origin and cardiomegaly.

**P027**

## Myocardial dysfunction after subarachnoid hemorrhage

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**Introduction:** Cardiac dysfunction and injury in subarachnoid hemorrhage suggests a combination of neural and humoral mechanisms where catecholamines are directly implicated. Clinical recognition of cardiovascular dysfunction in subarachnoid hemorrage is based on hemodynamic changes, electrocardiographic, echocardiographic findings, and expression of cardiac-specific biomarkers **Objectives:** Describe cardiovascular dysfunction in patients with subarachnoid hemorrhage **Methods:** Between 2008–2009, 26 patients presenting with subarachnoid hemorrhage were identified and prospectively evaluated in four centers of North America. Electrocardiograms, echocardiograms and cardiac biomarkers were reviewed in all patients, All data was centrally interpreted in one institution by experienced cardiologists. **Results:** 26 patients, 59% female 41% Male, mean age: 53.5 ± 12.2 years, mean Left Ventricle Mass 145.5 ± 59.2 grm, Stroke Volume 70.2 ± 12 cc, Ejection fraction 60.3 ± 5.2 %, Cardiac Output 5.7 ± 1.6 Lts/min, Left Ventricle Diastolic Volume 95.9 ± 18.5 ml, Left Ventricle hypertrophy identified in 37.5% of patients, no cases of diastolic dysfunction identified in this series of patients. Wall motion abnormalities identified in 6.3% of patients. The most frequent electrocardiographic abnormalities were QT prolongation in 31.6% of patients, 31.3% abnormal repolarization, T Wave inversion in 6.3 % and ST Depression in 6.3%, no cases of ST elevation. Elevated cardiac biomarkers were identified in 27.2 % of patients. **Conclusion:**

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The Clinician should be familiar with the concept of "Neurogenic stunned myocardium," 1/3 of the patients who suffer of subarachnoid Hemorrhage present cardiac dysfunction and injury.

**P028**

## Effects of Waon therapy on hemodynamics, sympathetic nervous activity and oxidative stress in patients with chronic heart failure

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**Introduction:** It has been reported that Waon therapy (systemic thermal therapy) improved clinical symptoms, hemodynamics and neurohumoral factors in chronic heart failure (CHF) patients. **Objectives:** The purpose of this study was to clarify effects of Waon therapy on hemodynamics, sympathetic nervous activity and oxidative stress in patients with CHF. **Methods:** 17 male and 6 female patients,60±13 years, were eligible for this study who hospitalized in the cardiovascular center of Kitasato University Hospital because of CHF, NYHA II-IV. Waon therapy uses a far infrared-ray dry sauna, which is maintained at 60□and differs from traditional sauna. The patients were placed in this sauna for 15 min, and then after leaving the sauna, they underwent bed rest with a blanket to keep them warm for an additional 30 min. All patients were weighed before and after the therapy, and oral hydration with water was used to compensate for weight lost due to perspiration. Waon therapy was performed once a day, 5 days a week for 2–4 weeks. The blood pressure (BP), heart rate (HR), cardiothoracic ratio (CTR), left ventricular diastolic dimension (LVDd), left ventricular ejection fraction (LVEF), plasma catecholamine levels (epinephrine: EP and norepinephrine: NE), the plasma concentration of brain natriuretic peptide (BNP) and atrial natriuretic polypeptide (ANP) were measured. And oxidative stress was measured performing the d-ROMs test which determined plasma reactive oxygen metabolites(d-ROMs), whereas the antioxidant activity was assessed determining the biological antioxdant potential(BAP) before and 2–4 weeks after Waon therapy. **Results:** There were no significant differences in nutrition state, glicolipid metabolism, electrolyte, renal function before and after therapy. There were no significant changes in systolic and diastolic BP, HR. LVEF was significantly increased and CTR and LVDd were significantly decreased after Waon therapy as compared with those before the therapy. NE ANPand BNP were significantly decreased after Waon therapy, although there was no significant change in EP.The d-ROMs levels was significantly decreased, but there was no significant change in BAP levels. **Conclusion:** Waon therapy is effective for patients with CHF by improving hemodynamics, correcting elevated sympathetic nervous activity and decreasing oxidative stress.

**P029**

## Early features for left ventricular function abnormalities in patient with obstructive sleep apnea

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**Introduction:** Obstructive sleep apnea (OSA) is accompanied by several changes in the cardiovascular system. **Objectives:** We aimed to evaluate some early signs for pathological changes in the left ventricular function (LV) in patients with OSA and echocardiographic criteria for normal systolic and diastolic function. **Methods:** We examined 21 persons with newly diagnosed and non treated OSA, proven by polysomnography at the age between 28 and 48 years; 8 were females and 13-men; inclusion criteria: non treated OSA and normal parameters from the M-mode and 2-D trans-thoracic echocardiography; exclusion criteria: arterial and pulmonaryhypertension, known cardiovascular or respiratory disease; we performed tissue Doppler (TDI), strain and strain rate of the LV; we compared the data with the results in 20 healthy persons without any history and symptoms of sleep-related disorders and cardiovascular diseases.

**Results:**

1. all patients with OSA displayed impairment of the LV longitudinal strain: 16.1%±0.6%, compared to controls:-18%±0.8%;
2. 17 of the patients presented a decreased circumferential strain:-16.9%±0.5%, compared to controls:-18%±0.6%;
3. 19 of the patients had a decreased radial strain: +35%±1.2%, compared to controls+38%±0.7%;
4. the isovolumetric acceleration, performed by TDI was also diminished-for the septal mitral anulus -3.01±0.43 cm/sec, and for the lateral mitral annulus-3.1±0.59 cm/sec; the normal ratios for the healthy controls was–3.84±0.6 cm/sec for the septal mitral annulus and 4.1±0.58 cm/sec for the lateral mitral annulus;

**Conclusion:**

1. OSA is related with early abnormalities in the LV function, which is not clinically manifested, but can be detected before the development of structural pathology and echocardiographic criteria for systolic and diastolic dysfunction of the LV;
2. the most significant was the decrement of the LV longitudinal strain, which was observed in all patients with OSA;
3. strain, strain rate and the isovolumetric acceleration are promising methods for early detection of abnormal LV function in patients with OSA.

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**P030**

## Can the development of cardiac dysfunction in patients with liver cirrhosis and portal hypertension be predicted?

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**Introduction:** The development of cardiac dysfunction to extent of varying in severity heart failure is a common complication in patients with liver cirrhosis (LC) and portal hypertension (PH) but the pathophysiological mechanisms of cardiac disorders are not clarified yet. **Objectives:** To investigate the prognostic value of different morphological, functional and biochemical parameters for development of cardiac dysfunction in patients with LC and various degree of PH and to suggest a practical model for early detection og cirrhotic cardiomyopathy. **Methods:** In our research we studied 142 patients (94 men and 48 women, mean aged 54 ± 10 years) with LC of various ethiology and PH, aiming a precise determination of the causal relationship between the degree of PH, assessed by BAVENO IV and the corresponding cardiovascular alterations, assessed by electrocardiography, echocardiography and biochemical markers. **Results:** Our results showed significant deterioration in the parameters of cardiovascular function in patients with LC, correlating significantly with the severity of PH. However, a significant relation between the ethiological causes of the liver injury and cardiac disorders was not obtained. Based on these results we suggested a practical model for early detection of cirrhotic cardiomyopathy, which would be helpful for the complex management of patients with LC and PH, especially of those, candidates for liver transplantation. **Conclusion:** This condition might be suspected as already existing despite of the lack of echocardiographic data for alterations in cardiac structure and function when the following criteria are present:

1. Serum concentrations of BNP over 0.35 ng/ml, endothelin-1 over 19.0 pg/ml and aldosteron over 512 ng/ml
2. ECG recordings: ventricular extrasystolic beats ≥ II Lown class, prolonged cQT-interval > 400 ms, despite of the data in literature about its significance > 440 ms
3. Reduced blood flow velocity in v. portae under 5.8 m/sec, evidence of ascites, varices of the oesophagus over II degree and spleen size over 14 cm.

**References:**

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**P031**

## Right ventricular function in patients with end-stage renal disease starting dialysis therapy. A tissue doppler imaging study

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**Introduction:** Heart failure is a common problem in end-stage renal disease (ESRD) patients on long term dialysis. Detection of right ventricular (RV) dysfunction before starting dialysis may help to identify patients at higher risk of developing heart failure. However, little data exists regarding RV function in predialysis patients. **Objectives:** To assess RV function in predialysis patients using tissue Doppler imaging (TDI) derived myocardial performance index of RV (MPI-RV). **Methods:** Echocardiography including pulsed TDI of lateral tricuspid annulus was performed in 41 patients with ESRD before starting dialysis therapy and 12 age and gender matched healthy controls. RV dysfunction was defined as MPI > 40; a value above the median MPI-RV in controls. **Results:** Compared to controls, ESRD patients had significantly higher blood pressure and lower haemoglobin level. MPI-RV was significantly impaired in ESRD patients compared to control (0.61 vs. 0.4, p<0.001). RV dysfunction was identified in 23 ESRD patients (56%). ESRD patients had significantly lower e' velocity and e'/a' ratio as compared with controls. Pulmonary hypertension was detected in 15 (36.5%) patients. Among ESRD patients, no correlation was detected between MPI-RV and calculated mean pulmonary artery pressure (r= -0.13, p=0.47), pulmonary artery systolic pressure (r= -0.12, p=0.6), left ventricular ejection fraction (r=0.294, p=0.06),or MPI of left ventricle (r=0.3,p=0.065). ESRD patients with and without pulmonary hypertension had similar MPI-RV (0.6 vs.0.62, p = 0.32). **Conclusion:** Subclinical RV dysfunction - as estimated by TDI derived MPI - is prevalent among ESRD patients even before starting dialysis therapy. Pulmonary hypertension is not significantly associated with RV dysfunction in these patients.

**P032**

## Right ventricular function and haemodynamic changes in diffuse and limited scleroderma

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**Introduction:** Cardiopulmonary involvement in scleroderma (Ssc) patients portend poorer prognosis. Right ventricular (RV) dysfunction could be primarily related to pulmonary vascular disease particularly in those with limited Ssc or intrinsic myocardial disease. There remains a

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challenge to manage patient with advanced pulmonary arterial hypertension with secondary right ventricular dysfunction and concomitant primary right heart failure. Thus, it is of clinical importance to identify patients with higher risk which would benefit from early medical intervention. We aim to characterise systolic and diastolic RV function in limited and diffuse Ssc. **Objectives:** We aim to characterise systolic and diastolic RV function in diffuse and limited Ssc. **Methods:** Transthoracic echocardiography was performed in 45 consecutive scleroderma patients. In addition to RV fractional area change, Tei index, tricuspid (Tr) inflow parameters, tissue Doppler (TD) indices and pulse wave of hepatic vein were measured. **Results:** Forty five Ssc patients (24(53.3%) with limited disease, 21(46.7%) with diffuse disease); mean age 48.7±14 years old were recruited. There was no significant difference in RV systolic function between both groups. The mean RV fraction area change were 36.9% vs. 40.8%, mean Tei index were 0.72 vs. 0.57, mean TAPSE were 21.0mm vs. 22.3mm for diffuse and limited subtype respectively. In addition, there was a trend that those diffuse Ssc have worse diastolic function of the RV. The Tr deceleration time was slightly shorter in diffuse Ssc group (132±60ms vs. 159±70ms, p=NS), No difference was detected in Tr E/A ratio between the groups, neither were TD indices (Table 1). The estimated pulmonary arterial systolic pressure (PASP) was not significantly higher in those with diffuse Ssc (43.2±19mmHg vs. 38.3±22mmHg, p=NS). PASP correlated significantly with systolic function indices (RV fraction area change, r=-0.33; Tei index, r=0.54; p<0.05 for both) for the whole cohort.

**Image/graph I:**

Table 1 Selective Right ventricular echocardiographic characteristics of the study subjects

| | Diffuse scleroderma (±SD) | Limited scleroderma (±SD) | P |
|---|---|---|---|
| Age(years) | 45.6(±15) | 51.3(±13) | NS |
| RV fractional area change (%) | 36.9 | 40.8 | NS |
| TEI Index | 0.72 | 0.57 | NS |
| TAPSE(mm) | 21.0(±4.3) | 22.3(±4.5) | NS |
| Tricuspid E | 51.4(±13) | 52.8(±14) | NS |
| Tricuspid A | 41.0(±11) | 39.7(±9) | NS |
| Tricuspid E/A | 1.34(±0.5) | 1.34(±0.4) | NS |
| Tricuspid Deceleration time(ms) | 132(±60) | 159(±70) | NS |
| RVOT IVRT(ms) | 99(±29) | 95(±26) | NS |
| RV e' | 10.3(±1.7) | 12.0(±4.5) | NS |
| RV a' | 13.6(±5.2) | 12.7(±4.7) | NS |
| RV e'/a' | 0.86(±0.5) | 1.06(±0.6) | NS |
| RV s' | 12.4(±3.7) | 12.2(±2.9) | NS |
| RV E/e' | 4.9(±1.7) | 4.74(±1.9) | NS |
| TR max(cm/s) | 276(±69) | 250(±83) | NS |
| Estimated PASP(mmHg) | 43.2(±19) | 38.3(±22) | NS |
| Hepatic vein S/D | 1.25(±0.7) | 1.41(±0.5) | NS |

**Conclusion:** There is a trend that diffuse scleroderma has poorer RV systolic and diastolic function for which the cause is yet to be determined, be it due to microvascular disease or pulmonary vascular remodelling. However, the results may provide some mechanistic insights on subclinical haemodynamic changes in this patient subgroup. More haemodynamic studies are needed to better understand the RV function in scleroderma patients.

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**P033**

## Left ventricle hypertrophy and percutaneous aortic valve implantation: 6 month follow up study

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**Introduction:** Transaortic valve implantation (TAVI) constitutes a therapeutic alternative for high operative risk patients with severe aortic stenosis who have been rejected for surgery. The clinical benefit is mainly attributed to the decrease in the transaortic gradient. Data regarding follow up and other echo parameters are lacking. **Objectives:** We aimed to evaluate the effect of TAVI on left ventricle hypertrophy. **Methods:** A total of 70 consecutive patients suffering from severe symptomatic aortic stenosis were included in the study. Other inclusion criteria were: aortic valve area <1 $cm^2$ (<0.6 $cm^2/m^2$); aortic valve annulus diameter in the range 20–27 mm; diameter of the ascending aorta at the level of the sinotubular junction <or = 40 mm (small prosthesis) or <or = 43 mm (large prosthesis), and femoral artery diameter >6 mm. Six month follow up echocardiogram was compared with an echocardiogram performed before valve implantation. Transaortic gradients and left ventricle hypertrophy parameters were compared. **Results:** Table shows echocardiographic parameters studied. Peak and mean transaortic gradient, posterior wall and septum thickness decreased at six months follow up compared to pre-implantation values.

**Image/graph I:**

| | Before implantation | At 6 month | P |
|---|---|---|---|
| Peak transaortic gradient (mmHg) | 89.6±22 | 18.5±7 | <0.001 |
| Mean transaortic gradient (mmHg) | 53.3±12 | 9±3.7 | <0.001 |
| Posterior wall thickness (mm) | 14.1±2 | 13.2±3 | 0.001 |
| Septum thickness (mm) | 16.9±2 | 15.9±3 | 0.003 |

**Conclusion:** In patients with symptomatic aortic stenosis, the implantation of the CoreValve prosthesis results on decrease of transaortic gradients, septum and posterior wall thickness at 6 month follow up.

**P034**

## Efficacy of coronary artery bypass grafting in prevention of heart failure in patients with previous myocardial infarction

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**Introduction:** Coronary artery bypass grafting (CABG) is an effective treatment of patients with previous acute myocardial infarction and residual ischemia and leads to an improvement in both cardiac symptoms and prevention of heart failure, and improves global and regional left ventricle systolic function. **Objectives:** The aim of this study is to determine the advantage of CABG surgery compared to conventional medicamentous therapy in patients (pts) with significant residual ischemia and viable myocardium after acute myocardial infarction (AMI) by using two echocardiographic diagnostic parameters. **Methods:** We measured wall motion score index (WMSI) of the left ventricle and global left ventricle ejection fraction (EF) using area length method during hospitalization, 6 months after AMI and 72 months after CABG. These echocardiographic parameters were measured in order to evaluate residual ischemia after AMI and improvement in myocardial contractility after revascularization. **Results:** We included in our study 354 patients with AMI (242 men and 112 women). The average age was 60.82 ±10.66 years and 277 pts had STEMI while 77 pts had NSTEMI. All pts underwent CABG after AMI. Six months after AMI pts with residual ischemia had lower EF (39± 6%) while 72 months after revascularization theirs' EF was significantly increased compared to early post-AMI period (52± 8%) (p<0.0001). In pts without residual ischemia after AMI there was no significant difference in these echocardiographic parameters. **Conclusion:** By using two simple and reliable echocardiographic parameters it is possible to select patients who would have the most benefit from myocardial revascularization.

**P036**

## Right ventricular remodeling is associated with the sport discipline in Olympic water sport athletes

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**Introduction:** Long term elite endurance training is associated with eccentric left and right ventricular hypertrophy at rest. Total heart volume has been introduced as an independent predictor of maximal work capacity in both athletes and non-athletes. Recently, a disproportionate load of intensive exercise on the right compared to the left ventricle has been demonstrated in endurance athletes, which shows association with sporting discipline. Data on the right ventricular remodeling in athletes doing Olympic level water sports are limited. **Objectives:** Hungarian Olympic water polo athletes and kayakers have been selected for treadmill exercise test and cardiac magnetic resonance imaging (cMRI). **Methods:** Olympic athletes, including water polo players (n=32) and kayakers (n=20) were screened in this study using cardiac magnetic resonance imaging and results were also compared with non-athlete volunteers (n=73). Age (28.3±5.9 years) and female ratio (24.7%) was not different between athletes and controls Maximal oxygen consumption during treadmill exercise in controls was <50ml/kg/min, while it was higher in all athletes. **Results:** Left and right ventricular cavity size were significantly larger in athletes compared to non-athlete individuals and in males compared to females in athletes and non-athletes. In the athlete group there was no difference between elite water polo players and kayakers concerning left ventricular cavity size and function. Right ventricular remodelling was, however more pronounced in kayakers versus water polo players. Both, resting right ventricular end diastolic (RVEDVi) and end systolic volumes (RVESVi) indexed to the body surface area were higher in kayakers versus water polo players (RVEDVi: 132±7.2 $ml/m^2$ vs. 125±6.1 $ml/m^2$ mean±STD, $P$<0,03, RVESVi: 57±6.1 $ml/m^2$ vs. 53±4.9 $ml/m^2$ mean±STD, $P$<0,01). Right ventricular ejection fraction and stroke volume index were not different between the two groups of Olympic athletes. **Conclusion:** Olympic level water sport training protocols in kayakers versus water polo players results in attenuated right ventricular end diastolic and end systolic volumes indexed to the body surface area, without any difference between left ventricular remodelling determined by cMRI and no difference between oxygen consumption during treadmill exercise.

**Reference:**

Effect of the sporting discipline on the right and left ventricular morphology and function of elite male track runners: a magnetic resonance imaging and phosphorus 31 spectroscopy study. *Am Heart J* 2007;**154**:937–42.

**P037**

## Changes of apelin and PDCD5 levels in elderly patients with chronic heart failure

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**Introduction:** Heart failure is associated with complex neurohormonal changes and loss of cardiomyocytes. The apelin gene are present on endothelial cells, vascular smooth muscle cells, and cardiomyocytes. In preclinical models, apelin signaling exerts major effects on both

vascular tone and cardiac contractility. Apelin might be the most potent endogenous inotrope described so far, and it can cause vasorelaxation and causes a rapid fall in both arterial blood pressure and systemic venous tone with corresponding reductions in left ventricular afterload and preload. But there is no report about the apelin expression and the PDCD5 levels in elderly patients with heart failure publicated so far. **Objectives:** To detect the plasma levels of apelin and PDCD5 antibody in elderly patients with chronic heart failure. **Methods:** Forty patients with chronic heart failure (male 22, femal 18, aged 70 ±10 years old) and twenty normal volunteers were enrolled. Plasma samples of every subject were collected from limosis vein in the morning and kept at -80°C after centrifugation at 4°C. The plasma apelin-13 levels were measured with ELISA. Apelin kit was from R&D Co, USA. Tetrabenzidine(TMB) was used to colure, Optical density(ODvalue) were read at wavelength of 450nm. PDCD5 kit was from R&D Co,USA. Data was expressed as mean ± SD(±s), Statistical soft ware was SPSS16.0, 2-tailed Student *t* test and Pearson relative analysis were used. **Results:** (1) The plasma level of apelin in patients with heart failure was significantly lower than that in control group(2.18±0.80 in HF and 4.29±0.77 in normal subjects, $P<0.05$; (2) The plasma level of PDCD5 was increased in HF group compared with that in normal group(2.9±1.4 ug/mlvs 1.6±1.2 ug/ml, $P<0.05$). **Conclusion:** The plasma levels of apelin in patients with chronic heart failure were increased in heart failure, and the plasma levels of PDCD5 antibody were increased. These results suggested that detecting the apelin and PDCD5 levels might be useful in the diagnosis and evaluation the prognosis for heart failure.

**Reference:**

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**P038**

## Influence of IGF-1 on right ventricular function in patients with acute myocardial infarction with ST-segment elevation treated with primary PCI

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**Introduction:** There is known cardioprotective influence of IGF-1 on the heart, but the relationship between right ventricular (RV) function and IGF-1 in patients with myocardial infarction is unclear. The prognostic importance of RV dysfunction in heart failure (HF) has been suggested in pts with severe systolic HF. Tricuspid annular plane systolic excursion (TAPSE) is a simple echocardiographic measure of RV ejection fraction. **Objectives:** To assess the influence of IGF-1 concentration measured on the 1st day of STEMI on RV function. **Methods:** In 50 pts (M 34, age 56.3±10.8 yrs) with STEMI treated with PCI concentrations of IGF-1 and IGFBP-3 were measured 3 and 12 hrs after PCI. All pts had STEMI of left ventricle: 60% inferior, 26% anterior and 14% lateral wall infarction. Heart function was assessed acc. to Killip class on admission (68% Killip I, 26% Killip II, 6% Killip III); acc.to NYHA class 3 months after STEMI (22% NYHA I, 18% NYHA II, 14% NYHA III; and 44% pts remained without symptoms of HF). RV function was assessed acc. to ECHO on 3rd day of STEMI and after 3 month follow-up. In ECHO: TAPSE, RV area (RVA), RV systolic preassure (RVSP), R *atrium* area (RAA) and left ventricular ejection fraction (LVEF) were measured. **Results:** The mean value of IGF-1 concentration was significantly higher 12 hrs after PCI as compared to the mean value obtained 3 hrs after PCI (176±77 vs 162.8±62.5 ng/ml, p=0.02). There were no significant differences between the mean value of IGFBP-3 concentration 3 and 12 hrs after PCI (4.38±1.1 vs 4.25±1.1 ug/ml). The mean values of ECHO parameters measured on 3rd day of STEMI vs 3rd month follow-up were as follows: TAPSE 20.89±4.4 vs 21.14±5.48 mm; RVA 17.45±4.5 vs 16.78±2.39cm$^2$; RVSP 22.77±14.65 vs 30.37±11.38 mmHg; RAA 16.82±3.45 vs 17.04±3.25 cm$^2$; LVEF 47.8±6.6 vs 49.4±6.7 % (p=NS). Significant correlations were detected between IGF-1 (both 3 and 12 hrs after PCI) and TAPSE on 3rd day of STEMI (r=0.47, p=0.012 and r=0.43, p=0.031 respectively). But there were no correlations between IGF-1 and TAPSE after 3 month follow-up. There was no relationship between IGFBP-3 and TAPSE. **Conclusion:** 1. The mean value of IGF-1 concentration increases during the 1st day of STEMI treated with PCI and is significantly higher 12 hrs after PCI as compared to the mean value observed 3 hrs after PCI. 2. Increased IGF-1 concentration during the 1st day of STEMI treated with PCI is connected with improvement of the right ventricular function on 3rd day after PCI.

**P039**

## Increased plasma markers of inflammation and endothelial dysfunction in patients with different degree of chronic heart failure (CHF)

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**Introduction:** Despite being relatively recent, a growing and significant accumulation of experimental and clinical evidence has been observed that points to a gradual state of immune-inflammatory activation in patients with heart failure (HF). **Objectives:** To evaluate whether plasma biomarkers of inflammation and endothelial dysfunction differed in patients with different degrees of CHF, and to examine the association of these biomarkers with B-type natriuretic peptide (BNP). **Methods:** Biomarkers of inflammation [fibrinogen, hs-C-reactive protein (hs-CRP), tumor necrosis factor alpha (TNF-alpha)] and endothelial dysfunction [intercellular adhesion molecule-1 (ICAM-1) and vascular cell adhesion molecule-1(VCAM-1)] were measured in 120 patients with ischemic CHF and in 69 healthy controls. Biomarkers were determined by ELISA method. **Results:** Levels of fibrinogen, hs-CRP,TNF-alpha, ICAM-1 and VCAM-1 were markedly higher ($p<0.001$) in CHF patients than in healthy controls; Afterscheduling patients by NYHA classplasma biomarkers were significantly increased in those with more advanced disease compared with those with early stages of CHF. Fibrinogen and levels of hs-CRP and TNF-alpha were increased in patients with CHF, with the rise more prononunced in NYHA IV class($p<0.001$). In patients with NYHA I class, levels of ICAM-1 and VCAM-1 did not significantly differ from values obtained in controls. However, VCAM-1 levels were significantly higher in NYHA classes III/IV patients in comparison to NYHA I/II patients and controls ($p<0.05$;$p<0.01$, respectively).In addition, significant positive correlation of BNP with VCAM-1(r=0.19;p=0.038) and hs-CRP(r=0.228;p=0.012) were found but hs-CRP was correlated with LVEF(r=-0.189;p=0.039), showing clear relationship between the inflammatory markers and the severity of myocardial dysfunction. **Conclusion:** These results indicate that CHF is associated with increased levels of inflammatory and endothelial dysfunction markers. The measurement of these markers thus have potential to play an important role for risk assessment in patients with CHF.

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**P040**

## The interaction between vascular load and left ventricular performance in patients with congestive heart failure

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**Introduction:** Vascular load is an important determinant of ventricular function. This is particularly true of the failing heart, which is exquisitely load-sensitive. The impact of aortic stiffness on left ventricular (LV) function in patients with dilated cardiomyopathy (DCM) was not extensively studied **Objectives:** To assess the relationship between the aortic stiffness as measured by pulse wave velocity (PWV) and the left ventricular systolic and diastolic function in patients with DCM. **Methods:** 30 patients with DCM and 20 healthy subjects as a control group. All subjects underwent echocardiographic assessment of LV systolic and diastolic function and evaluation of aortic stiffness by measurement of aortic PWV . **Results:** The PWV was significantly higher in the DCM patients compared with the control group (7.24 ± 3.29 m/s vs 3.20 ± 1.09 m/s, $P<0.001$). According to PWV, DCM were classified into subgroup (A) including 22 patients showed a PWV£ 5 m/s and subgroup (B) which included 8 patients with a PWV > 5 m/s. Patients of subgroup (B) had a worse NYHA class, a lower ejection fraction (EF), fractional shortening (FS), a longer E wave deceleration time (E.DT) and a lower E/A than patients of subgroup (A) ($P<0.05$) while age, systolic blood pressure (SBP, diastolic (DBP) and pulse pressure showed a non significant difference between both subgroups ($P>0.05$). In patients with DCM, the PWV showed a significant negative correlation with LV EF (r=-0.79, $P<0.001$), FS (r=-0.77, $P<0.0001$) and E/A (r=-0.69, P0.001) while a significant positive correlation was found with age (r=0.64,$P<0.001$) and E.DT (r=0.73, $P<0.001$). **Conclusion:** Increased aortic stiffness was associated with a worse LV systolic and diastolic function in patients with CHF due to DCM.

**P041**

## Popliteal artery blood velocity during exercise in patients with heart failure

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**Introduction:** It is known that decrease in heart pumping function influences peripheral blood circulation. **Objectives:** In this connection have studied the responses of a peripheral blood flow to exercise in patients with heart failure. **Methods:** This study involved 79 subjects: 39 patients with heart failue and 40 healthy subjects. Patients were performed the multistage treadmill-test with gas analysis and Doppler imaging of blood flow in the popliteal artery. After each stage of the test the maximal (Vmax) and diastolic (Vd) velocities were measured, and resistive index (RI) were calculated. Patients were divided into 2 groups: 23 patients (1 group) with origin of pathological oxygen debt (left ventricular failure) and 16 patients (2 group) with normal dynamics of oxygen debt (normal pumping function). **Results:** At exercise increasing all patients demonstrated initially increase of Vmax and Vd and then the stabilization. The RI were decreased at first and then were stabilized. The stabilization of indexes peripheral blood flow in the first group was coincide with the origin of pathological oxygen debt and was happened at the exercise 3,3±0,24 MET (less then 40% of maximal exercise). The stabilization of blood flow indexes in the second group and in the control group was happened at the large exercises–6,8±0,22 MET and 9,0±0,29 MET, respectively (more then 40% of maximal exercise). In these groups this moment was coincide with the origin of anaerobic threshold. In the 1 group were observed reliable high values ($p<0,05$) of RI at maximal exercise comparably with 2 group and control group (0,65±0,025, 0,58±0,019, 0,57±0,013). This finding points out on higher peripheral vascular impedance at the exercise in patients with the origin of heart pumping function's failure. **Conclusion:** The stabilization of Vmax, Vd and RI within the limits of exercise to 40% of maximal with the sensitivity 82% and specify 81% was testified to the origin of heart pumping failure. The stabilization of these indexes at the higher levels of exercise was point out to the origin of physiologic anaerobic threshold (specify 87%, sensitivity 81%).

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P042

## Advantages of short-term nebivolol therapy on changes in arterial stiffness and central wave reflection in ischemic systolic heart failure patients

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**Introduction:** Large randomized trials have shown that beta-blockers (BB) reduce mortality and hospital admissions in patients with heart failure. From the other hand, in arterial hypertension (AH). which found in 2/3 of ischemic CHF pts, with BB administration increase central aortic pressure and augmentation index (AIX) due vasoconstriction, which possibly can lead to increase resistance to cardiac output. **Objectives:** the evaluation is it a difference between usual BB and Nebivolol (N) as BB with vasodilating properties in changing of arterial stiffness and central wave reflection parameters (AIX), during 6 months of treatment **Methods:** 40 patients with ischemic systolic HF (EF<40%), 72% with AH were randomized to **N** 5mg/day(n=20, mean age 61(±10,3), male 80%, BMI 29,7kg/m$^2$, NYHA 2[2;3]; EF 33,7(±5,5)%, or other BB–metoprolol or bisoprolol (n=20, mean age 58(±9,9), male 85%, BMI 28,9kg/m$^2$, NYHA 2[2;2]; EF 33,8(±5,2)%. Arterial stiffness and central wave reflection parameters were measured by applanation tonometry (Sphygmocor). **Results:** There were similar improvement in clinical status, exercise tolerance and quality of life in both groups of pts. But **N** administration lead to significant decrease of carotid femoral pulse wave velocity **(PWV)** from **9,4±2,2 to 8,9±2,0 m/s, p<0,05**, decrease of mean aortic pressure **(MAP)** by 3,9 mm Hg and significant fall in **AIX** (normalized on HR=75 beats per minutes) from **18,9 to 15,7 (p=0,04).** In **BB** group not **PWV,**nor MAP didn't changed and **AIX/75**increased from 20,9 to 26,6 p=0,18. **Conclusion:** Nebivolol due their additional vasodilator properties can have advantages over usual BB in reduction of arterial stiffness and AIX as determinant of resistance to cardiac output, which is especially important at the start of BB administrations in ischemic systolic HF.

P043

## Liver dysfunction at chronic heart failure patients

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**Introduction:** Comorbid conditions such as anemia. liver and renal dysfunction are significantly influence on CHF prognosis **Objectives:** To studying of a liver function at patients with chronic heart failure. **Methods:** 82 patients from 22 to 58 yrs (mean 44,2±1,8, males/females 61/21) are included. CHF has been caused by ischemic (n=25) and idiopathic dilated cardiomyopathies (DC, n=56). The hepatic function was assessed by determination of aspartate (AsT) and alanine transaminase (AIT), total bilirubin (TB), and albumin plasma concentration. After initial investigation all patients are divided on two: I (with liver abnormalities, n=28; 43,7±2,1 yrs) and II (without hepatopathy, n=54, 41,4±1,9 yrs) groups. **Results:** Apparently, the prevalence of liver dysfunction characterized by increasing of TB and/or transaminase levels was 37,2% and at 6 (5,8 %) from them had cirrhosis signs. The most typical markers of hepatic damage at our patients was hyperbilirubiemia, registered at 25 (89%) pts of I gr. At the same time, increase of transaminase was less expressed (at 18 pts). It is noticed, that at I gr patients decreasing of plasma albumin (3,3±0.12g/l vs 3.8±0,15g/l) and total cholesterol (allocated as adverse predictor at CHF patients) levels was more expressed (123,8±9,7mg/dl vs 147,3±6,8mg/dl, both p<0.05). Comparative analysis of diseases severity showed that differences of NYHA class was non significant, but I gr pts characterized by reduction of distance by 6 minute walking test on 16.3% (168.7±9.3m vs 202±10.2m accordingly, p=0.04). **Conclusion:** The 37.2% ptswith various etiology CHF had signs of hepatic dysfunction, including cirrhosis. It is noticed, that the hyperbilirubiemia is frequent display of hepatopathy. Increasing of liver markers associated by hypoalbuminemia, hypocholesterolemia and physical tolerance worsening.

P044

## Dilated cardiomyopathy in woman with Morgagni–Stewart–Morel syndrome (case report)

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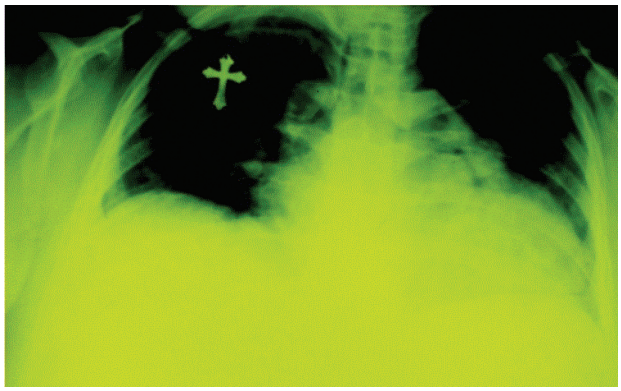
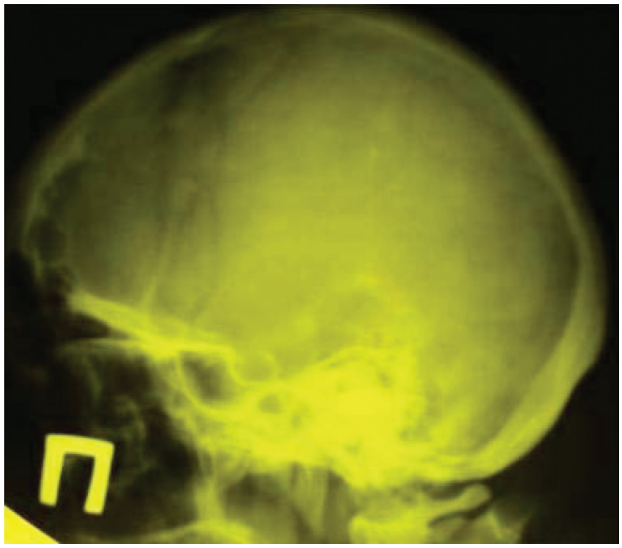
**Introduction:** Morgagni–Stewart–Morel syndrome is genetic based disorder characterized by hyperostosis of frontal bone, metabolic disables and different autoantibodies availability. There is no data about heart's lesion in patients with this syndrome. **Objectives:** The aim of the study was to show the possibility of interrelation between Morgagni–Stewart–Morel syndrome and cardiomyopathy. **Methods:** A woman 36 years old was admitted in the Saratov State Hospital (Russia) with the complaints on weakness, short breathing and headache. Standard procedures were used in patient's examination. **Results:** From the birth time patient had obesity, sex gland hypofunction, hypertrichosis and low cognitive functions, from 33 years–diabetes mellitus corrected by diet. All the women in patient's family had obesity; patient's brother had the imbecility. There was no infections and alcoholism in the anamnesis.
From 34$^{th}$ year the patient had permanent headaches with normal blood presser, in three month before the hospitalization the patient noted the short breathing, swelling of feet and increase of the mass from 80 kg to 120 kg. In the moment of hospitalization patient had the IV class of heart failure by NYHA. Blood presser was 100/60 mmHg; respiratory rate–35–40/min., arterial oxygen concentration–85%95 %; BMI–45 kg/m$^2$. High disposition of the diaphragm, cardiomegalia was found (figure 1). Low voltage ECG, tachycardia (HR 120 beats/min) was registered. By transthoracic echocardiography was found the dilatation of heart's cavities, ejection fraction of left ventriculus completed 28%. Patients biochemical profile and blood counting was normal, antinuclear antibodies and rheumatic factor highly exceeded normal levels. Hypothyreosis, system lupus erythematosys, antiphospholipid and Pickwick syndromes, infections and brain's tumor were excluded. Using X-rays imaging of the scull was found the hyperostosis of the inner table of the frontal bone (figure 2). As the patient had the hyperostosis of the frontal bone, obesity, hypertrichosis, headaches, low cognitive functions, diabetes mellitus, sex gonads hypofunction, and inheritance in obesity and imbecility the Morgagni–Stewart–Morel syndrome was established.
**Image/graph I:**



**Image/graph II:**



**Conclusion:** In the reported case the combination of Morgagni–Stewart–Morel syndrome and cardiomyopathy was found. Our patient had sufficient conditions that cause dilated cardiomyopathy (autoimmune aggression, metabolic and genetic disabilities).

P045

## Lack of adaptive left ventricular hypertrophy in athletes with arrhythmogenic right ventricular dysplasia

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**Introduction:** Arrhythmogenic right ventricular dysplasia (ARVD) is characterized by progressive atrophy of the right ventricular myocardium accompanied by fibro-fatty replacement and is increased risk of arrhythmic sudden death. Many ARVD patients have a history of endurance athletic training. **Objectives:** This study tested the hypothesis that this genetically predetermined condition prevents adaptive left ventricular hypertrophy (LVH) that accompanies endurance training. **Methods:** A total of 102 ARVD patients (age 41±18 yrs, 63% M) including

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35 athletes (heavy participants in competitive sports in high school/college/post graduation) were studied. Cardiac imaging studies (echocardiogram and/or cardiac MRI) of living individuals, autopsy reports of expired patients, and pathology reports of those who had undergone heart transplants were evaluated for LVH. **Results:** LVH was found in 2% (2/102) of ARVD patients, one by cardiac MRI and the other by autopsy assessment. Both were athletes. Seven ARVD patients had systemic hypertension, but none had evidence of left ventricular wall thickening. **Conclusion:** In patients with ARVD, there is a low prevalence of LVH even among those who participate in athletic training. Lack of LVH may be a trait of ARVD, and recognizing this feature may help differential ARVD from other types of cardiomyopathy.

**P046**

## The validity of the dispersion of myocardial velocities in the differentiation between ischemic and dilated cardiomyopathy: a tissue doppler echocardiographic study

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**Introduction:** Differentiation between ischemic and non ischemic cause for left ventricular dysfunction has important therapeutic implication in patients with chronic heart failure. Tissue Doppler imaging (TDI) has provided an objective means to quantify global and regional left ventricular (LV) function with improved accuracy and high reproducibility . **Objectives:** The present study aimed to use tissue Doppler imaging of the left ventricle for differentiation between ischemic and dilated cardiomyopathy. **Methods:** A total of 40 subjects were included in this study, 15 patients with ischemic cardiomyapathy (ICM), 15 patients with dilated cardiomyapathy (DCM) and 10 healthy subjects as a control group. All studied subjects underwent 12 lead electrocardiogram, transthoracic echocardiographic examination and TDI; The following regional parameters were measured in the four basal LV myocardial segments (lateral, saptal, anterior and inferior walls) : myocardial systolic (Sm), early diastolic(Em) and late diastolic (Am) velocities, with calculation of dispersion index of each TDI velocity. **Results:** Both Sm and Em were significantly lower in patients group than in control group ($p<0.05$). The mean dispersion index of Sm in control group was (8%±4%), in ICM group (28%±8.1%) and (14%±7.1%) in DCM group, the Sm dispersion index was higher in patients than in the control group and in ICM group compared to DCM group ($P= 0.01$). The mean dispersion index of Em in control group was (14%±9%), in ICM group (31%±11.6%) and (19%±4.4%) in DCM group, the Em dispersion index was higher in ICM group in comparison to control group or DCM groups ($P= 0.001$). The mean dispersion index of Am in control group was (5%±3%), in ICM group (28%±11.8%) and (19%±9.6%) in DCM group, the Am dispersion index was higher in both patients groups in comparison to control group ($P= 0.0001$). Receiver operating characteristic (ROC) analysis showed that Sm dispersion index cut off value of (14%) detected patients with ICM with a sensitivity (73%) and a specificity of (90%) while Em dispersion index cut off value of (22%) could detect ICM patiets with a sensitivity (80%) and a specificity (90%). **Conclusion:** Both systolic (Sm) and Early diastolic velocity (Em) and dispersion of myocardial velocities(Sm ,Em and Am) measured by TDI can help for differentiation between ischemic and dilated cardiomyopathy .

**P047**

## Hospitalization cost of heart failure: examining effect of depression among 16,889 heart failure patients in 2008 by race & gender

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**Introduction:** Depression is frequently observed in heart failure (HF) patients. However, its effects on the cost of HF hospitalization and whether those effects vary by race and gender, are unknown. This analysis delineates the prevalence of depression among HF patients and estimates its effect on hospitalization cost. **Objectives:** What does depression contribute to stroke health care cost by race and gender. **Methods:** Data on depression, healthcare cost, and HF-related co-morbidities were extracted on adults (aged 20+ years with HF (ICD-9 codes - 402,404,428) as the primary diagnosis; 61% females; 18% blacks) from TN 2008 hospital discharge data. Race and sex differences, and hospitalization costs were evaluated for three groups of stroke patients: (1) HF-Only ($HF^{O}$, n=8,306), (2) HF+Depression/anxiety ($HF^{+D}$, n=4,125), and (3) HF+other Mental health diagnoses ($HF^{+M}$, n=4,458). **Results:** 4.2% of all patients had HF as a primary diagnosis; more blacks than whites (4.5% vs. 4.2%, $p<0.001$), and more men than women had HF (5.1% vs. 3.7%, $p<0.001$). Nearly one-quarter of HF patients (24.4%) had depression; more women than men and more whites than blacks were diagnosed with depression. Other HF co-morbidities were more prevalent among blacks than whites. Per patient hospitalization cost was higher among HF than non-HF patients ($82,509 vs. 40,301, $p<.000$). Further, $HF^{+D}$ patients had higher hospital cost compared to $HF^{O}$group ($109,390 vs. $68,503, $p<0.001$), representing a $40,887 (59.7%) increase in treatment cost associated with depression. Among $HF^{+D}$ patients, higher hospital charges emerged for black men compared to white men ($166,301 vs. $120,134, $p<0.001$) and among black women compared to white women ($138,133 vs. $93,443, $p<0.001$). **Conclusion:** Depression in HF patients is associated with increased hospitalization costs. Additional research is needed to determine whether aggressive treatment of depression among women might reduce the costs of care. Lower prevalence of depression in men and blacks may represent under-ascertainment in these groups.

**P048**

## The relationship between low T3 syndrome and cardiac death in heart failure

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**Introduction:** Thyroid hormone has many effects on cardiovascular system. Initial studies demonstrated that reduction in plasma triiodothyronin (T3) without significant changes in thyroxin (T4) or TSH (low T3 syndrome) can occur in patients with cardiac or non cardiac illness. Clinical and experimental evidences have shown that T3 plays a major role in modulating heart rate and cardiac contractility. **Objectives:** We sought to evaluate effects of low T3 syndrome on the prognosis and mortality of the patients with systolic heart failure. **Methods:** A total of 222 patients with systolic heart failure (EF≤40%) that underwent thyroid function test, divided in two groups: group I, 111 patients (64.86% male) with low T3 syndrome and mean age of 60.44 year, group II, 111 patients (67.57% male) with normal thyroid function test and mean age of 60.00 year. All patients were on medical management for heart failure without any treatment for low T3. The patients with thyroid disease or severe comorbid diseases were excluded from the study. We followed up these patients for 1 year and considered cardiac death events. **Results:** After 1 year follow up, there were 29 cardiac death in group I and 10 in group II (25.89% versus 8.92% P:0.006). This study showed that low T3 syndrome is the most important predictor of cardiac death in patients with systolic heart failure. In the second level, hyperuricemia had significant effect on mortality in these patients. In other side, hyponatremia or increased level of creatinine showed no significant effects on mortality in this study. **Conclusion:** In patients with systolic heart failure, low T3 syndrome is a substantial predictor of cardiac death. So, more evaluation of low T3 syndrome in patients with heart failure versus its treatment is needed.

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**P049**

## Hypertrophic cardiomyopathy: 5-years prospective observational study

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**Introduction:** Hypertrophic cardiomyopathy (HCM) is the most common familial genetic disease of the heart (1/500 to 1/1,000). The prevalence is estimated to be 0.2%. Sudden death is the most common cause of death in hypertrophic cardiomyopathy and occurs more often in young asymptomatic or only mildly symptomatic patients. **Objectives:** Analysis of outcomes and risk factors during 5 years follow-up. **Methods:** 108 patients of all HCM-spectrum was included in the study (67 men and 41 women). Mean age was 45.9±2.58 years. Among all patients, obstructive form was - 12%, non obstructive - 67,6%, latent - 20.4% of cases. **Results:** 11 patients (10.2%) died during follow-up. The structure of the deaths were as follows: chronic heart failure - 7 patients; sudden cardiac death - 2 patients; infective endocarditis–1 patient, pulmonary embolism - 1 patient. Analysis of deaths showed that reason of death for all patients with non obstructive HCM was heart failure. Main reason of death for obstructive form of the disease was sudden cardiac death (50% cases).

During follow up were identified risk factors for poor prognosis. They were:

1. Patients with family history of sudden death (OR = 5,86);
2. HCM among relatives (OR = 8,88);
3. Presence of syncope in family history (OR = 1,47);
4. Ventricular tachycardia (OR> 18.4);
5. Cardiac arrest or ventricular fibrillation in anamnesis (OR 25.2);
6. Dilatation of left atrium > 4.5 cm.

Patients with these risk factors have a high probability of death in the next 3 years.

At the same time identified factors of good prognosis (low risk of dying over the next 3 years):

1. A patient complaints of palpitations (OR = 1,39);
2. The presence of the mitral regurgitation's murmur (OR = 2,63);
3. Absence of ventricular tachycardia, and cardiac arrest and/or a history of ventricular fibrillation in anamnesis;
4. Left atrium size <4.2 cm.

**Conclusion:**

1. The study showed that patients have different risk of death. Active management must be use for high-risk patients.
2. Patients with obstruction form of HCM have a more stable clinical course and the cause of deaths in 50% of this cases–sudden cardiac death.

**P050**

## Anaemia versus low glomerular filtration rate: the better predictor of mortality in patients admitted with decompensated heart failure

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**Introduction:** Previous studies have showed that, in heart failure, reduced haemoglobin levels and chronic kidney disease independently predict increased risks of death and hospitalisation.

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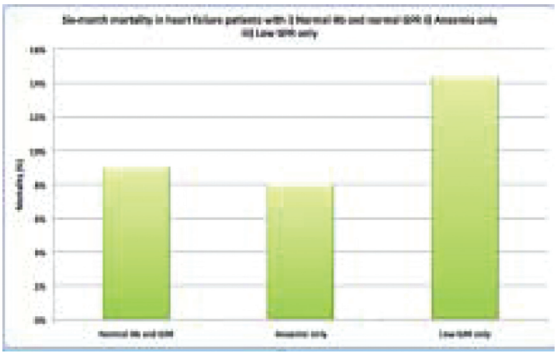
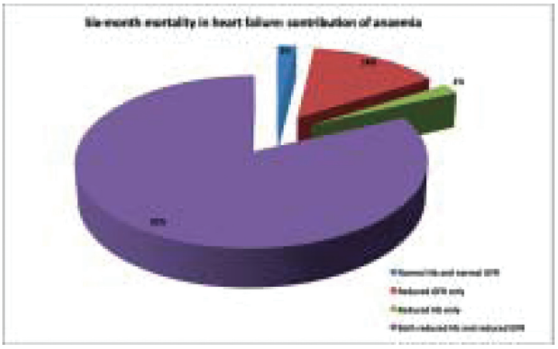
It is widely recognised that the combination of heart failure, anaemia and chronic kidney disease is a lethal one. However, it remains unclear as to which offers the greater prognostic value in terms of mortality: low haemoglobin (Hb) or low glomerular filtration rate (GFR). **Objectives:** We sought to compare the prognostic significance of anaemia with that of a reduced GFR in predicting six-month mortality amongst patients admitted with acute-on-chronic heart failure. **Methods:** We examined the trends between anaemia, glomerular filtration rate (GFR) and mortality at 6 months in a prospective cohort of chronic heart failure patients admitted in decompensated heart failure. Heart failure admissions were identified by primary discharge diagnosis, accompanied by confirmation on echocardiogram. Longitudinal haemoglobin and creatinine levels were obtained from Case-notes tracking system. Six-month mortality was obtained from Case-notes, as well as from enquiries to General Practitioners. GFR (mL/min) was estimated using the Cockcroft-Gault formula. Anaemia was defined as a Hb of <13.0 units; while low GFR was characterised by a cut-off value <90 mL/mi. **Results:** Among the 371 patients admitted with heart failure, mean age was 76 years and 45% of admissions were women. Six-month mortality was 24.2%, with 90 patients having not survived the first six months. Of these, 82% had both anaemia and a reduced GFR. However, a very small proportion (2%) had anaemia only, as opposed to 14% who presented with low GFR only. Mortality in patients having both a normal Hb and a normal GFR was 9%. Surprisingly, mortality amongst patients with anaemia only (and normal GFR) was only 8%. (RR=0.89, 95% confidence interval 0.83–0.95). Mortality amongst patients with a reduced GFR only (and normal Hb) was much increased at a rate of 14.4% (RR= 1.6, 95% confidence interval 1.48–1.72).

**Image/graph I:**



**Image/graph II:**




**Conclusion:** In heart failure, a low glomerular filtration rate is a substantially stronger predictor of 6-month mortality compared to anaemia.

**Reference:**

1. Hemoglobin level, chronic kidney disease, and the risks of death and hospitalization in adults with chronic heart failure: the Anemia in Chronic Heart Failure: Outcomes and Resource Utilization (ANCHOR) Study.Circulation. 2006 Jun 13 ;113(23):2713–23.

## P051

## Peak VO2 and predicted VO2 in patients under beta blocker therapy-lower cut-off for heart transplantation

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**Introduction:** The prognostic value of peak VO2 and predicted VO2 have been validated in the past few years and are of major importance when deciding the timing for heart transplantation. **Objectives:** Beta-blocker (BB) therapy has shown to improve survival without changing peak VO2, and this implies the need to establish a lower cut-off value in this group of patients. **Methods:** A transversal study was performed on a group of patients with dilated cardiomyopathy of all causes, referenced to a tertiary hospital, who performed cardiopulmonary testing, for all-cause mortality and for occurrence of death or urgent transplantation. Information on clinical, anthropometrical, echocardiographic and laboratorial parameters was collected. Cut-off values of peak VO2 of 12mlO2/kg/min and of predicted VO2 of 50% were established and analysis through Kaplan-Meier survival curves was performed. **Results:** From a group of 83 patients, 12 were lost for follow-up. Of 71, 57 (80.3%) were men; the age at the time of cardiopulmonary testing was 50±12 years and followed by 75±51 months. Mean left ventricular ejection fraction was 27.1±10.3% and mean peak VO2 was 18.2±6.8 mlO2/kg/min. Sixty patients (84.5%) were under BB. Fifteen (22.1%) patients died during follow-up and 11 (15.5%) were submitted to heart transplantation. Using Kaplan-Meier analysis peak VO2 and predicted VO2 revealed difference in survival between the group of patients treated with beta-blockers and those who were not (p=0.002 and p=0.001). In patients treated with BB, compared with those not on BB, at one and five years of follow-up, survival for the group of peak VO2<12ml/kg/min was 98% vs 80% and 86% vs 40%, respectively; and for peak VO2 <12ml/kg/min was 91% vs 75% and 58% vs 0%, respectively (p=0.002).Regarding predicted VO≫50% cumulative survival for 1 and 5 year follow-up was 96% vs 67% for both and in patients with predicted VO2<50% it was 93% vs 83% and 66% vs 0%. (p=0.00). **Conclusion:** For patients treated with BB survival was significantly higher and this group showed an excellent survival rate at 1 and 5 years follow-up when peak VO2≫12mlO2/kg/min and predicted VO2≫50%. This fact reinforces the idea that with BB therapy a lower cut-off value of peak VO2 should be used when deciding transplantation.

## P052

## Endothelial dysfunction is associated with increased mortality risk and predicts long-term cardiovascular-related events in chronic heart failure patients

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**Introduction:** Impaired endothelial function is known to be associated with chronic heart failure (CHF) and impaired functional capacity. **Objectives:** To examine if endothelial dysfunction in CHF is associated with mortality risk and adverse cardiovascular events (ACVE). **Methods:** 120 patients suffering from CHF were included in the study. The criterion for admission was left ventricular ejection fraction <45%. All patients were assessed brachial flow-mediated dilation (FMD). According to FMD values patients were divided in two groups: Group 1 with FMD5% (n=75) and Group 2 with FMD≤5% (n=45). All patients were subjected to one-year follow-up for death, myocardial infarction and episodes of non-stabile angina pectoris. **Results:** Median overall survival in Group 2 was lower in comparison to that found in Group 1 (324; 95% CI:309–340 vs. 342; 95% CI:333–356 days, respectively) during the study period. Although one year survival rate was also lower in Group 2 (86.7%) in comparison to Group 1 (97.7%), Kaplan-Meier survival analysis revealed no significant differences (p=0.066). During the follow-up, 11 patients died, out of which 9 had belonged to the Group 2. The relative risk of mortality was significantly higher in patients with FMD equal to or less than 5% compared to those with FMD above 5% (OR=1.52, CI:1.2–1.94; p<0.05). The frequency of ACVE also differed significantly between the two groups. Namely, all AMI that appeared during the one-year follow-up were among the patients with FMD less than 5% (p<0.05). The frequency of new episodes of non-stable angina pectoris was higher in Group 2 (p<0.05). **Conclusion:** Endothelial dysfunction in CHF as assessed by FMD in the brachial artery is associated with an increased mortality risk and predicts long-term cardiovascular-related events particulary acute miocardial infarction.

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D. Greig, P. Castro R. Miranda, R. Concepcion, M. Chiong, H. Alcaino,, G. Diaz-Araya, C. Bustos, H. Verdejo, S. Lavandero. Inflammation and endothelial dysfunction in patients with chronic heart failure.Rev Med Chil,2008; 136:687–93

## P053

## Are we using beta blockers in heart failure adequately and appropriately? Saudi hospital experience

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**Introduction:** Traditionally, beta blockers have been considered to be contraindicated in patients with heart failure. Recently, however, several large randomized, controlled mortality trials have been stopped early because of significant improvement in mortality rates in patients with heart failure who were given beta blockers in addition to angiotensin-converting enzyme inhibitors, diuretics and, sometimes, digoxin. Beta blockers should now be considered standard therapy in patients with New York Heart Association class II or class III heart failure who are hemodynamically stable, who do not have dyspnea at rest and who have no other contraindications to the use of these agents **Objectives:** We studied to see if beta blockers were used adequately and appropriately in patients of congestive cardiac failure. We also studied their tolerance and untoward effects if any. **Methods:** The study was done in one of the largest corporate hospitals in the central province of the Kingdom of Saudi Arabia. We randomly and prospectively selected case notes or electronic records of the 186 patients who had congestive cardiac failure as their primary diagnosis. These patients were either admitted to the hospital or were attending the Cardiology clinics between the period of July 2010 and July 2011. **Results:** There were 84 male and 102 female patients. Majority (88 and 66) patients were in NYHA class II and NYHA class III respectively. 44 patients were already established on beta blocker when presented to the hospital. Beta blocker was newly commenced either in Cardiology clinic or on admission to hospital 63 patients. We had no information in this context for 24 patients. Metoprolol was the most preferred beta blocker and was used in 58 patients, followed by Carvedilol (24), Bisoprolol(14), Nebivolol (6),Atenolol (5). 18 patients were lost to follow up. 4 patients required hospital admission with de compensated heart failure within one week of initiating beta blocker. 5 patients complained of extreme lethargy. 1 patient

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complained of impotency.2 patients developed severe sinus bradycardia while 1 patient developed complete heart block that required pacemaker implantation. **Conclusion:** Despite good clinical evidence of its benefits, beta blockers are still under utilised in patients of heart failure.Clear well established guidlines for their use are often not followed.

**Reference:**

Chavey W The Importance of Using Beta Blocker in Heart Failure Am Fam Physician 2000;62:2453–62.)

**P054**

## Prognostic score validation in pediatric dilated cardiomyopathy

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**Introduction:** Dilated cardiomyopathy (DCM) represents a significant number of children hospitalizations for heart failure with high mortality rate (30 to 50%). The prognosis remains unknown at the time of clinical presentation by the absence of parameters indicative of final endpoint. The establishment of these parameters would allow an early referral for heart transplantation. Recently it was proposed a prognostic score composed by functional by NYHA class IV, mitral regurgitation moderate or severe, greater cardiothoracic ratio on chest X-ray, left ventricular ejection fraction and ventricular arrhythmias. **Objectives:** To validate in a different population this prognostic score for death. **Methods:** Case studies, time series, in which it was analyzed the records contained in medical records of consecutive pediatric patients with DCM followed between 1990 and 2008. It was reviewed 54 medical records that had adequate data validation records (history, physical examination, electrocardiogram, echocardiogram and chest X-rays). A ROC curve was constructed from the values of the score obtained by each patient and it was compared with the ROC's original score previously proposed. Statistical analysis was performed in Statistica 8.0 and Stata 11.0. It was used alpha = 0.05. **Results:** The two populations studied (score and validation) were homogeneous for age (p = 0.86) and sex (p = 0.25). In Group score: area under the curve (AUC) = 0.88, sensitivity = 94.4% and specificity = 76.4%. In the validation group: AUC = 0.87, sensitivity = 84.6% and specificity = 75.6%. Comparing the ROC curves both were equivalent (p = 0.77). **Conclusion:** This study validates the prognostic score proposed earlier. The validation of the score can predict the evolution of child and adolescent patients with dilated cardiomyopathy.

**P055**

## Predicting 30-day mortality among patients hospitalized for decompensated heart failure

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**Introduction:** Congestive heart failure prognosis is generally poor with almost 50 percent of the patients dying within 5 years of being diagnosed. **Objectives:** We investigated clinical correlates of in-hospital mortality and comorbidity of patients demonstrating heart failure progression in Beijing. **Methods:** We included 6,949 patients with demonstrating heart failure who hospitalized from January 1, 1993, through December 31, 2007, at Chinese PLA General Hospital in Beijing. Hospital mortality and comorbidities were examined for patients primarily admitted for decompensated HF. **Results:** The 30-day in-hospital mortality was 5.4% in patients. Cox regression multivariate analysis showed that a history of cor pulmonale, stroke, renal failure, cirrhosis of liver□myocardial infarction, pneumonia, gastrointestinal bleeding and multiple organ dysfunction syndromes and age older than 65 years were the only independent predictors of in-hospital mortality. Using the regression coefficient as a benchmark, we calculated a convenient score. Nearly 23% of the patients with the score >6 died compared with only 1.2% of the patients with the score of 0. **Conclusion:** Medical comorbidity at admission or age older than 65 years is an independent risk factor for 30-day mortality in patients with heart failure. The study illustrates that medical comorbidities at admission have proved to be a major prognostic marker for immediate poor outcome in the patients with heart failure. The score may help to identify patients who are more likely to have a risk of in-hospital mortality within 30-days.

**P056**

## Effects of sustained-release trimetazidine on chronically dysfunctional myocardium of ischemic dilated cardiomyopathy: six months follow-up result

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**Introduction:** Ischemic cardiomyopathy is a progressively increasing burden in the third world country where there is increasing prevalence of diabetes and ischemic heart disease. So far many benefits of trimetazidine has been proposed and established by clinical trials in both ischemic and non-ischemic dilated cardiomyopathy. We evaluated sustained release trimetazine on ischemic dilated cardiomypathy in our third world population. **Objectives:** The objective of this study is to evaluate the role of sustained release trimetazine on the improvement of clinical status, reduction of ventricular dimention and improvement of LV systolic function in patients with ischemic dilated cardiomyopathy. **Methods:** 98 patients (aged 58.5±9.2 years) admitted in National Institute of Cardiovascular Diseases and Hospital, Dhaka with decompensated heart failure with previous history of myocardial infarction and/or documentation significant coronary artery disease with previous coronary angiography were taken for the study. After one months of stabilization in home from hospital discharge they were randomly divided into two groups-one group was provide with Trimetazidine 35mg sustained released tablet twice daily and the other with placebo. Enrolled patients should have dilated LV (LVIDd > 57mm) and left ventricular ejection fraction (LVEF) ≤ 40%. **Results:** Patients were followed up for six months and evaluated for clinical improvement and echocardiographic assessment of cardiac function. There was significant improvement of NYHA class of heart failure state in trimetazine group. Statistically significant higher number of patients in trimetazidine group were in NYHA class I (p=0.03) and class II (p=0.01) and higher number of patients in placebo group were in NYHA class III (p=0.005) and NYHA class IV (p=0.01). Anginal episodes per week were significantly lower in trimetazidine group (4.5±1 vs. 8.1±1, p=0.001) and sublingual nitrate use per week was also significantly lower in trimetazidine group (3.5±1 vs. 7.5±1, p= 0.001). LVEF (36.6±5.5 vs. 31.2±6.4, p=0.001) and left ventricular diastolic dimension (59.7±5.2 vs. 65.1±6.1, p=0.001) were significantly defer in two groups. **Conclusion:** Sustained release trimetazidine improves cardiac function proved clinically and objectively with echocardiographic evidences. These benefits are also persisted in south asian population.

**P058**

## The impact of the rapid use of beta-blockers on ventricular remodeling and mortality in end-stage heart failure (the FAST study)

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**Introduction:** The therapy with beta blockers (BB) is fundamental in the treatment of heart failure(HF). However, even though the data documents the benefits of BB, the optimizing of the dosage of this medication during hospitalization has yet to be tested. **Objectives:** Our objective was to evaluate the safety and effectivity of the rapid usage of BB on patients (pcts) hospitalized for advanced HF.**Methods:** Ninety-two pcts were studied with advanced HF(NYHA IV) and fraction of ejection (EF) of the left ventricule (LV) <45% were hospitalized for compensation and accompanied after release. The average age was 62.25 years of age with 59 being males. The ptcs were divided into two groups: 46 for treatment (GT) and 46 control (GC). During hospitalization, they were placed randomly for BB rapid usage with an increase of dosage every two days (GT), or every 15 days (GC). The principal result was the occurrence of re-hospitalization or death for various different causes.Utilizing: t from Student, Mann-Whitney, Qui-square, Fisher calculation. Kaplan-Meiyer for survival, with comparison using the test of Log-rank and the "hazard ratio" or the reason of the risks calculated with the Cox model. **Results:** With the GT group, there was a significant reduction of the diameter of the systolic of the LV in 3 months and 1 year (p<0,001), and remained unaltered among GCs (P=0,337). The final diastolic diameter of the LV presented a significant reduction. (p=0,036) for the GTs, and the GCs did not show any sig. reduction (p=0,250). There was a sig. increase of the LVEF with the GTs (p<0,001) in 3 months, but did not occur with the GCs (P=0,151). The distance covered in the running test of 6 minutes increased sig.(P <0,001) with the GT in relation to the GC. The GT presented the probability of being free of any sig. future hospitalization_greater than the GT (p=0,045). The possibility of survival for the GT was sig. greater than the GC during the period of evaluation (P=0,002) (HR and CI at 95%). **Conclusion:** Beta blockers rapid optimization dosages during hospitalization of end-stage HF patients is safe and promotes a better ventricular remodeling and lower mortality rate than that observed with a usual treatment schedule.

**P059**

## Sarpogrelate, a serotonin type 2A receptor inhibitor, suppresses phenylephrine-induced hypertrophic responses in cardiomyocytes

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**Introduction:** Serotonin (5-HT) is a neurohormone participating in a wide range of physiological functions. The potential role of 5-HT in cardiac function has generated much interest in recent years. However, its role in cardiac hypertrophy is still not well understood. Multiple subtypes of 5-HT receptor such as 5-HT2A, 5-HT2B and 5-HT4 are reported to be expressed in the heart. **Objectives:** We hypothesized that 5-HT2A receptor-dependent pathway plays important roles in myocardial cell hypertrophy induced by an $\alpha$1-adrenergic agonist, phenylephrine (PE). **Methods:** First, primary cardiomyocytes from neonatal rats in culture were treated with 5-HT (30 nM ~ 1 mM). After 48 hours, we stained these cells with a $\beta$-myosin heavy chain ($\beta$-MHC) antibody and measured the myocardial cell surface areas. Furthermore, the relative endothelin-1 (ET-1) and atrial natriuretic factor (ANF) promoter activities were calculated from the ratio of firefly luciferase activity to sea pansy luciferase activity after the transient DNA transfection. Next, to examine the effects of sarpogrelate, a 5-HT2A receptor antagonist, on 5-HT-and PE-induced hypertrophic responses, cardiomyocytes were pre-incubated with sarpogrelate (10 nM ~ 1 mM) for 2 hours and then stimulated with saline, 1$\mu$M 5-HT, or 30 $\mu$M PE for 48 hours and stained with a $\beta$-MHC antibody. Finally, to determine whether sarpogrelate inhibits the hypertrophic stimulation-induced signaling pathway, protein extracts from cardiomyocytes treated with PE and sarpogrelate or their vehicles were subjected to immunoblotting with the antibodies against phosphorylated forms of Akt or ERK1/2. **Results:** 5-HT induced cardiomyocyte hypertrophy in a dose-dependent manner. Sarpogrelate inhibited 5-HT-induced increases in cell size, and transcriptional activation of the ANF and ET-1 promoters. Notably, sarpogrelate also inhibited PE-induced hypertrophic responses in cardiomyocytes. However, the expression level of 5-HT2A mRNA in cultured cardiomyocytes was not changed by PE stimulation. Sarpogrelate blocked the PE-induced increase in the phosphorylation of Akt and ERK1/2. **Conclusion:** 5-HT induces hypertrophic responses in cardiomyocytes,

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at least in part, through the 5HT2A receptor-dependent pathway. The inhibition of PE-induced hypertrophy by suggests in cardiac hypertrophy *in vivo*.

**P060**

## The repeated treatment with levosimendan in elderly patients with AHF

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**Introduction:** Acute Heart failure (AHF) is a major public health problem because of its high prevalence and impact on mortality, morbidity, quality of life, and social costs. **Objectives:** The aim of this study was to clarify whether repeated infusions of the inotropic agent levosimendan (L) in elderly patients (pts) can safely improve outcomes in CHF patients (mortality and re-hospitalization). **Methods:** 292 AHF patients (68±9 years old) are enrolled in an observational registry; of these, 80 pts > 70 years old were treated according to ESC guidelines and intravenous infusion of L (0.05–0.1 mcg/kg/min for 24 h); 98 pts > 70 years old were treated with standard therapy (Control Group, CG). 49 pts in L group were retreated with a second "cycle" of L between 30 days and 45 days after the first infusion. Pts presenting with a new episode of acute decompensated heart failure needing re-hospitalization were excluded. **Results:** Re-hospitalization rates were significantly lower in the L group vs CG at 6 months (1.44% vs. 3.3%; $p<0.05$) and 12 months (7.6% vs. 14.3%; $p<0.05$). Mortality rate at 1 month was 1.2% in L group vs 6% in the CG($p<0.05$). **Conclusion:** The repeated infusion of levosimendan in elderly patients is associated with reductions in re-hospitalization, mortality rates.

**P061**

## Outcomes for rotary continuous-flow left ventricular assist device patients stratified by severity of clinical status

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**Introduction:** The use of continuous-flow left ventricular assist devices (LVAD) is an accepted therapy for patients with advanced heart failure. New generation of these devices may have an impact on improved survival rates and quality of life (QoL). Here we report about our single-center experience with the new generation of LVAD's. **Objectives:** Between 2006 and 2010, 41 transplantable and 8 non-transplantable patients were selected for LVAD-therapy at our institution due to refractory severe heart failure. All patients were INTERMACS Level 1 to 3 (Level 1: n=23; Level 2: n=18 and Level 3: n=8). The cohort included 44 men and 5 women with a mean age of 53 ± 12 (range 20–75 years). The patients were supported either by Heart Mate II (n=39) or HVAD (n=10) LVAD. **Methods:** In-hospital (30-day) and long-term survival, freedom form re-operation and neurological complication, and rate of drive-line infection were examined. Additionally, the QoL was assessed retrospectively. **Results:** Mean support time was 138 ± 53 days (range 1–867 days). In-hospital (30-day) mortality was 27% (n=11) due to severe cardiogenic shock with multiple organ failure and sepsis. The follow-up survival for all was 32 of 49 patients (65%). Bleeding requiring reoperation occurred in 13 patients (n=27%). Neurological problems were identified in 12 patients. There were 6 drive-line infections. 63% of all patients were discharged at home. Overall, 3 patients underwent transplantation, 23 patients awaiting a donor organ, 1 patient was successfully weaned and finally, 5 patients are on destination therapy with good QoL. **Conclusion:** Treatment of severe heart failure with new continuous-flow LVAD can significantly improve the acute and long-term survival with low device associated complication and improved QoL. The clinical implementation of new miniaturized LVAD's have no negative impact on outcome and complication rate.

**P062**

## Health economic evaluation of acute heart failure treatments in the UK

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**Introduction:** Acute heart failure (AHF) is a common reason for emergency medical admissions and subsequent readmissions in the UK. AHF is also a major cause of morbidity, with a 30% one year mortality for hospitalized patients, and represents 1%–2% of total health care expenditure. Data on the cost burden of AHF and cost-effectiveness of treatments are limited. **Objectives:** The aim of the current study was to develop a decision analytical model to compare the cost-effectiveness of currently available and potential new AHF treatments from a UK National Health Service perspective. **Methods:** A semi-Markov cost-effectiveness model was constructed in Microsoft Excel that included the health effects (length of stay [LOS] of index hospitalization, re-hospitalization rate, mortality) and costs associated with treatment of AHF over a variable time horizon. Model inputs i.e. patient characteristics, impact of population and clinical characteristics on mortality, clinical effectiveness, adverse events, cost and utility data were based on literature and experts' input. Costs and effects were discounted at an annual rate of 3.5%. Primary outcome was cost per unit change in effectiveness. **Results:** Over a 60-day time horizon, the total cost of current standard AHF treatment was £4,361. Index hospitalization with an average LOS of 9 days accounted for 82% of the total costs, while 14% of the costs were attributable to AHF re-hospitalization (re-hospitalization rate of 27% at day 60). A hypothetical AHF therapy that reduces hospital LOS by 1 day, with no impact on mortality, re-hospitalization rate and adverse events, may lead to cost-savings of £330 over 60 days. If an additional benefit of reduced re-hospitalization at 60 days (relative risk reduction of 15%) is added to the above assumptions, the cost-savings increase to £409. Adding a mortality benefit does not decrease costs but can be quite cost-effective by increasing the number of life-years saved. **Conclusion:** The economic burden of AHF is substantial. The results of this study suggest the importance of better management of AHF: New AHF treatments that have a favorable impact on index hospital LOS or re-hospitalization rates, can lead to cost-savings.

**P064**

## An Asian experience of peripartum cardiomyopathy

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**Introduction:** Peripartum cardiomyopathy is a rare condition that complicates a pregnancy in its last month and up to five months after delivery. **Objectives:** We report a case series of 11 patients presenting at our centre. **Methods:** All patients admitted to our centre with the diagnosis of peripartum cardiomyopathy between October 2009 to November 2010 were analysed. **Results:** The incidence of peripartum cardiomyopathy in our study was 0.89 per 1,000 live births. Mean age was 32.3±5.7 years. The ethnic distribution was as follows: 7 (63.6%) Malays, 3 (27.3%) Chinese, 1 (9.1%) Japanese. 8 (72.8%) were primiparity, while 2 were in their second pregnancy and 1 patient had delivered her 5th child. 45.5% were smokers, and the same proportion had a history of pregnancy-induced hypertension. Majority (72.8%) of patients developed symptoms post-partum. In our cohort, symptoms occurred from 2 days before delivery to 55 days after delivery, with the mean at 12.8 days post-partum. 6 (54.5%) patients presented with mild to moderate heart failure, while 5 (45.5%) patients presented with frank acute pulmonary edema - 4 of whom required mechanical ventilation. Only 1 patient required intravenous dobutamine for inotropic support. All patients received conventional treatment with ACE-inhibitors or ARBs and beta-blockers unless contraindicated. All 11 patients were successfully treated for the acute episode and discharged well. 1 patient had subsequent pregnancy which was terminated 3 months after diagnosis of cardiomyopathy. Mean LVEF at diagnosis was 26.9±9.1% and mean left ventricular internal diameter in end-diastole (LVIDd) was 5.5±0.5cm. 8 patients underwent echocardiographic re-evaluation at 6 months. 3 patients defaulted follow-up. At 6 months, the mean LVEF was 51.9±10.6% and LVIDd was 5.1±0.6cm. 5 out of these 8 patients assessed had a normal LVEF. All patients with at least mild-moderate grade of mitral regurgitation showed improvement on follow up echocardiography. All patients were of NYHA functional class I status on review, except for 1 patient who was of NYHA functional class II. **Conclusion:** Peripartum cardiomyopathy remains a rare condition and appears to occur more commonly in Malay patients. Smoking and pregnancy-induced hypertension appear to be significant risk factors. There was no maternal mortality in our cohort. Long term management and outcome remain unclear due to the rarity of this condition. Collaborative studies with other tertiary centres will help enhance our understanding of this condition.

**P065**

## Impact of heart failure on morbidity and mortality according to gender and region in Brazil, between 2008–2010

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**Introduction:** Heart failure (HF) is a complex syndrome that affects 1% of world population, consumes 1–2% of health care costs and provides 50% mortality in 5 years (An. Internal Med. Vol. 24, No. 10, PP.500–504, 2007). Its incidence has increased in recent decades due to population aging (NHLBI, 2009). **Objectives:** Cross-sectional study to analyze and compare the HF mortality by sex, age and region of Brazil between the years 2008–2010 with other countries and the world. **Methods:** Using data from a nationwide population-based registry (DATASUS), we analyzed the variables year, region, age and sex based on the term "heart failure." **Results:** There were 268,987 hospitalizations in 2008, 271,936 in 2009 and 262,859 in 2010, but mortality was respectively 22,080, 23,169 and 23,606. In the age group above 60 years, 27,798 women and 25,682 men had died in this period justified by HF. The Southeast region showed the largest absolute number of deaths (34,366), followed by the Northeast (13,992), South (12,552), Midwest (2,600) and North (4,756). Mortality due to HF in Brazil was similar to that found in the UK and countries such as Spain and the United States of America. The prevalence was higher after 60 years of age, especially after 80 years. As expected, the Southeast region is most affected because it is more populous. Women suffer more with the HF due to increased longevity and medical search more frequent than men. **Conclusion:** HF is the end stage of diseases of the cardiovascular system and affects more elderly people, being the most frequent cause of hospitalization for cardiovascular disease (III Braz. Guidelines Heart Failure). The most common causes of death are pulmonary edema, arrhythmias, electrolyte disturbances, renal failure. Some doctors did not identify the cause of death, but death as an aggravating factor (NHLBI, 2009).

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**P066**

## Worsening renal function in patients hospitalized with acute heart failure: a moroccan experience for risk factors and prognostic

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**Introduction:** Worsening Renal Function (WRF) during the hospitalization for Acute Heart Failure (AHF) occurs frequently and may also have a prognostic significance. **Objectives:** To determine, the clinical predictors, and the prognostic significances of Worsening Renal Function (WRF) in hospitalized patients with Acute Heart Failure (AHF). **Methods:** A retrospective study examining all patients who developed acute renal failure in their hospitalization for acute heart failure, to determine etiologies ,with prognostic factors at the short time . **Results:** Nearly 23 % of patients developed WRF. The independent predictors of WRF analyzed with a multivariable logistic regression were history of chronic kidney disease (P = .022), age >75 years (P = 0.03). furosemide daily dose ($p$=0.05) and congestive heart failurewith severely depressend cardiac function ($p$=0.045) **Conclusion:** Different clinical predictors at hospital admission can be used to identify patients at increased risk for developing WRF. congestive heart failurewith severely depressend cardiac function is the most important predictor of the occurrence of WRF.

**P067**

## Gender and in-hospital ouctome in patients hospitalized with congestive heart failure

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**Introduction:** Results of previous studies on the influence of gender on prognosis in heart failure (HF) have been conflicting and almost exclusively performed in Caucasian population. **Objectives:** The aim of this study was to determine whether mortality risk among Middle eastern women and men hospitalized with HF is different. **Methods:** We conducted retrospective analysis of a prospectively collected data of all patients hospitalized with HF in the State of Qatar from 1991 through 2010. Clinical characterstics, managment, and outcome of HF patients were compared according to gender. **Results:** During the 20-years period; 2,379 women and 4,689 men were hospitalized for HF. Women were older and more likley to have diabetes mellitus (66.6% vs. 52.5%, p=0.001), hypertension (69% vs. 53%, p=0.001), dyslipidemia (24% vs. 16%, p=0.001) and chronic renal impairement (9.7% vs. 8%, p=0.02) when compared to men. Women were less likley to be smokers (1.3% vs. 20.5%, p=0.01) and have HF secondary to acute coronary syndrome when compared to men (15% vs. 21%, p=0.001). Women were less likley to receive angiotensin converting enzyme inhibitors (ACE-I) and angiotensin receptor blockes (ARB) (52% vs. 57%, p=0.001) and antiplatelet agents (71.6% vs. 75.6%, p=0.01) when compared to men. Calcium-channel blockers (12.8% vs. 7.4%, p=0.001) and inotropes (11% vs. 9%, p=0.002) use was more common among women when compared to men, while beta blockers and diuretics were comparable between the 2 groups. At discharge, women were less likely to be prescribed beta blockers, ACE-I/ARB, antiplaletet agents and more likley to be prescribed diuretics. In-hospital mortality rates were comparable between the 2 groups (7.7% women vs. 8.2%, p=0.4) **Conclusion:** In Middle-eastern patients hospitalized with congestive heart failure, female gender is not associated with worse outcome. Women hospitalized with heart failure may be under treated with ACE-I and ARB.

**P068**

## Effect of age on clinical charactertics and outcome in patients hospitalized for congestive heart failure in a middle eastern country

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**Introduction:** The association between age and hospitalization for congestive heart failure (HF) is not clear. **Objectives:** To describe the association between age and risk factors in patients hospitalized with HF and to determine the effect of age on mortality. **Methods:** We condcuted retrospective analysis of a prosectively collected data on all patients hospitalized with HF in the State of Qatar during the 20 years (1991–2010). Patients were divided into 3 groups (gp); gp 1 (≤50 years;n=1,275), gp 2 (>50 to 70 years, n=4,097) and gp 3 (>70 years, n=1,694). **Results:** Gp 1 patients were more likley to be men and smokers when compared to the other 2 gps. The prevalence of hypertension (40.8%, 59.4% & 61.8%, p=0.001), chronic renal impairemnt (4.7%, 8.8% & 10.8%, p=0.001) and history of prior myocardial infarction (21.2%, 32.5% & 35.2%, p=0.001) increased among the older age groups. The prevalence of diabetes mellitus was higher among gp 2 when compared to the other 2 gps. Atrial fibrillation prevalence incraesed with increasing age of HF patients (1.3%, 2.2% & 2.7% resepectively, p=0.03). The prevalence of HF secondary to acute coronary syndrome was comparable between the various groups. On admission, the older the age of HF the less likley they received beta-blockers (17.5%, 15.4% & 13.9%, p=0.03), antiplatelet agents (69.5%, 76.6% & 72.1%, p=0.001) and angiotensin-converting enzyme inhibitors (ACE-I) and angiotensin receptor blcokers (ARB) (58.4%, 56% & 52.5%, p=0.001). Diuretics (80.2%, 83.3% & 83.7%, p=0.02) and inotropes use increased with increasing age. At discharge, the older the HF patient, the less likley were prescribed beta blockers, antiplatelet agents, ACE-I, ARBs and diuretics. In-hospital mortality rate was higher in gp 3 when compared to the other 2 gps (10.6% gp 3 vs. 7% gp 1 & 7.2% gp 2, p=0.001). After adjustment for baseline varables, age was independent predictor of mortality (OR 1.02, 95% CI 1.01–1.02, p=0.001). **Conclusion:** The clinical characterstics of HF Middle-eastern patients vary considerably with age. Elderly patients were less likely to be treated with evidence-based therapy and more likley to face a grave prognosis.

**P069**

## Advanced heart failure support (AHFS): a new methodology in medical training

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**Introduction:** Acute heart failure (AHF) is a major public health issue. Despite effective medical therapy, it is still highly prevalent worldwide, accounting for a significant number of hospital admissions. In Brazil, approximately 250.000 patients are hospitalized each year, only in the public health system. A systematic approach to these patients could improve diagnosis and treatment, reducing length of stay, in-hospital mortality and early readmissions. **Objectives:** To evaluate the efficacy of a training program, based on a systematic approach to patients with AHF (Advanced Heart Failure Support–AHFS), measured by a specific multiple-choice test. **Methods:** AHFS program is an interactive teaching methodology that uses a textbook, intended to be read 30 days in advance, followed by a 6-hour course including tutorials and hands-on sessions, using low-cost mechanical models. Courses are divided in three hand-on stages, including early, intermediate and late in-hospital treatment. In each stage, 3 to 4 case scenarios are simulated, with management guided by the ABCDEFGH system (formed by initials in Portuguese for the following: assessment, ventilation, circulation, diuretics, ECG, heart rhythm, continuing drugs and heparin). A multiple-choice test was performed before and after the course. **Results:** Between January 2008 and August 2011, 1.136 physicians, including cardiologists and ICU specialists, performed 38 AHFS courses at 8 Brazilian cities. Of these, 472 (57.8% men) were submitted to the multiple-choice test. Before the training sessions, mean scores were 78.17 ±20,42 points (with 0 to 100 possible), while 18.22% (86) of the physician scored 100 points. After the sessions, the mean scores increased to 87.07 ±15.23 points (11.13% relative increase, p<0.0001), with a twofold increase in the number of physicians scoring 100 points (37.5% (177), p<0.001). **Conclusion:** The AHFS training program effectively improved physician's knowledge and skills in AHF patients management. Widespread Implementation of this program could improve AHF patients care provide by physicians in Brazil and abroad.

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**P070**

## Fetal stem cells (FSC) in combined treatment of chronic heart failure (CHF) with left ventricular systolic dysfunction

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**Introduction:** CHF incidence is growing every year, and this disease is one of the major concerns of all the developed countries, which calls for the development of new methods of its treatment, one of which is transplantation of low differentiated cells with high proliferative and differentiation potential–fetal stem cells. **Objectives:** Study FSC effect in CHF. **Methods:** 7 patients with NYHA Class III-IV CHF (M-85,7%, F–14,3%, 63,8±2 y.o.) participated in the clinical study. CHF was diagnosed on the basis of clinical symptoms confirmed by EchoCG findings (LVEF<45%). All patients underwent routine treatment (diuretics, beta blockers, ACE inhibitors and/or ARBs, cardiac glycosides, and anticoagulants of indirect action). **Results:** - · NYHA Class downgrading

--Statistically significant reduction of serum BNP by 4,3% 1 month after FSC transplantation (FSCT) and by 11,3% 3 months after the treatment (Table 1)

--Marked improvement of mental status

Table 1

**LV Morphofunctional Status in CHF Patients After FSCT (n=7)**

| Parameter | Healthy (n=30) | Before FSCT | 1 month | p | 3 months | P | $p_1$ |
|---|---|---|---|---|---|---|---|
| **LVEF, %** | 57,6 ±1,7 | 36,8±1,4 | 37, 1±1,9 | > 0,05 | 40, 5±2,7 | < 0,01 | < 0,01 |
| **EDV, ml** | 116 ± 11,5 | 222,8 ± 19,3 | 205,3 ± 10,1 | < 0,01 | 192,7 ± 7,6 | < 0,05 | < 0,01 |
| BNP, pg/ml | 36,5± 17,3 | 430,8 ± 22,8 | 285,4± 11,5 | < 0,05 | 184,5 ± 14,9 | < 0,05 | < 0,05 |

Note:

1. p–CHF significance before and after FSCT;
2. $p_1$–CHF significance 1 and 3 months after FSCT;
3. * - p<0,05 vs. healthy;

--Subjective and objective clinical improvements in all the patients

--Though there was no significant LVEF elevation after 1 month, but its statistically significant increase by mean 6,4% was reported 3 months after FSCT.

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**Conclusion:** FSCT is a safe and effective method of CHF treatment and can be used as supportive therapy in patients waiting for heart transplant, preparation for reconstructive heart surgery, or substitution of fibrous tissue with viable cardiomyocytes.

**P071**

## A 3 month study on the safety of non selective beta blockers in chronic heart failure patients with obstructive airway disease

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**Introduction:** Heart failure (HF) and obstructive airway disease (OAD) frequently coexists and present a challenge to the medical practitioners. Beta blockers (BB) have been under prescribed among HF patients with OAD for fear of inducing bronchoconstriction. Numerous small, short term studies have shown that non-selective BB appeared to be tolerable in patients with concurrent HF and Chronic Obstructive Pulmonary Disease (COPD). **Objectives:** We aim to assess the long term effect of BB on lung function as well as its clinical implication in HF and OAD patients. **Methods:** All the patients in the Penang General Hospital HF programme who were already on BB or deemed to benefit from BB were recruited. Patients were then followed-up every 2–6 weeks for dose adjustment and clinical symptoms (evidence of worsening cough or sputum production). Bedside spirometry measurement (FEV1, FVC & FEV1/FVC) were taken upon recruitment and during each visit. **Results:** Sixty two patients with a mean age of 60 ±13 year old were recruited, mean left ventricular ejection fraction was 33.9±10%, 15 have coexistent OAD (asthma/COPD). The mean follow-up period was 121±62days. Seventeen patients (27.4%) were on selective BB (bisoprolol, metoprolol) and 45 (72.6%) were on non-selective BB (carvedilol). Paradoxically, there was a mean increase in FEV1 for both patients with and without OAD (0.29±0.7L vs. 0.21±0.5L, p=NS) as the NYHA functional class improved. As a whole, 40 (65%) patients have either unchanged or higher FEV1 or FVC at follow up. Subgroup analysis showed that 33% of patients with OAD who were on non-selective BB have decrease in FEV1 which is comparable to 35% for those without OAD. Generally, OAD patients on either BB were not worsening clinically with respect to their symptoms (cough and sputum, p=NS for both). **Conclusion:** Both selective and non selective BB is safe in patients with OAD and the dosage can be safely optimized. However, further long term studies need to be done to assess this.

**P072**

## Long term follow up of surgical ventricular restoration patients: Saudi German hospital experience

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**Introduction:** Patients who underwent surgical ventricular restoration (SVR) with coronary artery bypass graft (CABG) surgery still had benefit at long term in the form of improved congestive heart failure functional class (CHF-FC) and left ventricular ejection (LVEF), smaller left ventricles and less hospital admissions. **Objectives:** SVR is safe and reproducible procedure for dilated ischemic cardiomyopathy (DICM) with benefits that stay with the patients at long term follow up. **Methods:** A total of 50 patients with DICM had SVR at our center and were prospectively observed for 3–5 years (mean 3.8 ± 1.2 years). Preoperative and postoperative left ventricular end systolic volume index (LVESVI), left ventricular end diastolic volume index (LVEDVI) and LVEF were assessed by echocardiography. CHF-FC was assessed by clinical interview with patients and results were analyzed statistically. **Results:** The mean age of patients was 58 ± 8 years, all were males, (48 patients had CABG + SVR), and 2 patients had (CABG + SVR + closure of ischemic ventricular septal defect). No hospital mortality was reported. During a mean follow up period of 3.8 ± 1.2 years the mean LVEF was significantly increased from 24± 4 % to 46± 6 % ($p<0.02$). LVESVI was significantly decreased from 108± 70 to 68± 40 ml/m$^2$ ($p<0.01$), and the LVEDVI was significantly decreased from 170± 40 to 118± 38 ml/m$^2$ ($p<0.01$). The mean CHF-FC was improved from 3.3± 0.3 to 1.8± 0.3 ($p<0.02$). There was neither sudden cardiac death nor readmissions for CHF. One patient died at 3 months of a stroke and one patient went missing at one year follow up and reported dead. **Conclusion:** In our series we proved that patients who were given SVR with CABG surgery maintained an improvement in CHF-FC, LVEF, and reduction in LV size at long term follow up.

**P073**

## Study on heart failure, its prevalence and management in Ruhengeri Hospital, Musanze, Rwanda

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**Introduction:** Heart failure is one of the major non communicable diseases, causing much morbidity and mortality. Its prevalence is high in developed world. But of greater concern is the rising prevalence in the developing countries, where resources for diagnosis and treatment are limited. Life style changes and diseases like rheumatic heart disease, T.B. and HIV/AIDS are the possible reasons for heart failure in underdeveloped countries. **Objectives:** This study was undertaken to know the prevalence of heart failure in internal medicine department of Ruhengeri hospital and its management with available resources **Methods:** Files of patients hospitalized with heart failure were studied for the period of 1st June 2009 to 28th February 2010 and data was collected. **Results:** There were 3.43% of patients hospitalized for heart failure in this period. Regarding gender distribution, there were 32%males and 68% females. Maximum cases were seen in the age group of under 30 years (28%) The principal clinical manifestations seen were breathlessness (81.3%), cough (41.3%), pedal edema(61%), hepatomegaly (57.3%), ascites(40%). Based on clinical observations, valvular heart disease was found to be the most common cause(30.7%) for heart failure, followed by hypertension (18.7%). Other causes were renal failure (13.3%) anemia in 5.3% and tubercular pericarditis in 4% cases. Diuretics alone were used for treatment in maximum (92%, cases), whereas diuretics and digoxin combination was used in 52%. ACEI were used in 16%, low dose aspirin in 12% and beta blockers in 5% cases. The mortality due to heart failure was 8% of all hospitalized patients. **Conclusion:** The prevalence of heart failure in internal medicine department was 3.43%. It was more in females (68%) than males (32%), more in age below 30 years (28%). Mortality due to heart failure was found to be 8%.

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**P075**

## Clinical and echocardiographic profile and outcomes of peripartum cardiomyopathy: the Philippine General Hospital experience

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**Introduction:** Peripartum cardiomyopathy (PPCM) is a rare disease entity of unknown etiology. High rates of mortality or poor overall clinical outcome are reported in women with this condition. Certain demographic characteristics are risk factors for this disease. In the Philippines, no data exist regarding the prevalence nor risk factors for PPCM. **Objectives:** (1) To determine the prevalence of PPCM among live deliveries in Philippine General Hospital (PGH) from January 1, 2009 to December 31, 2010; (2) To determine clinical profile of these patients, (3) to describe their echocardiographic findings and (4) to describe maternal and fetal outcomes **Methods:** All patients diagnosed with PPCM in the period of January 1, 2009-December 31, 2010 were studied. Demographic data and echocardiogram of the patients were reviewed. **Results:** Nine patients were diagnosed with PPCM during the study period. The prevalence is 1 in 1270 live births. Mean age was 29 years old. Moderate to severe heart failure (NYHA Class III &IV) symptoms in the prepartum period were seen in 78%. The purported risk factors for PPCM, obesity, multiparity and preeclampsia were seen in most patients (78% each). Conversely, only one patient admitted to having more than a single sexual partner. Only one patient had multifetal (twin) pregnancy. None of the patients were smokers. No patient underwent tocolysis. Echocardiographic findings showed the following : multisegmental wall motion abnormalities in all cases, mean ejection fraction of 34% & mean fractional shortening of 20%. No mortality was seen. Fetal outcomes were generally good with all resulting in live births and most (71%) were appropriate for gestational age. **Conclusion:** PPCM is a rare entity in the Philippines. Compared with international data, our patients are younger with low percentages of promiscuity, multifetal pregnancy, smoking history and tocolytic use. Similar to previous studies, obesity, multiparity and preeclampsia were also present in our PPCM patients. Maternal and fetal outcomes were generally good.

**P076**

## Left bundle branch block and the development of mechanical dyssynchrony–3D echo data

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**Introduction:** LV dyssynchrony can be reversed by cardiac resynchronization therapy (CRT), accurate and reproducible assessment of LV dyssynchrony is essential. **Objectives:** to evaluate the development of dyssynchrony of left ventricle with live three-dimensional ECHO (3D-ECHO) in patients with left bundle branch block (LBBB). **Methods:** 45patients, mean age 55,2±5,3 (48–60) with LBBB were examined. They were divided into two groups: 1st with EF > 50% (n=27 patients) and 2d with EF <50% (n=18 patients). Etiology factors in both groups were: dilated cardiomyopathy–11 patients, ischemic cardiomyopathy–9 patients; hypertension–20 patients and otherwise healthy–5 patients. In addition to standard examinations (ECG, 2D–ECHO, angiography, ect.) 3D–ECHO was performed. The time to minimum systolic volume (Tmsv) and the dispersion (Diff.) for each segment were analyzed. **Results:** Left intraventricular dyssynhrony did not have any correlations with QRS-complex duration (ratio= 0, 75, p=0, 46 in 1st group; ratio= 0, 6, p=0, 15 in 2d group) and LBBB presence.The 1st group had the following characteristics of intraventricular dyssynchrony by 2D ECHO: intraventricular delay was 57,0±17 ms, delay of contraction of the posterior wall to the intraventricular septum - 85,5±40,7 ms. Ccharacteristics of intraventricular dyssynchrony in the 2d group were approximately the same 55,6±13,5 ms and 87,5±17,0 ms, correspondingly (p = 0,78 and 0,46). However the prevalence of intraventricular dyssynchrony assessed by 3D ECHO was significantly different among the groups. While parameters of intraventricular dyssynchrony were almost normal in the 1st group (Sel-SD Tmsv 24,63±8,2 ms, Sel-Diff. 22,0±15,6 ms, Sel-SD Tmsv 2,9±1,2ms), they were significantly increased in the 2d group (Sel-SD Tmsv 124,3±86,2 ms, Sel-Diff. 242,4±185,6 ms, Sel-SD Tmsv 15,610,2 ms). Ejection fraction did not related to intraventricular delay and had weak correlation with it (r=0,06, p=0,76 и r=0,04, p=0,61 for 1st and 2d group, correspondently). **Conclusion:** The presence of LBBB does not have any influence on lent intraventricurlar dyssynchrony. The greatest decrease of mechanical dyssynchrony was observed in patients with EF below 50%.

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**P077**

## Minimally invasive technique for coronary sinus lead repositioning for the treatment of phrenic nerve stimulation

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**Introduction:** Phrenic nerve stimulation (PNS), which is often intolerable for the patient, is a known complication of resynchronization therapy (CRT). Our aim was to develop a minimal invasive method for treating PNS. **Objectives:** In 21 CRT patients with distal coronary sinus (CS) lead position reprogramming of the device did not terminate PNS, thus we performed minimally invasive CS lead reposition. **Methods:** An ablation catheter and an Amplatz Left 2 type guiding catheter were introduced into the right atrium via the right femoral vein. CS was cannulated with the Amplatz catheter and on a typical guide wire a coronary stent was introduced beside the lead into the side branch in 17 cases or a bigger stent into the CS main branch in two patients. The ablation catheter was looped around the CS lead in the atrium with bent tip, and was drawn backward together with the CS electrode. New lead positions were evaluated with electrophysiological measurements, and the suitable position was stabilized with inflation of the stent. In the two remaining cases only repositioning of the electrode was performed without stent implantation, in these pateints CS lead was anchored with a stent during the previous CRT implantation. **Results:** Pericardial effusion was not detected on postoperative echocardiography. After repositioning left ventricular pacing (LVP) threshold was not higher than 3.5 V; 0.5 ms in 20 cases. In one patient LVP was effective only using 6V; 1 ms pacing energy. PNS was not found with 7.5 V; 1.5 ms pacing. During follow-up (28±8 months) stable pacing threshold values were measured, transient and reprogrammable PNS was present in only two patients. Impedance measurements did not suggest insulation damage of the electrodes. **Conclusion:** CS electrode reposition using femoral approach seems to be a safe and effective procedure. The technique can be used successfully when distal CS lead dislocation is present.

**P078**

## Transseptal endocardial left ventricular lead implantation, a highly effective alternative method for resynchronization in selected cases

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**Introduction:** Left ventricular (LV) lead positioning might be challenging or in some instances it can not be carried out via the tributary of the coronary sinus (CS). In these cases alternative methods might be necessary. The aim of our study was to investigate the effectiveness and safety of transseptal endocardial left ventricular lead implantation. **Objectives:** Transseptal endocardial left ventricular lead implantation was performed in 12 patients (9 men, age: 62±11 years, NYHA III-IV stage). **Methods:** Transseptal puncture was done via the femoral vein, and the site of the puncture was dilated with a 6mm, later an 8 mm balloon. After the puncture of the left subclavian vein, steerable CS (8 pts) or ablation catheter (4 pts) was introduced into the CS sheath. The CS catheter was used to reach the left atrium and the left ventricle through the dilated transseptal puncture gap. In the left ventricle the region of latest activation (RLA) was searched. In 4 cases CARTO electroanatomical mapping system was used to help to find the septal gap and RLA. Active fixation bipolar electrode was fixed in the lateral wall of the left ventricle through the sheath. **Results:** The lead was fixed in the left ventricle in all cases with good pacing threshold values (0.65±0.2 V;0,4 ms). Puncture complication, pericardial effusion was not detected. Because of anticoagulation therapy started immediately after the procedure, pocket haematoma was found in three cases, one of them needed evacuation. Follow-up is longer than one month in 8 patients (12,4±12 months). Significant improvement was observed in all but one case, on the first month control left ventricular ejection fraction was (27±4% vs 37±9%). Patient's NYHA class improved at least one class on the last visit. Early lead dislocation was noticed in one case, the lead dislodged into the right atrium, reposition was performed using the originally punctured transseptal opening. Explantation of the system was necessary because of pocket infection in one case, it was performed with traction only, no complication was noticed during and after the operation. **Conclusion:** If transvenous and surgical epicardial method can not be applied, left ventricular endocardial electrode implantation might be an alternative for implanting the left ventricular lead.

**P079**

## Influence of cardiac resynchronisation therapy on long-term survival in patients with coronary artery disease and dilated cardiomyopathy in real clinical practice

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**Introduction:** Results of many randomized controlled trials showed the better response to cardiac resynchronisation therapy (CRT) in patients with dilated cardiomyopathy (DCM) in comparison withcoronary artery disease (CAD). **Objectives:** To assess the influence of CRT on survival rate in patients withDCM and CAD in real clinical practice. **Methods:** 107 patients with DCM (n=47) and CAD (n=60) enrolled in local registry of CRT evaluated during a median follow-up of 24±1 month after CRT implantation were compared with the control group of 118 patients with DCM (n=12) and CAD (n=106) on optimal pharmacological treatment. All patients were NYHA class II-IV, ejection fraction ≤35%, left ventricular diameter ≥55 mm. Patients with CRT had intraventricular and/or interventricular dyssynchrony evaluated by echocardiography and/or QRS duration ≥120 ms. **Results:** Median age for DCM group was 49±1 years vs 58±1 years for CAD group ($p<0.001$).Patients with DCM were significantly higher treated with b-blockers (86% vs 73%; $p=0.05$), diuretics (86% vs 72%, $p=0.03$), warfarin (42% vs 25%; $p=0.015$), digoxin (61% vs 46%; $p=0.05$), spironalocton (86% vs 55%; $p=0.001$). Survival rate calculated by Kaplan-Meier method in CRT group was 70.7% compared to 49.5% in pharmacological treatment group ($p=0.03$).In patients with DCM the survival rate was 73% in CRT group vs 78% in control group ($p=0.5$), in CAD group 69% and 45% ($p=0.03$), respectively. **Conclusion:** In real clinical practice CRT reduces mortality in patients with congestive heart failure. Our data demonstrated higher efficacy of CRT on survival rate in patients with CAD compared to patients with DCM probably because of difference in pharmacological treatment and age of the patients.

**P080**

## Endothelial progenitor cells and CD34+ in patients with ischemic heart disease and chronic heart failure

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**Introduction:** Mature endothelial cells possess limited regenerative capacity. There is therefore much interest in circulating endothelial progenitor cells (EPCs). It has been suggested that these cells might not only be responsible for the continuous recovery of the endothelium after injury/damage, but also might take part in angiogenesis. **Objectives:** Peripheral blood CD34+ cells and EPCs were studied in ischemic heart disease and chronic heart failure (CHF). **Methods:** Peripheral blood CD34+ cells and EPCs, assessed both as CD133+ cells and CD133+ cells coexpressing CD34 and vascular endothelial growth factor (VEGF) receptor-2 cells and tumor necrosis factor-$\alpha$ (TNF-$\alpha$), C-reactive protein, VEGF, granulocyte-colony stimulating factor (G-CSF), NT-pro brain natriuretic peptide (NT-proBNP) were studied in 106 men with ischemic heart disease and chronic heart failure (CHF) I-IV class (NYHA), who were compared with 21 age-matched men with ischemic heart disease without CHF and 10 age-matched healthy control subjects. **Results:** There was an decrease CD133+, CD34+/CD133+/VEGFR2+ cells in men with CHF compared without CHF ($P<0.05$) and healthy controls ($P<0.05$). Men with more severe CHF (class III–IV) had lower CD34+, CD133+, CD34+/CD133+/VEGFR2+ cells ($P<0.05$), than class I-II. TNF-$\alpha$ ($P<0.001$). A significant decrease levels of CD133+, CD34+/CD133+/VEGFR2+ cells ($P<0.05$) were detected in CHF with left ventricular ejection fraction (<40%), negative correlated to age, smoking, NYHA class, left ventricular ejection fraction, number of myocardial infarctions, NT-proBNP, and positive–to VEGF, CD34+, CD133+ cells. **Conclusion:** CD34+ cells and EPCs mobilization was decreased in patients with ischemic heart disease with CHF, especially with more severe NYHA class, left ventricular systolic dysfunction and can be related to the myelosuppressive role of cytokine activation.

**P081**

## Synergestic treatment of stem cells and coronary artery bypass in cardiac failure patients

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**Introduction:** Cell therapy with bone marrow-derived stem/progenitor cells is a novel option for improving neovascularization and cardiac function in ischemic heart disease. **Objectives:** In this study we present several patients with Congestive Heart Failure (CHF) who had undergone simultaneous injections of mesenchymal and CD 133+ stem cells. **Methods:** This study was performed as a quasi-experimental survey. Eight known CHF-patients attended Tehran Shariati hospital in 2008–9, were selected for stem cell Injections. Three weeks before the injections, 150 mls of bone marrow tissue (for extraction of CD133+ and mesenchymal stem cells) and 50 mls of peripheral blood (for culturing and serum preparation) were obtained from each patient. During the Coronary Artery Bypass Graft (CABG) procedure, one ml from the mixture of CD133+ and mesenchymal stem cells containing $10x10^6$ cells was injected into several sites around the myocardial scars of heart in each individual patient. **Results:** Before the intervention, the mean left ventricular ejection fraction (LVEF), end-diastolic, and end-systolic diameters were 35.5%, 6.3 cm, and 4.6 cm, respectively. After the intervention, the mean left ventricular ejection fraction (LVEF), end-diastolic, and end-systolic diameters were 46.3%, 7.9 cm, and 6.2 cm, respectively. There was a statistically significant differences between before and after the intervention EF, end-diastolic, and end-systolic volumes ($p<0.0001$). None of the patients experienced complications **Conclusion:** Our findings indicate that, the use of mesenchymal stem cells were a safe and effective therapeutic option leading to increased functional cardiac capacity in patients with post ischemia heart failure

**P082**

## Hospital training and its continuation at home with central telemonitoring significantly improves exercise capacity and echocardiographic parameters in heart failure patients after CRT implantation

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**Introduction:** Chronic Heart Failure (CHF) is one of the major issues in the healthcare. It is also an important social and economic problem for the patients. **Objectives:** The aim of the study was the evaluation of the effectiveness of in-hospital and centrally telemonitored training of

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patients with CHF treated with cardiac resynchronization therapy. **Methods:** The study included 47 patients (5W/42M), 52–75 (av. 62±9,3) years old, with CHF (NYHA III) of ischemic and noninschemic etiology. All patients were treated with cardiac resynchronization therapy (CRT-D) and had optimal pharmacotherapy. 20 patients (group A, mean age 61,9±9 years) went through 3 weeks of in-hospital rehabilitation period and 8 weeks (5 exercises sessions per week) of home rehabilitation, which was telemonitored by the physicians and rehabilitants at hospital. 27 patients were in the control group (group B, 62,5±8,9 years). Patients performed cardiopulmonary treadmill exercise test (CPX) with Naughton protocol, before CRT-D implantation and 3 months after the procedure. Echocardiography (2D and Doppler) and Nt-proBNP measurement were also performed. **Results:** In CPX studies pts results, before and after 3 months, were: $VO_2$ peak [ml/kg/min]:: group A 12,2±2,7 vs 14,6±2,7, ($p<0,05$); group B 10,9±3,8 vs 11,9±4,0, (ns); VCO [ml/kg/min]: group A 1,1±0,3 vs 1,3±0,2, ($p<0,05$); group B 0,9±3,8 vs 1,0±0,4,(ns); VE/VO2 slope: group A 38,7±7,5 vs 30,0±4,6, ($p<0,005$); group B 38,0±9,7 vs 35,2±10,6, (ns); VE/VCO2 slope: group A 35,7±6,4 vs 34,5±5,6, (ns); group B 41,0±10,8 vs 37,2±14,3 (ns); VE max [l/min]: group A 52,7±7,2 vs 51,8±9,2, (ns); group B 44,7±12,0 vs 45,7±15,5, (ns); METs: group A 3,5±0,9 vs 4,3±0,6, ($p<0,001$); group B 2,8±0,9 vs 3,3±1,1, ($p<0,05$). In the echocardiographic examination significant reduction of LVsD in both groups was observed (group A: 5.1±1.0 vs 4.6±0; $p<0.05$; group B 5.5±1.1 vs 4.9 ±1.0; p,0<0.05)., and nonsiginificant improvement of ejection fraction in both groups: group A: 25,2% vs 29,7 %,(ns), group B: 24,8% vs 28,9%, (ns). Nt-proBNP did not change in group A: 1558±1582.9 vs 1447.9±1597 pg/ml (ns), there was significant reduction in group B: 2861.2±3301.1 vs 2400.1±3277.5 pg/ml ($p<0.05$). **Conclusion:** Systematically applied centrally telemonitored home exercise training considerably improves physical efficiency in chronic heart failure patients treated with cardiac resynchronization therapy. It constitutes an effective, safe adjunctive therapy in this group of patients.

**P083**

## Relation between red cell distribution width and echocardiographic parameters in patients with diastolic heart failure

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**Introduction:** Red cell distribution width (RDW) was found to be a prognostic marker in heart failure patients. **Objectives:** The aim of the study is to investigate the relationship between RDW and echocardiographic parameters in diastolic heart failure (DHF). **Methods:** 71 consecutive DHF patients (26 male) and 50 controls (21 male) were included in the study. All of the study population underwent echocardiographic evaluation and blood samples were obtained. **Results:** RDW and N terminal-probrain natriuretic peptide (NT-proBNP) values were significantly higher while there was an increasing trend for hs-CRP levels in DHF subjects than controls ($P<0.001$, $P<0.001$ and $P=0.064$, respectively). All of the echocardiographic parameters evaluating diastolic function were more deteriorated in the DHF group (Table 1). Patients that had a RDW value above the cut-off point also had higher NT-proBNP levels, an elevated ratio of mitral peak velocity of early diastolic filling to early diastolic mitral annular velocity (E/Em) and increased estimated pulmonary capillary wedge pressures (PCWP) by tissue Doppler parameters, but lower creatinine clearance ($P<0.05$ for all) (Table 2). According tothe cut-off values calculated using ROC analysis, RDW>13.6% and NT-proBNP>125 pg/mL have high diagnostic accuracy for predicting DHF.

**Table 1:** Data of patient and control groups

| | Control (n=50) | Patient (n=71) | *P* value |
|---|---|---|---|
| **RDW (%)** | 12.99±1.34 | 14.33±1.53 | **<0.001** |
| **NT-proBNP (pg/mL)** | 57 [26-94] | 97 [57-264] | **<0.001** |
| **hs-CRP (mg/L)** | 3.19 [3.19-5.60] | 3.27 [3.22-4.46] | 0.064 |
| **E (cm/sec)** | 65.14±17.45 | 77.87±20.30 | **<0.001** |
| **Em lateral (cm/sec)** | 10.87±1.81 | 8.70±1.91 | **<0.001** |
| **E/Em lateral** | 6.06±1.56 | 9.43±3.33 | **<0.001** |
| **PCWP lateral (mmHg)** | 9.00 [7.98-10.82] | 12.63 [11.36-15.44] | **<0.001** |
| **E/Em mean** | 6.46 [5.33-7.96] | 9.85 [8.74-11.45] | **<0.001** |
| **PCWP mean (mmHg)** | 9.91 [8.51-11.77] | 14.12 [12.74-16.09] | **<0.001** |

**Table 2:** Data of lower and higher RDW groups

| | Lower RDW (≤13.6) (n=25) | Higher RDW (>13.6) (n=46) | *P* value |
|---|---|---|---|
| **Creatinine clearance (mL/min/1.73 m²)** | 140±26 | 97±27 | **<0.001** |
| **NT-proBNP (pg/mL)** | 70 [57-106] | 191 [57-560] | **0.006** |
| **hs-CRP (mg/L)** | 4.33±2.22 | 5.05±3.74 | 0.227 |
| **E/Em mean** | 9.4 [8.7-10.1] | 10.6 [8.5-14.0] | **0.047** |
| **PCWP mean (mmHg)** | 13 [13-14] | 15 [12-19] | **0.047** |

**Conclusion:** RDW values were increased in the DHF population. Our results suggest that the high RDW levels in patients with DHF may be related to increased neurohormonal activity, impaired renal functions and elevated filling pressure, but not to increased inflammation.

**P084**

## Capability of catestatin as indicator of cardiac structural changes in asymptomatic patients with heart failure risk factors

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**Introduction:** In the ACC/AHA guidelines for the evaluation of chronic heart failure, it has been suggested that in asymptomatic patients at high risk for developing heart failure (e.g., patients with systemic arterial hypertension, diabetes mellitus, or coronary artery disease), echocardiography is used to detect patients progressing along the heart failure pathway, which is important because these patients require more intensive therapy. Thus, a screening test to be performed before echocardiography would be clinically useful for ruling out **cardiac** structural changes in this high-risk population and thereby reducing the frequency of echocardiography. Up until the present, many cardiologists have focused on catestatin. Catestatin is a chromogranin A-derived peptide that participates in the regulation of cardiovascular function. Previous studies showed that the peptide could decrease cardiac output by reducing catecholamine secretion. **Objectives:** The aim of the study was to evaluate the diagnostic utility of catestatin for the detection of **cardiac** structural changes in asymptomatic patients with heart failure risk factors. **Methods:** This study included 204 patients with hypertension, diabetes mellitus, or coronary artery disease. Diagnosis of **cardiac** structural change was based on the presence of systolic or diastolic dysfunction, left atrial dilatation, left ventricular dilatation or **hypertrophy**, pulmonary hypertension, and wall motion or valvular abnormalities. Blood concentrations of **catestatin** were measured by available assays on the day of the echocardiographic evaluation. Diagnostic accuracy of catestatin was assessed by ROC curve analysis. **Results:** There was significant difference between catestatin concentrations of patients with **cardiac** structural changes($n = 96,13.68\pm4.81$ng/ml) and patients without ($n = 108,21.29\pm7.10$ng/ml) ($P<0.05$).In distinguishing between patients with **cardiac** structural changes and patients without, area under the curve was 0.840 (95% confidence interval, 0.752–0.918). Cutoff value with 90% sensitivity for detecting **cardiac** structural changes was 15.2 ng/mL with 45% specificity. **Conclusion:** Catestatin has a certain capability for detecting **cardiac** structural changes in asymptomatic patients with heart failure risk factors. In the setting evaluated, a screening strategy relying on measurement ofcatestatin may be of limited value because of the low specificity at the selected cutoff values.

**P085**

## Association of serum complement C3a and C3 levels with ventricular volumes and mass in top athletes

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**Introduction:** The complement system, an effector of the innate immune system plays an important role in several pathophysiologic processes besides maintaining immune-homeostasis. However, the role of complement in the response of the heart to physical stress is not yet known. **Objectives:** The aim of the present study was to determine the association of total complement C3 (C3) and its activation product C3a with the characteristics of the athlete's heart. **Methods:** In a cross-sectional study, we included 94 top athletes and 39 age and sex matched healthy non-athlete controls and determined their total C3 and C3a concentrations. Left and right ventricular end systolic volume indices (LVESVi, REVSVi), end diastolic volume indices (LVEDVi, RVEDVi), stroke volume indices (LVSVi, RVSVi) and mass indices (LVMi, RVMi) were determined by cardiac magnetic resonance imaging. **Results:** We found significantly lower total C3 (1.14 [1.03–1.29] vs. 1.24 [1.08–1.39] g/L, $p=0.0270$) and C3a (0.39 [0.30–0.59] vs. 0.51 [0.40–0.68] ng/mL, $p=0.0270$) concentrations in top athletes compared with non-athlete controls. Total C3 levels inversely correlated with LVESVi ($r=-0.2181$, $p=0.0347$), LVEDVi ($r=-0.2682$, $p=0.0090$), LVSVi ($r=-0.2689$, $p=0.0088$), as well as with RVEDVi ($r=-0.2322$, $p=0.0243$) and RVSVi ($r=-0.2750$, $p=0.0073$), marginally with RVESVi ($r=-0.1802$, $p=0.0822$), but not with LVMi ($p=0.2067$) or RVMi ($p=0.1125$). C3a levels inversely correlated with LVESVi ($r=-0.3042$, $p=0.0029$), LVEDVi ($r=-0.3531$, $p=0.0005$), LVSVi ($r=-0.3160$, $p=0.0019$), as well as with RVESVi ($r=-0.2833$, $p=0.0057$), RVEDVi ($r=-0.3089$, $p=0.0025$) and RVSVi ($r=-0.3083$, $p=0.0025$). C3a levels also inversely correlated with LVMi ($r=-0.3450$, $p=0.0007$) and RVMi ($r=-0.4779$, $p=0.0001$). We could not detect correlation of C3 or C3a with left or right ventricular volume and mass indices in the non-athlete control group. **Conclusion:** Our data suggests, that the complement system might play role in remodeling of the heart due to physical stress in top athletes. According to our results low C3a levels are associated with increased ventricular systolic, diastolic and stroke volumes and mass. The study was supported by TÁMOP-4.2.2./B10/1.-2010–0013 and TÁMOP-4.2.2–08/1/KMR-2008–0004 grants.

**P086**

## Inflammatory markers (TNF-$\alpha$, IL-6, CRP), BNP and spiroergometric stress test parameters in patients with heart failure and atrial fibrillation

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**Introduction:** Heart failure frequently coexists with atrial fibrillation. There are only a few reports on concentrations of inflammatory markers (TNF-a, IL-6, CRP), BNP and exercise capacity evaluated by cardiopulmonary testing (CPX) in this group of patients. **Objectives:** To compare concentrations of TNF-a, IL-6, CRP, BNP and CPX parameters in heart failure patients with atrial fibrillation and sinus rhythm. **Methods:** 106 patients with heart failure in NYHA class II and III (AF group - 26 patients with atrial fibrillation and SR group–80 patients with sinus rhythm). We analyzed functional capacity according to NYHA classification, concentrations of TNF-a, IL-6 and CRP, BNP, echocardiographic parameters (LVDd, LVEDV, EF) and CPX and gas exchange ($t_{max}$, $HR_s$, $HR_{max}$, $VO_{2peak}$% N, $VO_{2peak}$).**Results:** LVEF was comparable between groups. In AF group as compared with SR group we found significantly higher CRP ($21.13\pm20.06$ vs. $13.2\pm11.28$ mg/dl; $p=0.04$), IL-6 ($13.55\pm10.94$ vs. $8.6\pm7.33$ pg/ml; $p=0.05$), and BNP ($582.75\pm179.35$ vs. $442.94\pm213.75$ pg/ml; $p=0.03$). In AF patients there was a negative correlation between IL-6 and test duration ($r=-0.24$, $p=0.5$) and MET ($r=-0.24$, $p=0.05$).

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Differences in CPX between groups:

| | Sinus rhythm (SR) | Atrial fibrillation (AF) | Inter-group comparison |
|---|---|---|---|
| | ± SD | ± SD | *p* |
| $t_{max}$(s) | 618,11 ± 269,78 | 419,50 ± 241,34 | 0,019 |
| $HR_s$(1/mm) | 80,48 ± 15,25 | 97,50 ± 20,95 | 0,001 |
| $HR_{max}$(1/min) | 123,14 ± 16,69 | 148,17 ± 16,08 | 0,000 |
| $VO_{2peak}$ (ml/kg/min) | 15,30 ± 4,83 | 12,45 ± 3,16 | 0,03 |
| $VO_{2peak}$ % N | 52,97 ± 15,95 | 43,45 ± 9,11 | 0,058 |

**Conclusion:**
1.Patients with heart failure and atrial fibrillation have higher IL-6 and CRP, BNP indicating increased inflammatory reaction in this group.
2.Atrial fibrillation significantly reduces exercise tolerance and peak oxygen consumption in patients with heart failure.

**P087**

## How can we manage patients with heart failure (HF) who could not reach a target level (100 pg/Ml) of B-type natriuretic peptide (BNP) despite BNP-guided HF therapy?

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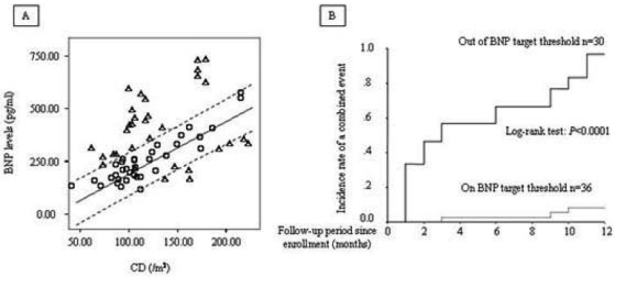
**Introduction:** Previously, even among clinically stable systolic heart failure (HF) patients, we identified a high incidence rate of cardiac event in cases with high levels of B-type natriuretic peptide (BNP) in plasma.[1] Furthermore, titrated HF therapy according to plasma BNP level improves treatment outcome.[2] However, clinical course or disease management in patients who could not reach its target level remains uncertain. **Objectives:** The aim is to identify outcome and a target threshold of BNP in HF patients with high levels of BNP despite titrated systolic HF therapy. **Methods:** Clinically stable 116 non-ischemic dilated cardiomyopathy outpatients who received titrated HF therapy including beta blockers, angiotensin-converting enzyme inhibitors, and diuretics according to BNP levels below 100 pg/ml during first 6 months after discharge for decompensated HF were enrolled, and then followed for 12 months. Main end-point was readmission for decompensated HF or death. **Results:** Patients who could not reach the goal of BNP at 6 months had an extremely higher event-risk compared with those who did it (the Log-rank test: $P<0.0001$). However, even among such high-risk patients, the half was free of events. BNP levels significantly correlated to cardiac dilatation in this event-free group alone ($r=0.90$, $P<0.001$) (Figure 1A). The target threshold of BNP at post-discharge 6 month defined by this correlation could identify low-risk patients even from high-risk group (the Log-rank test: $P<0.0001$) (Figure 1B), which were associated with the improvements of cardiac dilatation and systolic dysfunction.
**Image/graph I:**

Figure 1

**Target threshold of B-type natriuretic peptide (BNP) for risk reduction in high-risk patients who could not reach target levels below 100 pg/ml despite titrated heart failure therapy.**




A: The correlation between BNP level and cardiac dilatation (CD). Only event-free patients had a significantly positive correlation between BNP level and CD (r=0.91; P<0.0001; BNP = -56.89 + 2.49 ×CD). B: Kaplan-Meier curves showing the incidence rate of readmission for decompensated heart failure or death according to the range between dotted lines: 95% confidence interval on solid line: the linear regression line specific for event-free patients. Open circles or triangles indicate event-free patients or event patients, respectively. CD is indicated by left ventricular end-diastolic dimension× left atrial diastolic dimension/wall thickness/body surface area.

**Conclusion:** Even clinically stable patients with non-ischemic dilated cardiomyopathy under BNP-guided therapy had a poor outcome, provided that they could not reach its target level. However, we identified an individual target threshold of BNP related to cardiac dilatation for risk reduction in such high-risk cases.
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**P088**

## Serum levels of soluble VEGF receptor-2, but not those of VEGF, are decreased in patients with left ventricular hypertrophy and systolic dysfunction

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**Introduction:** Vascular endothelial growth factor (VEGF) plays a key role in angiogenesis and is required for preventing the transition from compensatory left ventricular hypertrophy (LVH) to heart failure (HF). Soluble VEGF receptor-2 (sVEGFR-2), which retains an affinity for VEGF but is unable to activate its signal transduction, acts as an endogenous inhibitor of VEGF. While serum sVEGFR-2 levels are increased in subjects with metabolic syndrome, the possible role of sVEGFR-2 in LVH or HF in human is unknown. **Objectives:** We investigated serum levels of sVEGFR-2 in patients with LVH or HF. **Methods:** We measured serum levels of N-terminal pro-B-type natriuretic peptide (NT-proBNP), VEGF, soluble VEGF receptor-1 (sVEGFR-1), and sVEGFR-2 employing enzyme-linked immunosorbent assays in 57 patients whose NYHA classes were stable for at least 3 months. They were divided into 3 groups: 19 patients with LVH (LV mass index (LVMI): male>116g, female>104/$m^2$) and systolic dysfunction (LV ejection fraction (LVEF) <50%) (LVH+HF+), age-, body mass index-adjusted 19 patients with LVH and preserved systolic function (LVH+HF-), and 19 patients with no LVH and preserved systolic function (LVH-HF-). **Results:** Systolic and diastolic blood pressures, VEGF, and sVEGFR-1 were similar among the 3 groups. NT-proBNP levels were greater in LVH+HF+ than LVH+HF-and LVH-HF-. In contrast, sVEGFR-2 was significantly lower in LVH+HF+ than LVH-HF-($P=0.02$). After adjustment for age and gender, sVEGFR-2 levels were positively correlated with triglycerides, LVEF, and were negatively correlated with LVMI and NT-proBNP. Stepwise regression analysis revealed that independent determinants of the sVEGFR-2 level were age, NT-proBNP, and triglycerides. Multiple logistic regression analyses including confounding factors revealed that a decrease in sVEGFR-2 was independently associated with both LVH and systolic dysfunction. **Conclusion:** Serum levels of sVEGFR-2, but not those of VEGF or sVEGFR-1, are decreased in HF patients with LVH. sVEGFR-2 might play a role in modulation of angiogenesis in hypertrophied LV with systolic dysfunction in human.
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**P089**

## The link between uric acid (surogat marker activity of xanthine oxidase) and cardiac autonomic disbalance in coronary artery disease patients

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**Introduction:** Uric acid (UA) has long been linked with cardiovascular diseases, and hyperuricaemia is a common finding in patients with CHF. **Objectives:** The purpose of this study was to investigate the association between cardiovascular autonomic function and level of UA as surogat marker of oxidant-producing enzymes, xanthine oxidase (XO), the major cardiovascular source of reactive oxygen species. **Methods:** This study included 107 consecutive patients (43 women, 64 men) with ischemic heart disease and all of them was analyzed cardiovascular autonomic function. Parameters of spectral analysis (ultra low frequency-ULF, very low frequency-VLF, low frequency -LF, high frequency –HF, LF/HF index) of heart rate variability (HRV) and standard time-domain parameters of HRV (mean RR interval, SDNN, SDANN, rMSSD and pNN50%) were obtain from 24h. EKG monitoring and correlated with serum level of UA **Results:** Level of uric acid was significantly, positively correlated with ULF ($r=0.28$; $p=0.01$), VLF ($r=0.29$; $p=0.01$), LF ($r=0.30$; $p=0.01$), HF ($r=0.29$; $p=0.01$). No significant relationship was noted between UA and LF/HF index ($r=-0,05$; $p=0,67$). Significant relationships between standard time-domain parameters of HRV and urin acid were also observed. UA was positively related to SDNN ($r=0.27$, $p=0.01$), RMSSD ($r=-0.28$; $p=0.01$) but not correlated with pNN50 ($r=0.19$;$p=0.85$). **Conclusion:** Our results suggest an association between UA levels and parameters of cardiac autonomic function, UA has emerged as a strong prognostic factor in patients with CHF. Our results indicate the possible significance of inhibition of XO in improving autonomic dysfunction so it represents an interesting therapeutic alternative for better outcome in CHF patients in the future.

**P090**

## Endothelial dysfunction assessed by noninvasive method and production of free radicals in the chronic heart failure

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**Introduction:** Vascular oxidative stress is assumed as a significant factor in the onset and progression of chronic heart failure (CHF). **Objectives:** We analyzed different markers of oxidative stress and evaluated their significance in the development of endothelial dysfunction in CHF patients. **Methods:** 120 consecutive patients with varying degree of CHF and 69 controls, were analyzed. Serum uric acid (a surrogate marker of xantine oxidase activity) levels and GGT activity as well as plasma malondialdehyde (MDA), protein

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thiol (P-SH) and reactive carbonyl groups (RCD), together with glutathione peroxidase (GSH-Px) and superoxide dismutase (SOD) activities were determined spectrophotometrically and/or by ELISA methods and correlated with flow-mediated endothelium-dependent vasodilation (FMEDV) in the brachial artery as a surrogate test for endothelial function. Flow-mediated endothelium-dependent vasodilation was measured in the brachial artery during reactive hyperemia after 5 minutes of cuff occlusion in the upper arm. **Results:** Levels of uric acid and GGT activity gradually increased with degree of CHF progression. Patients with severe CHF exhibited elevated MDA and RCD levels and decreased P-SH groups compared to asymptomatic patients or controls. Oxidative stress in severe patients was associated with significant fall in plasma GSH-Px activity. Correlation of serum uric acid levels (a surrogate marker of xantine oxidase activity) and RCD with FMEDV ($p=0.001$) was observed. MDA and P-SH groups were related to FMEDV $p=0.003$ and $p=0.005$ respectively, but only in severe stage. **Conclusion:** Significant role in the development of endothelial dysfunction in CHF patients have elevated free radical production mediated by xantine oxidase and oxidative lipid and protein damage.

## P091

## Relationship between catecholamines and structural and functional characteristics of the heart in patients with congestive heart failure

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**Introduction:** Congestive heart failure (CHF) is characterized by generalized sympathetic activation but interactions between catecholamines and structural and functional characteristics of the heart in patients with CHF are not well-defined. **Objectives:** To assess the relationship of adrenaline and noradrenaline levels in daily urine analysis with echocardiographic parameters, biochemical markers, heart rate variability (HRV) in patients with congestive heart failure (CHF). **Methods:** Correlation analysis of adrenaline and noradrenaline urine levels with NT-proBNP and endotheline-1, TNF-$\alpha$ levels, echocardiographic data and HRV parameters (5 min duration in rest and active orthostasis) was performed in 40 patients with CHF. **Results:** The level of noradrenaline negatively correlated with NT-proBNP ($r=-0.416$, $p=0.038$), endotheline-1 ($r=-0.413$, $p=0.035$) levels, left ventricular (LV) diastolic dimension ($r=-0.401$, $p=0.001$), right ventricular ($r=-0.362$, $p=0.022$), right atrial ($r=-0.489$, $p=0.089$), left atrial ($r=-0.501$, $p=0.01$) dimensions, positively correlated with LV ejection fraction ($r=0.389$, $p=0.013$). Positive correlation between the level of adrenaline and LV systolic dimension ($r=0.548$, $p=0.065$), TNF-$\alpha$ ($r=0.895$, $p=0.04$) and endotheline-1 ($r=0.383$, $p=0.053$) levels was detected. The coefficient adrenaline/noradrenaline (A/NA) positively correlated with NYHA class ($r=0.376$, $p=0.017$), NT-proBNP ($r=0.485$, $p=0.014$), endotheline-1 ($r=0.614$, $p=0.001$) levels, HRV parameters: ratio low-frequency (LF) [ms2]/high-frequency oscillations (HF) [ms2]) -LF/HF in rest ($r=0.975$, $p=0.005$), LF/HF in active orthostasis ($r=0.872$, $p=0.054$), very low-frequency oscillations -VLF% in active orthostasis ($r=0.900$, $p=0.037$) and negatively correlated with RMSSD (the square root of the mean squared difference of successive NNs) in active orthostasis ($r=-0.900$, $p=0.037$). **Conclusion:** The opposite correlations of adrenaline and noradrenaline with structural and functional characteristics of heart, biochemical markers of CHF emphasize the different role of these catecholamines in pathogenesis of CHF.

## P092

## Can progression of aortic stenosis be mathematically modeled?

Hitesh Patel[1,*], Nisha Patel[2], Ann Topham[1], Lesley Hart[1], Liz Cheek[3], Guppy Dhillon[1], Nikhil Patel[1], Lydia Sturridge[1], Guy Lloyd[1]
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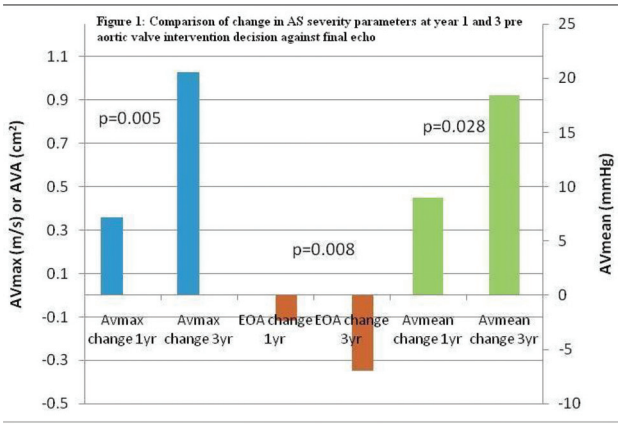
**Introduction:** Aortic stenosis (AS) is common and its prevalence is increasing. Symptomatic AS has a grave prognosis and even asymptomatic AS is not benign with an annual death rate of 1%. Progression is generally considered to be linear with specific groups of rapid progressors identified, but anecdotally variations of progression rate within individuals occur. **Objectives:** To create a mathematical model that describes progression of aortic stenosis. **Methods:** We performed a retrospective cohort analysis of all identifiable severe AS patients who have either had a valve replacement (AVR) or are on a waiting list and who were not having AVR because of coexisting requirement for coronary artery bypass. All included patients had at least two echocardiograms and the changes in echocardiographic parameters with time were examined. **Results:** We studied 72 patients (age $73.7\pm10.4$ (mean$\pm$SD), 37 male). 13 (18%) underwent mechanical valve replacement, 47 (65%) were bioprosthetic valves and 11 (15%) were pending. 19 (30%) patients had replacements in 1997–2004 and 45 (70%) had replacements 2005–2011. 2 (2.8%) died within one year post valve replacement. Co-morbidities included diabetes 8 (11%), hypertension 41 (57%), 3 (4%) current smokers and 28 (39%) ex-smokers. At time of AVR the peak velocity (AVmax) was $4.34\pm0.51$m/s (mean$\pm$SD), mean gradient (AVmean) was $44.3\pm$ 13.4mmHg (mean$\pm$SD), and the mean aortic valve area (AVA) was $0.72\pm0.18$cm$^2$ (mean$\pm$SD). Comparing 3 years with 12 months prior to AVR the AVmax increased 1.01m/s VS 0.43/s ($p=0.005$), AVmean increased by 20.49 VS 8.16mmHg ($p=0.008$) and AVA decreased by 0.33 VS 0.15cm$^2$ ($p=0.028$). See Figure 1. AVmax (m/s), AVmean (mmHg), and AVA (cm$^2$) all showed a logarithmic relationship with time, best described by the following equations: (Vmax= 4.37–0.488 log(x), where x= time (months), $r^2=0.974$, $p<0.001$). (AVmean= 45.25–9.39 log(x), $r^2=0.956$, $p<0.001$). (AVA= 0.65 + 0.22 ln(x), $r^2=0.894$, $p<0.001$). See Figure 2.

**Image/graph I:**




**Image/graph II:**

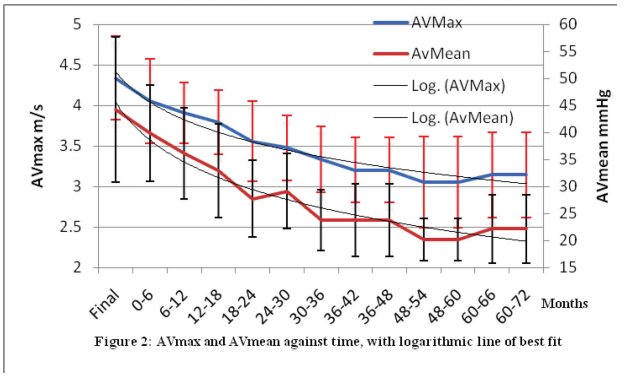


Figure 2: AVmax and AVmean against time, with logarithmic line of best fit

**Conclusion:** The rate of progression of aortic stenosis is not linear in patients requiring AVA. The rate of change for AVmax, AVmean and AVA can be defined mathematically by a logarithmic equation. A logarithmic decline in aortic valve function has biological plausibility. If confirmed prospectively this should allow better planning of valve follow up for patients with aortic valve disease.

## P093

## Outcome of aortic valve replacement in a single in centre in the UK and the future of TAVI

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**Introduction:** TAVI is being increasingly adopted worldwide. A EUROSCORE of 10 (peri-operative mortality of 20%) is a commonly used indication, however it is not globally agreed on, and the selection process for TAVI is case-based. **Objectives:** To compare the outcome of the conventional AVRs in our centre, based on their EUROSCORE, low risk versus high risk (*cut-off* 10, potential TAVI candidates, EUROSCORE >9). **Methods:** We data-minded our cardio-thoracic and Welsh demographic databases for all the AVRs done between 1996 and 2009. SPSS 17 was used to carry out the analysis. **Results:** 1905 AVRs were done in our centre during the study period. Out of which, 884 cases had a valid EUROSCORE, unsurprisingly all after 2006 (male 62.7%, mean age [SD] 71.05 [10.190] years, range 18–94y). Patients with a EUROSCORE more than 9 were three times more likely to succumb within one year of the operation (relative risk 2.875). The mean survival for those with a high score of more than 9 was 912.15 days where as the mean was 1023.54 days for those with a low score (p value $<0.02$). The mean bypass operation time was 170.38 minutes for high score versus 144.03 for low score ($p<0.02$). Patient mean total hospital stay in days was 31.21 for the group with a EUROSCORE > 9 versus 17.01 for those with a lower score ($p<0.02$). **Conclusion:** Patients with perioperative mortality for conventional AVR of 20% (EUROSCORE>9) do worse than patients with lower EUROSCORE, however the survival of both groups is comparable. Further studies are required to determine a better scoring system to aid us in deciding on suitable candidates for TAVI.

## P094

## Aortic root continues to dilate in bicuspid valve patients after aortic valve replacement. Predictors for dilatation

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**Introduction:** Bicuspid aortic valve (BAV) is associated with aortic pathology. Relationship between BAV and aortopathy has been explained by two hypothesis: genetic and hemody-

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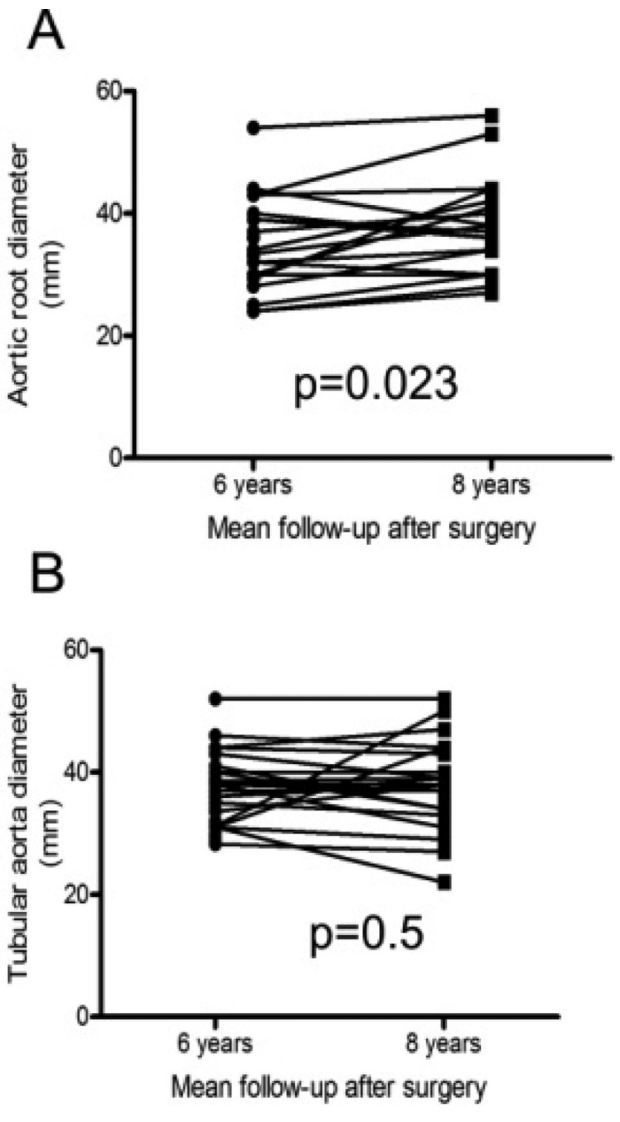
namic. We have previously shown that aortic root in BAV does not dilate (compared with pre-operative diameter) after 6 years of valve replacement [1]. Nonetheless, the aortorraphy effect in reducing its diameter underestimates its evolution. Aortic dilatation after aortic valve replacement (AVR) as well as the portion most affected has not been definitely assessed. **Objectives:** Evaluate aortic root and tubular aorta dilatation between 6 and 8 years after AVR as well as determining predictors of dilatation. Studying the evolution between these 2 time-points renders our results free of the aortorraphy effect. **Methods:** BAV patients with aortic diameter $\leq$ 45mm who underwent AVR between 2000 and 2003 were detected from our database. Marfan patients and ascending aorta replacement were excluded. Echocardiographic measurement of the aortic root and tubular aorta was done after a mean of 6 and 8 years post-operatively. Predictors for dilatation were estimated based on demographic data and pharmacologic treatment. Continuous variables were expressed as mean$\pm$SD. Student paired t-test and Pearson correlation was used for statistical testing and $p>0.05$ was considered significant. **Results:** A total of 23 patients were followed-up. Aortic root diameter between 6 ($34.6\pm7.4$ mm) and 8 years ($37.6\pm7.7$ mm) of follow-up increased significantly ($p<0.023$) (Figure 1). No differences were found with the tubular aorta. Predictors for aortic root dilatation were: family history of BAV or aortic pathology, smoking, dyslipemia and positive correlation with body surface area. The use of beta-blockers and statins protected from dilatation.

**Image/graph I:**




**Conclusion:** Our results suggest that aortic root and not tubular aorta continues to dilate after AVR in BAV patients. Therefore, aortic root evolution could follow the genetic theory while the tubular aorta the hemodynamic one. Patients with family history, smokers and dyslipemic should be closely followed-up. These results are preliminary and are limited by the low number of patients included. Nonetheless, it stands as a base for future larger scale studies.

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**P095**

## Rheumatic mitral valve stenosis: frequency, clinical characteristics, and management among patients admitted to cardiology department at Algomhori teaching hospital in Taiz, June 2008-February 2009

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**Introduction:** Rheumatic Heart Disease (RHD) is the predominant cause of mitral stenosis leading to death and morbidity in Yemen. It remains underestimated in developing countries. Target population is young adults causing health burden requiring more medical expenses and facilities to cover demands. **Objectives:** To describe clinical characteristics, hemodynamics, complications, outcomes and management of patients with pure rheumatic mitral valve stenosis admitted to Cardiology Department at Al-Gomhori teaching hospital in Taiz, Yemen. **Methods:** This study is a descriptive analytic prospective (hospital based) study for a period of 9 months, from 1st June, 2008 to 28th February, 2009 for patients admitted to Cardiology Department at Al-Gomhori Teaching Hospital. Patients were assessed by symptoms, physical signs, blood tests, chest X-rays, ECG and echocardiography. **Results:** Pure RMS constitutes 43.2%(89/206) of RHD admitted; mainly from Jabal Habashi and Saber areas (31.34%, 14.9%). Females were more prone (male:female 1:2.4). Patients age 18–75 years (mean age $36.02\pm14.13$yrs). Adherence to secondary chemoprophylaxis for RF was only 28.7%(25/87). Common complications were pulmonary hypertension (95.4%) pulmonary congestion (51.7%) and atrial fibrillation (AF) (40.2%). Only AF was affected by advancing age (p 0.034). AF, stroke and infective endocarditis were associated with prolonged hospitalization (p 0.000). More than half of patients were severely stenosed (45/87). Severity of stenosis increased left atrial dilatation (LAD)(p 0.033), Transmitral Gradient (TMG)(p 0.000) and Pulmonary Artery Systolic Pressure (PASP)(p 0.000). The tendency of AF was not influenced by LAD (p 0.309). Left ventricular systolic function (EF%) was normal in 89.7%. Case fatality was 9.2%(8/87); 75% were atrial fibrillation, 37.5% stroke and 37.5% frank pulmonary edema. Of all, 52.9% were recommended for BMVP, 28.7% surgical and 18.4% follow up, only 23.9%(17/71) underwent interventional therapy; 34.8%(16/46) of planned for BMVP and 4%(1/25) of surgical intervention.

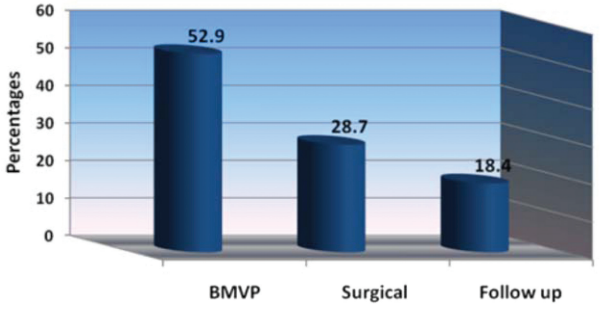
**Image/graph I:**

**Table 1.Complications in patients with rheumatic mitral stenosis according to hospital stay**

| Complication | Hospital stay | | | | | | P Value |
|---|---|---|---|---|---|---|---|
| | < 1week (n= 40) | | 1-2 weeks (n= 39) | | > 2 weeks (n= 8) | | |
| | № | % | № | % | № | % | |
| Pulmonary hypertension (n= 83) | 38 | 45.8 | 37 | 44.6 | 8 | 9.6 | 0.8 |
| Pulmonary congestion (n=45) | 19 | 42.2 | 23 | 51.1 | 3 | 6.7 | 0.41 |
| Atrial fibrillation (n=35) | 7 | 20 | 25 | 71.4 | 3 | 8.6 | **0.000** |
| Right ventricular failure (n=17) | 8 | 47 | 7 | 41.2 | 2 | 11.8 | 0.89 |
| Ischemic Stroke (n=11) | 3 | 27.3 | 1 | 9.1 | 7 | 63.6 | **0.000** |
| Frank pulmonary edema (n=9) | 6 | 66.7 | 3 | 33.3 | 0 | 0.0 | 0.34 |
| Left atrial thrombus (n=3) | 1 | 33.3 | 2 | 66.7 | 0 | 0.0 | 0.69 |
| Infective endocarditis (n=2) | 0 | 0.0 | 0 | 0.0 | 2 | 100 | **0.000** |
| Peripheral embolization (n=1) | 1 | 100 | 0 | 0.0 | 0 | 0.0 | 0.53 |
| Percentages calculated by rows | | | | | | | p value >0.05 statistically insignificant |

**Image/graph II:**

Figure1. Plan of therapy in patients with mitral valve stenosis according to American guidelines of valvular heart disease 2008




**Conclusion:** Pure RMS is still the commonest acquired rheumatic heart diseases with female predilection, rapid progressive course and poor prophylactic coverage. Most patients present

at a late stage with complications necessitating interventional therapy. Importance of screening patients at an earlier stage and encouragement of adherence to prophylaxis program are emphasized hand in hand to provide means for regular follow up and interventional therapy.

**P096**

## Characterization of mitral annulus geometry and dynamics in different mitral valve diseases: assessment by real-time three-dimensional transesophageal echocardiography

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**Introduction:** The complex, dynamic 3-dimensional geometry of mitral annulus (MA) plays an important role in efficient valve closure. There are conflicting data on shape and function of MA in different pathologies. **Objectives:** Our goals were to describe the dynamic morphology of MA in organic (OMD) and in myxomatous mitral valve disease (MVD) compared to healthy subjects, and to evaluate whether in myxomatous valve prolapse the MA dynamics are altered differently considering its main subgroups of Barlow disease (BD) and fibroelastic deficiency (FED). **Methods:** Sixtythree patients underwent real-time three-dimensional transesophageal echocardiography (Philips iE33): organic (rheumatic or senile calcific) mitral valve disease (OMD, n=20), myxomatous valve disease (BD, n=9, FED, n=18), and normal control subjects (NC, n=16). Different geometric parameters: 3D minimal surface area and its change (A3D, ΔA3D%), ellipsicity (E), height (H) of the mitral annulus were measured off-line by MVQ, Qlab 7.1 software at 7 specific time points of the cardiac cycle. After normality testing (Shapiro-Wilk) parametric (t-test, ANOVA) or non-parametric (Wilcoxon, Mann-Whitney, Kruskal-Wallis) tests were used for statistical analysis. **Results:** Annular area averaged over the cardiac cycle, corrected to body surface area was significantly enlarged in the MVD group compared to OMD and controls (801.5±144.13mm$^2$ vs. 562.5±178.9mm$^2$ vs. 500.4±78.6mm$^2$, all $p<0.001$). Annular geometry was similar between MVD and controls, but OMD group showed significant annular flattening and circular remodeling (H: 3.56±0.86mm vs. 4.25±0.7mm, p=0.036, E: 112.27±7.39% vs. 119.69±9.79%, p=0.01). Annular contraction measured by ΔA3D% was hypodynamic in OMD and FED, and hyperdynamic in BD. The difference between BD and FED was significant (24.11±9.98% vs. 16.07±7.08% p=0.02, NC: 20.65±6.79%). For each group studied minimum value of A3D was observed in protosystole, while maximal value in meso-telesystole. In the OMD, FED and control groups cyclic annular area change showed similar characteristics in time, but the BD group displayed a unique biphasic contraction pattern. **Conclusion:** Mitral annular dynamic morphology is different depending on disease etiology. Despite similar geometry, the annular dynamics in Barlow disease and in fibroelastic deficiency are different, which may influence surgical repair techniques.

**P097**

## Mitral valve repair: our modification of Reed's technique

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**Introduction:** Mitral valve repair is the operation of choice for severe mitral valve regurgitation, when the valve is suitable for repair and appropriate expertise are available. Several mitral valve repair techniques are on practice. One of the technique described was REED'S technique in which mitral commissural placation was the key step. This technique went into disfavor due to late recurrence of mitral regurgitation. **Objectives:** We have modified the REED'S technique by incorporating a mitral ring. **Methods:** Eighty one cases of mitral valve repair were performed between 1998–2011 using ower modified Reed's technique. The patients were of the age group between 8–62 years, 57 were female and 24 were male. All of the patients had grade IV mitral regurgitation and non–rheumatic. Cardiopulmonary bypass with aorto bicaval cannulation and blood cardioplegia for myocardial protection were used. Mitral valve inspected with special emphasis on the size of the anterior mitral leaflet, length of the chordee and the annular orifice. Mitral valve repair was done by placating both the commissures. Competence of the valve was checked by injecting saline into the left ventricle. Satisfied by the repair, the mitral annulus was reinforced with a mitral ring **Results:** Follow up ranges from four months to fourteen years. All patients are doing well without recurrence of mital regurgitation. Details of the technique and outcome will be presented. **Conclusion:** Modified Reed's technique is an a easy, affective and reproducible way of mitral valve repair in patients with non rheumatic mitral regurgitation with excellent long term result.

**P099**

## Predicting the reversibility of mitral regurgitation after CABG

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[1]*Cardiac Surgery, Day General Hospital, Tehran, Iran, Islamic Republic Of*

**Introduction:** The optimal management of moderate ischemic mitral regurgitation (MR) in patients undergoing coronary artery bypass grafting (CABG) remains controversial. While CABG alone can reverse regurgitation in some patients with moderate MR, adjunctive mitral repair may be necessary in others. **Objectives:** We performed low-dose dobutamine stress echocardiography (DSE) in patients with moderate MR who were candidated for CABG. **Methods:** Mitral regurgitation were evaluated in 110 candidated for CABG preoperatively by low dose DSE and post-operatively by trans-thoracic echocardiography. Group I, 47 patients who demonstrated reduction in MR during DSE, had CABG alone. Group II, 63 patients in whom MR was unchanged during DSE, had mitral valve repair during CABG. **Results:** MR was reduced postoperatively in both groups ($p<0.0001$). Postoperative ejection fraction in Group I (11.3%) improved more than that in Group II (8.1%) ($p<0.01$). **Conclusion:** CABG alone may be sufficient to correct moderate MR when MR is reduced during DSE. Our data suggest that CABG alone in selected patients can ameliorate MR by producing beneficial functional and structural improvements, for ischemic MR results from a defect in the left ventricle not the mitral valve.

**P100**

## Left atrial reservoir function as a predictor of symptoms in patients with moderate mitral stenosis

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**Introduction:** Mitral stenosis (MS) still results in significant morbidity and mortality worldwide. Type of treatment, as well as its timing, should be decided on the basis of clinical, morphological, and functional characteristics. Timing of surgical or percutaneous treatment in asymptomatic patients with moderate MS is still controversial. The finding of an echocardiographic index that is capable of evaluating which asymptomatic patients are at risk of adverse events may be very useful in planning the strategy of therapy in this subset of patients. **Objectives:** To evaluate the role of left atrial reservoir function in predicting symptoms in patients with moderate MS. **Methods:** The study included 40 consecutive patients with isolated moderate MS in sinus rhythm (31 females and 9 males; mean age: 29.47 ± 19.1 years). Patients were classified into symptomatic (Group I) and asymptomatic (Group II). All patients underwent transthoracic echocardiographic (TTE) examination to assess MS severity, pulmonary artery pressure and indices of LA reservoir function including LA maximal and minimal volumes, with calculation of fraction volume change (FVC) and indexed FVC. **Results:** in comparison with asymptomatic patients, symptomatic subjects showed a significantly higher LA maximal volume(74.25±19.12 Vs 70.65±31.34 ,P≤ 0.05), LA minimal volume(54.63±16.68 Vs 47.1±22.87,P≤ 0.05) and PASP(44.35±7.79 Vs 32.65±10.6,P ≤ 0.01) .while they showed lower (FVC) (28.61%±7.14% Vs 34.64%±7.37%,P≤ 0.01) and indexed FVC (17.17%±4.71 %Vs 20.48%±5.18%.,p≤ 0.001) .There were significant negative correlation between FVC and pulmonary artery systolic pressure and age in both groups. Multivariate analysis revealed that the best predictor of symptoms was the LA indexed FVC% (P = 0.03; coefficient: 0.112; SE: 0.054). ROC showed that at a cut off value <19.8 ml/m 2 for the atrial FVC% can predict the occurrence of symptoms in MS patients with a sensitivity of 80%, a specificity of 50%, a positive predictive value of 61.54% and a negative predictive value of 71.43%. **Conclusion:** Left atrial reservoir function is impaired in symptomatic patients with moderate MS.measurement of echocardiographic indices of LA reservoir function might help in directing plan of therapy and timing of intervention in asymptomatic patients with moderate MS.

**P101**

## Left ventricular strain is reduced in pure rheumatic mitral stenosis

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**Introduction:** Although left ventricular (LV) function is usually considered normal in patients with pure rheumatic mitral stenosis (MS), there are some studies showing decreased left ventricular function in this entity. Possible mechanisms are pre and afterload abnormalities, myocardial rheumatic involvement and increased right and left ventricular interaction. **Objectives:** To evaluate LV function in patients with pure mitral stenosis with the use of longitudinal strain. **Methods:** 40 patients with pure MS (MSG) and 20 controls (GC) underwent conventional Doppler echocardiogram. LV function was evaluated by longitudinal strain in the three apical views, where 3 segments measurements were obtained from each wall. **Results:** 90% of the MSG patients were female and mean age did not differ between the two groups (38.1±7.8 vs. 42.1± 12.1, p=0.126). Mean gradient was 11.9 ± 7.1, mmHg, mitral valve area 1.2 ± 0.4, indexed left atrial volume was 51.9 ± 15.8, and pulmonary systolic artery pressure was 45.4 ± 14.1mmHg. Mean LV ejection fraction (EF) was lower in the MSG (66.5% ± 5.4 vs 70.7% ±5.7, p=0.009), however it was still in the normal range. When strain was compared between the two groups, it was found to be lower in MSG in all walls (global longitudinal strian: 20.2 +-1.9 vs. 17.3 +-2.5 (Controls vs. MSG, respectively), $p<0.001$ **Conclusion:** Patients with pure rheumatic mitral stenosis present with decreased strain. This finding suggests that these patients may have incipient LV dysfunction, even when EF is still preserved. This may be important in terms of patient management, since LV dysfunction can be involved in their symptoms, especially when there is clinical and echocardiographic data discordance.

**P102**

## Differentiating infective endocarditis from its mimics: relevance of clinical, laboratory, and echocardiographic variables

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**Introduction:** Changing clinical presentations of infective endocarditis (IE) is frequently noticed. Differentiating IE from its mimics is a source of clinical difficulty. **Objectives:** To determine clinical, laboratory, and echocardiographic features that differentiate best between IE and IE-like diseases among patients (pts) referred to endocarditis service in university hospital. **Methods:** Among 191 pts referred with suspected IE, Duke-definite IE was confirmed in 161 pts (IE group). The remaining 31 pts (16.2%) had a firm alternate diagnosis (non-IE group). **Results:** The main aetiologies in the non-IE group were: acute chest infection (19%), acute rheumatic activity (16%), genitourinary infections (9.5%), and autoimmune diseases (7%). Other causes include ruptured mitral chordae, cardiac tumour, Behcet disease, active

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tuberculosis, lymphoma, subacute appendicitis, stuck aortic prosthesis, subarachnoid hemorrhage and meningitis. Significant differences between IE and non-IE pts are provided in table. Among all studied variables, independent predictors of definite IE were positive echocardiographic findings according to modified Duke Criteria (odds ratio[OR]: 7.2; 95% confidence interval [CI]: 2.86 to 17.9, p<0.001) and positive rheumatoid factor (OR: 6.8; 95% CI: 1.4 to 47, p = 0.009). A mass size ≥ 6.5 mm had 78% sensitivity and 75% specificity to define true infective vegetation.

| | IE group | non-IE group | p= |
|---|---|---|---|
| Median duration before referral, day | 28 | 14 | 0.001 |
| Health care associated infection | 54% | 29% | 0.01 |
| Splenomegaly | 29% | 6% | 0.008 |
| Hemoglobin, g/dl | 9.2±2.1 | 11±2.0 | <0.001 |
| White cell count,$10^3$/mm³ | 13.7±8 | 10.1±3 | <0.001 |
| Microscopic hematuria | 30% | 8% | 0.01 |
| +ve Rheumatoid factor | 33% | 4% | 0.009 |
| +ve Microbiology | 62% | 10% | 0.001 |
| +ve Echocardiography according to Modified Duke criteria | 93% | 3% | <0.001 |

**Conclusion:** Independent predictors of definite IE in suspicious cases are echocardiographic findings according to modified Duke criteria and a positive rheumatoid factor

**P103**

## Infectious endocarditis: a paradigm shift?

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**Introduction:** Infectious endocarditis is a very serious condition associated with significant mortality rates. Its epidemiology seems to be changing, therefore it is critical to identify the current risk and prognostic factors. **Objectives:** This study was designed to evaluate the clinical, epidemiological and etiologic features and to determine mortality predicting parameters in this disorder. **Methods:** Observational retrospective study conducted over a 10 years period (2001 to 2010). The study end point was in-hospital death. Between-groups comparisons of continuous variables were performed using non-parametric tests and Chi-square test was used to compare categorical variables. **Results:** In the study period there were 66 diagnosis of infectious endocarditis (74.2% male; age 63.0±14.6 years). The most common etiologic agents were *Staphylococcus* spp. (28.8%) and *Enterococcus* spp. (12.1%). Most were in native valves (71.8%) affecting the aortic (53.0%) and mitral (40.9%) valves. Among the patients with native valve endocarditis 91.8% had significant previous valve disease, mostly degenerative (71.1%). Other relevant risk factors were hospital admission (30.3%) and invasive procedures (31.8%) in the preceding 3 months. All patients had complete transthoracic echocardiogram and blood cultures and in 87.9% a transesophageal echocardiogram was performed. Twenty-four patients required valve surgery and the most common causes were severe aortic (n = 8) or mitral (n = 4) regurgitation, prosthesis dysfunction (n = 4) and pacemaker replacement (n = 4). The most frequent presentations were fever (71.2%) and heart failure (27.3%). Fifty-five patients (83.3%) had a complication, and the most common were moderate to severe aortic regurgitation (28.8%) and ruptured chordae or moderate to severe mitral regurgitation (22.7%). In-hospital mortality rate was 25.8%. Patients in the nonsurvivor group were elder (72.7 vs 59.6 years; p = 0.001). Development of shock (odds ratio: 68.6, 95% CI 7.6–620.9; p<0.001) or renal dysfunction (odds ratio: 12.7, 95% CI 3.1–51.2; p<0.001) were also significantly more common in the nonsurvivor group. **Conclusion:** Infectious endocarditis has high rates of complications and mortality. In the current study older age and the occurrence of shock or renal dysfunction were mortality predicting factors, demonstrating a tendency for a paradigm shift in this condition.

**P104**

## Mitral valve repair in systemic lupuserythmatousus (is it good choice?)

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**Introduction:** Optimal management of valvular disease in patients with lupus erythematosus (SLE) is still controversial. **Objectives:** This is a report of 3 SLE patients who developed precocious degeneration of the repaired mitral valve. **Methods:** Between 2001 and 2005, three women (17, 25 and 37 years old) with history of SLE were referred to us for rheumatic mitral valve disease. Preoperative echocardiography demonstrated dominant mitral insufficiency and some degree of stenosis associated with dilated left ventricle. Augmentation of the anterior leaflets with pericardium was therefore undertaken, followed by annuloplasty with prosthetic rings. TTE after surgery and at discharge showed good results. **Results:** Six months after surgery, the patients showed mitral valve thickness. Furthermore, the patients returned with recurrent dyspnea after one to two years (11 months, 16 months and 20 months). Echocardiography revealed thickening of the anterior leaflet, detachment of the pericardial patch, severe mitral valve regurgitation, and extensive calcification of the mitral annulus and leaflets in all the patients. Reoperation showed that the pericardial patch had shrunk and detached from the anterior leaflet in edge and the posterior leaflet was rigid and calcified. All the valves were replaced with prosthetic valves. All the patients have been well since surgery (mean follow-up: 2 years). **Conclusion:** Although some advocate mitral valve repair in SLE patients due to the risks of long-term anticoagulation, our experience with these patients and their extremely early valve degeneration favors valve replacement.

**P105**

## Clinical outcome and quality of life in geriatric patients ≥ 85 years of age following transcatheter aortic valve implantation (TAVI). a 14-month follow up

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**Introduction:** Very elderly patients (pts) with AS cannot always be offered conventional surgery at an acceptable risk. TAVI is considered the alternative treatment option with lower periprocedural risks. Although mortality and morbidity are typical outcome measures used to assess the effectiveness of various treatments, improvement in quality of life should be an additional target. **Objectives:** of the study was to assess clinical outcome in patients ≥85 years old following TAVI, with a special emphasis on clinical symptoms and quality of life. **Methods:** All octogenarians with a risk profile considered by the Heart Team to be unacceptable for surgery entered in this prospective registry. Quality of life of patients was assessed by questionnaire concerning current living (in an institution or at home), walking capacity (unassisted, with sticks, on a weelchair) and psychic performance status (good, acceptable according to age, bad)**.** Data were obtained from patients or family. **Results:** Sixty-three pts (mean age:88 ± 2; male:50%) underwent TAVI for severe AS (93.2%) (AVA:0.73±0.2 cm2; mean gradient: 57±14.5 mmHg; peak gradient: 91±22 mmHg) or pure grade 4 AR (6.8%). Patients were in NYHA class 2.8 ±0.6 and had a high-risk profile for surgery (ES(Log):26.6±15.7; STS score:9.2±7.7). Echocardiographic assessments included LVEF (12.3% =EF≤40%; 87.7% =EF40%) and sPAP (41.9 ± 10.5 mmHg). All pts underwent successful TAVI using Edward-SAPIEN valve (ESV) (71.2%) or Medtronic CoreValve (MCV) (28.8%) delivered by different approaches: transfemoral (89%), transaxillary (5.5%) and transapical (5.5%). At 14-month follow-up (interquartile range: 6.75–25.5)**,** 87.8% were alive and able to attend the visit. Patients showed improved NYHA class (baseline 2.8±0.6 vs after 1.4±0.6; p<0.001), decreased sPAP (baseline 40.7±9.2 mmHg vs after 36±6.8 mmHg; p<0,001) and a trend of improvement in pts with EF≤ 40% (baseline 37.4±4.4% vs after 42.8±18.4; p=0.38). Concerning quality of life, 100% were living at home, 50% walked with sticks, 48.4% walked unassisted and 78.1% referred self-awareness improvement following TAVI. **Conclusion:** TAVI procedures improve clinical ouctome and subjective health-related quality of life also in very elderly patients with symptomatic AS.

**P106**

## Mitral valvuloplasty long-term follow-up of single balloon versus inoue balloon techniques

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**Introduction:** The single balloon (SB), that is the less expensive technique to perform mitral balloon (MBV) valvuloplasty. **Objectives:** This study aimed to demonstrate that MBV with SB has similar outcome and long-term follow-up (FU) than MBV performed with the Inoue worldwide accepted technique. **Methods:** From 1987 to 12/31/2010 a total of 526 procedures were performed, being 312 procedures with a FU, 56 (17.9%) with Inoue balloon (IB), the IB group (IBG) and 256 (82.1%) SB Balt group (SBG). The mean FU in IBG was 33±27 (2 to 118) and in SBG 55±33 (1 to 198) months (P<0.0001). Univariate analysis (UA) and multivariate Cox analysis (MCA) were utilized to determine independent predict variables of survival and event free survival (EFS) in both technique groups and major events (ME) were (death, cardiac surgery and new MBV). **Results:** In IBG and SBG there were: female 42 (75.0%) and 222 (86.7%), (P=0.0276), mean age 37.3±10.0 (19 to 63) and 38.0±12.6 (13 to 83) years (P=0.7138), sinus rhythm 51 (91.1%) and 215 (84.0%), (P=0.1754), echo score (ES) 7.6±1.3 (5 to 10) and 7.2±1.5 (4 to 14) points (P=0.0528), echo mitral valve area (MVA) pre-MBV 0.96±0.18 and 0.93±0.21 $cm^2$ (P=0,2265). Post-MBV mean MVA (Gorlin) were 2.00±0.52 and 2.02±0.37 $cm^2$ (P=0.9550) and at the end of the FU there were: echo MVA 1.71±0.41 and 1.54±0.51 $cm^2$ (P=0.0552), new severe mitral regurgitation in 5 (8.9%) and 17 (6.6%) patients (P=0.5633), new MBV in 1 (1.8%) and 13 (5,1%), (P=0.4779), mitral valve surgery in 3 (5.4%) and 27 (10.4%), (P=0.3456), deaths 2 (3.6%) and 11 (4.3%) deaths, (P=1.000), being cardiac deaths 1 (1.8%) and 9 (3.5%), (p=1.0000), ME 5 (8.9%) and 46 (18.0%), (P=0.1449). In UA and MCA the SB or IB technique used do not predict survival or EFS and independent risk factors to survival (MCA with 2 models with 5 and 6 variables) were: age <50 years (P=0.016, HR=0.233, 95% IC 0.071–0.764), ES ≤8 (P<0.001, HR=0.105, 95% IC 0.34–0.327), MBV dilation area (P<0.001, HR 16.838, 95% IC 3.353–84.580) and mitral valve surgery in the FU (P=0.001, HR=0.152, 95% IC 0.050–0.459) and to EFS: prior commissurotomy (P=0.012, HR=0.390, 95% IC 0.187–0.813) and and post-MBV MVA ≥1.50 $cm^2$ (P<0.001, HR=7.969, 95% IC 3.413–18.608). **Conclusion:** MBV with SB and IB were equally efficient with similar survival and EFS in the FU. Independent predictors of survival were: age <50 years, ES ≤8 points, MBV dilation area and mitral valve surgery in the FU and of event EFS: prior commissurotomy and post-MBV MVA ≥1.50 $cm^2$.

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## Comparison of outcome of patients referred for transcatheter aortic valve implantation underwent surgery with patients underwent TAVI

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**Introduction:** Until recently, because of perceived risks of surgery many elderly patients with symptomatic aortic stenosis and multiple risk factors were untreated. With the advent of transcatheter aortic valve implantation there has been a surge in referral for treatment. **Objectives:** We decided compare outcome of patient candidates for TAVI and underwent surgical management with TAVI patients. **Methods:** 72 Consecutive patients referred for TAVI were prospectively evaluated. TAVI was performed only in 12 patients. Most of these patients were excluded for TAVI because of financial problems. And also minor of them also excluded due to unsuitable anatomy. These patients underwent conventional (28 patients) or minimally invasive (32 patients) AVR. **Results:** There were no significant differences in baseline characteristics and Echocardiographic findings between 2 groups. There was one in hospital mortality in TAVI group and two in surgical group. Also there was one mortality in one month due to multi organ failure in TAVI group. ICU and hospital stay was shorter in TAVI group (***0.8*** ± ***0.8*** & ***4.6*** ± ***1.9)*** compare with surgical group (***1.4*** ± ***0.9*** & ***6*** ± ***1.5***). There was one lymph trauma in TAVI group. There was no significantly different in other complications between two groups **Conclusion:** Many aortic valve patients are not referred for treatment due to lack of knowledge of referring physicians of real surgical risk and results of surgery.

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## Immediate and long-term follow-up of percutaneous mitral valvuloplasty using Inoue balloon in pregnancy

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**Introduction:** Percutaneous mitral balloon valvuloplasty (PMV) could be the first choice for Mitral Stenosis (MS) patients during pregnancywithout significant maternal risk or fetal morbidity or mortality. However, little is knownaboutmiddle andlong-term follow-up results after PMV in populations of pregnant women. **Objectives:** Thus, thepresent study was undertaken to determine the immediate and long-term outcomes afterPMV in a large cohort of pregnant patients with severe mitral stenosis. **Methods:** The patient population consisted of 121 consecutive pregnant women with severe rheumatic mitral stenosis admitted to the hospital with severe congestive heart failure (New York Heart Association class III and IV) for PMV. All patients underwent clinical and obstetricevaluations, electrocardiography, and 2-dimensional and Doppler echocardiography. **Results:** PMVwastechnically successful in all patients but one (99.2%),the optimal outcome was obtained in 89%resulting in a significant increase in mitral valve area from0.89 ± 0.23to 1.88± 0.38cm$^2$(p <0.001).At the end of pregnancy, 95% of the patients werein New York Heart Association functional class I or II.There was one death (0.8 %) after 3 months of successful PMV with unknown reason. At a mean follow-up of 36 ±41months, the total event-free survival rate was 67%. The mean gestational age at deliverytime was 37.2±2.9weeks. Preterm deliveries occurred in 13patients (11.7%). The average weight at delivery was 2832.19±469.8gr. At long-term follow-up of 36 ±41months (range 3–120 months) after birthwere available in 111 patients of 121 (91.7%), the 111childrenexhibited normal growth and development and did not show any clinical abnormalities. **Conclusion:** PMV is safe and effective, has a low morbidity and mortality rate for themother and the fetus, and has favorable long-term results in pregnant women withrheumatic mitral stenosis in New York Heart Association functional class III or IV.

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## Predictors of major complications or need for re-intervention after percutaneous mitral balloon valvotomy

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**Introduction:** Currently the Inoue balloon technique is widely used for percutaneous transvenous mitral balloon valvulotomy (PMBV) and its efficacy has been well documented. **Objectives:** The purpose of this study was to define the predictors of major complications and need for re-intervention after percutaneous mitral ballon valvotomy (PMBV). **Methods:** Retrospective review of clinical records of patients with rheumatic mitral stenosis (MS) submitted to PMBV from November 1991 to March 2008. Follow-up was obtained by telephonic interview or clinical records, when available. Procedure was considered immediately successful in those patients that presented a post-procedure mitral valve area (MVA) ≪1.5cm2 in the absence of complications. Major complications included were severe mitral regurgitation, mechanical cardiac complications, severe hemorrhage and the need of emergency surgery. Reintervention was performed in those patients who developed restenosis throughout the follow-up. **Results:** We analyzed 124 patients, 108 (87.1%) of which were women. Mean (± standard deviation (SD)) age at time of repair was 46±11 years and mean follow up time was 10±4 years. Twenty-eight patients (22.6%) were submitted to re-intervention due to restenosis and 7 (5.6%) suffered major complications. Using logistic regression, NYHA classes before (2.5±0.5 vs 2.2±0.6) and after (1.5±0.8 vs 1.1±0.5) PMBV were predictors of reintervention (OR 2.75; 95% CI [1.26:6.1]; OR 3.3; 95% CI [1.57:7.05]). We also found as predictors the difference between hemodynamic mitral gradient before and after the PMBV (OR 0.9; 95% CI [0.81:0.99]) and the occurrence of major complications (OR 15.5; 95% CI [1.66:145.1]). Regarding major complications we found to be predictors the NYHA class before and after PMBV (OR 6.9; 95% CI[142:33.7] and OR 5.5; 95% CI [1.67:18.2], respectively) and the worsening of mitral regurgitation (OR 9.5; 95% CI [1.03:88.4]). **Conclusion:** We found to be predictors of major complications NYHA class and worsening of mitral regurgitation. Predictors of reintervention were NYHA class, a higher difference between mitral gradient before and after PMBV and the presence of major complications.

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## The 'Balloon Jerk Sign'-a new predictor of severe mitral regurgitation following percutaneous transluminal mitral commisurotomy

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**Introduction:** Acute Mitral Regurgitation(MR) is a dreaded complication of Percutaneous Transluminal Mitral Commisurotomy (PTMC). The classical risk factors for acute MR are high valve score, pre existing MR and calcification. Some develop MR in spite of having low preprocedural risk of MR **Objectives:** To investigate the predictors of MR, among patients undergoing PTMC, patient characterestics, echocardiographic, ventriculographic ,and procedural parameters including balloon inflation cine loops, were compared in those who needed an emergency Mitral Valve Replacement (MVR) with those who did not. The intraoperative findings during MVR also was studied. **Methods:** All patients who underwent PTMC with Inoue, and Accura balloons from April 2008 to March 2011 were included in the analysis. They underwent stepwise dilatations, with the baseline balloon sized at 3mm below the reference diameter, with gradient measurements ,echocardiographic assessment of valve area and MR between each dilatations. A successful procedure was defined as 50% fall in mean trans mitral gradient or a doubling of valve area by planimetry. **Results:** Complete records, echocaridograms and angiograms were available and analysed for 467 patients(14 with MVR and 453 without).68% of the patients were female. In the MVR group and the non MVR group, the sex ratio (75% vs 72% female),mean age (28+12 vs 31+14), Wilkins Score(7.8+2.8 vs 7.2+3.7), Fluroscopically visible calcium(4, 26% vs 135,32% )Angiographic Grade of MR(Gr I-2 no,14% vs 52no,11%) (Gr II-1no, 7% vs 38no, 8.5%), were similar. Redo procedure(post balloon or surgical commisurotomy) was 3 in the MVR group and 102 in the non MVR group(P= 0.08).The 14 MVR group patients had AML tear in 11, PML tear in 1 both AML and PML in 2. Three had avulsion of anteromedial chordae. The balloon, suddenly jerked back into the LA (balloon jerk sign)while the distal part was still inflated in 11 (78%)in the MVR group and 82(18%)in the non MVR group(P<0.001). Of the 82 patients who did not undergo MVR, but had the balloon jerk sign, 51(60%) developed Grade 2 MR, and of the 371 patients with out it had Grade 2 MR in79(21%)(P=0.04) **Conclusion:** The sudden jump of the distally inflated balloon from LV to LA appears to be due to the continued traction applied to the balloon assembly by the operator and this may predispose to the development of MR. We suggest that traction on the balloon should cease as soon as the balloon is inflated and this may decrease the incidence of Acute MR.

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## Cardiac disease in pregnancy: Corniche Hospital, UAE experience

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**Introduction:** Corniche Hospital is a major maternity hospital in Abu Dhabi,UAE with a delivery rate of 10,000/year. Many pregnant women with cardiac disease were not delivered here due to a lack of ICU facilities and cardiology services. This led to patient dissatisfaction and physician frustration. **Objectives:** It was hypothesized that a specialized clinic with a multidisciplinary approach would enable better care for these high risk women. **Methods:** A specialized clinic was set up in August 2008 manned by a visiting cardiologist, obstetric physician and an obstetrician. An arrangement was made with a tertiary facility for access to ICU if required. Patients with cardiac problems was referred to this clinic. Each woman had an individualized care plan and was followed prospectively for clinical outcome. **Results:** From August 2008 till July 2011, 25,745 patients delivered in Corniche hospital. 160 women were referred to the Cardiology Clinic. 89 (56 %) were identified as having a cardiac problem of which 38 had significant heart disease. These were advanced rheumatic heart disease (18), cardiomyopathy(4), valve replacements (3), complex congenital heart disease(11) and ischemic heart disease(2). 95% (36) of these women delivered in Corniche hospital. Live birth rate was 100%. 56% delivered vaginally and 44% by caesarean section. All caesareans were for obstetric indications except for one. This was a case of severe secondary pulmonary hypertension with a PAP of 97mmHg at 29 weeks gestation. 13% had preterm deliveries against a background of 8% preterm deliveries in the general hospital population. There were 2 terminations in the first trimester for severe pulmonary hypertension and a prosthetic valve on warfarin. None of the patients required transfer to an ICU. **Conclusion:** A multidisciplinary approach enabled women with significant cardiac disease to be delivered at Corniche hospital. It enhanced patient satisfaction and improved clinical outcomes.

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## Selection of patients for percutaneous transvenous mitral balloon valvotomy: is there a definitive limit for Wilkins score?

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**Introduction:** Percutaneous transvenous mitral balloon valvotomy (PTMV) optimal results are usually achieved when echocardiographic Wilkins score (WS) is ≤8. WS from 9 to 11 represent

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a gray zone in which only some patients have good results. **Objectives:** Determine the early and long term results of PTMV in patients with WS 8 or less and at the gray WS zone. **Methods:** Retrospective review of clinical records of patients with rheumatic MS submitted to PTMV from November 1991 to March 2008. Follow-up was obtained by telephonic interview or clinical records when available. Procedure was considered unsuccessful when post-procedure MV area (MVA) was <1.5cm2. **Results:** We analyzed 124 patients, 108 (87.1%) women. Mean age at the time of repair was 46±11 years and mean follow up time was 10±4 years. Before the procedure, 100 (80.6%) patients had WS ≤8 and 24 (19.4%) were at WS gray zone (118). WS ≤8 patients and gray WS zone patients had similar age at first intervention (45±11 vs 49±11 years; p=0.095) and follow-up time (10±4 vs 11±5 years; p=0.55). There were also no gender differences between groups (women: 86% vs 92%; p=0.735), or regarding baseline echocardiographic measurements [planimetry MVA 1.0 cm2 (P25–75: 0.9–1.1) vs 0.9 (P25–75: 0.8–1.2), p=0.514; PASP 53 mmHg (P25–75: 45–63) vs 50 (P25–75: 44–54), p=0.823); left atrial diameter >55mm (16.5% vs 13.6%, p= 1.00); mitral regurgitation (46.5% vs 37.5%, p=0.573)] and baseline hemodynamic transmitral gradient (13 mmHg (P25–75: 10–19) vs 13 mmHg (P25–75: 7–20). The MVA and hemodynamic gradient improvements were similar in the two groups (0.91±0.39 cm2 vs 0.84±0.44 cm2, p=0.55; 8.8±5.3 mmHg vs 7.3±5.9 mmHg, p=0.275 respectively). There were no significant differences in major complications or success rates (4.0 vs 12.5 p=0.131; 89.9% vs 95.8%, p=0.69) and need for urgent surgery or future reintervention (2.0% vs 8.3%, p=0.168; 22% vs 27%, p=0.801). NYHA functional class improvements early after procedure and at follow-up were similar between groups. Total mortality was similar is both groups (3.1 vs 8.7%, p=0.244). In-hospital mortality occurred only in WS gray zone patients [2 (8.3%) vs 0%, p=0.04], being one death (4.2% vs 0%, p=0.194) eventually correlated to a higher WS (secondary to stroke) as the other occurred in consequence of peripheral vascular complication. **Conclusion:** PTMV was a safe and effective procedure in both WS groups. Optimal results can be achieved in gray WS zone patients, when they are careful selected and operated at experienced centers.

**P114**

## Rheumatic heart disease remains a major cause of heart failure in developing nations: the Ugandan experience

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**Introduction:** Uganda has an accelerated epidemiological transition like many other African countries, with a marked increase in cardiovascular non-communicable diseases. Heart failure (HF) is seemingly a major cause of mortality in the community. **Objectives:** of the study was to provide a hospital-based epidemiological picture of systolic HF. **Methods:** During 2009–2010, 5 non-governmental organizations missions carried out by experienced Italian medical teams (over a cumulated period of 30 weeks) had the opportunity to prospectively collect clinical and echocardiographic data from consecutive patients referred to a urban Hospital in Kampala, Uganda. **Results:** Among 217 subjects referred to the hospital for suspicion of heart disease, 150 patients were actually affected by heart disease (69%). Among these, 97 (65%) presented with HF (median age 32 years, IQR 12–65, female 52%). Overall, the principal cause of HF was rheumatic heart disease (RHD) (n=29, 30%), mainly related to severe isolated mitral regurgitation (60%), that was associated to severe aortic regurgitation or mitral stenosis in 10 and 13%, respectively, and to moderate valve disease in others 17%. Mean left ventricular ejection fraction was 51±13%. Significant right ventricular dysfunction was noted in 40% of patients, with a mean systolic pulmonary artery pressure 61±15 mmHg. Among these HF patients affected by RHD, 23 (79%) had an indication for cardiac surgery. Other HF aetiologies included congenital heart disease (n=24, 25%), hypertensive cardiomyopathy (n=14, 15%), ischemic heart disease (n=11, 11%), primary pulmonary hypertension (n=9, 9%), endomyocardial fibrosis (n=4, 4%) and miscellaneous or unknown causes (n=6, 6%). **Conclusion:** RHD still remains the most common cause of HF in Uganda, with late presentation in most cases. Thus, our results should promote efficient cost-effective preventive measures focused on RHD.

**P115**

## Rheumatic mitral valve replacement: subvalvular preservation or resection?

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**Introduction:** Although subvalvular preservation is generally recommended for mitral valve replacement. The benefit of MVR for mitral stenosis is less clear. In patients with rheumatic mitral valve the choral structure can become adherent and calcified resulting in a small ventricle, in such situation the preservation does not seem to be beneficial. **Objectives:** In this study we report the result of MVR in a group of patients with rheumatic mitral valve who had undergone replacement at our center. **Methods:** From 2006 to 2009; 42 patients underwent mitral valve replacement at our center due to rheumatic mitral valve disease. 14 had complete subvalvular preservation 14 had partial preservation and 14 had the entire subvalvular apparatus resected. The patients were followed with echocardiography. **Results:** Gender and baseline ejection fraction and sphericity index were not different between the three groups. The mean sphericity index before operation, one months and the last follow-up in the complete preservation group was 76.851.86 78.923.88 79.694.96 respectively. For the partial preservation 75.36±3.18, 71.64±4.41, 72.79±5.82 and the resected group 76.71±1.68, 64.79±1.19, 63.93±1.82. There was a significant difference between the groups regarding the mean sphericity index during the follow-up period and the subvalvular resected grouped showed a better result (P-value <0.0001). **Conclusion:** In patient with rheumatic mitral valve disease and small ventricle, subvalvular resection results in better ventricle shape and function.

**P116**

## Rheumatic mitral valve repair: not always a surgical success

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**Introduction:** Although the benefits of mitral valve repair in comparison to replacement is clear. The result of rheumatic mitral valve repair, in the developing countries has been less than satisfactory. With the introduction of the newer surgical techniques such as patch augmentation the results were expected to improve. **Objectives:** In this study we report our follow-up of patients with rheumatic mitral valve repair, performed at our center. **Methods:** 50 patients underwent mitral valve repair at our center due to rheumatic mitral valve disease. Depends on valve involvement patients underwent leaflet augmentation, commissurotomy, papillary muscle splitting, chordal resection, ring annulomplasty, leaflet mobilization and other type of repair. Maze operation was performed on patients. The patients were followed with echocardiography. **Results:** sixty six percent were females. The mean age was 44.4 ±8.8. The mean follow-up time was 38.3 ±10.1 months. 30% developed moderate mitral regurgitation. And 8% had moderate to severe mitral stenosis by the last follow-up. Patients with more shortened anterior leaflet has more failure. **Conclusion:** Even with complete resection rheumatic tissue and newer techniques the rate of recurrence was high in our center, this can be related to subtle rheumatic disease or recurrent attacks in our group of patients.

**P118**

## Allergic reaction to long-term benzathine penicillin injection for secondary prevention of acute rheumatic fever and recommendations for skin testing

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**Introduction:** Rheumatic fever (RF) and Rheumatic heart disease(RHD) are common cardiac problem in Nepal with prevalence rate of 1.2/1000 children aged 5–16 years. Long term benzathine penicillin injection in being used for secondary prophylaxis of RF/RHD. Although allergic reaction to penicillin is rare skin testing is performed routinely before each and every penicillin injection delivery in most of the hospitals in Nepal. There are no published guidelines and recommendations for skin testing before penicillin injection delivery. **Objectives:** Obective of this study was to evaluate safety of long term benzathine penicillin injection and establish recommendations for penicillin skin testing **Methods:** Data from the register of RF/RHD prevention and control programme from 32 hospitals of Nepal were collected and analyzed in a retrospective study. This enrolled 4712 RF/RHD patients from June 2007 to Feb 2010 who received 3 weekly benzathine penicillin injection for Secondary prevention of RF. **Results:** After 77300 injections 65 patients (1.4%) had allergic reactions. 5 had anaphylaxis, an incidence of 0.1% (0.7/10000 injections), 10 patients had minor allergy while receiving new batch of benzathine penicillin (incidence of 0.2%) and 18 patients had minor allergy with new brand of benzathine penicillin (incidence of 0.4%).There were 8 vasovagal reactions (0.16%) among them 6 were with severe RHD. No death was reported. All allergic reactions occurred in age group >18 Years. **Conclusion:** Life-threatening allergic reactions are very rare in patients on long-term intramuscular benzathine penicillin for secondary prevention of RF. Minor reactions to penicillin may occur with change in batch number and brand. It is not beneficial to perform skin test before each and every benzathine penicillin injection. Skin testing is recommended in the following cases : 1. Before 1st injection 2. With change in batch number 3.With change in brand (commercial) name. Consent taking is recommended with all patients before 1st benzathine penicillin injection delivery.

**P119**

## Therapeutic approach to rheumatic carditis in Brazil

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**Introduction:** Although the therapy of rheumatic carditis is already established through the scientific literature and guidelines, we still observe different procedures. The rheumatic carditis is the most common acquired heart disease among children and adolescents and the immediate and correct treatment is a good prognostic factor. **Objectives:** To identify the forms of treatment of rheumatic carditis in Brazil. **Methods:** Twenty semi-structured interviews, based on previously chosen categories, were recorded with expert pediatricians and pediatric cardiologists selected according to the rigorous study criteria. Brazilian Society of Cardiology Guideline was the theoretical framework. This study was funded by the Ministry of Health of Brazil. **Results:** Respondents are aware of the guidelines, but they sometimes choose to deviate from it. Only some prescribe the methylprednisolone pulse therapy in all patients with severe carditis. In mild carditis they prescribe prednisone or acetylsalicylic acid instead. Also vary the criteria for admissions to hospitals in mild to moderate carditis. Although echocardiogram may take several days to be performed, all respondents agree in its importance in all cases of rheumatic fever. Although there are many studies to support the importance of a multidisciplinary team to adherence to treatment, in practice some did not value multidisciplinary support. Access to health services is a determining factor for adherence to treatment. Main concerns are Indians in amazon region after they return to their villages and adolescents for difficulty to conform to rules. Fears of penicillin anaphylaxis, although rare, reduce access to secondary prophylaxis.All respondents have highlighted the importance of training health professionalsand at no time they criticize their role as trainers. We observed large differences in resources available in institutions and patients' access to services, being inversely proportional to the human development index of the region. **Conclusion:** We conclude that there is an urgent need for better organization of the health system in several Brazilian regions. Special care is fundamental to special groups such as adolescents and indigenous population's

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.Access to secondary prophylaxis must be improved and ongoing qualification of health professionals is essential, especially those working in the country side of Brazil.

**P120**

## Rheumatic heart disease in the Fiji Islands: echocardiography confirmed prevalence and screening approaches

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**Introduction:** Rheumatic Heart Disease (RHD) is known to exact a large human and financial burden in the Pacific region. Indentifying a feasible and appropriate model for undertaking RHD screening in resource poor areas is a challenge for health ministries in developing countries. **Objectives:** To estimate the prevalence of RHD in primary school aged school children in Fiji diagnosed by echocardiography.To determine if nurses can be trained to use a basic RHD echocardiography screening protocol in a resource poor setting, using portable echocardiography machines. **Methods:** Since 2005 a comprehensive prevention and control programme for RHD has been undertaken in Fiji with the aim of improving primary health care. Research was undertaken to determine the echocardiography confirmed prevalence of rheumatic heart disease (RHD) in children aged 5-14 years in the Fiji Islands and compare this to the prevalence found by auscultation. A follow on pilot project was undertaken to determine if nurses could be trained in basic RHD echocardiography to undertake screening in a field setting. Nurses attended a workshop and two weeks supervised field experience, following this training they were tested on a blinded cohort of 50 children. **Results:** A coordinated national RHD prevention programme is now in place in Fiji. The RHD echocardiography confirmed prevalence has been confirmed as 2.4 per 1000 definite cases and 25.5 per 1,000 probable cases, giving a combined prevalence of 27.9 per 1000 based on RHD echocardiography definitions modified from the World Health Organisation and National Institutes of Health working party guidelines. Three nurses were trained in a pilot study to undertaken basic RHD screening echocardiography, testing against gold standard cardiologist echocardiography showed that given brief focused training nurses were able to accurately identify RHD cases requiring referral in a field screening setting with high sensitivity and specificity. A further study is underway to train a larger number of nurses in RHD screening echocardiography and test and validate the nurse led echocardiography module on a larger sample of children. **Conclusion:** The burden of RHD in Fiji has been established, efforts to control the disease and prevent new cases have been undertaken. Feasible screening methods have explored and developed.

**P121**

## The global burden of rheumatic heart disease and an analysis of mortality from rheumatic heart disease in an Indigenous population

Samantha Colquhoun[1,*], Jonathan Carapetis[2], Andrew Steer[3] on behalf of GBD RHD working group, Bongani Mayosi[4] on behalf of GBD RHD working Group, Ganesh Karthikeyan[5] on behalf of GBD RHD working group, George Mensah[6] on behalf of GBD RHD working group, John Condon[2] and Global Burden of Disease (GBD) RHD working group
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**Objectives:** To describe the epidemiology for a comprehensive reassessment of RHD burden in 21 regions of the world for the period 1980 and 2008 and to provide a 'snapshot' of RHD population based RHD mortality in a high prevalence region to contribute to international mortality estimates. **Methods:** A systematic review of RHD population based data on available published and gray data sources was undertaken as part of the Global Burden of Disease study; prevalence, incidence, DALYs and mortality rates were calculated by region. To contribute to the sparse mortality data available globally we undertook a comprehensive mortality analysis in Australia. Mortality analysis was by undertaken by Indigenous status, gender, age and year of death using population data. **Results:** Regional data was obtained for 18 of the 21 regions included in the GBD study regions. The majority of data found come from the Asia, Africa and Pacific regions. Of the published studies (84%) were conducted in school aged children, assessing RHD prevalence only. Recent studies have echocardiography-confirmed diagnosis, where earlier studies rely on clinical findings. Five published studies describing RHD incidence were found. Few studies providing population based mortality data were found. Attempts were made to access RHD register data from quality population databases in India, New Zealand and Australia. The mortality rate ratio for Indigenous people aged 25-44 years compared to non-Indigenous people was 304 in 2001. **Conclusion:** The most rigorously performed studies confirm that careful research methodology and echocardiography based screening will uncover many more cases than would otherwise have been detected. These recent data suggest that there is a large unrecognized burden of RHD, and a need for high-quality epidemiological studies in developing countries. Indigenous Australians have increased mortality from RHD and die at a much younger age than non-Indigenous Australians. There is much health inequality in Australia the rates seen in Indigenous people may suggest that these could be minimal estimations of RHD mortality for people living in high prevalence areas in resource poor countries. Although many Australian Indigenous people live in poor conditions they generally have better access to health and medical services than in most resource poor countries.

**P122**

## Rheumatic Heart Disease. Training and Awareness

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**Introduction:** Kenyan-Heart National Foundation (KHNF) was launched in 2004, under the World Heart Federation guidelines. In 2005, KHNF entered into a partnership with Danish Heart Foundation. KHNF applied for funding to DANIDA for the prevention of RHD, starting with Nairobi Eastlands. KHNF secured funding, which continues to date. KHNF hopes to ultimately eradicate RHD in Kenya. **Objectives:** Create awareness on RHD prevention through education-Seminars. To identify strep-sore-throats and the need to take prompt/appropriate measures. Ensuring that education given is translated to changed behaviour. Importance of healthy diet. **Methods:** KHNF uses these methods to disseminate information on RHD prevention: Kenyan-Heart Training Seminars for head-teachers, teachers, students, medical/health personnel, community and faith-based leaders. Kenyan-Heart Talking Walls in schools. Diagrammatic representation of the symptoms of Strep—Sore-Throat. Kenyan-Heart Clubs in schools. Children devise ways of spreading information about RHD.eg. songs, skits, and poems. Kenyan-Heart Kitchen Gardens Kenyan-Heart Poultry/Rabbits in schools to create awareness on the importance of healthy diet. **Results:** An increased level of knowledge regarding strep-sore-throat, RF and RHD prevention among all trained. Improved feeding habits on all those trained ie. Healthier meals. Health centres reported more cases of Strep-Sore-Throat, RF & RHD. There were no other heart-health-related projects in the area, that deliberately involved children in making individual and public health changes.
**Conclusion:** KHNF runs a unique and unparalleled RHD prevention program in East Africa. Significant achievements have been made in the sensitisation of school children, head-teachers, teachers and schools management on RHD and its prevention. Long term project sustainability is promising due to extensive involvement of school administration, community leaders, and local government. There is urgent need to expand this program to the rest of Kenya.
**References:**
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Conducted by F.Bukachi and B.Mayosi. 15 November 2008.
**Disclosure of Interest**: None Declared

**P123**

## Pulmonary hypertension dyspnea patients with ventricular dysfunction, inflammation and cellular damage guided cardiovascular remodeling. An extraordinary diagnostic approach and evaluation by serum NT-proB natriuretic peptide

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**Introduction:** Differentiation and diagnostic classification of chronic dyspnea patients with pulmonary arterial hypertention of primary idiopathic,secondary systemic and especially congestive heart failure origin is widely considered a great clinical dilemma in every day medical practice, regarding necessary therapeutic intervention and possibly control of any expensive pharmacologic overtreatment of the disease. **Objectives:** The purpose of the study was to investigate causal coincidence of pulmonary hypertention(PH) serum NT-ProBNP levels with either cardiopulmonary functional, inflammatory factors and/or latent cellular damage guided cardiovascular remodeling. **Methods:** Fifty five pulmonary hypertention dyspnea patients(pts),34 males and 21 females,mean age 69 years,underwent 1.Echocardiography 2.Lung function tests and arterial blood gasses 3.Evaluation of serum NT-ProBNP levels by the ECL method and various biomarkers,including inflammatory cytokines expressing tumor necrosis factor (TNF-a),interleukin 1a(IL-1a),interleukin-6(IL-6) and C-reactive protein (CRP-),cellular damage marker Troponin-I(Tr-I,) and Metalloproteinase-2(MMP-2),Metalloproteinase-9(MMP-9) and also Erythropoeitin (EPO),expressing cardiovascular remodeling. **Results:** Examination results demonstrated 1)Echocardiographic right ventricular systolic pressure(RVSP)35mm Hg in all patients(mean:52mm Hg),ejection fraction(EF)=57%,left atrial dimention(LAD)>4cm(mean:4,8cm) and asymmetric septal hypertrophy(ASH)=1,5 2) Respiratory function of restrictive or congestive type,hypoxemia and alveolar-arterial oxygen difference=49mm Hg 3)Abnormal serum NT-ProBNP values=4267 pg/ml,TNF-a=44 pg/ml,IL-1a=10 pg/ml,IL-6=42 pg/ml, CRP=7,8 mg/dl, Tr-I=1,2 ng/ml, MMP-2=236 ng/ml, MMP-9= 922 ng/ml,EPO=26m/U/ml andD-dimers=1,2ng/ml 4) Further primary significant correlations of a)NT-ProBNP with Tr-I, CRP, EF, LAD and $PCO_2$ b) Tr-I with IL-1a ,TNF-a, EF and MMP-2 c) MMP-2 with EPO and d) CRP with IL-1b, D-dimers and $PCO_2$. **Conclusion:** NT-ProBNP values and significant correlations could be highly suggestive that PH mainly coincides with either inflammatory(TNF-a,IL-1a,IL-6,CRP) cardiopulmonary dysfunction(EF,LAD,$PCO_2$) and thrombogenetic conditioning(D-dimers,$PCO_2$,*CRP)as well as apoptosis(MMP-2,EPO) and latent cellular damage guided(Tr-1) cardiovascular remodeling(MMP-2,EPO),compatible with PH of cardiac origin,differentiating cardiac from pulmonary dyspnea.

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**P124**

## Melatonin reduces cardiovascular alterations in rats with pulmonary arterial hypertension induced by monocrotaline

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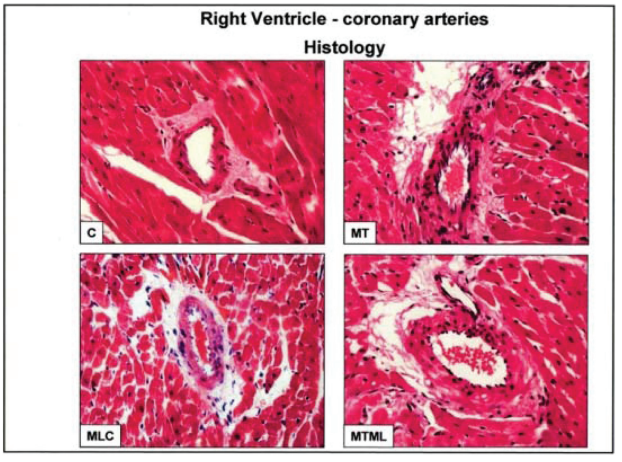
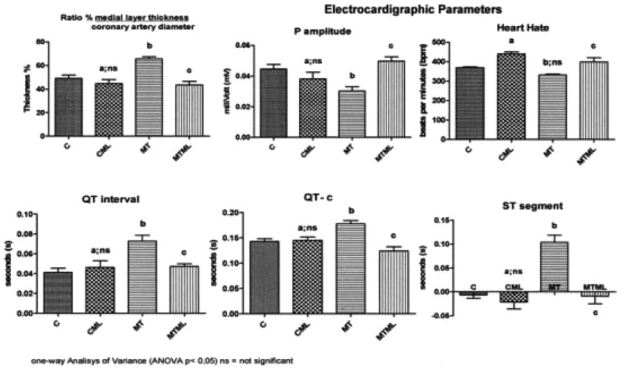
**Introduction:** Pulmonary arterial hypertension (PAH) is characterized by thickening of vascular smooth muscle cells, affecting the cardio respiratory system. Monocrotaline (MCT) is an alkaloid that induces PAH by increasing the production of vasoconstrictor agents, as well as vascular lesions in the lungs and heart. Melatonin (MEL), hormone produced by the pineal gland can reduce the smooth muscle vascular tone was a reduction in peripheral resistance and cardiovascular alterations in rats with this disease. **Objectives:** To evaluate the effect of melatonin in the treatment of monocrotaline-induced PAH. **Methods:** Male Wistar rats (250g.) were divided into four groups: C (control, n= 5), MT (monocrotaline, n = 5), CML (control Melatonin, n =5), MTML (Monocrotaline plus Melatonin, n = 5). MCT was administered as a single dose intraperitoneal (i.p.) (60mg/kg i.p.) to induce PAH. Melatonin was administred (15mg/kg i.p.) during 28 days of experimental period after this phase, the animals were anesthetized (Ketamine 100mg/Kg. plus Xylazine 7mg/Kg im) to obtain the electrocardiographic parameters and then were euthanized by anesthetic for further histological analysis of the heart. Statistical procedure: Analysis of Variance (ANOVA) followed by Tukey test for comparison between groups ($p < 0.05$). **Results:**
-reducing the thickness of the medial layer to the diameter of the coronary arteries, thus improving tissue perfusion;
-reduced electrocardiographic alterations in rats with PAH, increased the P-wave amplitude and the Heart Hate;
-reduction of the QT interval and consequently the risk of sudden death;
-decreased QT-c indicative of greater cardiac efficiency;
-decreased the cardiac ischemia as suggested by the reduction of the ST segment.
**Image/graph I:**




**Image/graph II:**




**Conclusion:** We conclude that melatonin treatment reduced the cardiovascular alterations resulting pulmonary arterial hypertension, can be used experimentally as adjunct in the treatment of this disease.

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Sandra Tenganttini; Russel J. Russel; Dun-Xian Tan; Maria P. Terron; Luigi F. Rodella and Rita rezzani ***J. Pineal*** 2008; 44: 16–25

**P125**

## Role of circulating microRNA in pulmonary arterial hypertension associated with congenital cardiac shunts

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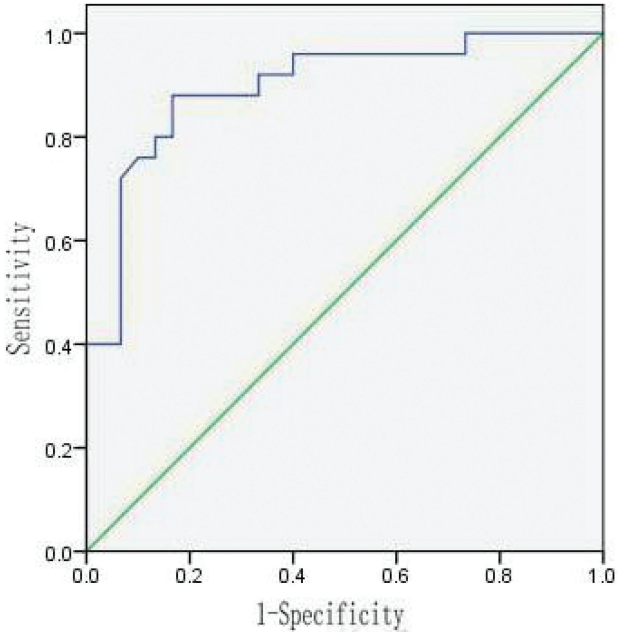
**Introduction:** MicroRNA (miRNA) is reported to be present in the blood of humans and opens up a new field for molecular diagnosis of cardiovascular disease. However, the role of circulating miRNAs in pulmonary arterial hypertension (PAH) due to congenital heart disease (CHD) is not clear. **Objectives:** The aims of this study were to evaluate the diagnostic value and to explore the prognostic value of circulating miRNA in patients with CHD both with severe PAH and without PAH. **Methods:** MiRNA microarrays were performed on tissues of 6 controls and 6 patients with PAH associated with congenital cardiac shunts. By verifying the tissue expression patterns of miRNAs with real-time polymerase chain reaction (PCR) analysis, miR-19a, miR-130a, and miR-212 were selected for a second clinical study. Serum miRNAs were measured in 16 individuals with PAH associated with congenital cardiac shunts at diagnostic catheterization and 20 individuals with congenital cardiac shunts but without PAH. Hemodynamics□functional capacity and time to clinical worsening before the introduction of sildenafil were assessed and repeated after a mean follow-up period of 6 months. **Results:** Evaluation of these three miRNAs levels in serum from PAH patients demonstrated that all three miRNA levels were substantially higher than those from non-PAH people. Notably, miR-19a was specifically enriched in blood of PAH cases and receiver-operator-characteristics (ROC) curve analysis showed miR-19a to be a better diagnostic predictor of PAH, with an area under the curve of 0.898 (95% confidence interval; CI = 0.813–0.983, $p<0.0001$). During a mean follow-up period of 6 months, six patients from PAH group were in WHO classes III and had significantly higher circulating miR-19a, and the time to clinical worsening was apparently early. Circulating miR-19a was an independent predictor of clinical worsening and correlated with hemodynamic variables and functional capacity.
**Image/graph I:**




**Conclusion:** Circulating miR-19a may be a novel, independent biomarker for diagnosis of PAH can be used to determine the clinical severity of disease and is independently associated with clinical worsening.

**P126**

## Progressive changes of cor pulmonale in chronic lung disease over a period of one decade

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**Introduction:** Cor pulmonale is Right ventricular hypertrophy and or failure due to long standing pulmonary disease. It is the fourth leading cause of death worldwide. It is essential to detect

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changes of Cor pulmonale early in COPD patients. **Objectives:** To determine the progressive and serial changes suggestive of Cor pulmonale in the chest X-ray, ECG, and ECHO cardiography in patients suffering from COPD of 2–11 years. **Methods:** 100 patients with typical history of COPD as per WHO criteria, for 2–11 years duration were subjected to chest X-ray, ECG and ECHO study. Routine blood tests and spirometry was done. Exclusion criteria: Patients of IHD, bronchial asthma, valvular heart disease, tuberculosis and bronchiectasis were excluded. **Results:** There were 10 patients in each year of symptoms, from 2–11 years. 27% were non smokers. 46/100 had pedal edema out of which 37 had all the features of Cor pulmonale. Chest X-ray: Dilated pulmonary artery of >16mm was the earliest evidence seen in 70% by 2 years and 100% by 8 years of symptoms. ECG evidence: P pulmonale was observed in 79%, in majority by 5 years and in all by ten years. Right axis deviation progressively increased from 40% to 100% from 3 years to 10 years of symptoms. RVH was observed by 5 years in 30% and 70% by ten years. ECHO: RV free wall thickness of >7mm and RA size of >55mm was seen only in 37% & 31% patients even by ten years.

**Conclusion:**

1. Dilated pulmonary artery in chest X-ray followed by Right axis deviation and P pulmonale in the ECG should be considered as early evidence of Cor pulmonale in COPD patients. ECHO changes are late and not always seen.
2. By the time pedal edema is seen most will be in frank Cor pulmonale.

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## P127

## Left atrial myxoma in near term pregnancy plan for successful outcome

Hossameldin W. Eid[1,*], Obaid M. Aljassim[1], Adel M. Alnazer[2], Tarek A. Abdulaziz[1], Talib K. Majwal[3], Laila M. Matar[4]
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**Introduction:** Cardiac Myxoma represent the great majority of heart tumors comprising more than 90% of reported cases. The remainder of the cases forms a varied group of benign and malignant lesions. **Objectives:** The unique about our reported case is that patient presented in thirdtrimenesternot as all other reported cases in the secondtrimenester. **Methods:** We present 37 years old female 36 weeks gestation gravida 3,para2 who presented to emergency department in state of impending pulmonary edema, diagnostic echo revealed she had a left Atrial Mass blocking the mitral valve orifice with high pulmonary wedge pressure and pulmonary hypertension **Results:** Viable healthy male baby weights 3.2kg. . ., No intra or post partum complications.Uneventful Excision of The left Atrial Myxoma through right atriotomy and septostomy,Post operative echo shows EF55%, dropped pulmonary artery pressure to normal value.Patient discharged in good general condition together with her baby. **Conclusion:** Optimum post operative recovery,Well healed Sternal wound, Compensated heart, SR, NYHA Class I, Clear chest, Follow up Echo –cardiograph: GoodLVF and No Intra cardiac Masses.

## P128

## Clinical predictors of left ventricular outflow tract obstruction in hypertrophic cardiomyopathy

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**Introduction:** In patients (pts) with hypertrophic cardiomyopathy (HCM), left ventricular outflow tract (LVOT) obstruction at rest is a strong, independent predictor of progression to severe symptoms of heart failure and death. Recently it was also associated with sudden cardiac death (SCD) risk. **Objectives:** In this study we aimed to assess the clinical predictors of rest LVOT obstruction in a population of pts with HMC. **Methods:** We retrospectively analyzed clinical reports of pts with HCM followed at a tertiary heart failure care centre. Demographic, clinical, laboratorial and echocardiographic data were analyzed. **Results:** Seventy pts were included. The mean age was 59 ± 17years and 45 (64%) were men. Most of pts (57%) were in NYHA class I, 31% in class II and 12% in class III at last observation. Median value ($25^{th}$, $75^{th}$ percentiles) of brain natriuretic peptide was 246 (129,568)pg/mL. The majority of pts (68%) had predominantly septal hypertrophy, 23% diffuse form and 9% apical HCM. Twenty-one (30%) had LVOT obstruction. Most of them (83%) had preserved ejection fraction. Multiple clinical factors were analyzed: syncope, chest pain, personal or familial history of SCD, heart murmur, signs of pulmonary or systemic congestion, blood pressure, and electrocardiographic findings. On univariate analysis, the presence of heart murmur (OR 13.3; 95% CI 1.6–108.4; p 0.003) and left ventricular hypertrophy (LVH) criteria on electrocardiogram (OR 7.02; 95% CI 1.8–27.6; p=0.03) were associated with the presence of LVOT obstruction. We also found that pts with LVOT obstruction had higher systolic blood pressure values (131 ± 23 vs 114 ± 19 mmHg; p=0.004). **Conclusion:** Simple clinical data (heart murmur and systolic blood pressure) and electrocardiographic findings (signs of LVH) may be of value in anticipating the presence of LVOT, which is an important predictor of adverse events in HCM pts.

## P129

## Takotsubo case series: role of beta blockers and pro-BNP/troponin-T ratio

Muhammad. R Sardar[1], Ankush Lahoti[1,*], Maaz Iqbal[2], Wajeeha Saeed[2], James M Tauras[2], Marwan Badri[1], Eric Gnall[1], Ronald Zolty[2]
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**Introduction:** Takotsubo cardiomyopathy (TC), also known as stress-induced cardiomyopathy; typically symptoms mimicks acute coronary syndrome (ACS), ECG changes similar to acute myocardial infarction, normal coronary arteries on cardiac catheterization (CC), and apical ballooning on cardiac imaging. Emotional stress is a known trigger event but now various other inciting events are also known **Objectives:** To look at the demographic patterns and various clinical presentations of TC **Methods:** We retrospectively studied the TC patients in the last seven years. Inclusion criteria are patients with diagnosis of TC established by non-obstructive coronary artery anatomy on CC, apical ballooning with preserved base of the heart and resolution of cardiomyopathy by ECHO after a week–1 month of inciting event. Atypical TC presentations on imaging and known CAD are excluded. **Results:** 52 patients are selected with mean age 65.9, 83% females with 23% pre-menopausal and youngest is 31 years. Out of 52, 40% Caucasians, 33% Hispanics, 15% African Americans, and 19% others. 66% and 25% patients have known HTN and DM respectively. Presenting symptoms are dividied in 3 groups. Group1–8 (15 %) have mental stress in form of anxiety, Group-2, 20 (38 %) have Chest pain mimicking ACS and no anxiety; and Group-3, 24 (47 %) have other medical problems (seizures, post operative, post chemotherapy, acute asthma/COPD). Mean EF at the presentation is 36. 4 % and at TC resolution is 59.2 %. Mean pro-BNP is 9663.4 with a mean proBNP to troponin T ratio (BNP/TNT) of 51543.4. Mean troponin–T at presentation, peak and resolution of TC are 0.42, 0.73 and 0.55 ng/dl respectively. At presentation, 25% were on BB and 90% were discharged on BB. There were 2 patients with HIV and both were premenopausal. Cardiogenic shock was presenting symptoms in 3 patients and were given BB. None of the patient in our registry died **Conclusion:** TC have varied Age groups, predominantly female and post menopausal. Only 15% of patient had anxiety as a stressor. 38% patients have symptoms of ACS making it difficult to tease out TC from ACS. We have found patients with TC have higher BNP/TNT ratio that should be evaluated in the future ACS vs TC studies. Most of our patients tolerated BB after TC and did well despite cardiogenic shock.

## P130

## Different MiRNA expressions between competitive athletes and patients with hypertrophic cardiomopathy

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**Introduction:** Growing lines of evidence suggest that MicroRNAs (miRs) play a key role in heart diseases by regulating cardiac development, hypertrophy, and angiogenesis. Hypertrophic cardiomyopathy (HCM) is a primary genetic cardiomyopathy characterized by a pathological myocardial hypertrophy (MH) and caused by mutations in genes encoding proteins of the cardiac sarcomere. It is the most common cause of sudden death in young people, including competitive athletes (CA) **Objectives:** HCM may not be distinguishable from the physiological hypertrophy that is consequent to continuative physical activity and usually found in CA. Aim of our study is to identify different miRs markers of pathological MH comparing plasma of CA with patients with HCM **Methods:** We enrolled 5 patients with HCM and 5 CA. All patients with HCM were evaluated by transthoracic echocardiogram, magnetic resonance imaging (MRI), Holter monitoring and by an accurate anamnesis to rule out familiarity. All CA were competitive athletes and secondary causes of MH, in particular arterial hypertension, were excluded. To evaluate MH we measured cardiac mass by echocardiogram and, when that value was "borderline" we performed MRI to exclude HCM. To determine whether in CA and patients with MH there is a differential expression of circulating miRs we compared miRs levels in the plasma of the two groups. Total RNA was extracted using the Trizol method and expression of miRs was assessed by Agilent technology. Results were normalized by measuring the level of C. elegans synthetic miR spiked into plasma before RNA extraction. **Results:** Eighteen miRs, out of the 88 expressed in the analysed plasma were differently regulated in CA and in patients with HCM. Four of them were significantly changed: miR-451 (p=0.02) and hsa-let-7b (p=0.03) were downregulated 17 and 3.7 folds respectively, whereas miR-1225–5p (p=0.02) and hsa-miR-630 (p=0.02) exhibited an up-regulation of 5.29 and 9.24 folds respectively in HCM patients compared to CA Little is known about the role of these miRs in hypertrophic cardiomiopathy. Only miR-451 seems to regulate cardiomyocyte survival and also to be involved in several other physiological and pathological processes. **Conclusion:** Our study shows that HCM patients have different expression of miRs compared to CA. This finding could be used for differential diagnosis purposes and to improve the molecular knowledge in the field of hypertrophic cardiomiopathy.

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**P131**

## Systemic sarcoidosis "induced" specific cardiomyopathy, latent heart failure and/or risk of sudden cardiac death. diagnostic Tc-99m-Pyp radionuclide myocardial scintigraphy and therapeutic prevention in 178 patients studied. Fact or fiction?

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**Introduction:** Less than 5% of pulmonary and systemic sarcoidosis patients(pts),accompanied by myo-pericardial involvement,is clinically suspected for cardiac disease,while the risk of sudden cardiac death is at least expected greater than 60% bibliographically. **Objectives:** The purpose of the study is to investigate the possible presence of cardiomyopathy as well as diagnostic and therapeutic prevention of the risk of sudden cardiac death. **Methods:** One hundred seventy eight pts,56 male and 122 female,mean age 47,8 years,with no clinical evidence of any other cardiac pathology,out of 278,biopsy proven,pulmonary and systemic sarcoidosis pts,followed up for 28 years,were investigated for the possible presence of asymptomatic, latent, cardiomyopathy.Further to clinical examination,ECG, pulmonary function and blood tests,pts were submitted to echocardiography and radionuclide myocardial scintigraphy by technetium-99m-pyrophosphate(Tc-99m-pyp).Two hours after intra venous injection of 20mCi,isotope uptake was recorded and classified according to computerized percent bias between left(precardiac) and right parasternal area. **Results:** 1.Abnormal myocardial scintigraphy in 65,9% pts 2.Diastolic ventricular dysfunction(DD) in 51% pts 3.Concomitant presence of abnormal Tc-99m-pyp scan and DD in 41% pts 4.Pericardial effusion(PE) in 49% pts,while 5.PE with concomitant abnormal scan in 42% pts 6.Asymmetric septal hypertrophy(ASH) co-existed with abnormal scan in 21,5% pts 7.Confirmed sudden cardiac death in 1,3% of pts. **Conclusion:** 1.Abnormal Tc-99m-pyp scan(69,9%) and DD(51%) could be compatible,when co-existed,with asymptomatic,latent,presence of cardiomyopathy in at least 41% of pts 2.PE, evaluated in various disease stage in 49% pts totally,coincides with abnormal myocardial scan in 42% of pts,suggesting of myo-pericardial involvement 3.ASH, mimicking hypertrophic cardiomyopathy,coincides with abnormal scan in 21,5% of pts,suggesting of myocardial sarcoidosis pathophysiology 4.Our data arise open discussion,weather suggested diagnostic approach of asymptomatic,latent,myocardial involvement as well as immediately applied early,long term,corticosteroid treatment could really prevent myocardial dysfunction and/or failure as well as the risk of sudden cardiac death.We consider that Both modalities seemed to be correlated with the surprisingly impressive absence of sudden cardiac death cases,restricted finally to 1,3% only of the sarcoidosis pts studied and suspected for specific sarcoid cardiomyopathy.

**P132**

## Familial aggregation of dilated cardiomyopathy in patients with peripartum cardiomyopathy

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**Introduction:** Peripartum cardiomyopathy (PPCM) is a form of unexplained pregnancy-associated heart failure that is associated with considerable morbidity and mortality. Most patients present with acute postpartal heart failure that otherwise resembles the clinical presentation of dilated cardiomyopathy (DCM). Insufficient data exists to formally evaluate any genetic contribution; most being case reports of PPCM cases whose mothers or sisters had the same diagnosis. Two recent Western studies and one local study favour theories that some cases of PPCM may be part of the spectrum of familial DCM (FDCM). **Objectives:** We hereby report on a study of the familial aggregation of DCM in patients with PPCM. **Methods:** Of prevalent and incident PPCM patients seen at two tertiary hospitals across South Africa, 51 were approached for consent to screen their first degree relatives. Consenting relatives underwent screening for DCM that included interview, clinical examination, ECG, 2D-transthoracic echocardiography, and, only in relatives thought to bear signs of DCM, the necessary additional investigations to exclude other causes of heart failure. For the sake of comparison, a subset of 9 patients manifesting hypertensive heart failure of pregnancy (HHFP; ie. pregnancy-associated heart failure with current or prior history of hypertension) also underwent family screening. **Results:** A total of 18 index patients with PPCM had at least one first-degree relative who was screened for DCM. Of these, 4 index cases (22%) had confirmed familial disease (i.e., DCM on echocardiography), whilst an additional 3 (17%) had possible familial disease, (i.e., early echocardiographic signs of DCM). Of these, autosomal dominant patterns of inheritance were observed in 4 families, while 3 families displayed autosomal recessive inheritance. None of the HHFP cases had confirmed familial DCM, but one (11%) had possible familial disease; and displayed autosomal dominance. **Conclusion:** Our findings support the notion that over a third of PPCM cases bear familial DCM, thus confirming the notion that PPCM is part of the spectrum of familial DCM. Our study also suggests that while HHFP are at far lower risk of familial disease, larger studies will still be needed to better quantify this risk. Detailed family history and routine family screening may be as much merited in PPCM as it is in DCM.

**P133**

## Short-term evolution of echocardiographic parameters in patients with inflammatory and noninflammatory cardiomyopathy

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**Introduction:** Substantial part of dilated cardiomyopathies (DCM) may have an inflammatory aetiology. Persistence of inflammation in the myocardium could have a variety of therapeutic and prognostic implications, including the possibility of restitution of left ventricular function after remission of inflammation. **Objectives:** Comparison of echocardiographic parameters evolution in the groups with and without inflammation in myocardium in 3-month follow-up. **Methods:** There were examined 50 patients, 28 of them (i.e. 56%) had inflammation in myocardium and were classified as ICM, and remaining 22 patients (44%) were classified as DCM. Baseline results did not significantly differ in left ventricular ejection fraction (LVEF) (DCM 24 $\pm$ 8% vs. ICM 26 $\pm$ 8%) or pulse tissue Doppler (TDI) parameters of systolic and diastolic function of left (LV) and right ventricle (RV). LV systolic (Ds) and diastolic dimensions (Dd), RV diameter and LV end-systolic (ESV) and end-diastolic (EDV) volumes were significantly lower in ICM group (all $p<0.05$). ICM was defined as the presence of $>$ 14 leucocytes (LCA+)/mm2 and/or $>$ 7 T-lymphocytes (CD3+)/mm2 in EMB samples. Baseline and 3-month follow-up echocardiographic results including TDI characteristics of the left (LV) and right ventricle (RV) were compared in and between the groups with and without inflammation in myocardium. The results were compared using t-test, paired for comparison within each group and unpaired for comparison between the groups. **Results:** In the ICM group LVEF increased to 35 $\pm$ 8 % and peak systolic mitral annular velocity (Sm) to 6.6 $\pm$ 1.7 cm/s. Also RV systolic function assessed by peak systolic tricuspid annular velocity (Stri) improved (increase to 12.2 $\pm$ 2.8 cm/s). E/Em ratio decreased from 13 $\pm$ 5 to 10 $\pm$ 5, both LV Ds and Dd were reduced to 51 $\pm$ 9 mm and 62 $\pm$ 8 mm, respectively. Similar decrease was recorded in LV ESV and EDV (all $p<0.01$ for comparison with baseline). No significant changes occurred in DCM group. In comparison of ICM and DCM group 3-month results was found more expressed improvement in LVEF, Sm, Stri and E/Em ratio in ICM group (all $p<0.01$). **Conclusion:** There was found significant improvement in systolic LV and RV function in ICM patients compared with baseline values and also in comparison with DCM group in 3-month follow-up. The parameters of diastolic function in patients with ICM did not improve except E/Em ratio. In patients with noninflammatory DCM were found no significant changes in any of the monitored parameters.

**P134**

## Effectiveness of intrapericardial installation of cisplatin for prevention of reaccumulation of pericardial fluid in malignant pericardial effusion

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**Introduction:** Pericardial effusion is a common condition we face in our daily admission in NICVD.. Most of them treated with anti-tubercular therapy without an effective search to establish the diagnosis. Malignant pericardial effusion is the second leading cause and has a high recurrence rate. Pericardiocentesis usually provide temporary relief of symptoms. **Objectives:** The objective of the study was to evaluate the effectiveness of intrapericardial installation of cisplatin in the prevention of recurrence in malignant pericardial effusion. **Methods:** It was a prospective observation study where 10 patients with established malignant pericardial effusion with various underling malignancy was taken for the study. After aspiration of pericardial fluid, intrapericardial installation of cisplatin was done and kept for 24 hours. Patients were evaluated for reaccumulation of pericardial fluid with echocardiography at 30, 60 and 90 days. **Results:** The mean age of the patients was 55.4$\pm$9.2 years and 20% were female. 80% patient presented with features of cardiac temponade. The distribution of underlying malignancies were: lung cancer 3 (30%), breast cancer 2(20%), Hodgkin's disease 2 (20%), oesophageal carcinoma1 (10%) and unknown primary 2(20%). Intrapericardial installation of cisplatin was 100% effective in preventing re-accumulation of pericardial fluid at 2 months and 90% effective at 3 months during the survival time of the patients. It is associated with very minimal side effects. **Conclusion:** Intra pericardial cisplatin is highly effective in preventing the recurrence and thus obviate the need of recurrent pericardiocentesis and gives symptomatic improvement of the patients.

**P135**

## Prevention of the post-pericardiotomy syndrome. A meta-analysis of published randomized trials

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**Introduction:** The natural history of the post-pericardiotomy syndrome (PPS), a relatively common complication of cardiac surgery, is variable ranging from mild, self-limited episodes to cases with protracted courses, recurrences and readmissions. Preventive strategies may be valuable to reduce morbidity and management costs. **Objectives:** Systematic review on available data for the pharmacologic prevention of the PPS. **Methods:** Controlled clinical studies were searched in several databases and were included provided they focused on the pharmacologic primary prevention of the PPS. Random-effect odds ratios (ORs) were computed for the occurrence of the PPS. **Results:** From the initial sample of 343 citations, 4 controlled clinical trials for the primary prevention of the PPS were finally included (894 patients); 3 studies were double-blind randomised controlled trials (RCT). Treatment comparisons were as

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follows: colchicine vs. placebo (2 RCTs enrolling a total of 471 patients), methylprednisolone vs. placebo (a single RCT on 246 pediatric patients), and aspirin vs. historical controls (a single non-randomised study on 177 pediatric patients). Meta-analytic pooling showed that colchicine was associated with a reduced risk of PPS (OR= 0.38 [0.22–0.65]). Data either on methylpredisolone (OR= 1.13 [0.57–2.25]), or aspirin (OR= 1.00 [0.16–6.11]) were negative but inconclusive because based on a single study and/or a non-randomised design. **Conclusion:** Clinical evidence for the primary prevention of the PPS is still limited to few studies of variable quality. Nevertheless, available data suggest a beneficial profile for colchicine, at present the only efficacious agent for PPS primary prevention.

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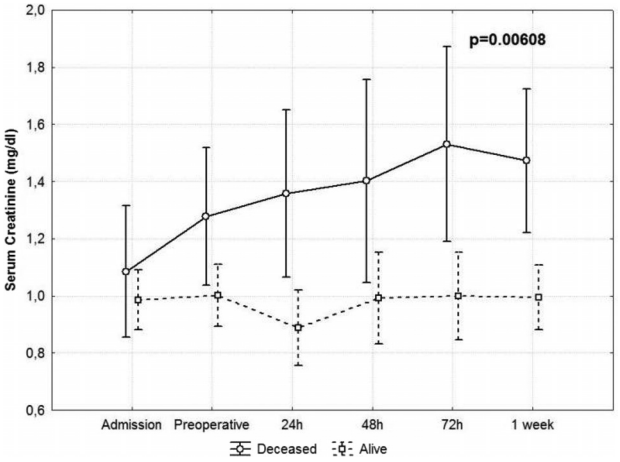
**Image/graph I:**




**Conclusion:** Renal dysfunction worsens the prognosis for patients undergoing cardiac surgery. Impaired renal function in the immediate postoperative period was an important predictor of death in these patients. Serum creatinine was a preoperative prognostic marker of death within 30 days after cardiac surgery for IE. However, creatinine clearance showed no prognostic value in this cohort.

## P136

## Cardiac tumors: imaging characteristics, surgical treatment and histopathological spectrum. a 10-year-experience

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**Introduction:** Tumors of the heart are very rare entities among cardiac diseases. Clinical symptoms of these tumors various from absent to nonspecific and often present themselves so different that their diagnosis and therapy may be delayed. **Objectives:** Tumors of the heart are very rare entities among cardiac diseases. Clinical symptoms of these tumors various from absent to nonspecific and often present themselves so different that their diagnosis and therapy may be delayed. **Methods:** We evaluated retrospectively all patients which underwent cardiac space-occupying lesion surgery in the observation period between 2000 and 2010 in our hospital, create a follow-up of these patients and compare the results with the actual literature. **Results:** Cardiac tumor surgery was performed in 84 cases at our center, i.e. 0.85% according to the total number (9829) of all surgical operations. The part of primary cardiac tumors was n=61 (72.6%). i.e. 58 benign and 3 malign tumors. In 9 cases (10.7%) secondary cardiac tumors were detected, most of them metastases of malignant tumors with no cardiac origin. In 14 cases (16.7%) cardiac thrombus were found. The majority of cardiac tumors was benign, most of them appeared histopathological as cardiac myxoma (n=48). **Conclusion:** Our follow-up study is in direct comparability to the actual literature regarding the frequency and allocation of the different cardiac tumors. Experiences have shown patients with benign tumors profit from undergoing surgery versus non surgical procedures with the risk of central or peripheral embolisms. Concerning malignant primary cardiac tumors and secondary cardiac metastases surgery can be only a palliative strategy in most cases.

## P138

## Renal function as a prognostic factor in infective endocarditis surgery

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**Introduction:** Infective endocarditis (IE) is a serious disease with a high mortality rate if not diagnosed early. Most patients are successfully subjected to antimicrobial therapy alone, but there is a group of more severely affected patients requiring an associated surgical approach. Pre-operative renal dysfunction is a marker of mortality, as well as worsening of renal function in surgical patients. Nevertheless, it remains doubtful if daily changes in serum creatinine are markers of mortality in this population. **Objectives:** To evaluate preoperative and postoperative renal function, using serum creatinine as a marker of mortality, in surgical patients with IE. **Methods:** We analyzed 59 consecutive patients undergoing cardiac surgery for the treatment of IE associated with antibiotic therapy in the period from Jan/2005 to Dec/2008. Serum creatinine was measured six times: on admission, the day before surgery, and 24h, 48h, 72h and 1 week post-surgery. Creatinine clearance was calculated from serum creatinine using the Cockroft-Gault formula. The variables were analyzed using ANOVA for repeated measures, Pearson correlation, and ROC curve. It was considered alpha value of 0.05. **Results:** Repeated measurements showed that creatinine increased in patients who died compared with those who survived (p=0.00608), which was not observed with creatinine clearance (p=0.24).

## P139

## Global alert for HCV-derived heart disease: the Egyptian response

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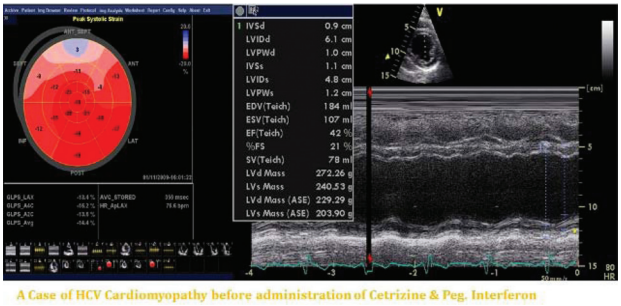
**Introduction:** Hepatitis C Virus "HCV" derived heart disease is a new global challenge. HCV prevalence is high in some Asian, African & South American countries.Few cardiologists in our region are aware of "HCV" as an etiology of heart disease. **Objectives:** To regionally highlight infectious heart disease through reviewing three Egyptian observational studies denoting cardiac involvement of HCV patients. **Methods:** Study I: 50 hepatitis C positive patients & 50 normal controls had been evaluated by medical history, physical examinations, ECG and conventional echo Doppler.Study II: 45 HCV positive patients & 45 matched controls had been evaluatedby PCR, ECG, Echocardiography "conventional Doppler, Pulsed wave tissue Doppler (PW-TD) & Strain Rate Imaging." NTproBNP was measured.Study III: HCV cases presented by dilated cardiomyopathy are subjected to echo Doppler and speckle tracking, before and after adding Cetirizine alone or combined with interferon and Ribavirin (triple therapy). **Results:** I -HCV positive patients had shown significant increase in prevalence of supraventricular arrhythmias with significant increase in corrected QT interval; p <0.05. Significant decrease in LV ejection fraction was observed in conjunction with significant decrease in A wave amplitude; p <0.05. II-HCV positive patients had shown highly significant decrease in tissue Doppler Ea, highly significant decrease in Aa, highly significant increased E/Ea ratio; p value <0.001. NTproBNP levels showed highly significant increase in HCV group compared to control group; p value <0.001, this increase was directly correlated to level of viraemia and to degree of diastolic dysfunction.III-Reversible significant decrease in global and regional strain had been observed in 15 cases of hepatitis C positive patients with dilated cardiomyopathy and normal coronary angiography. Dramatic improvement had been observed in systolic function by combining Cetirizine alone or with interferon and ribavirin therapy.

**Image/graph I:**




A Case of HCV Cardiomyopathy before administration of Cetrizine & Peg. Interferon

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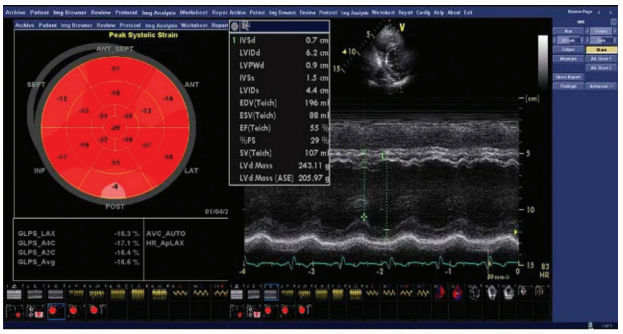
**Image/graph II:**




The Same Case After 2 months with administration of Cetrizine . Ejection Fraction was raised to 55% with peak systolic strain elevated to - 16.6% measured by speckle tracking.

**Conclusion:** -HCV infection might independently affect cardiac geometry, conduction, rhythm, diastolic & systolic functions. -NTproBNP is a strong indicator of diastolic dysfunction in HCV patients and might constitute an alarming sign before the development of cardiomyopathy and heart failure.-HCV heart disease might be reversible with applying effective therapy to revert post-infectious inflammatory and immune response. -Global Awareness of HCV heart disease should be promoted among both cardiologists and hepatologists.

**P140**

## Severe rheumatic heart disease patterns in urban italian population in epidemiologic transition

Antonio Grimaldi[1,*], Eloi Marijon[2], Valeria Cammalleri[3], Mariana Mirabel[2], Enrico Ammirati[1], Francesca Baratto[1], Federico Pappalardo[1], Antonio Colombo[1], Alberto Zangrillo[1], Ottavio Alfieri[1]
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**Introduction:** Little is known regarding rheumatic heart disease (RHD) patterns in urban Italian cities according to new trends of immigration. **Objectives:** We sought to evaluate clinical and echocardiographic characteristics of severe RHD according to mixed social background. **Methods:** A prospective evaluation was conducted among 458 consecutive patients referred for RHD surgery between 2003 and 2010 (S. Raffaele Hospital, Milan, Italy). All patients underwent systematic transthoracic and transesophageal echocardiography before treatment options, and analysis was conducted according to patient's social background. **Results:** RHD was diagnosed in overall 386 Italians and 72 Immigrants. Significant differences between the two groups (native Italians vs. Immigrants) were the following: age (59±12 vs. 44±15 years, $p<0.001$), female ratio (72 vs. 57%, $p=0.01$), symptoms (NYHA III-IV 37 vs. 17%, $p=0.014$), and permanent atrial fibrillation (52 vs. 19%, $p<0.001$). No significant difference of systolic pulmonary pressure was noted between groups (50±16 vs. 47±17 mmHg, $p=0.15$). Mitral valve was the most frequent valve involved by RHD process, particularly among native Italians (94 vs. 86%, $p=0.02$). Among multivalvular disease (60 vs. 62%, $p=0.74$), mitral valve disease was preferably associated to aortic valve disease, particularly in native Italians (48 vs. 28%, $p=0.002$). Tricuspid valve disease was significantly more prevalent among Immigrants (34 vs. 15%, $p<0.001$). Regarding morphological features of mitral valve disease, commissural and leaflet calcifications were more frequently associated in native Italian group (45 vs. 22%, $p<0.001$), whereas no differences in subvalvular thickening were noted (27 vs. 17%, $p=0.09$). **Conclusion:** Among people with severe RHD requiring surgery, significant clinical and echographic differences exist according to social background. Our data describe changes in the presentation of RHD in a tertiary center, mainly related to the migratory flow. Among native Italians, patients were more likely to be older and female, with more calcified lesions, whilst epidemiology in migrants may match the realities of the country they are originally from.

**P141**

## 5 year follow-up in patients with endstage CAD after treatment of myocardial ischemia using cardiac shock wave therapy

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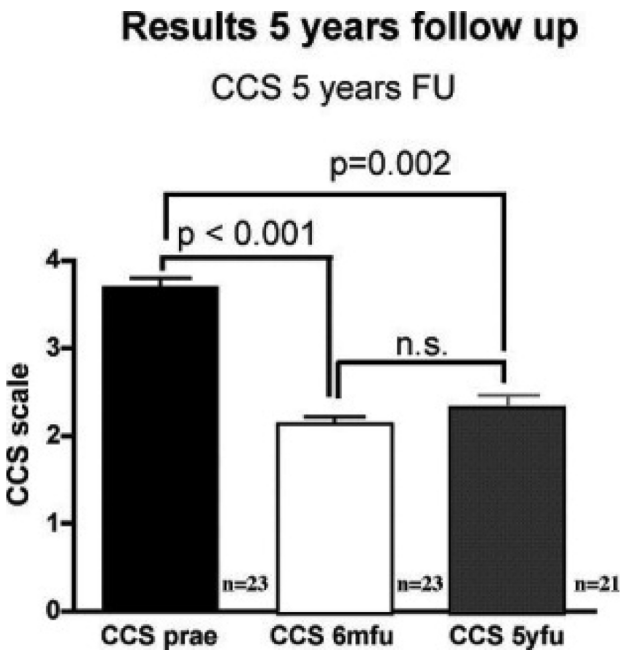
**Introduction:** Better invasive and operative techniques in cardiovascular disease lead to an increasing number of patients with endstage CAD with no therapeutic options and refractory angina. We here present our five year data on Cardiac shock wave therapy (CSWT). This is a new non-invasive technique that induces angiogenesis. **Objectives:** The objective of this study was to increase collateral bloodflow formation (angiogensesis) using electromechanical waves. It has been proven that CSWT induces angiogenesis via VEGF and HGF induction. This study was designed to show clinical benefit for endstage coronary artery disease patients **Methods:** CSWT was performed in 23 pts. with endstage CAD and proven ischemia using SPECT and PET. R-Wave triggered shock waves were focused via in-line ultrasound on ischemic areas.. About 3 x150 impulses were applied to ischemic areas using increasing energy fluxes densities from 0.05 to 0,1 mJ/mm. Pts. were examined in SPECT before and after a 6 months. In addition they were evaluated after 5 years. **Results:** Patients experienced no side effects during and after treatment. SPECT revealed a significant increase in perfusion in treated myocardial areas in 60% of the patients whereas in non treated there was no perfusion increase. CCS class was reduced from initial 3.69 ± 0.21 to 2,1 ± 0.17 staying at 2.32 ± 0.15 after five years. Mortality after 5 years was 8.4%. Mean survival 56.3 ± 11.3 months, symptom free interval was 23.94 ± 18.33 months.

**Image/graph I:**




**Conclusion:** CSWT is safe and feasible and non-invasive it relieves angina pectoris and increases exercise capacity also it improves myocardial perfusion. The mechanism of action is neoangiogenesis.

**P143**

## Gender differences in patients undergoing coronary angiography. A pilot study

Anna Vachulova[1,*], Branislav Vohnout[2], Branislav Liska[1], Ivan Varga[1], Jozef Pacak[1], Robert Hatala[1]
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**Introduction:** Important sex-related differences in the presentation, management and outcomes of CVD have been shown in different studies. **Objectives:** The aim of the current presentation was to evaluate gender differences in diagnostic findings in patients with clinical diagnosis of ischemic heart disease electively admitted for chest pain in a period of three months to our institution. **Methods:** Overall, 136 patients with CHD (58,1 % males, 41,9 % females) were included into the study. All patients underwent angiographic evaluation and in 42 women and 55 men bicycle stress testing was done.Syndrome X was definited by three common features: typical angina, angiographically normal coronary arteries and a positive exercise test. **Results:** Blood pressure was significantly higher in women, men had higher urikemia levels. Other basic clinical characteristics of the analysed populations were comparable. We found significantly more positive angiographic results (stenosis >50% in at least one major epicardial coronary artery) in men than in women (76% vs 38.6%, $p<0,0001$), however, significantly higher prevalence of syndrome X was noted in women (17,5% vs3,8%, $p<0,01$). Only 30% of women compared to 73.3% of men with positive ecg bicycle stress test had also positive angiographic finding ($p<0.001$). **Conclusion:** We have found important differences in angiographic and stress test findings between men and women. Positive predictive value of ecg bicycle stress test is much lower in women than in men (30% vs 73,3%, $p<0.001$). Angiographic findings do not explain chest pain in the majority of female patients. Therefore, coronary angiography should be indicated with prudence in female pts with stable chest pain.

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## Assessment of the most effective combination of antianginal medications in the treatment of patients with stable angina pectoris

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**Introduction:** Cardiovascular diseases, in particular ischaemic heart disease (IHD) are one of the leading causes of death world-wide. Despite of guidelines based treatment majority angina patients still symptomatic. **Objectives:** To assess the most effective combination of anti-anginal medications to reduce the number of angina attacks in stable angina patients. **Methods:** In the clinical study with epidemiological part we analyzed 1423 ambulatory stable angina patient-cards. Most (82%) patients had a history of myocardial infarction (MI). The study population included patients with plural concomitant pathologies and very high cardiovascular risk: 82% of patients had hypertension, 91% heart failure, 23% diabetes mellitus, 35% obesity (body mass index $\geq$ 30 kg/m$^{2)}$, 84% hypercholesterolemia (cholesterol level $>$4.5 mmol/L) and 66% heart rate $>$70 beats/min. 10,4 % underwent percutaneous transluminal coronary angioplasty (PTCA) and 9.9% coronary artery bypass grafting (CABG). Of the antianginal drugs being taken, beta-receptor blockers (BB) were prescribed in 82%, long-acting nitrates (LAN) in 57%, calcium channel blockers (CCB) in 25% of patients, with most patients taking a combination of these medications. A cohort of 1213 patients was split in 3 groups according to prescribed combination of medications: BB (group 1, n=400), BB + LAN + (group 2, n=691), BB + CCB (group 3, n=122). The therapy of patients did not change for at least 1 month. After that, all patients started taking original trimetazidine MR (visit 1) for two months (visit 2). **Results:** Trimetazidine MR substantially diminished the number of angina attacks in patients on background treatment with BBs or a combination of BBs with LANs or CCBs (see table). The combined use of LANs or CCBs with BBs did not result in an additional decrease in frequency of angina attacks per week compared with patients receiving BBs and original trimetazidine MR alone.

**Image/graph I:**

Table. Changes in frequency of angina attacks

| Mean number of angina attacks per week | BB (M±SD) | | BB+LAN (M±SD) | | BB+CCB (M±SD) | |
|---|---|---|---|---|---|---|
| | Visit 1 | Visit 2 | Visit 1 | Visit 2 | Visit 1 | Visit 2 |
| <3 | 1.8±7.0 | 0.4±10.4* | 2.0±7.0 | 0* | - | - |
| 3-6 | 4.1±3.5 | 1.0±3.5* | 4.4±3.5 | 1.2±3.5* | 4.3±7.0 | 1.3±7.0* |
| ≥7 | 13.4±3.5 | 3.1±3.5* | 10.5±7.0** | 3.4±3.5* | 10.4±3.5** | 3.4±3.5* |

- P<0.001 vs. visit 1, ** P<0.001 vs. visit 1 in BB group, SD-standard deviation

**Conclusion:** Modified-release trimetazidine in combination with BBs is the most effective combination decreasing of angina attacks per week in stable angina patients.

P145

## Ivabradine improves quality of life in subjects with chronic ischemic heart disease respect the treatment with $\beta$-blockers

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**Introduction:** Ivabradine (IVA), a selective and specific inhibitor of the $I_f$ current which reduced heart rate without adverse hemodynamic effects, has clearly and unequivocally demonstrated its efficacy in the treatment of chronic stable angina pectoris and myocardial ischemia with optimal tolerability profile due to selective interaction with $I_f$ channel. **Objectives:** None of published studies evaluated quality of life (QoL) with a 36-items Short-Form (SF-36) questionnaire in subjects with chronic ischemic heart disease treated with IVA and $\beta$-blockers. **Methods:** We evaluate if a 1 month treatment with IVA (5 mg bid) or $\beta$-blockers improves the QoL (assessed by SF-36 questionnaire) in patients with chronic cardiac ischemic heart disease. SF-36 was tested in 238 patients (mean age 62 $\pm$ 8 years) randomized in two groups (IVA group–118 pts; $\beta$-blockers group–120 pts) with chronic cardiac ischemic disease enrolled from a Cardiology Unit during 2009/2010. Data of QoL questionnaire and heart rate were collected by an interview during a clinical visit both at prescription time (basal) and after 1 month of therapy with IVA or $\beta$-blockers. QoL life and heart rate results after 1 month of therapy with IVA were compared with basal values. **Results:** The IVA vs $\beta$-blockers treatment was associated with a significant improvement of physical functioning (P=0.004 vs p=0.01), physical role functioning (P = 0.002 vs p=0.01), role-emotional functioning (P = 0.001 vs p=0.003), and psychic health scales (P = 0.001 vs p =0.01). Heart rate in IVA group was significantly lower respect the group of patients treated with $\beta$-blockers (56 bpm vs 62 bpm p=0.001). **Conclusion:** IVA treatment significantly improves the QoL in patients with chronic ischemic heart respect to $\beta$-blockers treatment. This improvement is associated with higher reduction in heart rate.

P146

## Uncovering the meaning of the Canadian Cardiovascular Society classification in patients with stable angina

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**Introduction:** Angina is the hallmark of coronary artery disease (CAD). More than 30 years ago, the Canadian Cardiovascular Society (CCS) proposed a classification regarding the functional impairment imposed by angina pectoris. There is, however, a major caveat with that classification that might lead to an underestimation of the extension of CAD: either patients (pt) become self-limited as a strategy to avoid exertional pain or they very often depend on the use of nitrates to tolerate different levels of exercise. **Objectives:** To determine the relationship between CCS classification and the frequency of angina attacks and the consumption of sublingual, short-acting nitrates tablets. **Methods:** 72 pt (60 men, 59$\pm$13 years) with stable angina due to CAD were included. All pt had to fulfill an angina diary during a 4-week period, in which they recorded the number of daily episodes of angina and the number of short-acting nitrates taken. Investigators also recorded the functional class according to the CCS classification (I to IV). Continuous data were expressed as mean $\pm$ SD and ordinal variables, as percentage. *Spearman's* rank correlation coefficient was applied to determine correlation between variables. **Results:** The distribution (n, %) of pt according to the CCS was CCS I (9, 12.5%), CCS II (41, 57%), CCS III (7, 9.5%), and CCS IV (15, 21%). The mean number of angina attacks *per week* and the mean number of sublingual nitrates tablets taken *per week* were, respectively, 3.0$\pm$3.0 and 1.2$\pm$1.4 (CCS I), 2.7$\pm$3.6 and 1.5$\pm$1.9 (CCS II), 7.8$\pm$4.6 and 1.6$\pm$2.3 (CCS III), and 5.5$\pm$3.7 and 2.1$\pm$3.3 (CCS IV). We found a strong, positive association between angina episodes and sublingual nitrates tablets per week (r=0.511; P$<$0.0001), a positive association between CCS and angina episodes per week (r=0.34; P=0.003), but no association between CCS and sublingual nitrates tablets per week (r=0.103; P=0.38). **Conclusion:** The CCS functional classification is a valid tool to predict the intensity of exercise level that evokes angina. However, it fails in estimating the frequency of the angina attacks. So, the true impairment in quality of life in patients with CAD (which depends not only on exercise tolerance [intensity] but also on angina frequency) may be underestimated by the CCS classification. More likely, pt may avoid certain activities previously known to them to provoke angina or use short-acting nitrates before angina actually occurs. This information must be carefully obtained by a detailed medical history.

P147

## Clinical impact of medical intensive treatment on functional class in patients initially diagnosed as refractory angina

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[1]Heart Institute (InCor), HCFMUSP, Sao Paulo, Brazil

**Introduction:** Refractory angina is a major clinical challenge. Patients (pt) usually have significant functional impairment due to disabling symptoms, which greatly adversely impact their quality of life. Many pt may be erroneously diagnosed as refractory angina, if not on intensive medical therapy. **Objectives:** To evaluate the impact of intensive medical treatment on angina functional class in pt initially diagnosed as refractory angina. **Methods:** 45 pt (31 men, 59$\pm$13 years) were included based on the following criteria: 1) disabling symptoms; 2) objectively documented myocardial ischemia; 3) coronary anatomy unsuitable for myocardial revascularization procedures. Medical visits were scheduled every 4 weeks during a 3-month period (Vo to V3). Angina functional class was recorded in each visit as proposed by the Canadian Cardiovascular Society (CCS). Medical therapy was strongly encouraged to be optimized based on patient's tolerance. Statistical analysis included the Student's t-test (continuous variables), the chi-square test (categorical variables), and the Wilcoxon test (changes in functional class). **Results:** There was an overall improvement in CCS class between V0 to V3 (p$<$0,001), with 30 pt (66.7%) improving at least 1 class. In 14 pt (31.1%) there was no difference and in only 1 pt (2.2%) there was worsening of CCS class. In V0 and V3, anti-ischemic drugs were used as follows (%), respectively: beta-blockers (96 vs. 96), calcium channel blockers (78 vs. 84), long-acting nitrates (96 vs. 100), and trimetazidine (38 vs. 93). Mean daily dosages (mg) of selected drugs were: atenolol 105$\pm$49 to 113$\pm$59 (P=0.16); carvedilol 44$\pm$16 to 55$\pm$20 (P=0.06); amlodipine 7$\pm$3 to 8$\pm$3 *(P=0.12)*; isossorbide 95$\pm$28 to 106$\pm$24 (P=0.09). There was a non-significant 4.4% decrease in the mean heart rate (bpm) from 66$\pm$11 to 63$\pm$9 (P=0.10), and a non-significant 4% reduction in mean systolic (SBP) and diastolic (DBP) blood pressure: SBP - 128$\pm$23 to 123$\pm$23mmHg (P=0.10), and DBP - 75$\pm$11 to 72$\pm$14mmHg (P=0.11). **Conclusion:** Pt enrolled in this clinical program, although initially diagnosed as refractory angina, experienced a significant improvement in their functional class. This could not be attributed to an increase in anti-ischemic drugs or to an hemodynamic effect. We believe that the regular visits at shorter intervals may have led to a better treatment adherence, emotional easiness and self-confidence. This study exemplifies how complex is the relationship between extensiveness of the disease and functional impairment.

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**P148**

## Clinical efficacy and tolerability of modified release trimetazidine in real practice settings (Russian study PERSPECTIVE)

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**Introduction:** Trimetazidine (TMZ) is the only antianginal drug that directly increases by 33% the energy available in the ischemic heart.[1] In clinical trials, it has been shown to both reduce angina pain[2] and preserve left ventricular ejection fraction (LVEF)[3]. No trial has established concomitant effects of the drug on symptoms and cardiac function in the conditions of everyday practice. **Objectives:** Investigate clinical efficacy and tolerability of TMZ 35 mg modified release in patients (pts) with stable angina (SA) in real practice settings in 40 Russian cities. **Methods:** 981 pts with SA (II-III CCS) and concomitant diseases (heart failure of NYHA functional class II-III, type 2 diabetes, or chronic obstructive pulmonary disease), aged 35–60 years were randomized into two groups–a group receiving active therapy (TMZ MR at a dose of 35 mg twice daily on top of standard therapy, n=838) and a control group (standard therapy without TMZ MR, n=143). The mean weekly number of angina attacks (AA) and nitroglycerine consumption (TNT); the basic echocardiographic parameters; the changes in patients' self-assessment of clinical status and treatment tolerability were evaluated during a 2, 6 and 12 months follow-up. **Results:** Analysis of baseline characteristics revealed no significant differences between the two treatment groups. TMZ MR reduced AA by 42% after 2 months ($p<0.0001$), by 63% after 6 months ($p<0.0001$) and by 70% after 12 months. In control group AA decreased by 42% only after 6 months ($p<0.001$), but returned to initial level at 12 months. A significant reduction in TNT was noted in the TMZ MR group (-41% after 2 months, and -68% after 12 months), but not in control group. LVEF increased significantly by 2.2% ($p<0.001$) and 2.4% ($p<0.001$) after 6 and 12 months, respectively, in pts receiving TMZ MR. No significant change was observed in the control group. Doctor assessement of treatment outcomes after 12 months was <<excellent>> in 32.6% and 6.1% of pts in the TMZ MR and control groups, respectively ($p<0.05$). Adverse events occurred in 7.19% pts of TMZ MR group versus 13.4% pts of control group ($p<0.012$). **Conclusion:** Trimetazidine modified release therapy provides an improvement in clinical status (AA, TNT and LVEF) in SA pts with concomitant diseases and symptoms in the primary care settings in various Russian regions.

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**P149**

## HOMA-IR index as a predictor of burden of atherosclerosis

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**Introduction:** Carotid intimal-medial Thickness (CIMT) has been proven to accurately predict the burden of atherosclerosis. It would be desirable to have an inexpensive and easily accessible marker that could reliably correlate with CIMT. **Objectives:** To evaluate the correlation between Insulin Resistance (IR) and CIMT in coronary artery disease (CAD) patients. **Methods:** The study comprised of 100 CAD patients. IR was calculated using Homeostatic Model for assessment of Insulin Resistance Index (HOMA-IR) and CIMT was estimated on high resolution B-mode ultrasonography. Normal level of IR was taken to be between mean±2SD calculated from 100 controls. All those factors which were statistically significant ($p<0.05$) on univariable regression analysis for predicting CIMT were tested with multivariable regression analysis. **Results:** Normal range of IR in sample population of controls was from 1.8–2.6. The mean HOMA-IR Index as well as CIMT was greater in diabetics than in non-diabetics ($p<.008$). Even after adjusting for age and sex of the patient, smoking history, presence of diabetes and its duration, mean triglyceride and cholesterol level and waist circumference of the patient HOMA-IR level had a direct association with CIMT ($r=0.597$; $p<0.01$).

| HOMA-IR INDEX | MEAN CIMT |
|---|---|
| <2.6 | 0.785±0.01 mm |
| 2.6-5.2 | 0.88±0.02 mm |
| 5.2-7.8 | 1.05±0.02 mm |
| >7.8 | 1.15±0.01 mm |

**Conclusion:** HOMA-IR Index can be used as a "cheap and easy" marker to predict the CIMT in CAD patients and thereby assessing the burden of atherosclerosis.

**P150**

## Angiographic coronary stenosis complexity and markers of inflammation in patients with angina pectoris

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**Introduction:** Acute coronary syndromes (ACS) result mainly from occlusive coronary artery thrombosis at sites of plaque fissuring, rupture or superficial erosion. At angiography, disrupted or ulcerated plaques often appear as "complex" stenoses with rough contours or "filling defects" suggestive of intracoronary thrombosis. Inflammation plays an important role in atherosclerosis. Neutrophil count (NC) and C reactive protein (CRP) are markers of ongoing inflammation and predictors of cardiovascular risk. In recent years it has become apparent that inflammatory mechanisms involved in atherogenesis may lead to plaque disruption, stenosis progression and ACS. A role has been suggested for systemic inflammation in the genesis of CAD progression and multifocal plaque disruption. **Objectives:** We sought to assess the relationship between NC and CRP and extent of CAD and angiographic stenoses morphology. **Methods:** We studied 131 angina patients, 55 with unstable angina (UA) and 76 with chronic stable angina (CSA) and 29 subjects with atypical chest pains and normal angiograms. Extent of CAD was assessed using a validated angiographic vessel score. The angiographic morphology of all coronary stenoses ≥30% diameter reduction was assessed. Complex lesions were defined by the following features: (1) irregular morphology or scalloped borders, or both; (2) overhanging or abrupt edges perpendicular to the vessel wall; (3) ulceration (i.e., outpouchings within the stenosis); and (4) the presence of filling defects consistent with intracoronary thrombus [4]. Coronary stenoses with no complex features were classified as smooth lesions. **Results:** Baseline NC and CRP levels were significantly higher in UA compared to both CSA and controls ($p<0.001$). In UA but not in CSA patients, a significant correlation was observed among CRP levels ($r=0.33$, $p=0.023$), NC ($r=0.36$, $p=0.007$) and the presence of complex coronary stenoses. CSA patients with multiple complex stenoses had higher NC than CSA patients without complex lesions. CRP levels and NC did not correlate with extent of CAD in UA or CSA patients. In UA patients multiple regression analysis showed that NC, but not CRP, was independently associated with the number of complex lesions ($p=0.009$). **Conclusion:** CRP levels and NC are higher in patients with UA compared to CSA patients and control subjects. In UA patients, CRP levels and NC are associated with plaque complexity but not with extent of CAD. In patients with CSA, multiple complex stenoses is associated with higher NC.

**P151**

## Prognostic value of coronary artery calcium score in stable angina pectoris patients underwent percutaneous coronary intervention

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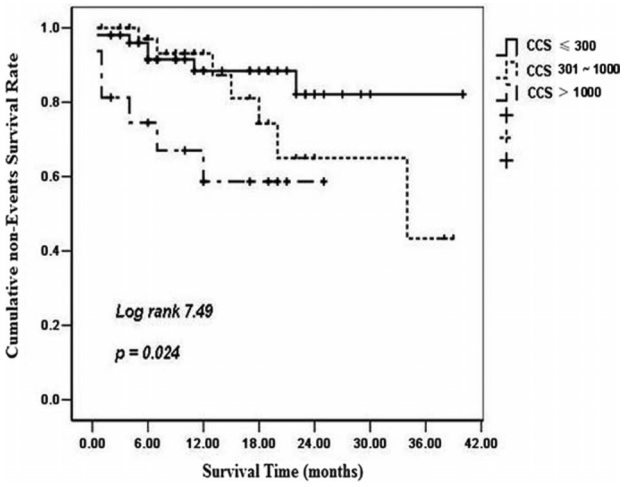
**Introduction:** In general populations, computed tomographic measurements of coronary-artery calcium score (CCS) is an independent predictor of coronary heart disease. However, it is not known whether CCS could predict prognosis in stable angina pectoris patients underwent percutaneous coronary intervention (PCI). **Objectives:** To evaluate whether CCS is an independent prognostic factor in stable angina pectoris patients underwent PCI. **Methods:** 109 stable angina pectoris patients underwent first PCI were enrolled and followed up. Electron-beam computed tomography (EBCT) was examined in all patients before PCI and CCS was calculated. Main adverse cardiac events (MACE) were defined as a combined end point of death, non-fatal myocardial infarction, revascularization and rehospitalization for cardiac reason. **Results:** CCS was positively correlated with age ($r=0.42$, $p=0.000$). It was higher in male patients and diabetes mellitus patients when compared with female patients and non-diabetes mellitus patients. After average 15.0 months of follow-up, Kaplan-Meier survival analysis showed the patients with CCS ≤ 300, CCS 301~1000 and CCS □1000 had significantly different cumulative non-events survival rates (88.2% *vs* 81.6% *vs* 62.5%, $p=0.024$). Adjusted for other confounders, multivariate Cox regression analysis showed the risk of occurrences of MACE increased 3.44 folds in the patients with CCS □1000 compared with the patients with CCS ≤ 300 (*HR* 3.44, $p=0.043$).

**Image/graph I:**




**Image/graph II:**

**Table 1 Baseline characteristics of total patients**

| Clinical characteristics | Total patients (n= 109) | Group 1 (n= 53) | Group 2 (n= 40) | Group 3 (n= 16) | *P* value |
|---|---|---|---|---|---|
| Age | 65.2 ± 9.3 | 61.7 ± 8.8 | 67.3 ± 8.8 | 71.9 ± 6.8 | 0.000 |
| Sex (male, %) | 67.0 | 64.2 | 62.5 | 87.5 | 0.165 |
| Hypertension (%) | 76.6 | 73.6 | 84.2 | 68.8 | 0.359 |
| Diabetes (%) | 35.5 | 28.3 | 39.5 | 50.0 | 0.231 |
| Hyperlipidemia (%) | 56.1 | 66.0 | 52.6 | 31.3 | 0.042 |
| Smoker (%) | 43.5 | 45.3 | 38.5 | 50.0 | 0.689 |
| Family history (%) | 23.8 | 23.5 | 21.1 | 31.3 | 0.723 |
| SBP (mmHg) | 129.4 ± 13.9 | 127.6 ± 12.8 | 129.5 ± 14.6 | 134.7 ± 15.1 | 0.207 |
| DBP (mmHg) | 74.3 ± 8.8 | 74.5 ± 10.0 | 74.3 ± 7.2 | 73.8 ± 8.3 | 0.957 |
| HR (次/分) | 68.8 ± 8.1 | 68.8 ± 7.1 | 68.9 ± 9.9 | 68.6 ± 6.9 | 0.992 |
| BMI (kg/m$^2$) | 25.6 ± 3.1 | 25.7 ± 3.5 | 25.9 ± 2.3 | 24.4 ±2.9 | 0.253 |
| hs-CRP (mg/L) | 4.5 ± 7.3 | 5.4 ± 9.0 | 4.0 ± 4.5 | 2.7 ± 5.4 | 0.440 |
| Cr (μmol/L) | 93.4 ± 18.3 | 92.4 ± 17.3 | 92.9 ± 19.9 | 97.8 ± 18.3 | 0.579 |
| T-CHO (mmol/L) | 4.5 ± 1.1 | 4.6 ± 1.0 | 4.5 ± 1.2 | 4.3 ± 0.7 | 0.652 |
| HDL (mmol/L) | 1.0 ± 0.3 | 1.0 ± 0.2 | 1.0 ± 0.2 | 1.0 ± 0.4 | 0.942 |
| LDL (mmol/L) | 2.7 ± 0.8 | 2.8 ± 0.8 | 2.6 ± 0.9 | 2.5 ± 0.5 | 0.511 |
| multi-vessel CAD(%) | 58.7 | 41.5 | 70.0 | 87.5 | 0.001 |
| TRV (%) | 94.5 | 96.2 | 97.5 | 81.3 | 0.041 |

TRV: Total revascularization; Continuous variables were presented as the mean ± standard deviation and categorical variables were presented as frequencies and percentages.

**Conclusion:** CCS is an independent predictor of long-term occurrences of MACE in stable angina pectoris patients treated with PCI.

**P152**

## Effect of enhanced external counterpulsation treatment on ejection fraction in patients with moderate left ventricular dysfunction

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**Introduction:** Enhanced External Counterpulsation is an emerging treatment for Chronic Angina patients to decrease symptom of myocardial ischemia by improving myocardial perfusion and vascular function. **Objectives:** We evaluated the improvement of ejection fraction and exercise time in EECP patients with documented ischemia and anginal symptom. **Methods:** We prospectively analysed 110 consecutive patients with pre and post EECP echocardiography and angina symptoms. **Results:** The patients mean age of 60±7 yrs underwent a total of 35 sessions. Demography includes 50% had prior MI, 66% hypertensive, 58% diabetes mellitus, 14% chronic smokers, 58% had triple vessel disease, 24% had prior CABG or PTCA. The average CCSA classification was 2.28 ± 1.02 at baseline, and reduced to 0.74 ± 0.74 post EECP ($p<0.01$). EF increased from 46.35 ± 12.9 to 51.75 ± 11.65%, ($p<0.001$), there is significant reduction in both EDV 112.13±56.67 to 99.83±42.15, ($p<0.001$) and ESV 62.44±47.01 to 52.80±37.18, ($p<0.001$) **Conclusion:** EECP treatment significantly reduce angina symptom and improve left ventricular ejection fraction by reducing both End diastolic volume and end systolic volume.

**P153**

## Relation between diabetes, heart rate variability and left ventricular function in patients with stable angina

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**Introduction:** Coronary patients with diabetes are at high risk of cardiovascular events. Coronary disease in diabetic patients has speed up, progressive course because of the synergic work of hyperglycemia and other risk factors of the coronary disease, as well as dyslipidemia, hypertension and obesity. Diabetic autonomic neuropathy which first involves vagal nerves contributes to the bad prognosis of coronary patients with diabetes. The best marker of the state of activity of the autonomic nervous system is the heart rate variability (HRV), which is a predictor of cardiac mortality. **Objectives:** The aim of this study was to assess the relation between diabetes, heart rate variability and left ventricular function in patients with stable angina. **Methods:** The study involved 117 patients with stable angina, in the sinus rhythm without AV blocks or branch blocks. Average age of patients was 57.9 years. 39 patients were with diabetes mellitus, and 78 were without diabetes. There was no significant difference in age or sex between two groups of patients. In all subjects 24-hour ECG recording and echocardiographic examination were performed. From the Holter record, the analysis of the heart rate variability was performed by software. Four parameters of the time domain heart rate variability were assessed: SDNN, SDANN, RMS-SD and NN>50 ms. **Results:** Patients with stable angina and diabetes had significantly lower values of followed parameters of the heart rate variability (97.2±21.1 vs 119.7±25.5ms, $p<0.001$ for SDNN, 88.2±17.6 vs 103.6±20.2ms, $p<0.001$ for SDANN; 27.5±9.3 vs 36.2±11.4ms, $p<0.001$ for RMS-SD and 5.8±4.9 vs 11.6±9.4, $p<0.001$ for NN>50ms) in comparison to those without diabetes. Patients with diabetes also had significantly lower values of left ventricular ejection fraction (56.3±8.2 vs 63.1±10.1%, $p<0.001$), and significantly higher values of left ventricular end-systolic diameter (36.8±5.3 vs 33.5±6.1mm, $p<0.005$) and left ventricular end-diastolic diameter (54.6±5.1 vs 52.2±5.8mm, $p<0.025$), as well as higher degree of left ventricle diastolic dysfunction, in comparison to those without diabetes, in comparison to those without diabetes ($p<0.02$ for ratio E/A and $p<0.001$ for Dt). **Conclusion:** The study demonstrated that patients with stable angina and diabetes have significantly lower values of HRV parameters, and higher degree of left ventricle systolic and diastolic dysfunction, in comparison to those without diabetes.

**P154**

## Angina control trial with procoralan

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**Introduction:** Despite therapeutic advances in chronic ischemia treatment, 6.5–16.5 million Americans suffer angina pectoris, most of them due to residual ischemia after PCI and CABG. Optimal medical treatment is often restricted due to intolerance to full doses of classic drugs such as beta-blockers, calcium channel blockers and nitrates. Thus, new anti-angina drugs are needed. **Objectives:** The objective of the study was to demonstrate the anti-angina and anti-ischemic efficacy of Procoralan (Ivabradine, the first selective and specific $I_f$ inhibitor) after 16-week treatment in Vietnamese patients. **Methods:** This is an open observational trial performed on 339 chronic ischemia patients in Vietnam between mars 2008 and mars 2009. These stable angina patients with heart rate superior to 60 bpm had treadmill exercise at the beginning and after 16-week treatment with Procoralan per os. Procoralan is given at 5mg twice a day after the first treadmill exercise then titrated to 7.5mg twice a day after 2 weeks upon patient's tolerance. Differences between two treadmill exercises on total duration of exercise, times to onset of ST-segment depression and chest discomfort, time to stop treadmill exercise because of chest pain, and maximal heart rate were analyzed by Student's test. **Results:** There were significant improvements, up to 126.5 seconds (+26.4%; $p<0.001$) for the total duration of the treadmill exercise, up to 90.8 seconds (+20.6%; $p<0.001$) for the time to onset of ST-segment depression, up to 108. 6 seconds (+20.5%; $p<0.001$) for the time to onset of chest discomfort, up to 93.9 seconds (+14.9%; $p<0.001$) of the time to stop treadmill exercise because of chest pain. The heart rate has a reduction of 20% (from 85.7 bpm to 68.6 bpm; $p<0.001$) at rest and 5.7% (from 147.4 bpm to 139.1 bpm, $p<0.001$) during exercise. The number of chest pain per week has a reduction of 85.2% (from 2.7 to 0.4; $p<0.001$). The number of short-acting nitrate pill required weekly is lessened to 50% (from 5.4 to 2.7 unit; $p<0.001$). The incidence of adverse effects was 3%, including fatigue (0.3%), dizziness (1.5%), headache (0.6%), digestive hemorrhage (0.3%). **Conclusion:** The anti-angina, anti-ischemic effects, safety and good tolerance of Procoralan were well demonstrated after 16 weeks of treatment in Vietnamese patients.

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## Dynamics of lipid peroxidation in patients with unstable angina during treatment by batroxobin

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**Introduction:** Ischemia is accompanied by a significant increase in lipid peroxidation (LPO) processes. Its intensity reflects the degree of metabolic disorders in the patient. When excess free radical formation strengthens the protective antioxidant system, with lack of effectiveness which develops oxidative stress. **Objectives:** Study of the state of LPO in patients with UA during the treatment by Batroxobin (Tobarpin). **Methods:** We included 60 patients with UA in age from 30 to 63 years. Study group comprised 30 patients with UA treated by standard therapy adding drug Batroxobin as follows: 2nd-day-10 batroxobin units (BU), 4th-day-5BU, 6th-day-5BU, 8th-day-5BU. The control group consisted of 30 patients with UA who received only standard therapy. Activation of LPO reactions tested by us on the content of secondary LPO products - malondialdehyde (MDA) in plasma and red blood cells (RBC). **Results:** Initial level of MDA in plasma and in erythrocytes in both groups was significantly higher than normal values in the plasma level of MDA in the main group 3,8±0,01mmol/L in the control group 3,8±0,02mmol/L at a rate of 3,6±0,025mg/dL, the level of MDA in RBC in the study group made up 48,2±0,2mmol/L in the control group 48,7±0,2mmol/L. Against the background of the therapy in patients with UA treated by Batroxobin, reduced MDA level was going faster and has a 14 day, reaching the plasma in the main group 3,7±0,02mmol/L in the control group 3,8± 0,01mg/dL, $p<0,05$, and in RBC by 28 days the level of MDA in the study group was significantly lower than those of control group: 42,8±0,2mmol/L, 43,9±0,2mmol/L, respectively, $p<0,05$. By the end of 2 months of observation indicated a significant decrease, reaching the level of MDA in plasma in the main group of 3,6±0,01mmol/L in the control group 3,6±0,01mmol/L in RBC in the study group 42,1±0,1mmol/L in the control group 42,6±0,1mmol/L, $p<0,05$. **Conclusion:** Received results suggest that the addition of standard therapy in patients with UA Batroxobin reduces oxidative stress, which is probably due to improved endothelial function, hemorheology.

P156

## The activity and diabetes mellitus modify circadian symptom onset of acute myocardial infarction

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**Introduction:** The circadian variation differences have been reported in different regions worldwide. **Objectives:** To investigate the modifying factors of circadian symptom of acute myocardial infarction (AMI) onset in Indonesia. **Methods:** Patients were eligible for inclusion in the study if they satisfied the AMI criteria defined by the joint ACC/ESC committee. The exclusion criteria were the onset of AMI more than 24 hours, uncertain symptom onset, conflicting data of symptom onset. The cut point of $>$ 4 mets were used to group into moderate to strenuous activity. The frequency distribution of time of AMI onset was then examined by $\chi^2$ analysis with the 24-day divide into four 6-hour time period. **Results:** The study sample consisted of 451 AMI patients (85.8% men; aged 57.1± 10.4 years). There were significant difference pattern of circadian AMI onset between resting or light activity moderate or strenuous activity groups, peaking at 00.01–06.00. AM and 06.01 AM -12.00 noon, respectively. The pattern was consistently detected in groups of men, younger than 70 years old, ST-elevation of myocardial infarction (STEMI), hypertension (HTN), without heart failure (HF) or non Diabetes Mellitus (DM). Interestingly, the peak of incidence observed between 00.01–06.00 PM in the DM group, this pattern of circadian variation different as compare to those of non DM group. Multi factorial analysis showed that the level of activity and DM are independent factor affecting circadian variation pattern of AMI onset. **Conclusion:** The activity level and DM are the independent factors affecting the pattern of circadian variation of AMI onset.

P157

## Impact of NICE guidance on patients regarded as non-cardiac by current chest pain pathway

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**Introduction:** Chest pain remains highly prevalent in current UK population but frequently it is of non-cardiac origin. Diagnosis continues to be a challenge and has significant implication on NHS resources. NICE has recently released guidance on investigation and management of recent onset chest pain. **Objectives:** To assess impact of implementing NICE guidance in stable chest pain to an established rapid access chest pain (RACPC) clinic. **Methods:** Based on data of all patients attending RACPC in 2009 out of 941 patients 522 were investigated as probable chest pain while 419 were discharged after initial review + 12 lead ECG. Of this group, 5 patients (1.19%) had hospital admission with TNI +ve chest pain, 1 patient (0.23%) had out of hospital death. We reassessed these 419 patient's data using NICE guidance and compared proposed outcome. **Results:** Total patients n=440. According to NICE guidance 210 (47%) are to be discharged after modifying risk factors which is concordant with our Chest pain pathway in BRI. 163 (37%) would have CTCA, 40 (9%) for MPI and 27 (6%) are regarded high risk and should have Angio. 5 patients in the non-cardiac group who presented with ACS in one year following discharge according to NICE pathway lie in intermediate risk group and should have CTCA. **Conclusion:** There is 47 % concordance with clinical history taking and risk scoring model proposed by NICE when compared to our pathway in BRI. As a result of NICE pathway there is higher demand on CTCA and 163 more studies are needed to potentially prevent 5 acute coronary events.

P158

## Efficacy of galavit in patients with unstable angina and chlamydia pneumoniae infection

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**Introduction:** Chlamydia pneumoniae (CP) is a common infectious agent that has been associated with atherosclerotic vascular damage. The inflammatory phenomenon of atheromatous plaques recently reported, as well as the binding of immune complexes to endothelial cells could act as triggers for ischemic events. Recent studies have shown association between C-reactive protein (CRP) and CP playing a role in recurrent coronary accidents **Objectives:** The aim of our study was the evaluation Galavit (aminodioxotetrahydrophtalasinedione sodium) efficacy in patients with unstable angina (USA) related with CRP and CP infection. **Methods:** We measured IgA, IgG, IgM serum antibodies by micro-immunofluorescence and CRP using a turbimetric method in 96 patients with USA (62 males, mean age 52.7± 12.7 years) and 22 controls (mean age 53.6 ±14.0 years) seen at the same hospital for non-cardiovascular, non-pulmonary disease. All 96 patients were subdivided into two groups: group I–44 patients who received standard therapy and group II–52 patients taking standard therapy and adding Galavit (in a daily dose 100 mg) for 3 weeks. **Results:** Our study demonstrated that titres suggesting chronic or significant previous infection with CP were significantly higher in USA patients (48.1%) compared to controls (15.1%) (X2test, $p = 0.02$). After three weeks of USA and CP infection therapy, the inflammatory markers were significantly better in group II: (CRP–group II from 8.8 ± 9 to 2.7 ± 1.7 mg/dl; $p<0.001$ vs group I from 8.6 ± 4.8 to 6.9 ± 2.2 mg/dl; $p<0.05$).Mean values of IgA, IgG and IgM levels were significantly reduced in group II (IgA-group II by 44.1%, $p<0.001$ vs group I–by 11.3%, $p<0.001$); (IgG-group II by 46.0%, $p<0,001$ vs group–by 12.6%, $p<0.01$); (IgM–group II by 38.7%, $p<0.001$ vs group I–by 4.7%, $p<0.05$).The number of anginal attacks was significantly reduced and general state was considerably improved in group II. **Conclusion:** CP infection is associated with USA. Galavit corrects inflammatory markers into the complex therapy of USA and CP infection. This therapy is a safe and can be used in preventing of atherosclerotic complication in coronary artery disease patients.

P159

## Levels of serum adiponectin during acute myocardial infarction and recovery of coronary microcirculatory function: does high adiponectine help?

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**Introduction:** Preservation of coronary microcirculation along with epicardial artery revascularization is a major goal of acute coronary artery intervention. Functional integrity of coronary microcirculation after IRA (infarct related artery) opening during STEMI is crucial for myocardial viability, recovery of LV contractility and LV remodeling. Coronary flow reserve (CFR) of IRA measured non-invasively by transthoracic echocardiography (TTE) is well evaluated method to determine functional integrity of the coronary microcirculation in the presence of patent IRA, after prim PCI. Serum lipids were shown to influence coronary microcirculation and CFR in hiperlipidemic patients in chronic settings, but little if any data are available regarding link between serum lipids during acute phase of AMI and recovery of coronary microcirculation. **Objectives:** To investigate whether lipid profile on admission and during first week after primary PCI is related to IRA CFR **Methods:** In 80 patients with first STEMI in whom IRA was successfully opened during prim PCI, adiponectine level, blood glucose, serum lipids and hs-CRP were determined on admission, on the 2nd and 7th day. CFR was measured on the 7th day after prim PCI by TTE. **Results:** The predictors of CFR of the 7nd day by univariant linear regression analysis were: adiponectin on admission ($r=0.34$, $p=0.01$) and adiponectin on the 2nd day ($r= 0.27$, $p=0.04$), blood glucose on admission ($r=-0.26$, $p=0.01$), HDL-Ch on the 7th day ($r=0.38$, $p=0.01$), ApoA1 on the 7th day ($r=0.40$, $p=0.002$) and hs-CRPmax during first week ($r=-0.49$, $p<0.01$). In multivariant regression analysis in the model that includes adiponectin on admission, hs-CRP, HDL on the 7th day, blood glucose level and NTproBNP on the 7th day, the independent predictors of the preserved coronary microcirculatory function estimated by CFR on the 7th day were adiponectin on the admission (beta=0.37, $p=0.029$) and NTproBNP (beta=-0.336, $p=0.03$) **Conclusion:** Adiponectin in acute coronary syndrome has potentially positive effect on coronary microcirculation. Higher adiponectin on admission and preserved higher adiponectin during first few days after prim PCI are predictors of good CFR, i.e. a good recovery of coronary microcirculation in the infarct zone. Should adiponectin and/or some of its form become a new therapeutic option during acute phase of STEMI remains to be examined.

P160

## Is it possible to predict myocardial infarction in the presence of LBBB?

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**Introduction:** Left bundle brunch block (LBBB) may have been observed in 2 to 3 % of patients with acute myocardial infarction (AMI). Numerous ECG criteria indicating possible acute onset of LBBB have been published during past decades. However, none of them have shown reasonable diagnostic power yet. **Objectives:** The **aim** of our study was to test the diagnostic value of 16 ECG criteria which have been proposed for the diagnosis of AMI on the presence of LBBB during previous five decades. **Methods:** LBBB on ECG had been registered in 39 of 1628 patients with acute coronary syndrome who had been referred to the Samara Regional Cardiology Center during 8 months (01/01–31/08/2009). AMI was documented by serum enzyme elevation (troponin I and/or MB-CPK) in 1029 patients. Twenty four of them had LBBB (study group). Remaining 15 patients

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comprised the control group. Baseline characteristics of patientsare presented in table 1. Admission ECG was interpreted according to 16 ECG criteria. **Results:** We succeeded to identify only four criteria with low-to-moderate sensitivity among aforementioned list of 16 ECG signs of acute MI in the presence of LBBB (#6, 10, 13, 14). Despite that T wave changes in left precordial leads (#6, 13) showed the highest sensitivity (37,7% and 58,5%), they also had the weakest specificity (60% and 53,3%, respectively). On the other hand, notching in the ascending limb of R wave in any lead (#10, 14) was observed in 20,8% and 29,1% of patients with AMI, while the specificity of them was rather high (93,6% and 86,7%, respectively). All Sgarbossa criteria showed low sensitivity 6.66% - 12.5%, and high specificity –up to 100%. **Conclusion:** Aforementioned criteria of the AMI in patients with LBBB have got serious limitations. Further, prospective, multicenter studies are needed to develop new criteria because ECG is still the most cheapest and available method of diagnosis of AMI.

**P161**

## Acute myocardial infarction in women: 10 year experience from a tertiary care centre

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**Introduction:** Acute myocardial infarction is a leading cause of death despite recent advances in diagnosis and management. Women represents are higher risk group with greater morbidity and mortality when they present with acute myocardial infarction as compared to men(1–2). There is dearth of data from Pakistan in this respect. **Objectives:** To review the clinical profile and in hospital outcomes of women presenting with acute myocardial infarction. **Methods:** A 10 year data (January 2000-December 2010) of women with acute myocardial infarction was collected through health information and management system(HIMS), AKUH.The study protocol was approved by ethical review committee. For categorical data ,frequency/percentage were utilized. Differences proportions were assessed using the Chi-square test., **Results:** 331 patients were included in the analyses based on the inclusion and exclusion criteria. The mean age was 64.23 years. 260 patients (75%) were hypertensives, 36 (10%) had chronic kidney disease and 185(53%) were diabetics. Only 16 females (4.6%) were premenopausal. 204 (61.6%) women had Non ST elevation where as 127 (38.4%) had ST elevation myocardial infarction. The in-hospital medications included aspirin (96%), Clopidogrel (70%), B-blockers (84%), ACE-I/ARB'S (70%), Calcium channel blockers (23.5%)and statins (83%). In hospital complications mainly were heart failure in 19% followed by death in 9.5%, atrial fibrillation in 5.8% and Ventricular arrhytmias in 2%.Only 2(0.2%) patients had ventricular septal rupture and 6 (1.7%) patients had third degree AV block. There was no statistically significant difference between patients with NSTEMI or STEMI in respect to hypertension and diabetes. 134(66%) women in NSTEMI group were treated with medical treatment only and less than half of women with STEMI received primary angioplasty as a mode of revascularization.
**Image/graph I:**

| Symptoms | Number of patients/331 | Percentage |
|---|---|---|
| Chest pain | 234 | 71 |
| SOB | 180 | 54 |
| Sweating | 143 | 43 |
| Arm pain | 100 | 30 |
| Ghabrahat | 99 | 29.9 |
| Chest heaviness | 62 | 18.7 |
| Vomitting | 57 | 17 |
| Back pain | 52 | 16 |
| Nausea | 42 | 13 |
| Abdominal pain | 38 | 11 |
| Shoulder pain | 29 | 9 |
| palpitations | 23 | 7 |
| Jaw pain | 22 | 7 |
| Neck Pain | 21 | 6 |
| Syncope | 11 | 3 |
| Pre-syncope | 7 | 2 |

**Image/graph II:**

Difference between clinical profile, angiographic findings and in hospital complication between NSTEMI and STEMI

| Variables | NSTEMI | STEMI | P value |
|---|---|---|---|
| Chronic kidney disease | 27 | 7 | 0.024 |
| Atrial fibrillation | 17 | 3 | 0.027 |
| mortality | 13 | 19 | 0.010 |
| Heart failure | 47 | 18 | 0.048 |
| Normal LV function | 78 | 32 | 0.003 |
| Three VCAD | 35 | 22 | 0.03 |

VCAD: vessel coronary artery disease; LV : left ventricle

**Conclusion:** This data suggest that women preseneting to the tertiary care hsopital primarily presented with non-STelevation as compared to ST elevation myocardial infarction and had higher frequency of three vessel coronary artery disease, in hospital atrial arrhythmias and heart failure.

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**P162**

## One-year outcome in patients with acute coronary syndromes: Taiwan ACS full spectrum registry

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**Introduction:** Acute coronary syndrome including ST-segment elevation myocardial infarction (STEMI), non-STEMI (NSTEMI), and unstable angina (UA) is a life-threatening disease. Clinical guidelines have been set up for ACS management, however, whether cardiologists comply with the guidelines in Taiwan remains unknown. **Objectives:** To identify current management of ACS nationwide in Taiwan. **Methods:** From October 2008 to January 2010, consecutive patients with ACS within 24 hours were recruited from 39 sites. The disease management data at admission, during in-hospital stay, and one-year follow-up were collected. **Results:** Of 3183 patients included, 52.3% of the patients were diagnosed with STEMI, 33.9% with NSTEMI, 12.2% with UA, and 1.6% accounted for others. The patients were predominantly male (78%) with mean age of 63 years. Hypertension (64%), smoking (42%), dyslipidemia (39%) and diabetes (36%) were the most prevalent risk factors for ACS. PCI was performed in 94% of the STEMI patients and in 75% of the UA/NSTEMI patients, whereas CABG was rarely performed (3%). Eighty-two percent of STEMI patients received reperfusion (primary PCI 97% and thrombolytics 3%). At discharge, beta-blockers were prescribed in 53%, statins in 60%, ACE/ARB in 63%. Dual antiplatelet therapy clopidogrel + aspirin declined dramatically from 75% at discharge to 25% at 1 year, replaced by aspirin only. From enrollment to one year follow-up period, all-cause mortality was 7.5% with a higher rate in NSTEMI (10.1%) than UA (6.2%) and STEMI (6.1%) ($p<0.01$). Dual antiplatelet therapy for 9 months or longer was associated with lower 1-year mortality (0.6% vs. 4.7%, $p<0.01$) **Conclusion:** One year mortality was 7.5% in Taiwanese ACS patients with a higher mortality in NSTEMI patients (10.1%). Rates of secondary prevention medication use in ACS patients were sub-optimal. Adherence to dual antiplatelet therapy was associated with lower mortality at 1-year.

**P163**

## Does reperfusion therapy have effect on the mortality in STEMI patients with acute heart failure in Serbia?

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**Introduction:** In Serbia, as a country in transition, low standard and not so good opportunities for the treatment with reperfusion therapy, primary PCI particularly, for all patients with STEMI diagnosis is still present. **Objectives:** The aim was to analyze the trends in applied reperfusion therapy and in-hospital mortality rate for STEMI patients (pts)

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with acute heart failure (AHF). **Methods:** We used the date of the Hospital National Registry for Acute Coronary Syndrome of Serbia (HORACS). The pts data in HORACS was filled-in by the attending physician in 54 CCU in Serbia and the study group was all pts with STEMI during 6 years (2004–2009). **Results:** There were 39817 pts with STEMI (~6636 per year), mean age 63.8±11.8 years, m/f ratio was 65/35. Fibrinolysis as the only possible therapy was applied in 2004–31.3% and 2005–37.4%. Primary PCI was started in the end of 2006 and the percentages of reperfusion therapy (primary PCI or fibrinolysis) were: 2006–44.6%, 2007–50.6%; 2008–51.5% and 2009–49.7%. Patients with AHF were treated with reperfusion therapy at low percentage: Killip class II-20.5%, 29.0%, 29.3%, 44.3%, 46.9% and 42.7%; Killip class III-18.2%, 21.0%, 28.1%, 29.3%, 30.8% and 35.6%; Killip class IV-16.8%, 24.1%, 27.2%, 36.0%, 38.0% and 46.3%, from 2004 to 2009 consecutively. Significantly low percentages of pts with AHF were treated with primary PCI ($p<0.01$): Killip class II-3.0%, 8.0%, 14.3%, 13.7%; Killip class III-1.7%, 2.3%, 9.7%, 12.5%; Killip class IV-2.7%, 6.0%, 10.3%, 20.5%, from 2006–2009, consecutively. Mortality of pts with AHF (Killip class≥II) was in similar percentage every year regardless increasing rate of reperfusion therapy and in spite of introduction of primary PCI: 2004–25.7%, 2005–25.2%, 2006–25.7%, 2007–31.4%, 2008–27.4% and 2009–29.5% (p=NS). **Conclusion:** In Serbia, reperfusion rate, primary PCI particularly, had a trend of increasing in STEMI pts with AHF, but it is not yet enough because mortality rate of these pts is similar and high in analyzed years. It may mean that high risk pts have not been treated with primary PCI in satisfactory rate, yet.

**P164**

## Predictors of in-hospital mortality in STEMI patients: impact of the reperfusion strategy

Habib Gamra[1,*], Ismail Ghrissi[1], Wiem Selmi[1], Fatma Ben Amor[1], Zohra Dridi[1], Semi Bouraoui[1], Amine Hdiji[1], Majed Hassine[1], Abdennaim Hajlaoui[1], Fethi Betbout[1]
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**Introduction:** Management of ST elevation myocardial infarction (STEMI) has been based on as early as possible reperfusion that can be achieved by either primary angioplasty (PAMI) or thrombolysis. Predictors of mortality of these two strategies may not be similar. **Objectives:** The aim of this analysis was to identify mortality predictors in STEMI patients (pts) according to the reperfusion strategy. **Methods:** A total of 1353 pts admitted for acute myocardial infarction (AMI) between January 1995 and April 2011 were included in our MIRAMI (MonastIR Acute Myocardial Infarction) registry. Reperfusion therapy was given to 788 (58.2%) pts. Because of lacking data, 117 were excluded, the remaining 671 pts were considered for this analysis: 372 pts received thrombolytics and 299 underwent primary angioplasty. In each group, an univariate then a multivariate logistic regression analysis was used to evaluate the impact on mortality of the following factors: age, sex, hypertension, diabetes, smoking, infarct location, Killip class, time to treatment (TTT), hemoglobin and serum creatinine levels. **Results:** Among the tested parameters, only four were identified to be independent predictors of mortality by multivariate analysis as shown below:

**Image/graph I:**

| | TTT > 6 hours | Killip class ≥ 2 | Creatinine >150µmol/l | Hemoglobin < 12 g/dl |
|---|---|---|---|---|
| Thrombolysis group | p = 0.03 OR = 3.28 | p = 0.001 OR: 2.9 to 17.17 | p = 0.014 OR = 4.39 | NS |
| PAMI group | p = 0.036 OR = 2.8 | p < 0.001 OR: 4.41 to 19.21 | p = 0.006 OR = 4.93 | p = 0.003 OR = 3.96 |

**Conclusion:** In our MIRAMI registry, regardless of the reperfusion strategy, mortality predictors were: time to treatment > 6 hours, heart failure and renal impairment. Hemoglobin blood level less than 12g/dl was an independent predictor only in the primary angioplasty group.

**P165**

## What are the predictors of not receiving a reperfusion therapy in STEMI patients?

Habib Gamra[1,*], Ismail Ghrissi[1], Fatma Ben Amor[1], Wiem Selmi[1], Zohra Dridi[1], Amine Hdiji[1], Semi Bouraoui[1], Majed Hassine[1], Abdennaim Hajlaoui[1], Fethi Betbout[1]
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**Introduction:** The standard of care for ST-segment elevation myocardial infarction (STEMI) is prompt coronary reperfusion with primary percutaneous coronary intervention or thrombolysis. However, a substantial number of patients (pts) with myocardialinfarction receive only conservative medical management. **Objectives:** The aim of the present study was to examine predictive factors of not receiving reperfusion therapy among STEMI pts. **Methods:** From January 1995 to December 2010, the MIRAMI Registry enrolled 1318 patients admitted for STEMI. Multivariate analysis was performed to determine predictors of not receiving reperfusion therapy. Two hundred eighty nine patients were excluded from this analysis because of lacking data. The remaining 1029 pts were considered for this analysis with 360 (35%) that received a reperfusion therapy and 669 (56%) that were treated conservatively. **Results:** Multivariate analysis identified only three independent predictors for not receiving a reperfusion therapy: age ≥75 years (p=0.004), time to hospital admission ≥ 6 hours from the onset of symptoms ($p<0.001$) and night (from 08:00 PM to 08:00 AM) occurrence (p=0.004).

**Image/graph I:**

| | P | CI |
|---|---|---|
| Age | **0.004** | 0.973 – 0.995 |
| Hospital admission ≥ 6 hours | **< 0.001** | 0.066 – 0.187 |
| Night occurrence | **0.004** | 0.236 – 0.766 |
| Female sex | 0.059 | 0.49 – 1.01 |
| Serum creatinine ≥ 150 µmol/l | 0.936 | 0.62- 1.66 |

**Conclusion:** More than half of the population of this study did not receive a reperfusion therapy. Elderly, female patients, late presenters and patients who present at night are more likely to not receive a reperfusion therapy.

**P166**

## Predictors of successful reperfusion with thrombolysis using streptokinase in a Tunisian population: results from the MIRAMI registry

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**Introduction:** Despite the superiority of primary angioplasty in the management of ST elevation myocardial infarction (STEMI), thrombolysis remains more frequently used worldwide particularly in developing countries. **Objectives:** The aim of this analysis was to identify predictors of thrombolytic therapy success in STEMI patients. **Methods:** Among 1353 patients included in our MIRAMI (MonastIR Acute Myocardial Infarction) registry between January 1995 and April 2011, 436 patients received thrombolysis. Streptokinase was the only lytic agent used. Multivariate logistic regression was used to determine predictors of thrombolysis success. **Results:** Thrombolysis success, defined as chest pain relief below 5 in a scale from 1 to 10 and ST elevation resolution over 50% from baseline, was obtained in 306 patients (70%). Time to treatment less than 3 hours (p=0.001; OR= 2.13), smoking (p=0.001, OR=2.1), and inferior location (p=0.009, OR=1.83) were identified as independent predictors of thrombolysis success. Inversely, severe heart failure (Killip III and IV classes) were found to be predictors of thrombolysis failure (p = 0.006, OR =0.13 for class III, p= 0.003, OR = 0.15 for class IV). **Conclusion:** In our MIRAMI Registry, short time to treatment (<3 hours), smoking and inferior location of STEMI were predictors of thrombolysis success, whereas severe heart failure was a predictor of its failure.

**P167**

## Epidemiology and management of the coronary disease in Morocco (experience of 2134 patients)

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**Introduction:** Coronary disease holds in cardiovascular diseases in Moroccan population a special place because of its high incidence and its high mortality. **Objectives:** In this work we propose to study the epidemiology and clinical characteristics, and treatment of coronary disease in moroccan people. Methods: Our retrospective study included all patients who underwent coronary angiography from 01/01/08 to 22/08/2011 at the cardiology department of the university hospital Ibn Rushd Casablanca **Results:** Of 2134 coronary patients the prevalence was 57 % male, mean age was 63+-7 years. Cardiovascular risk factors are found, HTA 44.5%, smoking to 37.67%, 37.76% diabetes, dyslipidemia was 13.37%, age over 75 years in 10.3 %, Heredity in Coronary 4% of cases Coronary disease wich needed a coronary angiography were : stable angina in 33% of cases, atypical chest pain in 9% cases, 7% in unstable angina, crescendo angina in 5% of cases, acute coronary syndrome (ACS) with ST elevation in 19% and without ST elevation in 26 %, ischemia was silent in 2%., dyspnea was noted in 23% of cases. Ischemia was documented only with the ECG changes in 74% of cases, a test of effort in 14% of cases, a stress test in 9 % of cases, a stress échocardiography in 5% of cases, and the elevation of cardiac enzymes in 41 % of cases. The number of patients with ACS presenting to emergency department in the first 24 hours was 57 %. The LV EF moderately decreased (41 -50%) in 23%, less than (30–40%) in 15% and markedly reduced (less than 30%) 10% of cases .. The management of ACS in our department consisted at thrombolysis in 67% of cases and only 14 % of primary angioplasty. the coronary angiography of our 2134 patients showed a stenosis of single-vessel in 15 % ,two vessels in 31% and multivessel stenosis in 35 % of cases. with 20 % normal angiography.The treatment consisted at selective angioplastie in 765 of cases(33%),coronary bypass surgery in 187 cases. **Conclusion:** The therapeutic goal in coronary disease in the Moroccan has not yet reached, in particular the myocardial revascularization in the acute phase, this epidemiological study was a first step to evaluate our management of the coronary disease in morocco.

**P168**

## Multiclinic assessment of rapid immunochromatographic assay for heart-type fatty acid-binding protein in the early diagnosis of myocardial infarction

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**Introduction:** An increased concentration of heart-type fatty acid-binding protein(hFABP) in blood is a well-known marker of myocardial infarction (MI). Due to small molecular weight

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this tissue-specific protein is one of the earliest sign of myocardial damage. **Objectives:** The aim of this study was to evaluate the efficiency of a rapid immunochromatographic assay for the blood level of hFABP in the diagnosis of MI in multiclinic setting. **Methods:** A novel, sensitive assay that is based on the immunochromatographic test-strip technique has been recently developed for rapid qualitative detection of hFABP in whole blood (BioTest Co., Novosibirsk, Russia). The procedure requires approximately 100 microliters of whole blood and can be completed within 20 min in any in-patient or out-patient settings without any special equipment. The analytical sensitivity of the test is 15 ng/ml. The assay was performed on blood samples from 157 patients admitted to the emergency departments of 5 different clinics in different cities of West Siberia with diagnosis of suspected MI. All assays were performed in 24 hours after appearance of clinical symptoms. Final diagnosis was based on standard clinical criteria. Troponin I level was determined in subsample of patients in accordance with technical capabilities and established for each center clinical practice. **Results:** MI was confirmed in 118 patients according to the standard criteria. In 71 of this patients troponin I assays was also performed and used for clinical diagnosis. Diagnosis of MI was rejected in 39 patients including 27 with troponin I assay. According to these criteria, the sensitivity of the hFABP assay within the first 24 hours was 92% for the total MI group and 93.4% for the subgroup with troponin I assay. The corresponding specificity was 90% and 93% in each group accordingly. At the same time, the sensitivity and specificity of the troponin I assay were 89% and 74% respectively. Importantly, the hFABP assay demonstrated high sensitivity and specificity during the first 3 hours from the onset of symptoms in 41 examined patients (94% and 75% in total group and 86% and 100% in patients with troponin I accordingly). **Conclusion:** The rapid immunochromatographic hFABP assay is a new and very effective tool for the early diagnosis of MI. Especially important are its high sensitivity and specificity during the first 3 hours of MI, allowing for timely and optimal treatment using conventional and new therapeutic approaches.

**P169**

## New echocardiographic parameters of global and regional left ventricular function in patients with ST-segment elevation acute myocardial infarction

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**Introduction:** Left ventricular (LV) functional recovery and morphological remodeling after acute myocardial infarction (AMI) followed by reperfusion remains incompletely understood. **Objectives:** The aim of the study was to describe the recovery of LV strain (LVS), strain rate (LVSR), twist (LVT) and untwist rate (LVUR) upon revascularization after AMI using 2-dimensional tissue tracking. **Methods:** We evaluated 88 subjects:22 normal volunteers (mean age 31y±5) and 66 patients with AMI (mean age 65y±12**)** out of which 26 had an inferior AMI and 40 an anterior one with ST-segment elevation. Echocardiography was performed in all subjects. Patients were scanned within 36h (baseline) after revascularization (PCI) and after 4 months (4mFU). Apical and basal short axis images were acquired (frame rate 67±5 fr/s) in addition to apical four, three and two chamber views. All images were analyzed offline in order to extract the segmental strain (rate) values and the LV torsion (rate) curve. Finally, the infarct size (IS) was estimated based on MRI delayed enhancement and expressed as a percentage of the total LV volume. **Results:** At 36h,LVS,LVSR,LVT and LVUR were significantly reduced in both AMI groups when compared to normals. At 4mFU, both AMI groups showed recovery in EF and reduction in IS (7.24±10.07 vs.20.13.0±13.9,$p<0.0001$ for inferior AMI and13.13±10.3 vs.24.40±15, $p<0.0001$, for anterior AMI). LVS, LVSR,LVT and LVUR increased significantly, but remained below normal levels. LVS and LVSR are significant reduced in infarcted zones, but in zones out from ischemia are closely to the normals. $LVS_{LL\ is}$the main parameter for myocardial dysfunction, which changed significantly in infracted zone ($p<0,001$).Correlation of LVT and LVUR with IS was significantly, but week ($r=0.34$ and $r=0.34$ respectively). In addition, a fair correlation of LVT with EF ($r=0.64$) and LVS and LVSR ($r=0.56$) with IS and a weak correlation of LVUR with EDV ($r=-0.34$) was found **Conclusion:** LVS, LVSR, LVT and LVUR are reduced in AMI patients early after reperfusion and recover incompletely upon follow-up. LVT and LVUR might be good parameters to monitor the recovery of global LV function after treatment. Ultrasound Strain Rate/Strain imaging can be used for analysis of regional longitudinal and radial deformation in patients with AMI and are good performance for regional LV function.

**P170**

## Abortion of myocardial infarction by primary angioplasty in STEMI patients pre-treated with a loading dose of 600 mg of clopidogrel

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**Introduction:** Pharmacologic treatment that facilitates primary coronary intervention (PCI) in STEMI patients still being investigated. We assessed the rate of aborted myocardial infarction (MI) in STEMI patients pre-treated with 600mg of clopidogrel. **Objectives:** To assess the rate of aborted myocardial infarction in STEMI patients pre-treated with a loading dose of 600mg of clopidogrel. **Methods:** We studied 305 consecutive STEMI patients referred for PCI. Inclusion criteria study were: (1) chest pain persisting for >30min, (2) ST-segment elevation >1mm in ≥ 2 contiguous leads, (3) admission within 12 hours of symptoms onset, (4) pre-treatment with a loading dose of 600mg clopidogrel, aspirin and unfractionated heparin (5000 IU bolus iv). Aborted MI was defined as maximal CK-MB ≤2x the upper limit of normal level. Relationships between rate of aborted MI and factors such as age, initial TIMI flow in the infarct-related artery (IRA), total ischemic time, clopidogrel to balloon time and ST-segment total (≥70%) resolution were analyzed. **Results:** Angiographic examination revealed TIMI flow ≥2 prior to PCI in 101 patients (33.1%). 31 patients (10.1% of the whole group) met the criteria of aborted MI. Patients with aborted MI did not differ with respect to age (59.2±9.8 vs. 60.2±11.1years; NS), total ischemic time (231.2±129.3 vs. 240.4±132.3min; NS) or clopidogrel to balloon time (93.4±32.6 vs. 100.5±36.9min; NS) when compared to the rest of group. Initial TIMI flow ≥2 (87.0 vs. 28.1%; $p<0.001$) and pre-PCI ST-segment resolution ≥ 50% (74.2 vs.24,1%; $p<0.001$) were significantly more frequently observed in patients with aborted MI. However, when examined an hour post PCI the difference in ST-segment resolution was no longer observed (87.1% vs. 85.2%; NS). A logistic regression model showed initial TIMI flow≥ 2 (OR 9.17, CI 2.66–31.57; $p<0.001$) and pre-PCI ST segment resolution (OR 3.45, CI 1.18–10.04; $p=0.02$) but not the short (≤2 hours) total ischemic time (OR 0.62, CI 0.15–2.67; NS) as independent predictors of abortion of myocardial necrosis. **Conclusion:** 1. Pre-treatment with a loading dose of 600mg clopidogrel is associated with about 10% rate of aborted MI. 2. Initial TIMI flow≥ 2 and pre-intervention ST-segment resolution are the main predictors of abortion of myocardial necrosis.

**P171**

## Myocardial damage in STEMI patients and age variability: cardiac magnetic resonance evaluation

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**Introduction:** In patients with ST-segment elevation myocardial infarction (STEMI) no studies have analyzed if exist any differences related to the age of patients. **Objectives:** The aim of our study is to evaluate how the age of patients weigh on the extent of infarct size (IS), microvascular obstruction (MVO), and myocardial volumes after a STEMI as assessed by Cardiovascular Magnetic Resonance (CMR). **Methods:** We enrolled 90 consecutive patients with STEMI, successfully treated by primary coronary angioplasty, who underwent CMR 3+2 days after myocardial infarction. Patients were divided into 3 age intervals quartiles: 30–50 years (group I, 30 patients); 51–65 years (group II, 30 patients); 66–85 years (group III, 30 patients). **Results:** No significant differences were observed between the groups in terms of baseline characteristics. We observed significant differences in terms of: Mean IS(g) ((g1) 19.1±7.05; (g2)13.9±5.04; (g3)13.6±5.9; $p=0.007$); MVO ((g1) 2.5±1,2 vs (g3)1.6±2.3; $p=0.001$); End-diastolic-volume ((g1)152±37; (g2) 135±34; (g3)119±32; $p=0.001$) End-systolic-volume ((g1)84±18; (g2) 72±15; (g3)62±15; $p=0.025$) . **Conclusion:** The age of the patients is an important variable in term of myocardial damage. Younger STEMI patients present "ruinous" myocardial infarction as shown by CMR evaluation.

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## ECG study of complete left main trunk occlusion

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**Introduction:** Usually in clinical practice Left Main Trunk (LMT) involvement is not complete (subocclusion) and is expressed in the ECG as extensive ST depression in more than 7 leads with ST elevation in VR. The cases with complete occlusion are very rare because in general the patients presents cardiogenic shock/ventricular fibrillation before arriving to Emergency Room. We present a series of nine cases of complete LMT occlusion. **Objectives:** To evaluate the ECG pattern of patients with complete LMT occlusion and its clinical outcomes. **Methods:** The cases were collected since May 2004 to May 2011 in the Emergency Department of Son Espases University Hospital in Palma de Mallorca, Spain. The ECGs were recorded at the hospital admission. All patients present chest pain. The mean time (minutes) since the onset of pain to the moment to record the ECG; the ECG-Cath laband the in-hospital clinical outcome were registered. **Results:** a) The nine patients presents: Mean time of onset of pain to the ECG was 201 min. ECG-Cath lab mean time was 601 min. b) Eight patients (88.8%) present clear STEMI. The only patient with ECG pattern of subocclusion (NSTEMI) preset grade 3 of collateral circulation from right coronary artery. c) In the eight cases with STEMI the pattern was similar to proximal LAD occlusion but without ST segment elevation in VR and V1, probably due to the fact that in cases of LMT occlusion the involvement of LCX + LAD generates a balance of forces of the injury vector in anterior wall (ST elevation in VR and V1–proximal LAD) and the forces of lateral wall (ST depression in VR and V1-proximal LCX). d) Six patients present right bundle branch block and superoanterior hemiblock. e) Regarding clinical outcome, seven of the nine patients (77.7%) present cardiogenic shock (CS) and four patients (44.4%) died in the hospital. **Conclusion:** 1) We must suspect total LMT occlusion when: a) The patient presents cardiogenic shock. b) There is a proximal LAD occlusion pattern without ST elevation in VR and V1. c) Conduction disturbances are often present. 2) In spite of high incidence of severe hemodynamic compromise, 5 of 9 patients are alive after the hospitality phase.

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## Autopsy rates for deaths attributed to cardiovascular diseases in Russia

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**Introduction:** Autopsy rates have been declining throughout the world, although preservation of the autopsy is considered a fundamental principle of medical care. Historically this problem is particularly important for Russia because of high out-of-hospital death rate. **Objectives:** To analyze the present-day autopsy rates for deaths attributed to cardiovascular diseases according to death certification. **Methods:** Record of the numbers of deaths and autopsies among 285 736 population of three Russian regions for 12 months. **Results:** 1972 deaths were registered among studied population. The percentage of people dying in homes (in the street, transport etc.) was 88.1%. Autopsy rate for deaths attributed to cardiovascular diseases amounted to 28.3%. Females were less often sent for a postmortem examination then males (13.6% vs 39.0%, $p<0.01$). However until 60-year age the autopsy rates are sufficiently high for males (68.8%) and females (65.7%), whereas after 60 years the autopsy rate rapidly declines to 0% among 90-years old patients. The most common cause of cardiovascular deaths was chronic coronary heart disease (CHD)–53.1% among males and 53.5% among females. Acute forms of CHD as cause of death were registered more rarely - in 2.6 times among males and in 5.2 times among females. Chronic CHD was confirmed by postmortem examination only in 28.7% (males) and 12.2% cases (females), whereas acute forms of CHD were confirmed by autopsy in 84.6% and 62.7% cases accordingly. **Conclusion:** The study revealed the deficient confirmation of cardiovascular mortality by postmortem examination, especially taking into account high percentage of out-of-patients deaths. This problem requires optimization of death registration measures.

**P174**

## HOMA-IR index as a marker of left ventricular dysfunction in acute STEMI

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**Introduction:** Insulin Resistance (IR) has been comprehensively proven to be a risk factor for STEMI in diabetics. However the role of IR in non-diabetics in STEMI has not been extensively studied. **Objectives:** To study the level of IR in non-diabetic acute STEMI (ND-STEMI) patients and to evaluate its correlation with LV dysfunction. **Methods:** A total of 100 ND-STEMI patients were enrolled in the study and underwent colour Doppler echocardiography on 4$^{th}$ day of admission. IR was calculated using Homeostatic Model for assessment of Insulin Resistance (HOMA-IR) on 2$^{nd}$ day of admission. Normal level of IR was taken to be between mean$\pm$2SD calculated from 100 non-diabetic controls. All those factors which were statistically significant ($p<.05$) on univariable regression analysis for predicting LV ejection fraction (LVEF) were tested with multivariable regression analysis. **Results:** Normal range of IR in sample population of controls was from 1.8–2.6. Even after adjusting for age and sex of the patient, location of the infarction (i.e. anterior or non anterior), serum triglyceride and cholesterol level and whether the patients were given thrombolytics, HOMA-IR level had an inverse association with LVEF ($r=-0.697$; $p<.009$). HOMA-IR Index$>$5.2 was associated with a greater degree of LV dysfunction than HOMA-IR Index$<$2.6.

| HOMA-IR INDEX | LVEF <35% | LVEF 35-40% | LVEF 40-50% | LVEF >50% | TOTAL NO.OF PATIENTS |
|---|---|---|---|---|---|
| <2.6 | 2 | 3 | 51 | 8 | 64 |
| 2.6-5.2 | 2 | 10 | 12 | 3 | 27 |
| >5.2 | 4 | 4 | 1 | 0 | 9 |

**Conclusion:** HOMA-IR Index can be used as a highly reliable non-invasive marker to predict the LVEF after an acute STEMI in non-diabetics and thereby help in assessing the prognosis of the patient and possibly giving a new therapeutic target.

**P175**

## Angiotensin-converting enzyme: marker of long-term mortality in patients with ST-segment elevation myocardial infarction

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**Introduction:** One of the mechanisms to preserver hemodynamic balance after acute myocardial infarction (MI), involves the renin-angiotensin-aldosterone system (RAAS). The activity of plasma angiotensin-converting enzyme (apACE) in the early stages may have an impact on prognosis of acute MI. **Objectives:** To evaluate the long-term prognostic accuracy of apACE in patients with ST-segment elevation MI (STEMI). **Methods:** In consecutive patients (pts) with STEMI submitted to primary angioplasty apACE was measured in arterial blood samples taken at the beginning of cardiac catheterization. The end-point was all cause mortality on long-term follow-up. Prognostic accuracy was evaluated by the area under the receiver operator curve (AUC) and Kaplan Meier survival curves were determined. **Results:** Long-term follow-up data was available for 133 pts (74% male; age 62$\pm$12 years; follow-up 588$\pm$163 days); 64% had hypertension, 39% were treated with ACE inhibitors or angiotensin II receptor blockers and 23% had prior MI. Mean paACE was30$\pm$20 IU/L (2–117 IU/L). Long-term mortality rate was 12.3%. apACE was significantly lower in the nonsurvivor group (20$\pm$24 vs 31$\pm$19, $p=0.019$) and showed good predictive accuracy for the defined end-point (AUC 0.74, 95% CI: 0.526–0.922, $p=0.021$). In addition, there was a trend towards increased risk of death in pts with lower apACE (701$\pm$37 vs 736$\pm$10 days) (HR: 4.14, 95% CI: 1.03–16.55, $p=0.029$). **Conclusion:** RAAS effects in the evolution of MI are complex. In the present study apACE, measuredat emergent cardiac catheterization, correlateswith long-term mortality.

**P176**

## Prognostic implications of glucose metabolism abnormalities in acute myocardial infarction

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**Introduction:** Diabetes *mellitus* is a well known cardiovascular risk factor. Previous studies have shown that hyperglycemia is associated with increased mortality in acute myocardial infarction (MI). However, glucose values may have a different impact on prognosis depending on the presence or absence of diabetes. **Objectives:** To evaluate the prognostic value of admission glycemia in STEMI patients (pts) with or without known diabetes. **Methods:** In consecutive pts with STEMI that underwent percutaneous coronary intervention, glucose was determined in a blood sample at the beginning of coronary catheterization. We evaluated the prognostic implications of glycemia with regard to: 1) short term prognosis by means of in-hospital mortality or evolution to cardiogenic shock, 2) long-term prognosis assessed by mortality, re-infarction and the combined end point of death, re-infarction and hospitalization for cardiac causes. The prognostic accuracy of glucose was determined by area under the Receiver Operator Curve (AUC). **Results:** We studied 161 pts (76% male, 61$\pm$12 years). The diagnosis of diabetes accounted for 24% of pts (n = 39) and 14% of whom had had prior MI. The mean glucose value at admission was 166$\pm$90 mg/dL, in diabetics was 262$\pm$101 mg/dL and in non-diabetics was 136$\pm$62 mg/dL ($p=0,041$). The combined end point of cardiogenic shock or death during hospitalization occurred in 13% of diabetic pts and in 10,1% of non-diabetics. Glucose at admission was significantlyhigherin thesepts (199$\pm$90 mg/dL vs 162$\pm$99 mg/dL, $p=0.041$). This association is probably accounted by the non-diabetic pts group because, in the diabetic group, glucose levels were similar irrespective of the outcome (165 $\pm$ 55 mg/dL vs 133 $\pm$ 62 mg/dL).Therefore, only in the non diabetic group glucose levels at admission predicted the occurrence of the combined end point (AUC=0,65, IC 95%: 0,53–0,77; p= 0,04). The glucose at admission didn't correlate with long-term prognosis. **Conclusion:** In STEMI patients, glucose levels at admission predicted in-hospital prognosis, particularly in the group of patients without known diabetes.

**P177**

## Does prior right coronary artery bypass surgery "protect" patients with acute inferior myocardial infarction from right ventricular infarction

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**Introduction:** Right ventricular infarction (RVI) usually occurs as a consequence of proximal right coronary artery occlusion. **Objectives:** The aim of this study is to analyse weather prior right coronary artery bypass graft (RCABG) protects patients (pts) with first acute inferior myocardial infarction (AIMI) from the occurrence of RVI. **Methods:** Two hundred four pts with first AIMI and prior RCABG (Group I) were compared with 280 pts with first AIMI and without prior RCABG (Group II). Right ventricular infarction was defined as ST elevation $\geq$ 1 mm in one of three precordial leads (V4R-V6R). **Results:** There were no differences in mean age and sex between two groups. Right ventricular infarction occurred in 13/204 (6.4%) pts in Group I and 93/280 (33.2%) pts in Group II ($p<0.001$). Hypotension occurred in 13/13 pts (100%) with RVI in Group I and in 17/93 pts (18.3%) with RVI in Group II ($p<0.001$). There were no significant differences in pts with RVI between two groups in the occurrence of complete AV block (none pts in Group I vs 31/93 pts - 33.3% in Group II), ventricular fibrillation (none pts in Group I vs 12/93 pts - 12.9% in Group II) and in-hospital mortality (4/13 pts - 30.8% in Group I vs 62/93 pts - 66.7% in Group II). In-hospital mortality in pts without RVI was 4/191 (2.1%) in Group I and 19/187 (10.2%) in Group II ($p<0.05$). In-hospital mortality was significantly higher in pts with RVI in both groups ($p<0.05$). **Conclusion:** Right ventricular infarction is a rare complications of first acute inferior myocardial infarction in patients with prior right coronary artery bypass graft. If right ventricular infarction occurs, it is bad prognostic sign in pts with prior right coronary artery bypass graft as well as in patients without prior right coronary artery bypass graft.

**P178**

## Gender differences in presentation, treatments and outcomes of over 20,000 acute coronary syndromes patients in India: the CREATE registry

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**Introduction:** Treatments and outcomes in acute coronary syndromes (ACS) are influenced by patient characteristics including gender. There are no data on gender differences from a

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representative sample across India. We conducted a large multi center ACS study in India and analyzed one-month outcomes[1]. **Objectives:** To study the differences between men and women in the treatments and outcomes of **Methods:** We prospectively recruited 20,468 ACS patients from 89 centers in 50 cities in India and followed up to 30 days. In addition to descriptive statistics, we performed multivariate logistic regression analysis to explore mortality by gender. **Results:** Of the 20,468 patients, 15,642 (76.4%) were men and 4,826 (23.6%) were women. The overall mean age was 57.5 (12.03) and women were older by 4 years. The patients reached hospital in 360 min (IQR 150-1190) from symptom onset; women took 35 min longer ($p<0.0001$). Except for smoking, women had higher rates of diabetes (37.9 vs. 28.3%), hypertension (52.3 vs 33.3%), heart failure at presentation (Killip $\geq$2, 18.2 vs. 15.3%), high heart rate (86.3 vs. 82.7%) and mean BP (139.3/86.6 vs. 133.0/85.5). The rates of angiography (19.3 vs 24.0%), thrombolysis (30.9 vs 44.9%) and coronary interventions (6.1% vs 7.7%) were lower in women as were use of antiplatelets (97.6 vs. 98.3%), lipid lowering drugs (50.6 vs. 53.0%) and angiotensin converting inhibitors/angiotensin receptor blockers (54.6 vs. 56.4%) ($p<0.003$). At 30 days 413 (8.6%) women and 968 (6.2%) men died, a 39% difference ($p<0.01$). There was no difference in recurrent myocardial infarction, strokes, heart failure and bleeding. After adjusting for age and risk factors, the 30-day mortality was greater in women (odds ratio 1.24, 95% confidence interval 1.09–1.43) and decreased marginally after adjusting for treatments (1.21, 1.05–1.40). **Conclusion:** Relatively fewer women in India are admitted with ACS. Women are older, reach hospital late, have more risk factors, receive inferior treatments and have worse outcomes. Variations in characteristics and treatments accounted for about 20% of the increased mortality. We need strategies to ensure women get better treatments and have improved outcomes.

**Reference:**

Denis Xavier, Prem Pais, PJ Devereaux, R Gupta, Salim Yusuf et al. Treatment and outcomes of acute coronary syndromes in India (CREATE): a prospective analysis of registry data. Lancet. 2008 Apr 26;371(9622):1435–42.

**P179**

## High reperfusion rate may improve outcome in patients with ST elevation myocardial infarction

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**Introduction:** The recent Euro Heart Survey (EHS) snapshot ACS registry showed only 70% of patients with ST-elevation myocardial infarction (STEMI) underwent reperfusion therapy (50 % PCI and 20% Thrombolysis). Mortality rate was twice higher in patients who did not undergo reperfusion therapy as compared to those treated with primary PCI. **Objectives:** We aimed to evaluate treatment and outcome of an all comer STEMI population in a high volume tertiary PCI centre. **Methods:** Individual patient data of all patients with the diagnosis STEMI between January 2006 and December 2009 were evaluated. Since it concerns a registry database without in-and/or inclusion criteria, all STEMI patients were registered and evaluated. **Results:** During the study period, 3216 STEMI patients were registered. Mean age was 65 $\pm$ 13 year, 27% were female and 12% were diabetes. Coronary angiography was performed in 3139 (97.6%) of the patients and reperfusion within hospitalisation period was performed in 2834 (88.1%). Rates of in-hospital, 30 day and one-year mortality, were respectively 127 (3.9%), 153(4.8%) and 240 (7.5%). One-year mortality in patients who did vs. did not undergo reperfusion therapy was 6.8 vs. 23.2%; $p<=0.001$. **Conclusion:** In our high volume tertiary PCI centre, 98% of patients underwent acute angiography with the aim to perform reperfusion of which 88% finally underwent revascularization. This was associated with low short and long term mortality rates. The remaining 2% of highly selected patients who did not undergo reperfusion therapy had a very high mortality. Results of STEMI care might be improved by offering reperfusion therapy to the great majority of the patients.

**P180**

## Echocardiographic IVC diameter: a simple, bedside guide to monitor fluid therapy in right ventricular infarction

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**Introduction:** Right ventricular infarction (RVMI) is one of the unique subsets of acute coronary syndrome. In RVMI augmentation of RV preload with fluids is considered vital. The seemingly paradox of raising the already raised RVEDP and RAP is often a risky hemodynamic adventure .There is no *simple guide* to monitor fluid therapy in RVMI. **Objectives:** In this context, we reasoned, a simple estimation of IVC diameter and it's respiratory variation would give a accurate reflection of volume in the right heart chambers **Methods:** 12 patients with established RVMI by clinical, ECG criteria were the subjects of the study. 6 had associated posterior MI, 3 had lateral ST elevation. Patients were treated as per STEMI protocol .10 were eligible for thrombolysis.The mean blood pressure on admission was 106(70 -120mmhg) During thrombolyis the blood pressure fell by 5–10mmhg .All patients were administered IV normal saline to augment the blood pressure. 1000ml were given over 1 hour and if the BP was not raising another 1000 ml was infused in the next 1 hours . **Results:** Bedside echocardiography was done on admission and was repeated during and/or after fluid infusion. The baseline IVC, RA, RV were dilated in 9/12 patients. The mean RV dimension was 2.8cm (2.4–3.6) RA -3.9 cm(3.6–4.5) The mean IVC diameter was 2.1cm (1.4–2.6). On completion of 1000ml fluid infusion, the mean IVC diameter was 2.5(2.3–3.0) .In terms of absolute size, IVC increased by 3–5mmin diameter at the end of fluid infusion. It amounted to 20–30% increase of diameter. There was minor increase in RA and RV dimension also. When there was $>$ 30% increase of IVC diameter, JVP became non pulsatile and four patients showed signs of lung congestion. There was a new reversal of E:A ratio in the mitral inflow in 2 patients who had lateral ECG changes .There was no significant increase in RV dp/dt following fluid administration. The TR jet derived peak RV pressure did not show significant difference with reference to fluid therapy. The mean LVEF was 44%(38–62%). **Conclusion:** Simple bedside estimation of IVC dimension by 2D echocardiography, can provide a fairly accurate estimate of volume status of right heart chambers .Careful monitoring of IVC size help us, in the fluid management of RVMI. One rule of thumb is an increase of IVC diameter by 30% from its basal value could be a cut of point for termination of fluid infusion.

**P181**

## Factors of longer pre-hospital delay in acute coronary syndrome (Resonance study, Russia)

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**Introduction:** Considering information about high cardiovascular mortality in Russian Federation it is necessary to study pre-hospital management of patient with cardiovascular diseases punctually and comprehensively. **Objectives:** To reveal factors associated with longer pre-hospital delay in Acute Coronary Syndrome (ACS). **Methods:** Factors of pre-hospital delay (since symptoms onset to hospital admission) were collected from 731 patients (the mean age 63.56$\pm$12.24 years, 58.96% males) with ACS in three Russian provincial regions with one hour availability of revascularization therapy. The analysis was performed in 9 groups (hospitalized within 1st, 2nd, 3rd, 4th, 5th, 6th, 7–12th, 13–24th and $>$24 hours after symptoms onset) by Multiple Regression Analysis. **Results:** The analyzed "patient-related" factors (age, sex, Myocardial Infarction in anamnesis, typical symptoms of ACS) didn't demonstrate the influence on pre-hospital delay ($p>0.05$) except for time-factor (nighttime of symptoms onset increased pre-hospital delay, $R2=0.3856$, $p=0.0413$). In analysis the "doctor-related" factors the patient call time shows the most powerful association with longer pre-hospital delay: (18:01–24:01 $>$ 12:01–18:00 $>$ 00:01–06:00 $>$ 06:01–12:00, $R2=0.4398$, $p=0.0468$). The weekend days (22.47% ACS cases) and method of patients transferring (by ambulance or by themself) had mild, but statistical significant effect on pre-hospital delay ($R2=0.0226$, $p=0.0.0003$ and $R2=0.0429$, $p=0.0008$ respectively). Provisional diagnosis (ACS with or without ST segment elevation, or other supposed acute pathology) haven't any effect on pre-hospital delay ($p=0.9382$). **Conclusion:** In our study pre-hospital delays are determined more by "doctor-related" factors than "patient-related" factors that suggest the measures for medical care optimization.

**P182**

## Apical ballooning syndrome among South Indian population

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**Introduction:** Though the incidence of Apical Ballooning Syndrome is considered to be approximately 1% of Acute Coronary Syndromes, there is scanty data in this regard among the South Indian population. **Objectives:** We present an 18 months data from a suburban center. **Methods:** Eleven patients were diagnosed as Apical Ballooning syndrome based on Mayo Clinic Criteria.8 patients were prospectively diagnosed as Apical Ballooning Syndrome by Electrocardiogram, cardiac enzymes and Echocardiography ,then confirmed with Coronary angiogram,while three were retrospectively analyzed following an angiogram showing normal coronaries in patients with ECG evidence of Acute Myocardial Infarction. **Results:** 7/11 patients are females. Two patients require special mention.1) A 56 years old female had anaphylaxis following intra-venous antibiotic injection and subsequently presented with angina and ECG evidence of acute anterior Wall Myocardial Infarction.2)A 62 year old female underwent a bifurcation stenting with Bare Metal Stents.Immediately after the successful procedure she had ST elevation in the anterior leads. Suspecting stent thrombosis she was taken for check angiogram which revealed patent stents. A bedside Echocardiogram showed apical ballooning .She had left ventricular failure which improved over time. Though apical ballooning Syndrome has been documented following drug Eluting Stent implantation, the same following Bare Metal Stents has not been described.

Most of them had ST elevation (8/11),6 had ST segment elevation in precordial leads and 2 had ST elevation in inferior leads.The remaining had ECG evidence of non-ST elevation Myocardial Infarction.All had elevated cardiac enzymes. 7/11 had moderate or severe Left Ventricular Dysfunction. Two presented with Left Ventricular Failure,one with embolic stroke and her Echocardiogram shower fragile left Ventricular Apical Clot which resolved with anticoagulation. Except one patient who has associated Sick Sinus syndrome, there are no major rhythm abnormality. All of them had an uneventful recovery. **Conclusion:** Apical Ballooning Syndrome is not a rare entity among South Indian population. They present in a myriad of ways including ischemic stroke. The presentation following percutaneous intervention(following ***Bare Metal Stenting***) is an extremely rare entity.

**P183**

## Validity of the GRACE risk score to predict in-hospital mortality in STEMI patients: experience from a tertiary care center in Thailand

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**Introduction:** The GRACE (Global Registry of Acute Coronary Events) risk score (GRS) is a validated risk score to predict mortality in acute coronary syndrome patients. Asian countries were not included in GRACE. Thus, data on the use of the GRS in Asian patients are limited. **Objectives:** To assess the validity of the GRS in Thai patients with ST segment elevation myocardial infarction (STEMI) who were admitted to the authors' institute. **Methods:** From June

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1, 2008 through May 31, 2010 consecutive patients admitted with STEMI were enrolled prospectively. The authors' institute is a tertiary care, academic center in Bangkok, Thailand. The patients received standard medical care at the attending cardiologist's discretion. The GRS was calculated for each patient. According to the GRS, patients were divided into three tertiles: high, intermediate and low risk groups. In-hospital mortality rate was assessed and compared to the GRS predicted mortality. **Results:** There were 209 patients enrolled, 74.6% were men, the mean age was 59.6 ± 13 years old and 31.6% were diabetic. 103, 59 and 47 patients were classified in high, intermediate and low risk groups, respectively.

| | Total n | Grace score Mean (pt) ± SD | In-hospital mortality n (%) | GRS predicted in-hosp mortality |
|---|---|---|---|---|
| Low risk ≤125 points | 47 | 110.3 ± 9.8 | 0 (0) | <2% |
| Int risk 126-154 points | 59 | 139.1 ± 8.1 | 2(3.4) | 2-5% |
| High risk ≥155 points | 103 | 196.9 ± 38.8 | 24(23.3) | >5% |
| total | 209 | 161 ± 46.2 | 26(12.4) | 8% |

Low risk vs high risk, intermediate risk vs high risk, $p < 0.005$
**Conclusion:** The GRS is a useful tool to predict in-hospital death in STEMI patients admitted to a tertiary care center in Thailand. To our knowledge, this is the first study to validate the use of the GRS in Thai patients.

**P184**

## Impact of universal health care coverage on in-hospital mortality of STEMI patients: experience from a tertiary care center in Thailand

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**Introduction:** Thailand has used the universal health coverage (UC) scheme since 2001. Limited data exist regarding the contribution of universal health coverage on the effectiveness of health care delivery and outcomes of patients with ST segment elevation myocardial infarction (STEMI) in developing countries. **Objectives:** To evaluate the impact of universal health care coverage on the mortality rate of STEMI patients at the authors' institute. **Methods:** This study was a cross-sectional study. We analyzed 209 consecutive patients from June 1, 2008 to June 30, 2010 who presented to our hospital with STEMI. Patients were categorized into 2 groups according to their insurance status: UC and non-UC (civil servant, social insurance and self-paid). Baseline characteristics, treatment and clinical outcomes were collected and compared in different insurance groups. **Results:** Of the 209 consecutive patients, 96 (45.9%) had universal coverage and 113 (54.1%) had other health insurance.
**Image/graph I:**

| | UC (N=96) | Non-UC (N=113) | p value |
|---|---|---|---|
| Age, years | 58.8 ± 12.7 | 60.3 ± 13.4 | 0.41 |
| Male, n (%) | 71 (74) | 85 (75.2) | 0.96 |
| Current smoker, n (%) | 49 (51) | 37 (32.7) | 0.01 |
| GRACE risk score (mean±SD) | 154.2 ± 44.7 | 167.0 ± 46.8 | 0.04 |
| Door to needle, min | 55 (40-73.5) | 65 (48.5-85.5) | 0.41 |
| Door to balloon, min | 118 (94.5-172.7) | 111.5 (87.2-166) | 0.51 |
| Thrombolytic, n (%) | 27 (28.1) | 24 (21.2) | 0.5 |
| Primary PCI, n (%) | 54 (56.3) | 72 (63.7) | 0.09 |
| DES | 35 (49.3) | 62 (67.4) | 0.03 |
| BMS | 26 (36.6) | 26 (28.3) | 0.33 |
| GPIIbIIIa inhibitor, n (%) | 21 (29.6) | 44 (47.8) | 0.03 |
| Death, n (%) | 10 (10.4) | 16 (14.2) | 0.40 |

**Conclusion:** Presence of UC had no impact on patient's in-hospital mortality, door-to-needle and door-to-balloon time. In the setting of STEMI at the authors' institute, the UC system appears to be effective in achieving similar in-hospital outcomes.

**P185**

## The effection of paroxetine on PAI-1 and ET in patients with AMI who comblined with anxiety and depression after PCI

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**Introduction:** AMI; emergency PCI; anxiety and depression; PAI-1,ET **Objectives:** Discuss the case of for patients with AMI whocomblined with anxiety and depression afteremergency interventional therapy,observe the effection of combined with paroxetine treatment on PAI-1 and ET in patients with AMI after PCI. **Methods:** 108 cases of patients with AMI underwent emergency PCI, of which 53 cases were diagnosed by the Hamilton Anxiety and Depression Scale. These patients were randomly assigned to two groups: paroxetine and control groups□determined the serum levels of PAI-1 and ET before the treatment, treats latter 1 week, in January, in March, at the end of June,repeated measures analysis of variance and multivariate analysis of variance **Results:** Serum PAI-1 and ET level change over time□and there is an interaction between time and group.The group of serum PAI-1 and ET levels were different trends over time. Receiving paroxetine treatment in January,serum levels of PAI-1 and ET in patients with AMI whocomblined with anxiety and depression after PCI can improve. **Conclusion:** Paroxetine may improve the serum PAI-1 and ET level in patients with anxiety and depression after the operation of emergency PCI in AMI line.

**P186**

## The causes of death for ST elevated myocardial infarction with J wave syndrome during hospitalization

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**Introduction:** J wave is a common electrocardiographic marker shared by benign early repolarization syndrome, pathological Brugada syndrome, unexpected sudden death syndrome and idiopathic ventricular fibrillation. In order to identify the clinical significance of ischemic J wave in the ST-segment elevation acute myocardial infarction ,we have collected 128 cases of ST-segment elevation acute myocardial infarction with J wave. **Objectives:** To investigate the causes of death for ST elevated myocardial infarction(STEMI) with J wave during hospitalization **Methods:** 128 patients of STEMI with J wave from Jan. 2004 to Jun.2009 were enrolled. The following characteristics were investigated: location of J wave, QT dispersion, Tp-e, Tp-e/QT, malignant ventricular arrhythmia, mortality and causes of death during hospitalization. **Results:** The QTd□"Tp-e and Tp-e/QT increased significantly in the dead patients□,*<0.05*□. The malignant ventricular arrhythmia was more common in the dead patients □,*<0.05*□. The mortality in anterior STEMI with J wave seemed a bit higher than in inferior or right ventricle STEMI with J wave ,but no significant difference statistically□,*0.05*□. Cardiogenic shock appeared more frequently in anterior STEMI than in inferior or right ventricle STEMI□,*<0.05*□ **Conclusion:** ST-segment elevationanterior acute myocardial infarction with J wave patients died of malignant ventricular arrhythmia and cardiogenic shock easily, that should be paid more attention in clinical practice.

**P187**

## Influence of hyponatremia on short-/long-term outcomes in older patients with acute myocardial infarction

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**Introduction:** Despite the fact that numerous prior studies have established the association between hyponatremia and poor outcomes in patients with HF, less is known regarding the correlation between hyponatremia in patients with AMI. **Objectives:** To assess whether hyponatremia on admission were associated with all-cause mortality in older patients with AMI by analyzing data from the Beijing Elderly Acute Myocardial Infarction Study (BEAMIS). **Methods:** From April 2004 to October 2006, 1854 older (age ≥65 years) AMI patients were enrolled in the Beijing Elderly Acute Myocardial Infarction Study (BEAMIS) consecutively. Hyponatremia was defined as a sodium concentration **Results:** Compared with eunatremia group, hyponatremia group was associated with higher incidence of in-hospital heart failure (15.5% vs. 7.2, P=0.003) and 3-year all-cause mortality (16.7% vs. 12.6%, P=0.048). This relationship applied equally to subgroups in the context of contemporary treatments. **Conclusion:** In older patients with AMI, hyponatremia was frequently found in the early phase of AMI, and associated with higher incidence of in-hospital heart failure and 3-year all-cause mortality.

**P188**

## Use of biomarkers in predicting regional wall motion abnormalities after non ST elevation myocardial infarction

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**Introduction:** Echocardiography is a useful and readily available tool that may be utilised in assessing and risk-stratifying patients after Non-ST elevation myocardial infarction (NSTEMI). **Objectives:** We looked at the role of cardiac biomarkers in identifying patients who may benefit from early echocardiography, and the utility of regional wall motion abnormalities (RWMA) in predicting significant coronary artery disease (CAD). **Methods:** We carried out a prospective observational study of 100 patients admitted to Coronary Care Unit with NSTEMI using a pre-designed proforma and a Microsoft Access database. We collected clinical, biochemical, echocardiographic and angiographic data. **Results:** The male to female ratio was 1.8 : 1, and the mean age was 69 years. Of the 100 patients, an echocardiogram was performed in 89 and an angiogram in 84. There was a significant correlation between rising CK and presence of RWMA: present in 36% of those with CK<200, 43% of those with CK 200–400 and 78% of those with CK400 (n = 0.004). A very high CK of >400 was also associated with the presence of significant CAD (97% vs 76% for CK ≤400, n=0.01) and abnormal LV function (73% vs 49%, n=0.03). 71 patients had a BNP measured and an echocardiogram. A higher BNP was

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associated with abnormal LV function, which was present in 40% of those with BNP400 (p=0.02). RWMA was present in 37%, 55% and 72% respectively (p=0.07). BNP did not correlate with the presence of significant CAD. RWMA was present in 34 of the 73 patients who had both an echocardiogram and an angiogram. RWMA assessment was not possible in 6. Severe CAD was present in 94% of those with RWMA, compared to 73% of those without (p = 0.02). There was no correlation between CK levels and troponin or BNP levels. **Conclusion:** Echocardiography can play an important role in risk stratifying patients after a NSTEMI. Patients with a higher CK and BNP after a NSTEMI are more likely to have RWMA on echocardiography. RWMA is associated with significant CAD, however, its absence does not preclude it. A combination of risk assessment tools, and clinical judgement remains important in risk stratifying patients with NSTEMI.

**P189**

## Release kinetics of copeptin in patients with acute myocardial infarction

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**Introduction:** Copeptin, a glycoprotein from the C-terminal fragment of the arginine vasopressin (AVP) prohormone, is co-secreted with AVP from the neurohypophysis. AVP release is triggered by drop in blood pressure, changes in osmotic pressure and stress reaction like acute myocardial infarctions. It influences osmoregulation and cardiovascular homeostasis. However, the copeptin release kinetic in patients with acute myocardial infarction within the first minutes after onset of chest pain is widely unknown. **Objectives:** The objective of the present study was to characterize the release kinetics of copeptin in patients undergoing transcoronary ablation of septal hypertrophy (TASH) as a correlate for patients with acute myocardial infarction. **Methods:** Consecutive patients (n=18) with hypetrophic obstructive cardiomyopathy (HOCM) undergoing TASH were included into the study. TASH was performed according to standard clinical practice. Plasma samples for measurements of copeptin and conventional troponin T (cTnT, Roche 4th generation) were collected before as well as 15 min, 30 min, 45 min, 60 min, 75 min, 90 min, 105 min, 2 hours, 4 hours, 8 hours and 24 hours after TASH. **Results:** Median copeptin levels showed an increase over the upper normal limit (14 pg/ml) 45 minutes after induction of myocardial infarction. The copeptin peak level occured 75 minutes (22.7 pg/ml [9.4–48.58] vs. 8.95 pg/ml [7.45–15.4]; p=0.031). CTnT levels showed the first significant increase after 60 min (0.03 ng/ml [0.018–0.03] vs. <0.01 ng/ml [<0.01]; p<0.01). The measurement of CK before and 12 hours after intervention showed a significant difference (843.5 U/l (537.8–1040.5) vs. 77.5 U/l (64.3–112.5); p<0.01). **Conclusion:** In conclusion, copeptin shows a continuous rise after onset of myocardial ischemia during the first 75 minutes and a drop to normal levels within 8 hours. These results suggest that copeptin could be valuable for the rapid rule out of acute myocardial infarctions during the first hour after onset of chest pain in additional use of conventional troponin T assays as an established myocardial biomarker.

**P190**

## Prior polyvascular disease in patients presenting with acute coronary syndrome: insights from a multicenter multinational registry

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**Introduction:** Polyvascular disease (PolyVD), defined as presence of more than one affected vascular bed, is associated with worse outcomes. **Objectives:** To evaluate prevalence and clinical outcomes of acute coronary syndrome (ACS) in patients with concomitant polyvascular disease (PolyVD). **Methods:** Data were collected from the 2nd Gulf Registry of Acute Coronary Events (GULF RACE-2) between October 2008 and June 2009. Patients were divided into 4 groups according to whether they had prior PAD, CVA, either or neither. Patients' characteristics and outcomes were analyzed and compared. Mortality was assessed at 1 and 12 months. **Results:** Of 7689 consecutive ACS patients, 110 (1.4%) had prior PAD, 284(3.7%) had prior CVA, 34 (0.5%) had both and 7254 (94.4%) had neither. Patients with PolyVD were older and more likely to have diabetes mellitus (DM), hypertension, dyslipidemia and renal failure. At presentation, those patients were more likely to have atypical angina, high resting heart rate, high Killip class and high percent of NSTEMI and 3-vessel disease. They were less likely to receive evidence-based medications and coronary intervention. DM and renal failure were independent predictors for presence of PolyVD [adjusted OR 2.3; 95% CI 1.79–2.89, and 2.2; 95% CI 1.54–3.03, respectively]. PolyVD was associated with worse in-hospital outcomes; however, after adjusting for relevant covariates, PolyVD was not independent predictor for short and long-term mortality. HF rate increased from 12% in ACS-alone to 25%, 36% and 50% in patients with prior CVA, PAD and both respectively. PolyVD was independent predictor for HF and stroke (adjusted OR 2.00; 95% CI 1.26–3.19), P=0.003 and 4.36; 95% CI 1.22–15.64, P=0.02, respectively. **Conclusion:** Although prior PolyVD is a marker of high risk population, those patients received less aggressive therapy. Apart from mortality, PolyVD is an independent predictor for worse in-hospital outcomes in ACS patients. Great efforts should be directed to primary and secondary prevention.

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## Stroke following acute coronary syndrome: prevalence, predictors and outcome in six Middle-Eastern countries: findings from the 2nd Gulf registry of acute coronary events (Gulf RACE-2)

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**Introduction:** Stroke is a potential complication of acute coronary syndrome (ACS). The clinical charactarstics and outcome of patients developing stroke in the current era is not clear. **Objectives:** The aim of this study was to identify the prevalence, risk factors predisposing to stroke and in-hospital outcome during the index admission with ACS among patients in the Middle East. **Methods:** Analysis of the data collected from a 9-month prospective, multicenter study of the 2nd Gulf Registry of Acute Coronary Events (Gulf RACE-2) that recruited 7,939 consecutive ACS patients from 6 adjacent Middle Eastern Gulf countries (Bahrain, KSA, Qatar, Oman, United Arab Emirates, and Yemen) was made according to the development of stroke. Patients diagnosed with ACS, including unstable angina (UA) and non-ST- and ST-elevation myocardial infarction (NSTEMI and STEMI, respectively), were recruited from 65 hospitals. Stroke was defined as neurologic deficit persisting more than 24 hours. **Results:** The prevalence of in-hospital stroke following AMI was 0.70 %. Most cases were ST segment elevation MI-related (STEMI) and ischemic in nature. Patients with in-hospital stroke were 5 years older than patients without stroke and were more likely to have hypertension (66% vs. 47.6%, *P*= 0.001). They were no differences between the two groups in regards to gender, other cardiovascular risk factors, or prior cardiovascular disease. Patients with stroke were more likely to present with atypical symptoms, advanced Killip class, higher heartrate, diastolic blood pressure, GRACE (Global Registry of Acute Coronary Events) risk scoring and serum creatinine when compared to non-stroke patients. Independent predictors of stroke were age, hypertension, dyslipidemia, atrial fibrillation and advanced killip class. Stroke was associated with increased risk of in-hospital (39.3% vs. 4.3%) and one-year mortality (52% vs. 12.3%). Stroke was independent predictor of in-hospital mortality (OR 9.96, [CI 3.68–26.86]). **Conclusion:** There is low prevalence of in-hospital stroke in Middle-Eastern patients presenting with ACS but with very high in-hospital and one-year mortality rates. Stroke patients were less likely to be appropriately treated with evidence-based therapy. Future work should be focused on reducing the risk and improving the outcome of this devastating complication.

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## Short-term outcomes related to admission glycemia in acute coronary syndrome (ACS) can be explained by the severity of ACS

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**Introduction:** Admission hyperglycemia is associated with adverse outcomes in patients with acute coronary syndrome (ACS). However, it is not clear if severity of the disease contributes to this relationship. **Objectives:** To assess if the relationship between admission glucose and short-term outcomes in ACS can be explained by severity of disease. **Methods:** We used data from a prospective registry of consecutive patients with ACS admitted to hospitals in six Middle Eastern countries in the Gulf region (Gulf Registry of Acute Coronary Events, Gulf RACE). A validated risk score (The GRACE score) was used as a measure of severity of ACS. We assessed the relationship between admission glycemia and in-hospital mortality as well as a composite of major adverse cardiac events (MACE = death, recurrent ischemia/myocardial infarction, congestive heart failure or stroke) with and without adjustment for GRACE score. **Results:** The cohort consisted of 8,176 patients with ACS (age 56 ± 12, 76% male, 40% with diabetes mellitus). The median admission glucose level was 141 mg/dL (25th and 75th percentiles: 107, 220). There was a significant relationship between admission glucose and both in-hospital death and MACE (Figure, odds ratio 1.005 [95% CI 1.002, 1.008] and 1.004 [95% CI 1.002, 1.007], for each 10 mg/dL increment, respectively). The association between glycemia and in-hospital death or MACE was not modified by diabetic status or ACS type (all interaction P values > 0.10). However, the association between admission glycemia and in-hospital death and MACE was no longer significant after adjustment for severity of ACS using GRACE score (P = 0.33 and 0.053, respectively).

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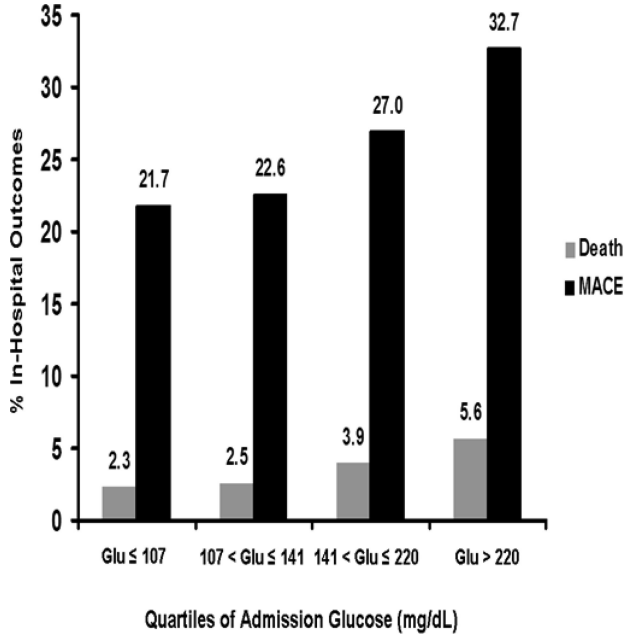
**Image/graph I:**




**Conclusion:** The association between admission hyperglycemia and worse in-hospital outcomes in patients with ACS is explained by severity of ACS. Admission glycemia is likely a marker of ACS severity rather than an etiologic link to adverse outcomes.

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## Enhanced external counterpulsation (EECP) in refractory angina pectoris: six months follow up

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**Introduction:** Enhanced External Counterpulsation (EECP) is a new non-invasive procedure that is used a therapeutic option for ischemic patients who are not eligible for other therapeutic options. **Objectives:** The aim of the present study was to evaluate the immediate and 6 months response to EECP sessions in patients with chronic refractory angina where no other options for surgical or percutaneous revascularization procedures are left. **Methods:** 48 patients (15Females, 33 Males) were treated by EECP. All patients were subjected to 35 sessions over 7 weeks (5days/week). Each session lasted for one hour. We looked at Canadian cardiac society class (CCS) nitroglycerine use per week and echocardiographic analysis (EF and SWMA) and adverse events where evaluated prior to EECP, at the end of study and six month later. And the results where compared. **Results:** 73% of the patients responded by improving one CCS class and 10% by more than 2 CCS class. 83% of those patients showed sustained improvement over 6 months. The mean nitroglycerin weekly consumption significantly decreased from 8.25 tablets/week to 3.12 tablets/week immediately and continued decreasing even after 6 months. P value=0.003. Segmental wall motion abnormality significantly improved. In 40% of the patients there was an improvement of 3 or more segments in the immediate phase, this improvement was maintained at the end of 6 months at 90% of the cases. The mean EF improved from 35.8% to 39.3% in the immediate phase and 38% at 6 months. The therapy was discontinued in two patients (one developed severe skin bullae and the other developed pulmonary edema) **Conclusion:** EECP is a non invasive procedure that can reduce the symptoms of Ischemic heart disease like Angina and heart failure. It improves both Canadian Cardiovascular Society (CCS) and New York Heart Association (NYHA) classifications, decreases in weekly angina episodes and nitroglycerin use. It improves all motion abnormality and EF Pro-BNP as a marker of LV dysfunction was significantly decreased.The study confirms the safety and efficacy of EECP (in patients with refractory angina when other options are not available.

**P195**

## Effect of trimetazidine therapy in acute myocardial infarction patients; from korean acute myocardial infarction registry (KAMIR)

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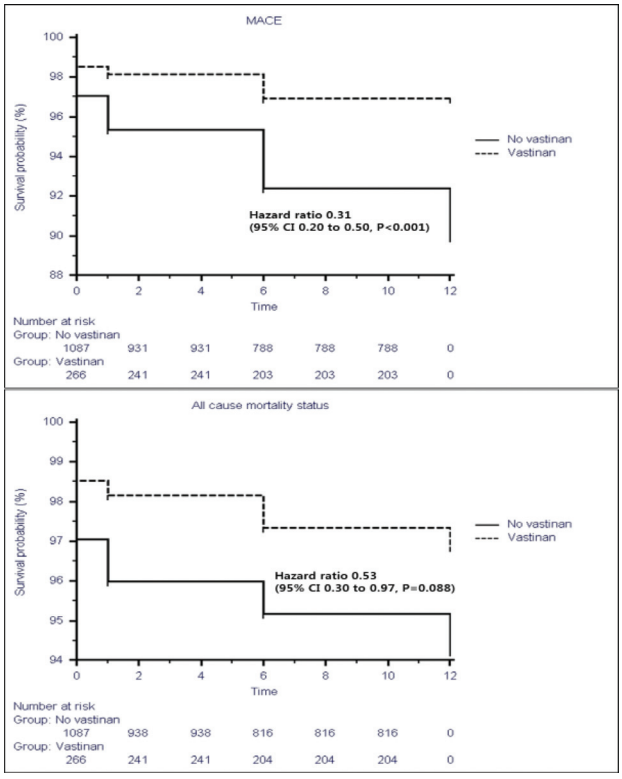
**Introduction:** The term metabolic treatment has been used to describe the use of drugs that improve the function of cardiomyocytes, and trimetazidine is the most tested of these drugs. But there are very limited data regarding the role of trimetazidine in managing acute myocardial infarction (AMI). **Objectives:** We studied the beneficial effects of in-hospital trimetazidine therapy for the improvement of clinical outcomes in AMI patients from the large-scale, prospective, observational Korean Acute Myocardial Registry (KAMIR). **Methods:** A total 9909 AMI patients enrolled in the KAMIR from November 2005 to April 2008. Patients were divided into 2 groups: trimetazidine therapy group and non-Trimetazidine therapy group and a propensity score matching analysis was performed to adjust for potential confounders. The primary end point was major adverse cardiac event (MACE), defined as a composite of all cause death, nonfatal myocardial infarction, and target lesion revascularization during the 12 months after the registration and secondary end point was acute complication of myocardial infarction, defined as a composite of acute Renal Failure, cardiogenic shock, new heart failure, life-threatening arrhythmia. **Results:** The baseline clinical characteristics were similar between the two groups. Compared with the non-Trimetazidine therapy group (N=1146), the trimetazidine therapy group (N= 271) had a significantly lower incidence of MACE (Hazard ratio 0.31; 95% confidence interval, 0.20 to 0.50; P<0.001), all cause death (Hazard ratio 0.53; 95% confidence interval, 0.30 to 0.97; P=0.088), and acute complications of myocardial infarction (adjusted odds ratio, 0.26; 95% confidence interval, 0.13 to 0.53; P P<0.001) during 12-month follow up.

**Image/graph I:**

Table 1. Baseline Characteristics

| Variables | Trimetazidine Group (N=271) | No Trimetazidine Group (N=1146) | P |
|---|---|---|---|
| Age | 63 ± 12.66 | 62 ± 12.55 | 0.84 |
| Gender (male:female) | 198(73.1%):73(26.9%) | 824(71.9%):322(28.1%) | 0.70 |
| BMI | 24 ± 3.17 | 24 ± 3.12 | 0.36 |
| Blood Pressure (systolic/diastolic) | 126/76 | 129/79 | 0.67 |
| Past History | | | |
| Prior Ischemia | 29 (10.7%) | 127 (11.1%) | 0.86 |
| Hypertension | 121 (44.7%) | 478 (41.7%) | 0.38 |
| DM | 66 (24.4%) | 274 (23.9%) | 0.88 |
| Dyslipidemia | 17 (6.3%) | 75 (6.5%) | 0.87 |
| Thrombolysis | 18 (6.6%) | 69 (6.0%) | 0.70 |
| PCI | 258 (95.2%) | 1084 (94.6%) | 0.69 |

**Image/graph II:**

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**Conclusion:** Trimetazidine therapy seems to be beneficial for AMI Patients. These results may provide the rationale for the use of trimetazidine in AMI patients.

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## Outcome data from enhanced external counterpulsation (eecp) for refractory angina in bradford royal infirmary

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**Introduction:** Coronary artery disease remains prevalent. There is an increasing population of patients who have persistent angina even after having exhausted surgical and percutaneous revascularisation options. Enhanced external counter pulsation has been reported to reduces angina and improve exercise tolerance in patients with non interventional CAD and offers a safe, non invasive treatment option. **Objectives:** To assess affect of EECP in refractory angina patients. **Methods:** Patients with chronic refractory angina, were evaluated pre and post-EECP. Response to treatment was assessed by following three criteria.

1. Improvement in quality of life: Exercise capacity on treadmill exercise (ETT) with Bruce protocol, measurements of workload (METS), exercise duration and time to onset of both angina and dyspnoea.
2. Symptomatic improvement in angina (Canadian Cardiovascular Society [CSS] Classification)
3. Objective improvement in coronary ischemia: time to 1mm ST segment depression on ETT.

**Results:** All patients n=83 (age range from 94–43 yrs, mean age of 68yrs) completed 35 one-hour sessions of EECP without complications.

1. 43 patients underwent ETT pre-post EECP.

Improvement in ET, Time to dyspnoea/angina/1mm ST depression& METS are given in table 1.

2. 40 patients had pre-post EECP CCS classification assessment

- Mean Post EECP CCS class was lower than Mean PreEECP CCS Class $p<0.0001$
- Assessing CCS classification for individual patients shows 24 dropping one class, 13 dropping 2 classes, 1 dropping 3 classes and 2static.

| | Pre-EECP | Post-EECP | p value |
|---|---|---|---|
| METS | 5.4 | 6.6 | p< 0.00001 |
| Exercise duration | 237 sec | 321 sec | p<0.0000001 |
| Time to onset of angina | 169 sec | 241 sec | p<0.0001 |
| Time to onset of dyspnoea | 161 sec | 239 sec | p< 0.000001 |
| Time to 1mm ST depression | 193 sec | 271 sec | p=0.0001 |

**Conclusion:** EECP is a safe and non invasive therapy which is well tolerated and can provide sustained symptomatic and functional benefit in patients with refractory angina. Statistically significant improvements were noted in both subjective symptoms and objective exercise capacity Post EECP. Longer term follow up data is currently being compiled and looks promising with regards to sustained benefit of EECP with significant cost savings due to decreased hospital admissions and acute events.

**P197**

## Prevalence of unrecognized diabetes mellitus in patients with acute coronary syndrome: a prospective study from Qatar

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**Introduction:** Diabetics who develop Acute Coronary Syndrome (ACS) have higher risk of complications. However, diabetes may have not been previously recognized in many patients admitted with ACS. The prevalence of unrecognized diabetes among hospitalized patients with ACS in Qatar is not well established. **Objectives:** To study the prevalence of unrecognized Diabetes and Pre-Diabetes in patients admitted with ACS using admission Random Plasma Glucose (RPG), Fasting Plasma Glucose (FPG) and abnormal Glycoselated Hemoglobin A1c (HbA1c) levels, The Lipid profile was also studied. **Methods:** A prospective study of 583 patients admitted with ACS, without previous history of Diabetes. RBG and FBG levels were measured in all patients.. HbA1c was measured in all patients with high RPG and FPG. Patients were classified according to the Latest International Criteria into frank Diabetes (DM), Pre-Diabetes (PDM), and Stress Hyperglycemia (SHG). **Results:** The mean age was 51 years, and 81.3 % were males. Frank DM was discovered in 123 patients (21.1%). Another 82 (14.1%) had PDM, while 57 (9.8 %) had SHG. The rest (321), (55.1%) were non-diabetics (NDM). The mean FPG among DM, PDM and NDM were 10.9, 6.7 and 5.8 mmol/l respectively while the mean HbA1c was 8.7%, 6.9% and 5.9 % respectively. There was no significant difference with regard to total cholesterol, low and high density lipoprotein levels. However, Triglyceride levels were significantly higher in DM ($2.2\pm1.5$ mmol/l), compared to ($2.1\pm1.5$) in PDM and ($1.8\pm1.0$) in NDM. There was a significant prevalence of ST-Elevation (STEMI) among NDM group (50.6 %) compared to (30.9%) in DM, but only 18.45% in PDM group. Non-STEMI was not significantly different, but Unstable Angina was significantly higher among NDM (71.8%) versus (16.%) in DM and (12.1%) in PDM. **Conclusion:** In patients admitted with ACS who were not previously recognized to have DM, almost half had features of Abnormal Glucose Metabolism. Frank DM was discovered in nearly a quarter of all patients. Another quarter can be classified as Pre-diabetes or stress hyperglycemia. This is much higher than commonly perceived and warrants further study.

**P198**

## Obesity and its impact on the prediction of coronary heart disease in relation to the metabolic syndrome

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**Introduction:** The clinical risk score, in terms of prediction and prevention of coronary heart disease (CHD), in the last several decades, belongs to the metabolic syndrome (MetSy), although this fact is still controversial. **Objectives:** It is important to assess the impact of abdominal obesity (defined by BMI and waist circumference) and metabolic syndrome in predicting the degree of coronary artery disease. **Methods:** MetSy was defined according to the IDF International Diabetes Foundation criteria (IDF). Obesity was defined by BMI (body mass index) and with the waist circumference. We analized four groups of patients in relation to MetSy or type 2 diabetes mellitus (DM). Group A included patients who did not have any MetSy or DM, group B had DM/no MetSy, group C did not have DM and had MetSy and group D had both DM and MetSy. **Results:** The study included 837 consecutive patients (pts.) after invasive cardiac diagnostic procedures. 75.6% (632) patients met the criteria for MetSy. CHD incidence in those with MetSy or without MetSy was not significantly different ($p=0.088$). Moderately obese by BMI usually have normal results on blood vessels, but those who were overweight often had three or two vessels disease and pts. with normal BMI range had three or one vessel disease ($p=0950$). Pts. with normal BMI were most often in the A group (46.3%), obese by BMI were usually in the group D (62.9%)($p<0.001$). Obese pts. by waist circumference often do not have CHD (14.2% vs. 20.4%), one or foure wessel disease is more common in obese pts. (24.4% vs. 25.7% vs 3.9% respectively. 4.7%), and two or three-vessel disease was present mainly in those who were not obese, but that was not statistically significant (chi-square=4.3, df=4, p=0367). Normally pts. measured by waist circumference were most often in the A (48.4%), and those who were obese by waist circumference were usually in the group D (60.2%)($p<0.001$). **Conclusion:** MetSy or abdominal obesity, are not significant predictors of coronary heart disease, as well as its extensiveness. BMI rather than waist circumference, was used to identify individuals at risk for the occurrence of CHD, though the height and weight measurements are simple and easy to perform comparing with the waist circumference, which is not routinely performed nor standardized.

**P199**

## Fasting glucose, HgA1c, HOMA-index and metabolic syndrome in predicting coronary heart disease

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**Introduction:** Fasting glucose (FG), HgA1c and HOMA-index values are parameters for assement direct insulin sensitivity. The impact of type 2 diabetes (DM) on coronary heart disease (CHD) is without doubt, but the ability to predict coronary heart disease using these parameters for insulin sensitivity is still unclear. **Objectives:** To asses impact of direct (HOMA index) and indirect (Metabolic syndrome) insulin sensitivity to degree of coronary heart disease. **Methods:** MetSy is defined by the IDF (International Diabetes Foundation) criteria. HOMA-index is calculated from the mathematical formulation of serum glucose (FG) and fasting insulin. Four groups were formed in relation to MetSy or type 2 diabetes mellitus (DM) in the principle yes/no (group A (-MetSy/-DM), B (DM +/-MetSy), C (-DM/+ MetSy) and D (+ DM/+ MetSy). **Results:** After invasive cardiac diagnostics in 188 patients we done: FG, HgA1c and HOMA-index. FG average value was $6.16 \pm 1.8$ mmol/L ,4.2–21 .1 mmol/L); HgA1c$5.51 \pm 1.37$mmol/L (3.8–14mmol/L), HOMA-e, $9.05 \pm 8.36$mmol/L (2–53mmol/L). Average values of FG, HgA1c, HOMA-e were significantly higher in the group with than in those without DM (Chi-square = 1064.34, df = 1, p = 0.0001). Significantly statistical difference was present in the group with then without MetSy (6.3 vs. 5.5mmol/l), while HgA1c was similar between groups, but with normal values. HOMA-e was significantly higher in those with MetSy, indicating that insulin resistance was present in this group ((10.3 vs. 6), Chi-square = 666.7, df = 1, p = 0.002). FG and HgA1c were significantly higher in groups A and B. HOMA was significantly higher in group D (12) compared with group C (7.9) (Chi-square = 1334, df = 3, p = 0.0001). Values of FG, HgA1c and HOMA-e were higher in a groups with three, four or more vessels disease, compared to those without coronary stenosis or who had one or two-vessel disease, but the difference was not statistically significant. It was found that those who had one vessel disease or did not have coronary stenosis had almost the same average value of observed parameters (HOMA, Chi-square = 198.84, df = 4, p = 0587). **Conclusion:** Patients with MetSy, with or without DM, had statistically higher values of insulin resistance, estimated by HOMA index, compared to patients without MetSy. HOMA idex is not a valid parameter for prediction of CHD.

**P200**

## The best predictor of cardiorenal syndrome in ischemic cardiomyopathy

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**Introduction:** Acute renal dysfunction has an unquestionable negative impact on prognosis of patients (P) with acute coronary syndromes (ACS). **Objectives:** Determine the prevalence of cardiorenal syndrome (CRS) in P with ACS, its predictors and prognostic importance. **Methods:** Prospective study of 368 P (66.6% male, age $66.8\pm13.8$ years), admitted for ACS to a

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Coronary Unit, along 16 months. CRS was defined as an increase in serum creatinine ≥ 26.5 umol/L. Demographic, clinical and analytical parameters; development of new heart failure (HF); severity of coronary artery disease (CAD) and in-hospital (IH) mortality (M) were compared.A follow-up (FU) (7.1±5.3months) concerning mortality was performed. **Results:** CRS occurred in 93 P (25.8%). The factors at admission associated with CRS were: older ages (73±12 vs 65±14; p<0.001); diabetes (p<0.001),hypertension (p<0.001), chronic HF (p=0.001),chronic renal failure (p<0.001); higher levels of BUN (12.4±11.5 vs 7.3±3.6; p<0.001), creatinine(147.7±135.0 vs 86.9±27.7; p<0.001), cystatin-C (Cys-C) (1.57±0.9 vs 0.87±0.3; p<0.001) and NT-pro-BNP (p<0.001); lower glomerular filtration rate (GFR, calculated with MDRD) (57.7±30.6 vs 80.6±24.6; p<0.001) and haemoglobin (12.7±2.0 vs 13.9±1.8; p<0.001). No association was found between CRS and sex, blood pressure at admission and troponin. In multivariate analysis Cys-C was the best predictor of CRS (p<0.001). Among P who developed CRS 33.3% had normal creatinine and 22.6% normal GFR although high Cys-C. P who developed CRS were treated with higher daily doses of intravenous (iv) furosemide (p<0.001); required more often iv inotropes (p<0.001), intra-aortic balloon pump (p=0.005) and renal replacement therapy (p<0.001).Those P had higher GRACE risk score (p<0.001); longer hospitalizations (7.6±5.5 vs 4.7±2.9, p<0.001); higher incidence of acute HF (KK≥2; p<0.001);more extensive CAD (number of vessels and segments evolved-);more frequently were discharged with the diagnosis of new HF (p<0.001)and had higher mortality both IH (p<0.001) and in FU (p<0.001). **Conclusion:** Worsening renal function is common in ACS P and as expected has a negative impact on prognosis. In this study, Cys-C is the parameter at admission that best predicts cardiorenal syndrome, being able to identify the high risk P among those with normal GFR. This work highlights the importance of preventive measures of renal injury in parallel to the treatment of ACS and the importance of biomarkers, such as Cys-C, able to identify the P at risk.

**P201**

## Cystatin-C and acute coronary syndromes: the best renal risk marker?

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**Introduction:** Renal dysfunction has an unquestionable impact on prognosis of patients (P) with acute coronary syndromes (ACS). Cystatin-C (Cys-C) has a linear relation with glomerular filtration rate (GFR). **Objectives:** Determine the short and medium term prognostic value of Cys-C in P admitted with ACS, particularly in those with normal GFR. **Methods:** Prospective study of 368 P (66.6% male, age 67±14years), consecutively admitted for ACS to a Coronary Unit. Cys-C was obtained in the first 24 hours. P were classified according to Cys-C: LOW-CYS - Cys-C≤0.95mg/L (n=214) vs HIGH-CYS - Cys-C>0.95mg/L (n=154). MACCE was assessed at follow-up (FU) (7.1±5.3months). **Results:** LOW-CYS were younger (61.1±13.3vs74.9±9.7; p<0.001) and presented a higher incidence of males (p=0.018), smokers (p<0.001), dyslipidaemia (69.2%vs53.9%; p=0.003) and family history of coronary artery disease (CAD) (9.3%vs0%; p<0.001); they had lower incidence of diabetes (20.1%vs49.4%; p<0.001), hypertension (61.2%vs83.1%; p<0.001), chronic kidney disease (2.3%vs49.4%; p<0.001), heart failure (HF) (4.2%vs24.7%; p<0.001) and previous CAD (23.8%vs33.1%; p=0.050). HIGH-CYS had lower haemoglobin (14±1.5vs12.5±2.1; p<0.001) and GFR (MDRD) (90±22vs52±23; p<0.001); and higher urea (6.2±1.7vs12.3±9.7; p<0.001), creatinine (78±17vs151±135; p<0.001) and NT-pro-BNP (p<0.001). Incidence of complications was higher in HIGH-CYS: acute HF (KK≥2; 8.9%vs44.2%; p<0.001); left ventricular dysfunction (EF <40%) (14.4%vs24.8%; p=0.016); contrast nephropathy (13.7%vs43.1%; p<0.001); cardio-renal syndrome (9.4%vs49.3%; p<0.001); longer hospital stay (4.6±3.0vs6.8±4.7; p<0.001); more frequently were discharged with the diagnosis of new HF (17%vs40.4%; p<0.001) and higher IHmort (1.4%vs9.7%; p<0.001). CAD was more extensive in HIGH-CYS (≥ 2 vessels - 36.8%vs52.2%; p=0.005). In the FU, HIGH-CYS had higher mortality (0.5%vs19.5%; p<0.001) and higher incidence of re-infarction (4.9%vs11.1%; p=0.036), admission for HF (2.0%vs14.3%; p<0.001) and bleeding (3%vs13.5%; p<0.001). A sub-analysis regarding P with GFR>60 (n=256), showed that HIGH-CYS had higher mortality both in hospital (1.5%vs7.0%; p=0.025) and in the FU (0.5%vs11.5%; p<0.001). **Conclusion:** As an accurate marker of renal disease, Cys-C identified P at higher risk of complications both in-hospital and at FU. Cys-C was able to identify the high risk P among those with normal GFR. These results reinforce the prognostic value of renal function in ACS, suggesting that Cys-C>0.95 is a marker of P that need even greater care.

**P202**

## Clinical pathway is very useful tool to improve quality of care for patients with acute myocardial infarction in Japan

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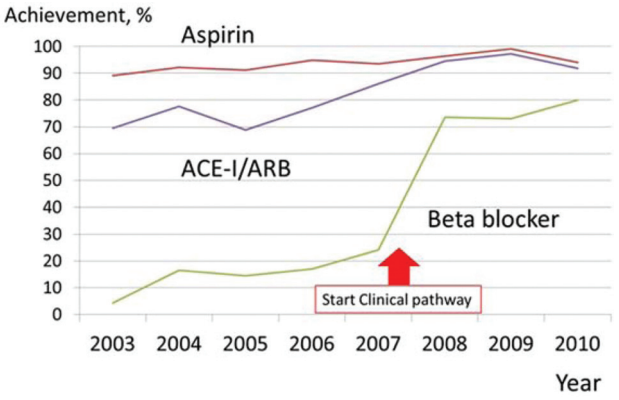
**Introduction:** Proper and effective medication for patients with acute myocardial infarction (AMI) is very important. But in Japan, prescription rate of beta-blocker is significantly lower comparing with US and Euro. In our institution, we introduce clinical pathway to improve not only prescription rate, but also quality of patient care of AMI from November 2007. **Objectives:** To compare the prescription rate of beta-blocker and other drugs in patients with AMI before and after introduction of clinical pathway. **Methods:** From July 2003 to December 2010, all patients with AMI in our institution (n=771, age;64.2±12.8, male;n=629) were enrolled. Prescription rate of aspirin, ACE-I/ARB and beta blocker before(Bef) and after(Aft) introduction of clinical pathway were compared. **Results:** There were no significant differences in patient characteristics in these two groups(age;64.1±12.8 vs 64.4±12.8 p=0.747, male;81.5% vs 81.7% p=0.522, Bef and Aft respectively). The prescription rates of these drugs were increased after introduction (Figure: aspirin92.6% vs 96.6%, p=0.01, ACE-I/ARB; 76.6% vs 94.2%, p<0.01, beta-blocker; 16.2% vs 72.2%, p<0.01). There is no significant differences in in-hospital mortality in the two groups(6.8% vs 8.0%, p=0.310). The significant change of prescription rate especially of beta-blocker occurred after introduction of clinical pathway.
**Image/graph I:**




**Conclusion:** Clinical pathway is very useful tool to improve patients care of AMI in Japan.
**References:**
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**P203**

## Prior oral antiplatelet use in patients presenting with acute coronary syndrome. insights from GULF RACE-2 registry

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**Introduction:** Although antiplatelet therapy effectively reduces ischemic events, significant proportion of patients develops recurrent coronary events **Objectives:** To evaluate the impact of prior single or dual antiplatelet (PAP) use in patients presenting with acute coronary syndrome (ACS). **Methods:** Data were collected from the 2nd Gulf Registry of Acute Coronary Events between October 2008 and June 2009. Patients were grouped according to whether they were PAP users or not (NAP). Patients' characteristics and outcomes were analyzed and compared. Mortality was assessed at one and 12months **Results:** Among 7,827 consecutive ACS patients, 41% were PAP users (70% aspirin, 1% clopidogrel, and 29% dual antiplatelet agents). In comparison to NAP, PAP use was associated with higher rate of co-morbidities, atypical presentation, severe LV dysfunction, 3-vessel disease, and high GRACE risk score. After adjustment for relevant covariates, PAP use was independent predictor for recurrent ischemia in unstable angina (OR 1.7,95%CI 1.17–2.57) and non-ST-elevation myocardial infarction (NSTEMI) (OR 1.9,95%CI 1.38–2.65) and for heart failure in NSTEMI (OR 1.5,95%CI 1.11–2.15) and STEMI (OR 1.4,95%CI 1.08–1.93). Although PAP use was associated with high mortality (unadjusted OR 1.4 and 1.8 in STEMI and NSTEMI respectively), it was not independent predictor for mortality. Among PAP users, PCI independently reduced risk of hospital (OR 0.25, 95%CI: 0.20–0.32), 1-month (OR 0.31, 95% C.I: 0.26–0.37) and 12-month mortality (OR 0.28, 95% CI: 0.24–0.33). **Conclusion:** PAP use identified a high-risk population across the ACS spectrum. Early coronary revascularization may improve CV outcomes in these patients.

**P204**

## Elevated high-sensitive troponin t predict long-term prognosis in patients with stable cardiovascular disease

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**Introduction:** Recently, high sensitive troponin T (hsTnT) assays have been shown to improve diagnostic sensitivity in patients presenting with an acute coronary syndrome (ACS). However, only few data are available on long-term prognosis and hsTnT in patients with stable

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cardiovascular diseases (CVD). **Objectives:** In the present study we aimed to analyse troponin T levels measured by a conventional (cTnT) and a new hs assay in patients presenting with symptoms of CVD as well as to evaluate the prognostic information derived from elevated hsTnT levels in patients with stable CVD. **Methods:** The present study enrolled 774 consecutive patients from a tertiary cardiac center in whom troponin T has been measured on a routine basis. The study population was divided into stable (404 [52.2%]) and acute (298 [38.5%]) cardiovascular patients. The remaining 72 (9.3%) patients suffered from non cardiovascular diseases. Cardiac troponin T was measured in plasma with a newly developed high-sensitivity electrochemiluminescence immunoassay (hsTnT, Elecsys Analyzer 2010, Roche Diagnostics, Mannheim, Germany) and a commercial one-step electrochemiluminescence immunoassay ($4^{th}$ generation cTnT, Elecsys 2010, Roche Diagnostics). Patients were followed over 18 months. Death after 18 months was the primary endpoint. Follow up data was achieved during a contact by telephone, which has been afforded by 96% of patients. **Results:** HsTnT- and cTnT-level were significantly higher in acute patients. Patients with stable CVD and without elevated troponin T (hsTnT $<$14 ng/l, cTnT $<$0.03 ng/ml) had a better outcome than patients with hsTnT $\geq$ 14 ng/l and cTnT $<$0.03 ng/ml (Log Rank 9.35; p=0.002 for 20-months mortality). Furthermore, Kaplan-Meier survival analysis (Log Rank 8.34; p=0.004) and Cox regression analysis (95% CI 1.46–12.47; p=0.008) revealed that this difference was also true for patients with hsTnT $\geq$ 14 ng/l and cTnT $\leq$ 0.01 ng/ml. **Conclusion:** With the introduction of a high sensitive troponin T assay elevated troponin T levels will be detectable also in a substantial number of patients with stable cardiac diseases. However, the absolute troponin levels are about 4-fold higher in acute patients. Mortality rates for patients with stable CVD and elevated hsTnT $\geq$ 14 ng/l appear to be higher as those of patients w/o elevated hsTnT.

**P205**

## Initial heart rate and cardiovascular outcomes in patients presenting with acute coronary syndrome

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**Introduction:** Resting heart rate is an important and modifiable predictor in cardiovascular disease. **Objectives:** To assess the impact of on-admission heart rate (HR) in patients presenting with acute coronary syndrome (ACS). **Methods:** Data were collected from the 2nd Gulf Registry of Acute Coronary Events (GULF RACE-2) between October 2008 and June 2009. Patients were divided into 4 groups according to the initial resting heart rate ($\leq$ 60, 61–70, 71–80, and $>$80 beats per minutes). HR (61–70) was considered a reference group in the analysis. Patients' characteristics and outcomes were analyzed and compared. Primary endpoints were hospital mortality, re-ischemia and heart failure. Secondary endpoints were Mortality at 1 and 12 months **Results:** Among the 7933 consecutive ACS patients, 770 (10%) patients presented with bradycardia ($\leq$60) and 4162(52%) patients presented with tachycardia ($>$80). Diabetes mellitus, hypertension, renal failure and khat chewing were more prevalent in patients with tachycardia while smoking and prior coronary revascularization were more prevalent in bradycardia group. At presentation, unstable angina was more frequently diagnosed in the reference group, NSTEMI in the higher HR groups while STEMI was similarly high in bradycardia and tachycardia groups. On admission, clopidogrel, beta blockers, statin, thrombolytics and PCI were less received in the tachycardia group. Both bradycardia and tachycardia were associated with comparable worse hospital outcomes except for HF that was more evident in the tachycardia group. After adjusting for baseline characteristics and treatment, high HR was independent predictor for HF (OR 3.7, 95%CI 2.53–5.31). Low HR was independent predictor for hospital mortality (OR 2.3, 95%CI 1.24–4.23) and 1-month mortality (OR 1.7, 95%CI 1.02–2.77). **Conclusion:** Trends of the cardiovascular outcomes associated with resting HR differ in ACS than that in stable patients. Low and high HR is a marker of high risk population that needs aggressive management and further evaluation.

**P206**

## Concomitant diseases may modulate heart rate turbulence in patients with coronary artery disease

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**Introduction:** Heart Rate Turbulence is a non-invasive parameter useful in post-MI risk stratification. Nevertheless, pts with coronary disease frequently presented concomitant disorders like diabetes mellitus (DM) or sinus node dysfunction (SND), influencing the reflex mechanism underlying the heart rate turbulence reaction on premature ventricular contraction. **Objectives:** evaluation of clinical factors influencing heart rate turbulence in relation to its prognostic value in coronary artery disease patients. **Methods:** we observed 70 pts (18 women, 52 men) aged 30–77 yrs, with sinus node dysfunction (SND) in course of coronary artery disease - group I, 31 pt. with $1^{st}$ type of DM (14 men, 17 women) aged from 19 to 33 years - group II, 10 pts (9 men and 1 woman) 8 to12 months after orthotopic heart transplantation (HTx) (29–54 yrs) - Group III and 32 healthy persons (23 men, 9 women) aged 31–69 yrs - group IV. All pts underwent 24-hour ECG Holter monitoring. These of pts who revealed at least 5 ventricular premature beats (VPB) in 24-hours ECG were referred to HRT analysis (45 pts from gr. I, 22 pts from gr II, 8 pts from gr. III and 23 pts from group IV). HRT View Versions 0.60–01 software was used for HRT analysis. The following parameters of HRT were evaluated: turbulence onset (TO) and turbulence slope (TS). Evaluated HRT parameters were compared between groups I, II, III and IV. **Results:** Mean values of TO were significantly decreased in patients with SND (0,25 vs 2,50%, p$<$0,05) and after HTx (0,57 vs 2,50%, p$<$0,04) an did no change in patients with DM (3,14 vs 2,50%) in comparison to control group. Mean values of TS were significantly decreased in patients with DM (7,62 vs 16,43ms/RR, p$<$0,05) and after HTx (1,24 vs 16,43ms/RR, p$<$0,04) an did no change in patients with SND (12,36 vs 16,43ms/RR) in comparison to control group. Sinus node dysfunction leads to significant reduction of Turbulence Onset, diabetes mellitus related neuropathy significantly diminishes Turbulence Slope, whereas surgical denervation after orthotopic heart transplantation attenuates both HRT parameters. **Conclusion:** 1. Different clinical circumstances may affect the value of Heart Rate Turbulence parameters. 2. Influence of sinus node dysfunction or diabetic neuropathy should be considered during Heart Rate Turbulence analysis as a prognostic factor in post-MI patients.

**P207**

## Visit-to-visit variability in heart rate as a predictor of stroke and coronary events in stable CHD patients: results from the TNT trial

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**Introduction:** Heart rate (HR) is a powerful predictor for cardiovascular events (CVE). Recently, visit-to-visit variability in blood pressure (BP) has been shown to provide prognostic information regarding risk of CVE. Whether visit-to-visit variability in HR provides similar independent predictive value is not known. **Objectives:** This analysis of data in the TNT trial aimed to assess whether visit-to-visit variability in HR is a predictor of stroke and coronary events in the large cohort of CHD patients receiving atorvastatin 10 mg or atorvastatin 80 mg. **Methods:** In the TNT trial, mean HR data during follow-up visits from 1 year onwards was available for 9334 subjects. These data were analyzed to determine the risk of stroke and coronary events in relation to visit-to-visit variability in HR, expressed as standard deviation (SD), coefficient of variation (CV), variation in mean (VIM), and average successive variability (ASV), independent of mean baseline HR. **Results:** When analyzed as a continuous variable, and after adjusting for treatment effect, heart rate variability parameters (SD, CV, VIM, and ASV) were significant predictors for the occurrence of stroke and coronary events (Table). There was no evidence that intensive treatment with atorvastatin 80 mg had an interaction with the predictive value of visit-to-visit variability in HR on occurrence of stroke or coronary events. Partition analysis suggested that incremental increases in visit-to-visit variability in HR predict an increased risk for occurrence of stroke or coronary events.

**Image/graph I:**

***Table: Effect of visit-to-visit HR variability on risk of stroke and coronary events***

| Model | Stroke | | | Coronary Events | | |
|---|---|---|---|---|---|---|
| | Hazard Ratio* (95% CI) | $\chi^2$ | P | Hazard Ratio* (95% CI) | $\chi^2$ | P |
| Rx + SD HR | 1.23 (1.12-1.35) | 19.6 | <0.0001 | 1.23 (1.17-1.29) | 72.1 | <0.0001 |
| Rx + CV HR | 1.23 (1.11-1.36) | 16.5 | <0.0001 | 1.19 (1.13-1.26) | 40.1 | <0.0001 |
| Rx + VIM HR | 1.22 (1.10-1.36) | 14.2 | 0.0002 | 1.16 (1.10-1.23) | 26.9 | <0.0001 |
| Rx + ASV HR | 1.21 (1.10-1.32) | 16.8 | <0.0001 | 1.25 (1.20-1.30) | 107.7 | <0.0001 |

*Hazard Ratio for 1 SD increase of variability in heart rate; SD=Standard deviation; C V=Coefficient of variation; VIM=variability independent of mean; ASV=average successive variability

**Conclusion:** Visit-to-visit variability in HR is a significant predictor of stroke or coronary events. This predictive ability was independent of treatment intensity with atorvastatin, suggesting that visit-to-visit variability in HR is a predictor of CVE, independent of lipid values.

**P208**

## Atypical presentation of myocardial infarction: the Philippine General Hospital experience

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**Introduction:** Myocardial infarction is one of the leading causes of death among Filipinos. Patients with atypical presentation may lead to misdiagnosis or delay in management. At present, local studies on atypical MI, its prevalence, risk factors and outcomes are lacking. This information is important to develop a higher index of suspicion for the disease and subsequently render prompt management. **Objectives:** Primary objective : To determine the proportion of atypical presentation of MI in the Philippine General Hospital. Specific objectives: (1) to identify these atypical symptoms, (2) to compare characteristics of this population from those who presented typically ; (3) to identify risk factors for atypical presentation and (4) to compare inpatient outcomes. **Methods:** We conducted chart review of patients diagnosed with MI during the period of October 2006 to September 2007. Chief complaint, population characteristics and inpatient outcomes were extracted. Logistics regression analysis was employed to elicit association of population characteristics to presentation of MI and outcomes. Bartlett's Test for Variance were used to relate chief complaint with hospital stay. **Results:** We identified 97 patients admitted for MI. Thirty eight percent presented with atypical complaints. dyspnea (62%) was most common followed by epigastric pain (8%) and syncope (8%). Patients

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who presented with typical and atypical symptoms were comparable in age, presence of hypertension, diabetes mellitus, chronic kidney disease, prior CV event, family history of cardiovascular disease and level of low density lipoprotein and triglycerides. Four factors were identified to be significantly associated with atypical presentation namely : female gender (OR 11.54, 95% CI [1.46, 91.48]), presence of heart failure (OR 7.31, 95% CI [1.28, 42.60]), decrease in level of HDL (OR 13.7, 95% CI [1.14, 165]) and duration of smoking history (OR 1.05, 95% CI [1.0, 1.09]). Patients with atypical symptoms had significantly increased risk for mortality (OR 6.9, 95% CI [1.24, 165]) and inhospital complications (OR 5.7, 95% CI [2.15, 16.21] with arrhythmia being most common. Atypical MI patients also tended to have longer hospital stay, however this was not statistically significant. **Conclusion:** A considerable proportion of patients with MI presented atypically and were shown to have poorer outcomes. Female gender, duration of smoking history, presence of heart failure and low HDL are associated with atypical presentation.

**P209**

## Persistent high prevalence of impaired glucose metabolism in patients with severe coronary heart disease or acute myocardial infarction

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**Introduction:** Diabetes is considered a coronary heart disease (CHD) equivalent. Patients of CHD are prone to insulin resistance and diabetes. However, there is still no consensus to recommend patients with severe CHD or acute myocardial infarction (AMI) has to receive standard 75-g oral glucose tolerance test (OGTT). **Objectives:** This study aims to prospective follow-up the determinants of cardiovascular events in patients with severe CHD or AMI. Subclinical diabetes also was evaluated for every participant. **Methods:** Participants should be below 60 years-old and with a formal work before events, and with angiography-documented severe CHD or AMI from National Taiwan University Hospital and will be followed up to evaluate the possible roles of work-related factors and biological factors in cardiovascular events from 2008 through the end of 2011. Controls were recruited from healthy volunteers. **Results:** Until this June, we had recruited 140 patients with AMI, 64 patients with severe CHD s/p coronary artery bypass surgery (CABG), and 130 patients with severe CHD s/p percutaneous occluded balloon angioplasty with stenting (POBAS), 334 subjects in total in patient group. There were 540 subjects recruited in control group. Patients without diabetic history (n=253) received standard oral glucose tolerance test (75g OGTT), there were 22.4%, 34.2% and 22.2% identified as subclinical diabetes after OGTT in AMI, CABG and POBAS groups respectively. In addition, there were 35.7%, 32.7%, and 30% of patients diagnosed as impaired glucose tolerance (IGT) in corresponding patient groups. However, there were only 5.5% of subclinical diabetes and 10% of IGT in healthy controls. Patients with abnormal OGTT in 1st screen test received the second OGTT after 4th month later. The repeated OGTT revealed the similar results either in IGT or in diabetes by WHO definition. **Conclusion:** Patients with severe CHD or AMI should be screened for subclinical diabetes or IGT before hospital discharge. These findings also call for special attention regarding the importance of abnormal glucose metabolism and subclinical diabetes in the pathogenesis and triggering of severe CHD or AMI.

**Reference:**
We thank a grant support (NHRI-EX100–9721PC) from National Health Research Institute of Department of Health, Taiwan.

**P210**

## Influence of chronic kidney disease on clinical presentation, management and outcome in patients with acute coronary syndrome: one-year data from taiwan acute coronary syndrome full spectrum registry

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**Introduction:** Recent studies have shown that chronic kidney disease (CKD) may contribute to the worsening of cardiovascular outcomes in patients with acute coronary syndromes (ACS), and hence might complicate the treatment strategies. **Objectives:** We investigte possible causes for above correlation. **Methods:** We evaluated 2819 ACS patients enrolled in the real life study of Acute Coronary Syndrome Full Spectrum registry (ACS FS Registry), and compared the differences in clinical presentations, management, as well as cardiovascular outcomes (CVO) including death, recurrent myocardial infarction (re-MI) and stroke between patients with or without CKD at 12 months. CKD was defined as an estimated glomerular filtration rate, using the Modification of Diet in Renal Disease Study equation, less than 60 ml/min per 1.73 $m^2$. **Results:** Patients with CKD (n = 949) appeared to be older, had higher Killip class, faster heart rate, higher percentage of ST-segment depression, also with more co-morbidities (hypertension, diabetes, history of coronary artery disease (CAD), coronary artery bypass grafting (CABG), peripheral artery disease, stroke and congestive heart failure) compared with those without CKD (n = 1870). The time from admissions to diagnostic catheterization was recorded longer in CKD patients, who also received less frequent percutaneous coronary intervention (PCI). Patients with CKD received lower percentage of aspirin, clopidogrel, angiotensin-converting enzyme inhibitor and b-blocker during admission, at discharge and at 12 months follow-up. Furthermore, CKD patients experienced longer admission duration, suffered from higher percentage of new-onset cardiogenic shock, acute renal failure, ventricular arrhythmia, re-MI and death during admission, as well as more CVO at 12 months follow-up. After adjustment, CKD subjects were associated with an increased risk of the CVO (odds ratio 2.17, 95% confidence interval, 1.63 to 2.87, p<0.01) as compared with non-CKD subjects. **Conclusion:** Despite having more co-morbidities, patients with CKD were treated less aggressively with fewer guideline-recommended medications being prescribed. This may partly explain the reasons of having poor cardiovascular outcomes at 12 months in ACS patients with CKD.

**P211**

## Erectile dysfunction in coronary heart disease patients: why do we always forget?

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**Introduction:** Erectile dysfunction prevalence is unsurprisingly high in coronary heart disease (CHD), reflecting similar structural and functional vascular abnormalities. **Objectives:** Evaluate the prevalence and clinical predictors of sexual dysfunction in patients enrolled to a cardiac rehabilitation program (CRP) after an acute coronary event. **Methods:** All male patients admitted to an outpatient CRP after suffering an acute coronary event between September 2008 and October 2010. Anxiety and depression were assessed using the Hospital Anxiety and Depression Scale (HADS), functional status by Short Form-36 (SF-36) and erectile function through the 5-Questions International Index of Erectile Function (IIEF). Erectile dysfunction was defined as an IEEF <17. **Results:** One hundred thirty six male patients were evaluated, mean age of [mean (SD): 52.9(8.7)] years. Erectile dysfunction was present in 55 (40.4%) patients. There were clear associations with age (OR 2.03 per 10 year increase; p=0.02), previous history of CHD (OR 3.74; p<0.01), diabetes (OR 3.49; p=0.02), cumulative cigarette smoking (OR 1.22 per 10 pack-year increase; p=0.01), metabolic syndrome (OR 2.12; p=0.05), functional status at admission (SF-36 physical component summary: OR 0.94, p=0.01; peak MET level and peak exercise perception at initial sessions: OR 0.81, p=0.02 and OR 1.94, p=0.04, respectively) and psychosocial profile at admission [HADS-depression≥8: OR 3.50, p<0.01; HADS-anxiety≥8: OR 4.84, p<0.01 and SF-36 mental component summary: OR 0.94, p<0.001]. Multivariate analysis identified age (OR 2.08 per 10 year increase; p=0.003), presence of metabolic syndrome (OR 4.55; p=0.03), previous history of CHD (OR 5.45; p=0.01) and HADS-depression≥8 (OR 5.35; p<0.01) as significant predictors. Erectile dysfunction did not improve at the end of CRP without a targeted approach to this problem [median (interquartile range): 19 (14–23) to 18 (14–23), p=0.823)]. **Conclusion:** The incidence of erectile dysfunction was considerable and this condition was significantly associated with worse cardiovascular and psychological profiles. Patients should be routinely assessed and advised on sexual activity as part of a comprehensive approach to rehabilitation and the identification of higher risk patients can favor a more effective pharmacological and psycho-behavioral intervention in this population setting.

**Reference:**
Circulation 2011; 123 ;98–101. J Urol 2003; 170: S46–S50. Int J Impot Res 1999; 11: 319–26. Eur Urol 2007; 52: 1590–600.

**P212**

## Does left ventricular dysfunction affect the response to cardiac rehabilitation after an acute coronary syndrome?

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**Introduction:** Cardiac rehabilitation has a well known positive impact on physiological and psychosocial status. Early left ventricular dysfunction is often regarded as a criterion for postponing referral. **Objectives:** The purpose of this study was to evaluate the effect of left ventricular function (LVF) on functional capacity (FC) and quality of life perception (QoL) in acute coronary syndrome (ACS) patients undergoing a cardiac rehabilitation program (CRP). **Methods:** We enrolled 184 consecutive patients who completed a phase 2 CRP after an ACS. Functional capacity (FC) was evaluated in metabolic equivalents (METS) achieved during the exercise stress testing. Perception of QoL was estimated through Medical Outcomes Study Short Form 36 (MOS SF-36, physical and mental summary components). Both measurements were assessed at program initiation and completion. Improvement in FC and QoL perception were measured by the difference between final and initial METS and MOS SF-36 values. **Results:** In our population, 91.3% patients were male, mean age was 54±9.3 years. Patients were divided into 4 groups according to LVF: group 1 (71.7%) with preserved function, group 2 (10%) with mild dysfunction, group 3 (16.7%) with moderate dysfunction and group 4 (1.7%) with severe dysfunction. After the CRP, FC improved significantly in all groups: in group 1, from 5.6±1.2 to 9.3±1.8 METS ($p$=0.0001); in group 2, from 5.4±1.1 to 9.3±2.1 METS ($p$=0.0001); in group 3, from 5.2±1.2 to 9.2±2.2 METS ($p$=0.0001) and in group 4, from 5.1±1.2 to 9.3±1.4 METS ($p$=0.019). Regarding QoL, there was an increase in physical summary component perception relevant for all groups ($p$=0.0001) except for severe dysfunction ($p$=0.456). There was also betterment in mental summary component perception in all groups, however it was statistically significant only for the group with preserved function ($p$=0.014). No between-group differences were identified in either initial or final FC, QoL and magnitude of improvement. **Conclusion:** In our population, FC capacity improved significantly and to the same extent in all patients undergoing the CRP, independently of left ventricular function. The gain in terms of QoL was less clear in ventricular dysfunction patients.

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## Effects of regular exercise habit on peak oxygen uptake early after acute ST-elevation myocardial infarction

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**Introduction:** To investigate the relationship between regular exercise habit and peak oxygen uptake ($Vo_{2peak}$) early after acute ST-elevation myocardial infarction (STEMI). **Objectives:** To investigate the relationship between regular exercise habit and peak oxygen uptake ($Vo_{2peak}$) early after acute ST-elevation myocardial infarction (STEMI). **Methods:** We retrospectively reviewed 239 patients who underwent cardiopulmonary exercise testing (CPET) early after STEMI in a single exercise laboratory. Demographic data, presence of concomitant diseases, exercise habits, characteristics of STEMI, echocardiography and angiography findings were evaluated. **Results:** 53.6% of the patients reported to have regular exercise habits before STEMI. There is no significant difference between patients with and without exercise habit in $Vo_{2peak}$ early after STEMI ($P=0.317$). After adjusted by subject demographic features, clinical characteristics and cardiovascular risk factors, regular exercise habit is an independent factor for $Vo_{2peak}$ ($\beta=1.703$, $s=0.692$, $s\beta=0.154$, 95% CI 0.339~3.066, $P=0.015$). Following age-stratification, the significant difference was found between patients with and without exercise habits in $Vo_{2peak}$ only in patients ages 40~49 ($P=0.004$). **Conclusion:** The relationship between regular exercise habit and $Vo_{2peak}$ early after STEMI suggests that exercise capacity of patients with exercise habit will be better than sedentary patients even after STEMI.

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## The value of heart rate variability and turbulence for discriminating the true coronary artery disease from false positive results in patients with ST segment depression without angina during exercise stress testing

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**Introduction:** ST segment depression during exercise stress test without angina causes diagnostic problems especially in non-diabetic patients. Heart rate variability (HRV) and heart rate turbulence (HRT) are used for evaluating changes in cardiac autonomic functions and also both are known to be blunted in coronary artery disease. **Objectives:** The aim of the study is to evaluate the value of HRV and HRT for discriminating the true coronary artery disease from false positive stress test results. **Methods:** Ninety non-diabetic patients who were referred to diagnostic coronary angiography with suspected coronary artery disease because of ST segment depression without angina during exercise stress test were enrolled to the study. Before coronary angiography, 24 hour ambulatory electrocardiogram recordings were taken using Pathfinder Software. **Results:** Patients were divided into 3 groups according to the severity of their coronary lesions (Group 1 normal, group 2 non-obstructive, group 3 obstructive). There were no differences between the groups with regard to age, sex, systolic and diastolic blood pressures, body mass index, fasting glucose, lipid profile, and creatinine clearance. HRV parameters and TS were significantly lower while TO was significantly higher in group 3 than group 1 and group 2 (Table 1). These significances were also seen between group 1 and group 2 (Table 1).According tothe cut-off values calculated using ROC analysis, SDNN≤69.63 msec, TO>0.14%, and TS≤2.78 msec/RR have high diagnostic accuracy for predicting obstructive coronary artery disease.

**Table 1:** HRV and HRT parameters of the study groups

| | Group 1 n=30 | Group 2 n=30 | Group 3 n=30 | *P* value |
|---|---|---|---|---|
| SDNN (msec) | 125±35 | 118±28[a] | 93±34[a] | <0.001 |
| RMSSD (msec) | 37 [26-50] | 27 [19-47] | 23 [18-27][a,b] | 0.001 |
| Total power (msec$^2$) | 3427 [2584-5202] | 2715 [1468-3150] | 2262 [1657-2595][b,c] | 0.002 |
| LF (msec$^2$) | 720 [517-1789] | 381 [102-632] | 346 [295-493][a] | <0.001 |
| HF (msec$^2$) | 264 [147-504] | 134 [44-256] | 83 [48-140][a,b] | <0.001 |
| TO (%) | -3.85±4.24 | -1.25±2.87[c] | 1.89±2.17[d] | <0.001 |
| TS (msec/RR) | 9.25 [4.31-12.25] | 6.02 [3.25-1169] | 2.08 [1.63-2.58][a,e] | <0.001 |

[a]$P<0.001$ vs group 1, [b]$P<0.05$ vs group 2, [c]$P<0.01$ vs group 1, [d]$P=0.001$ vs group 2, [e]$P<0.001$ vs group 2

**Conclusion:** HRV and HRT parameters provide additional information for discriminating the patients who really required coronary angiography in order to reduce unnecessary requests.

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## Correlation between carotid ultrasound and exercise stress test for assessing the subclinical vascular diseases in asymptomatic patients

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**Introduction:** Carotid ultrasound is a useful tool to detect plaque and measure carotid intimal-medial thicknes (CIMT), which help identify asymptomatic patients at risk of cardiovascular events. The role of carotid ultrasound in stratifying risk in asymptomatic patients has not been studied. **Objectives:** The relationship between carotid pathology and exercise stress test(EST) in patients with new onset symptoms for cardiovascular disease(CVD)as predictor for cardiovascular events. **Methods:** EST and echocardiography exams were performed in 503 patients(mean age54±17,5y,men64%) with typical and untypical symptoms for CVD, and without previously history for CVD in two cardiological centers. After EST patients were classified in three groups-with positive,negative and questionable results.Color duplex sonography of rigth and left carotid arteries and CIMT of the common carotid(CCA) was measured. No modifiable (age and sex) and some modifiable(hypertension,diabetes,atrial fibrillation,dyslipidemia,carotid artery stenosis,obesity),FR for CVD were evaluated.The patients with positive EST were on PTCA undergone.The patients with questionable EST,the decision for PTCA was taken after severity of carotid pathology and clinical exam **Results:** AH was the most common RF in all groups 75 %,dyslipidemia 64 %,diabetes 28 %.A symmetrical hypertrophy of the LV and a decrease of its contractility,as E/E''>15 was found as typical diastolic dysfunction.Mild stenosis of ICA(35%)predominated in all groups while moderate(36–55%)or severe(>60%)carotid stenoses were relatively rare,especially with positive EST.Symptomatic thromboses ofICA were seen in4,5 %pts with positive EST.IMT correlated positively with the arterial blood pressure($r=+0.60$,$p<0.05$).A positive corelation was established between CCA, diastolic blood flow and EF in all groups ($r=0.45$;$p<0.01$). In group with postive EST(32%) were found significant carotid disease(28%)and significant coronary anatomy.The multivariable analysis confirms that AH,positive EST and questionable EST correlated very fair with moderate and mild carotid pathology and significant coronary diseases in pts with positive EST($p<0.001$).There were fewer subjects with signifcant plaques in lower risk group(2%)and more subjects with plaques in the high risk group(60%). **Conclusion:** The study confirms clinical impact of carotid pathology alone or its association with other RF is under consideration.Noninvasive carotid sonography in patients with CVD is sensitive method for assessment of coronary pathology.

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## Exercise induced prominent anterior qrs force is a reliable sign of left anterior descending coronary artery disease

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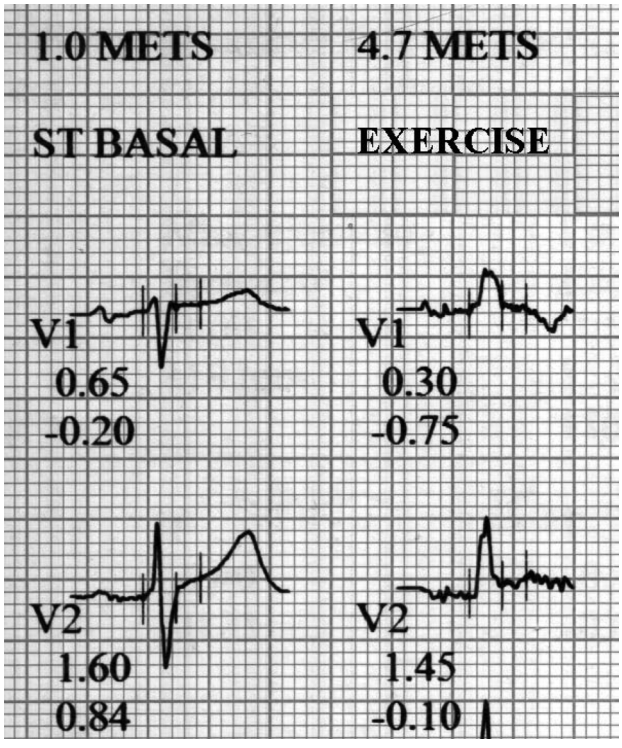
**Introduction:** Prominent anterior QRS force (PAF), defined as tall R waves in the right or middle precordial leads, can be the expression of left septal fascicular block. Some rare cases of intermittent PAF during acute ischemia involving the septum have been published. **Objectives:** We report a single center series of patients with transient, exercise induced PAF. **Methods:** In 6000 treadmill exercises tests, we found 6 patients (5 males, 1 female, mean age 63.5 years, range 56–86 years) that developed PAF during a diagnostic exercise test. The 6 patients reported angina during the test. A mean workload of 7 METS was attained (range 4,4–11 METS). In 2 cases, there was slight anterior ST elevation, in one case there was diagnostic ST depression in V5-V6, and in the remaining 3 cases there were not ST changes during the exercise. **Results:** All patients underwent coronariography, and a single lesion in the left anterior descending coronary artery was found (mean severity 88,2 %, range 80–100, located proximally in 3 cases). Stenting was successfully performed in all patients. After the revascularization procedure a control exercise test showed no abnormalities.
**Image/graph I:**

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**Conclusion:** In conclusion, exercise induced PAF is infrequent (0.1 % of exercise tests), and is a reliable electrocardiographic marker of significant LAD disease.

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## To explore the ischemic burden induced by isometric contraction for evoking maximal intrinsic femoral artery collateral circulation

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**Introduction:** Physiological ischemia training has the possibility of being a new, safe way to treat□"with peripheral arterial disease effectively. Nevertheless, the best intensity and duration of physiological ischemic training on the formation of femoral collateral circulation has not been well clarified. **Objectives:** To explore the ischemic burden induced by isometric contraction for evoking maximal intrinsic femoral artery collateral circulation. **Methods:** 52 adult New Zealand rabbits weighing 2.1–2.3 kg were subjected to a model of isometric contraction-induced ischemia. An electrode was implanted in the sciatic nerve of the left hind limb for evoking isometric contraction of the gastrocnemius, which blocked local blood flow and induced local ischemia□ΔFemoral artery collateral blood flow (FCBF) was measured using a microsphere technique. **Results:** Local blood flow was the lowest at 40□"of the maximal isometric contraction (IEmax), and reached plateau at 60□"of IEmax. FCBF increased gradually and reached a plateau at 40□"of IEmax in the 4th min. After 4 minutes at 40□"of IEmax□FCBF had increased to higher than pre-stimulus, peaking in the 2nd minute, and then decreasing gradually to baseline at the 5th minute after reperfusion. It ceased to increase when reperfusion was prolonged to 8 or 10 min. FCBF were significantly higher in the 4 wk group compared to the 2 wk group at the end of experiment. There was no significant difference among 4 wk, 6 wk, and 8 wk groups. **Conclusion:** The data suggests that the minimal ischemic burden for full obstruction of the femoral artery is 40□"of IEmax□and the shortest stimulus duration is 4 min. The maximal FCBF opening duration is no more than 5 min. The fully of promoting the formation of collateral circulation after artery occlusion requires at least 4 weeks.

**P219**

## Influence of heart rate pattern during exercise treadmill test on prognosis of functional status in patients with acute myocardial infarction treated with primary PCI

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**Introduction:** Heart Rate pattern during exercise treadmill seems to be related to clinical outcome in patients after myocardial infarction. **Objectives:** The aim of study was analysis of value of HR measured during exercise test in prediction of left ventricle function and exercise capacity in patients with acute myocardial infarction (AMI) treated with primary PCI. **Methods:** We observed 74 pts, (47 man, 27 woman) aged 37–76 yrs (mean age 56,8) with first AMI treated with primary PCI. All pts underwent echocardiography examination with evaluation of LV function (LVEF) and serum level of NTproBNP measurement at 3rd day, 1st and 3rd month after AMI. Cardio-pulmonary exercise test with evaluation of VO2 max consumption (VO2max), anaerobic threshold (AT) and VE/VCO2 curve slope (VE/VCO2) was performed at 1st month of follow-up. During this test the following parameters of HR were evaluated: rest and peak HR, HR and HR decrease (compared to peak HR) at 1st (HR1'; dHR1') and 3rd (HR3'; dHR3') minute of recovery were evaluated and compared with values of LVEF, VO2max, AT, VE/VCO2 and NTproBNP levels. **Results:** Mean values of LVEF was 51,9% (31–65%) at 3rd day and 53,7% (32–66%) at 3rd month. Values of: Vo2max ranged from 7,4–32,1 ml/min/kg b.w. (x-22,1); AT–0,6–1,5 (x-1,0) and VE/VCO2 ranged between 18,4 and 39,1 (x-25,9). Mean level of NTproBNP was 1765,2 at 3rd day, 421,3 at 1st month and 535,8 pg/ml at 3rd month of follow-up. The significant negative correlation between VO2max and HR1' (-0,53, $p<0,01$), HR3'(-0,50, $p<0,02$) and dHR1'(-0,64,$p<0,01$) were found. Positive significant correlation was found between LVEF at 3rd month and dHR1' (0,42, $p<0,02$) and dHR3' (0,33, $p<0,02$). NTproBNP levels (both - 1st and 3rd month of follow-up) also correlate with HR1' (0,58 and 0,54; $p<0,03$), HR3' (0,56 and 0,48; $p<0,02$), dHR1' (0,48 and 0,41; $p<0,03$) and dHR3' (0,33 and 0,41; $p<0,04$). **Conclusion:** 1. Values of HR as well as HR decrease at 1st and 3rd minute of recovery after exercise test in patients after myocardial infarction treated with primary PCI correlate with values of parameters describing functional status of the heart like left ventricle ejection fraction, maximal O2 consumption and NTproBNP level. 2. Value of HR and HR decrease at 1st and 3rd minute of recovery after exercise test seems to be a useful prognostic method in patients after myocardial infarction treated with primary PCI

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## A significant association exists between coronary ischemia and carotid stenosis

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**Introduction:** Although there are several studies that show correlation between carotid disease and coronary artery disease, there are some that indicate no relationship. **Objectives:** There is paucity of data regarding association between coronary ischemia and carotid stenosis, so the purpose of our study was to further investigate this association. **Methods:** We analyzed 335 patients in a cardiology clinic who had stress myocardial perfusion (SMP) test and carotid duplex within six months of each other from 2005 through July,2011. Perfusion studies were done using 99 sestamibi or PET scan and extent of carotid disease was evaluated by duplex sonography. Carotid stenosis was defined as $\geq$ 50% stenosis in either left or right carotid artery. Coronary ischemia was characterized by the presence of a perfusion defect in a major coronary vessel. **Results:** The mean age of patients was 73.4 (68% male). Only 28 (8.5%) patients had carotid stenosis and 16 of these 28 (57%) had coronary ischemia. 223 patients did not have coronary ischemia, but 12 (5.5%) of these 223 had carotid stenosis. 16 of 112 patients with coronary ischemia (14.5%) had carotid stenosis.

| | No Coronary Ischemia | Coronary Ischemia | total |
|---|---|---|---|
| No Carotid Stenosis | 211 (63%) | 96 (28.5%) | 307 (91.5%) |
| Carotid Stenosis | 12 (3.5%) | 16 (5%) | 28 (8.5.5%) |
| | 223 (66.5%) | 112 (33.5%) | 335 (100%) |

P-value: 0.011

**Conclusion:** In conclusion, carotid stenosis was more frequent in patients with coronary ischemia and coronary ischemia was more prevalent in patients with carotid stenosis.

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**P222**

## Cardiopulmonary arrest in patients with acute myocardial infarction: is it possible to change the adverse prognosis?

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**Introduction:** In GRACE Registry, patients (P) with acute coronary syndrome (ACS), had a rate of ventricular fibrillation (VF) or pulseless ventricular tachycardia (VT) of 6,9% and in-hospital mortality of 52%. **Objectives:** The purpose of this study was to evaluate the in-hospital mortality in a Cardiology Department (CD) and its predictors in P admitted with acute myocardial infarction (AMI) and cardiac arrest (PCR) by VF/VT. **Methods:** We conducted a retrospective, descriptive and correlational study, encompassing 3232 P with MI hospitalized in a CD, between January 2004 and September 2010, of which 46 P (1.4%) had PCR for VF/VT. We evaluated the following parameters: demographics data, place of PCR, direct admission into CD (with emergency department bypass–EDB), left ventricular function (LV) (good>50%, fair 30–50%, poor <30%), coronary angiography on admission, realization of angioplasty, complications and in-hospital mortality. For statistical analysis we used SPSS 13.0. **Results:** Of the 46 P, the PCR was witnessed in 44 P (96%) and occurred in the pre-hospital in 30 P (65%). Thirty two P (70%) were admitted by EDB. Forty P (87%) had ST elevation MI (STEMI),in 23 P (58%) were located in the anterior wall. Cardiac catheterization was performed on admission in 37 P (80%) and angioplasty with implantation of stent was performed in 35 P (76%). During hospitalization, 26 P (57%) were under mechanical ventilation, 7 P (15%) had neurological sequelae, 4 P (9%) had major bleeding and 2 P (4%) had a reinfarction. The in-hospital mortality was 26% (12 P). The factors that significantly increased mortality were: PCR not witnessed (100% vs 18.2%, $p = 0.006$), "non-admission by EDB" (42.9% vs 12.5%, $p = 0.022$), Killip class IV at admission (42.9% vs 12.5%, $p = 0.022$), poor LV function (67% vs 19% vs 9%, $p = 0.008$), anterior wall STEMI (34.8% vs 8, 7%, $p = 0.032$) and no stent implantation (45.5% vs 14.3%, $p = 0.029$). However, only the PCR not witnessed was an independent predictor of in-hospital mortality ($p = 0.042$). **Conclusion:** 1 - The in-hospital mortality was relatively low when compared with the GRACE Registry. 2 - Most cases of PCR by VF/VT in P with MI occurred in the pre-hospital. However, most PCR were witnessed allowing to change the adverse prognosis. 3 - It is foreseeable that policies on population education and the massification of automated external defibrillators programs, with early defibrillation, can significantly improve the prognosis.

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## Quality of chest compressions performed during one and two minutes by medical students

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**Introduction:** In order to perform an efficient CPR, it is very important to pay attention to the frequency of the thrusts and the depth of the movement being made into the chest. **Objectives:** The main objective was to compare the quality of chest compressions performed during one

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and two minutes. **Methods:** We trained 48 first year medical students through the "Family and Friends CPR Anytime" course. Next, a minute of continuous compressions on the Resusci Anne training mannequin with PC Skillreporting system, were performed. After one week, two minutes of continuous chest compressions were performed on the same mannequin. **Results:** The mean age was 20,94 ±3.51 years, the mean body mass index was 25.7 ±4.7 kg/m$^2$ and 25 students (55%) were of male gender. Comparing the compressions performed during one and two minutes, respectively: the average rate of compressions per minute were (116 vs. 123, p=0.011), the average of incomplete release (5% vs. 19%, p<0.001), the average of duty cycle (47% vs. 49%, p=0.034), percentage of compressions with no error (54% vs. 38%, p=0.014), with appropriate depth (57% vs. 48%, p=0.037) and the average depth (48mm vs. 45mm, p=0.034) show significant differences. The only parameter evaluated that showed no significant difference was the percentage of compressions with correct hand position, 93% vs. 86%, respectively (p=0.35). **Conclusion:** The results of the study show significant differences in important parameters of chest compressions and reveal better quality when performed during one minute rather than two minutes. This corroborates that it would be better to change the rescuer even before the two minute mark has elapsed. Furthermore, the main parameter that needs improvement would be the depth of compressions, reinforcing the need of devices which measure the depth of chest compressions during CPR maneuvers.

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## Evaluation of knowledge levels in basic life support of the students from last year of medicine graduation

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**Introduction:** Due to high rates of cardiac arrest in countries like USA, Canada and Brazil, it is very important that students in the health field know the Basic Life Support (BLS), especially medical students. **Objectives:** The main objective wasevaluated if medical students, of the last year of medicine graduation of Brazil, would be able to pass the practical test of the course of the American Heart Association BLS. **Methods:** We studied 136 medical students in the last year of medicine graduation. The assessment of knowledge levels of BLS was performed by an experienced instructor with the check-list of the BLS Test of AHA according to the 2005 Guidelines of Cardiopulmonary Resuscitation by AHA. Skills were realized on a BLS manikin. **Results:** The mean age was 24.4 ±1.8 years, 68% were male. Five students had the BLS course certificate by AHA. It was observed that all of the participants did not accomplish, at least, one of the evaluation requirements. According to the criteria of the Test BLS: 94% checked for response, 68% told someone to phone emergency response number and 86% got an AED, 70% opened correctly the airway, 55% checked for no breathing, 45% gave two breaths, 71% evaluated carotid pulse, 64% delivered first cycle of compressions at correct rate, 52% gave two breaths, 46% delivered second cycle of compressions at correct hand position, 56% gave two breaths. Concerning the AED use, 36% turned AED on, 74% selected proper AED pads and places correctly, 40% cleared victim to analyze, 69% cleared victim to shock, 95% restarted chest compressions, 83% keptpads on the chestof the manikin. **Conclusion:** The results showed that an unsatisfactory level of knowledge in BLS is presented in the final year of medicine graduation, and suggests that the BLS course should be part of the curriculum of medical schools.

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## Knowledge level in general population about sudden death and adult basics cardiovascular life support

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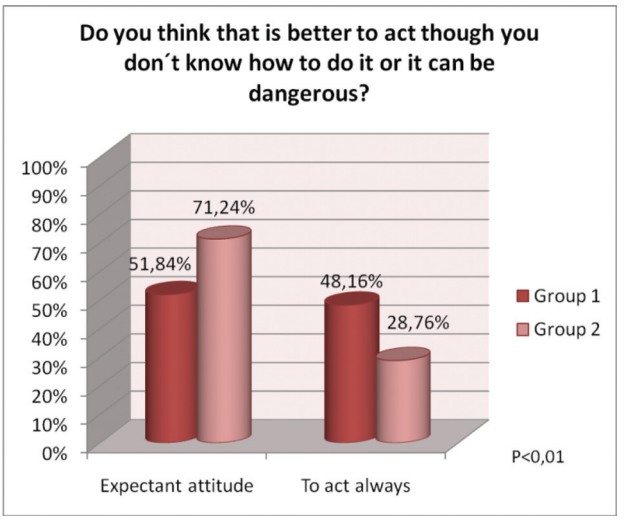
**Introduction:** Sudden death (SD) is an important cause of death in the general population. Early practice of basic life support (BLS) maneuvers increases the probability of survival after a cardiac arrest. People who attend a SD should be able to recognize it quickly and initiate BLS as soon as possible. However, limited knowledge of the population in this area involve a lower likelihood of recovering the victim. **Objectives:** To evaluate in a general population with Internet access, the knowledge about the importance of rapidly identifying a SD and initiating BLS maneuvers. **Methods:** We designed an on-line questionnaire with ten simple multiple choice questions. The results were analyzed using the statistical program SPPS 10.0 **Results:** A total of 2573 individuals were included: 55% were between 20 and 30 years old, 49 % had university studies non-related to the health field, 47% recognized having received specific formation in BLS and 50% affirmed to be able to perform BLS maneuvers. Most of the polled ones defined correctly the SD and identified adequately the subjects of major risk, 72% would telephone the emergency health system as a first step while 59% would remained expectant. We compare the results of the polled ones with university sanitary studies or who had been formed in BLS (group 1) with the rest of the population (group 2)(figure): 82 % of the group 1 claimed to be able to perform BLS maneuvers for only 23% in group 2. Nevertheless, 47% of people in group 1 would not act if they were attending a SD, increasing this percentage to 67% in group 2.

**Image/graph I:**




**Conclusion:** Most of the polled population can recognize a cardiac arrest and are aware about the importance of performing BLS maneuvers. Nevertheless the majority of polled ones can not act properly in the case of a cardiac arrest. It would be of great importance to implement specific training in cardiopulmonary resuscitation aimed at the general population.

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## Hungarian myocardial infarction Register

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**Introduction:** Myocardial infarction (AMI) is the number one public health problem in all industrialized countries. In 1970–1971 a Myocardial Infarction Register (MIR) was conducted in the Hungarian capital. Since 1971 no systematic epidemiological data collection was performed on myocardial infarction. In 2010 a web based Myocardial Infarction Register Pilot Study was started. Twelve hospitals - among them 7 with heart catheterization facility (HCF)–participated in the program and were located in different parts of the country. **Objectives:** The aim of the study was as follows: to collect data on myocardial infarction with and without ST segment elevation (STEMI, NSTEMI), to define the prevalence of primary percutan coronary intervention (pPCI) in patients (pts) with STEMI, to have data on hospital-and long term mortality and on the drugs used at the time of hospital discharge. **Methods:** All participating centers registered pts with hospital diagnosis of AMI using the web based system. A predefined electronic case record form was used containing 69 questions on previous medical history, prehospital and hospital data of the index disease including the different time intervals before pPCI. Continuous effort was made to increase the number of participating centers and the number of registered pts to have a representative data set. **Results:** Between 1st of January 2010 and 15st August 2011 5882 pts were registered from 32 hospitals. Among the 5882 registered pts there were 3140 STEMI (53.4%) and 2423 NSTEMI (41,2%) cases. 183 pts (3%) were treated because of unstable angina; data were missing in 2.3 %. Among the 3140 STEMI pts 2715 (86.7%) were treated in a hospital with HCF - 49% of them were admitted directly to these departments. Table 1 contains the main characteristics of the two patient groups:

Table 1.

| | Number of patients | Mean age (+/-SD) years | CA was performed (%) | PCI/pPCI was performed (%) | Hospital mortality (%) |
|---|---|---|---|---|---|
| STEMI | 3140 | 62.3 +/-14.1 | 82.3% | 76.9% | 5.4% |
| NSTEMI | 2423 | 68.2 +/-13.4 | 69.8% | 51.5% | 5.7% |

CA:coronary arteriography; PCI: percutan coronary intervention; pPCI: primer percutan coronary intervention.
In the STEMI pts group the median time between the onset of pain and balloon inflation was 3 hours and 35 minutes.

**Conclusion:** The web based MIR is a reliable and necessary method to follow patient care with AMI and participating in this program is recommended to all hospitals caring for pts with AMI.

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## Biochemical score for risk stratification of acute coronary syndrome

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**Introduction:** There are many causes of myocardial ischemia, but certainly the most common the is coronary artery atherosclerosis. On the basis of a clinical and electrocardiogram suspicion the use of cardiac biomarkers in the diagnosis and monitoring of acute coronary syndrome (ACS) can direct a good clinical approach. And also the biochemical tests could achieve a specified capacity to improve the diagnosis, with high positive predictive value (PPV). **Objectives:** Improve a sensitive and specific biochemical score for risk stratification of the acute coronary syndrome. **Methods:** We studied 576 patients whom attended our emergency unit and remain hospitalized, with suspected ACS and also meet the inclusion criteria for our study. We obtain a blood sample at the time of hospitalization for determining 27 biochemical parameters of various metabolic processes involved in ACS(inflamación, necrosis, risk factors, coagulation, ischemia). With these data, we performed an statical multivariable analysis to obtain a formula that included parameters for the different processes. We check the validity of this formula in a population of 103 patients with the same inclusion criteria that previous population. **Results:** Among the 27 biochemical parameters for the diagnosis of ACS the validation shows a PPV with: AST, CK, cTnI, D-dimer, myoglobin, microalbuminuria a risk factor for hypertension. With these markers we create the following formula: SCORE = 3 * Hypercholesterolemia + 7 *HTA + 6 * cTnI + 7 * Hemoglobin A1c +12* Creatinine + 4* myoglobin + 6* Ddimero. Once obtained the results we use the ROC curve to demonstrate the statistical validation formula, and then we applied this formula to the new population of 103 patients,with same inclusion criteria and the analysis shows an area under the curve very valid (close to 1). **Conclusion:** Because there is not an ideal biochemical marker that meets sensitivity and specificity. The combination of several metabolic processes related to the ACS, reachesgreater PPV for the diagnosis of ACS. It may be useful in clinical practice to improve the prognosis in these patients.

**Reference:**

Hamm CW, Katus HA. New biochemical markers for myocardial cell injury. Curr Opin Cardiol. 1995;10:355–60

P230

## Sudden coronary death in average russian population

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**Introduction:** Cardiovascular diseases are the leading cause of mortality in Russia. At the same time the cardiovascular mortality structure requires specification. **Objectives:** The aim of our study was to describe the prevalence of sudden coronary death (SCD) in typical Russian population. **Methods:** The present study was performed in 285 736 population (76.4% of them ≥18 years) during 6–12 months in three Russian regions. We retrospectively analyzed all death cases for sudden cardiac death criteria of European Society of Cardiology (in 1 hour since symptoms onset). SCD was diagnosed in cases of proved coronary aetiology of sudden cardiac death. **Results:** SCD prevalence amounted 156 per 100 000 in male population (73.8% of Acute Coronary Heart Disease (CHD) mortality in males) and 72 per 100 000 in female population (in 2.2 times less, then in males, $p<0.001$; 64.7% of Acute CHD mortality in females). The SCD maximum in male population was keeping in three decades of man life (figure-of-plateau)–from 50 to 79 years old (38–40 SCD cases in each of these decades per 100 000 male population). In females we revealed the chisel-like peak of SCD in 70–79-years-old group (35 SCD cases per 100 000 female population). The age-related Acute CHD mortality graphs in males and females had the same character (with the plateau in male 50–79-years-old groups and the peak in female 70–79-years-old group). **Conclusion:** SCD is the main reason of Acute CHD mortality in Russian population, so SCD prevention should be one of the primary strategies for demographic situation improvement in Russia. The 50–79-years-old males and 70–79-years-old females have the greatest risk of SCD.

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## Predictors of CRUSADE bleeding risk in patients with acute coronary syndromes without ST-segment elevation

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**Introduction:** In recent years, aggressive treatment strategy in patients (P) with acute coronary syndrome without ST segment elevation (NSTEMI) has been accompanied by an increased bleeding risk. **Objectives:** The purpose of this study was to evaluate the risk of major bleeding, according to CRUSADE criteria, and their predictors in P admitted with NSTEMI in a Cardiology Department (CD). **Methods:** We conducted a retrospective, descriptive and correlational study, encompassing 703 P with NSTEMI admitted in a CD from January 2008 to September 2010. We evaluated baseline characteristics, data on admission, therapeutic strategy, vascular access, the rate of major bleeding and its predictors. For statistical analysis we used SPSS 13.0. **Results:** The median CRUSADE score was 30 (19–45) points. 31% of P were in classes of high risk and very high risk of bleeding. The rate of major bleeding (4,6% vs 9,4%, $p<0,001$) was lower than in the CRUSADE Registry. The bleeding risk was higher in P with cardiac catheterization by femoral artery (9,5% vs 3,6%, $p = 0,009$), in P with hematocrit (HCT) <36% at admission (9% vs 3,4%, $p = 0,003$), in P with heart failure (HF) on admission (10,5% vs 3,6%, $p=0,002$) and in female P (7,4% vs 3,4%, $p = 0,018$). There was no statistically significant difference in P who underwent ≥ 2 anti-thrombotic ($p = 0,245$), who did glycoprotein IIb/IIIa inhibitors ($p = 0,819$) or underwent cardiac catheterization ($p = 0,937$). Were identified as independent predictors of bleeding risk, HF on admission ($p = 0,021$), female gender ($p = 0,027$), the HCT <36% (0,014) and femoral artery access ($p = 0.026$). **Conclusion:** 1 - The use of more aggressive anti-thrombotic therapeutic strategies was not associated with increased hemorrhagic risk. 2 - The rate of major bleeding was lower than that in Crusade Registry. 3–The female gender, the HCT <36%, HF at admission and the femoral artery acess were independent predictors of bleeding risk.

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## Early prediction of acute kidney injury in patients with acute myocardial injury

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**Introduction:** Previous studies have revealed acute myocardial infarction (AMI) with acute kidney injury (AKI), about 17%, is strongly related to long-term mortality and heart failure. The dynamic changes in renal function during acute myocardial infarction are strongly related to long-term mortality and heart failure. **Objectives:** Our study used clinical parameters and AKI biomarkers, including NGAL, IL-6, IL-18 and cystatin C, to evaluate prognostic relevance of AKI in the setting of AMI. **Methods:** This prospective study was conducted from November 2009 to January 2011 and enrolled sequential 96 catheter-proved AMI patients; it was approved by the Institutional Regulation Board of Chang Gung Memorial Hospital, Taiwan (IRB 99–0140B), and conformed to the tenets of the Declaration of Helsinki. The definition of AKI is the elevation of serum creatinine of more than 0.3mg/dl within 72 hours. **Results:** Our results show the incidence of AKI after AMI is 17.7% (17 patients). The following could be statistically related AKI after AMI: NGAL ($P=0.005$), IL-6 ($P=0.01$), IL-18 ($P=0.002$), and Cystatin C ($P=0.002$) in serum, age ($P=0.012$), and cardiac functions (Killip stage and echocardiogram; $P=0.003$ each). An age older than 62 years, serum cystine C of more than 1362 mg/L, or cardiac ejection fraction less than 42.5% could be used to predict AKI (both overall correctness = 0.77). Moreover, IL-6 in serum is also associated with the major cardiovascular events after AMI ($P=0.02$) in our study. **Conclusion:** In conclusion, advanced age, impaired systolic function and severity of the AMI are clinical factors relating to AKI; and the plasma NGAL, IL-6, IL-18 and CysC can be used to predict AKI. Older patients, high CysC, or low EF are in the highest risk group for AKI. Moreover, IL-6 can also be used as a 30-day MACE indicator after AMI. A larger prospective and longitudinal study should follow the relationship between AKI after AMI.

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## Tissue Doppler and strain analysis of patients undergoing PCI for acute myocardial infarction with cardiogenic shock

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**Introduction:** Tissue Doppler and strain Analysis can give a guide for recovery of Myocardial function in patients after Acute Myocardial function. **Objectives:** This study aims at studying the Correlation between Tissue Doppler parameters and Short term Clinical Course in Sick patients with Acute Myocardial Infarction **Methods:** We analyzed 40 Patients before and after PCI for Anterior Myocardial Infarction with cardiogenic shock or Heart failure(Killip 3 or 4) with Tissue Doppler and strain imaging using a Philips IE33 system. There were 28 males and 12 females in the group. Age range 31–78 yrs. 14 patients were in Cardiogenic shock at admission and 28 in Left ventricular failure. 30 had Anterior MI with LAD occlusion and 10 with Inferior or Lateral MI. All patients were taken up for Urgent PCI with Stent implant within 2 hours of admission. Tissue Doppler Echo was done At admission and 12 hours, 24 hours, 36 hours and 72 hours and 96 hrs after PCI. The PCI was successful with TIMI 3 flow in 98 % of cases. 35 cases required IABP support The mortality at 72 hours was 32 % (13 out of 40 cases). 50 % of cases remained in LVF at 96 hrs. Patients with Valvular stenosis were excluded from study. Parameters assessed were Global Ejection fraction, Regional Wall motion changes, Valve regurgitation, TVI Based Velocity Gradient with segmental TT plot,, Septal to Lateral wall delay, Regional strain rate Evaluation with CAMM plot and "Bullet " map, Dp/dt measurement using MR jet, e/e' Ratio to assess LA pressures and Myocardial Performance index measurements (Tei Index). Baseline EF was 18–38 % (average 24 %), e.e' Ratios 12–18 (average 15 ), dp/dt 1100–840 (average 980) and Tei index 0.37–0. 66 (average 0.55). Survival at 30 days was 60%. **Results:** Post PCI The patients who were Not in LVF or Low Cardiac output had Significantly improved dp/dt values($p<0.01$), Improved Tei index ($p<0.01$), Improved Global EF ($p<0.01$) and Improved Segmental TVI based TT plots and Strain rate values($p>0.001$). Also all patients who showed recovery from LVF or Shock had improved Tissue Doppler parameters at 36 hrs with No late improvement at 96 hrs. **Conclusion:** Tissue Doppler parameters can be a good guide to assess recovery from PCI after Acute Myocardial infarction (Killip 3 or 4). Early recovery of Tissue Doppler parameters at 36 hrs seem to predict eventual recovery.

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## Incidences of groin complications post arterial sheath removal in compressive vs non compressive methods

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**Introduction:** Groin complications following removal of femoral arterial sheaths are well recognised. Traditionally, post puncture is managed with 15 minutes of groin compression with strapping and sand bag for 6 hours. **Objectives:** Compared two techniques, aims to identify whether extra strapping and sand bag compression (**Traditional method**) used to achieve haemostasis, vs simple dressing alone **without** strapping and sand bag compression (**New method**), with or without coronary stent placement, made any difference in groin complica-

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tions. **Methods:** Randomised prospective trial involving 145 participants. 22.8% (n = 33) were unable to be included as a result of the absence of data on the Coronary Angiogram Groin Management Form. Only **single** puncture access with either 6F or 7F sized sheaths were included in the study. 112 participants' data were randomly assigned to New Method (n=56) and Traditional Method (n=56). Participants' groins were observed, prior to discharge for evidence of complications including immediate and late bleeding, haematoma formation, backache, urinary retention and pseudoaneurysm. 6 F sized catheters were used in 80 participants (84.2%) and 7F in 6 participants (6.3%). **Results:** There were 2 cases (3.6%) of **immediate** bleeding in the New Method arm and none in the Traditional Method arm (p value 0.154). 2 cases (3.6%) of **late** bleeding occurred in the New Method arm vs 1 case (1.8%) in the Traditional Method arm (p value 0.558). Both immediate and late bleeding were statistically insignificant. **Superficia**l haematoma occurred in 5 cases (8.9%) of New Method arm and in 12 cases (21.4%) of Traditional Method arm (p value 0.112). **Deep** haematoma were noted in 2 cases in each arm respectively (p value 1). 1 case of **pseudoaneurysm** was reported in the traditional method arm (p value 0.315). There were no statistical significance in all the above outcomes. 1 incident of **backache** in the New Method arm (1.8%) compared with 4 in the Traditional Method arm (7.1%) (p value 0.170). **Urinary retention** requiring CBD ocurred in the Traditional Method arm, 4 cases (7.1%) and none in the New Method arm (p value 0.118). This was statiscally not **significan**t. **Conclusion:** Traditional Method is **not** superior to New Method. Both methods have similar incidences of groin complications of bleeding. No significant differences between the two arms. The Traditional Method arm had slightly more incidences of backache and urinary retention was only noted in the traditional method arm which was not significant (p value 0.118).

**P235**

## Tako-tsubo cardiomyopathy: a review of 5 years in a high volume PCI referral center

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**Introduction:** Presentation of Tako-tsubo cardiomyopathy mimics acute myocardial infarction. Although the exact pathophysiological mechanism is unclear, an emotional or physical stressor is often involved. There is a preponderance in post-menopausal women. **Objectives:** to identify baseline characteristics, in-hospital mortality and morbidity. **Methods:** Data were retrieved from our acute coronary syndrome registry. This study group consisted of all patients admitted between 2006 and 2010. Coronary angiograms and clinical data of all patients who did not undergo revascularisation were reviewed. Diagnosis was made according to the Mayo criteria. **Results:** 40 cases of Tako-tsubo cardiomyopathy were identified. Mean age was 65.7 years (SD±12.1). The majority of the patients were females (85 %). Male patients were nearly 11 years younger at presentation. In 60% an emotional of physical trigger was identified. Admission duration averaged 4.3 days (SD±3.2). One patient died in-hospital (2.5%). Morbidity such as total AV block, atrial fibrillation, QT prolongation, TIA, shock, IABP, severe mitral valve regurgitation, LVOT obstruction and left ventricular thrombus occurred in 8 patients (17.5%). On admission the left ventricular ejection fraction was approximately 30–35%, with marked improvement and normalisation in echocardiographic follow-up. **Conclusion:** Tako-tsubo cardiomyopathy is a clinical entity mimicking acute myocardial infarction. Regarding mortality, the syndrome has a relatively favourable outcome. Nevertheless, significant morbidity is seen in our registry. Further studies are necessary to elucidate the etiology and clinical course.

**P236**

## Feasibility of step down unit care in patients with acute ST elevation myocardial infarction who remained in killip class 1 or 2 immediate post successful primary percutaneous intervention

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**Introduction:** With the increasing number of acutely ill patients with heart disease that need intensive monitoring as well as limited resources in Coronary Care Unit (CCU), there is a need to ensure appropriate admission to CCU. **Objectives:** We assess the need of CCU admission for patients with ST elevation myocardial infarction (STEMI) who remained in Killip Class 1 or 2 after undergoing successful primary percutaneous coronary intervention (PPCI). **Methods:** This was a retrospective study over 12 months period. Inclusion criteria including patients presented with STEMI at emergency department and underwent successful PPCI which defined as achieving TIMI 3 flow. Study end point was in-hospital major adverse cardiovascular events (MACE) that include all cause death, cardiac death, target lesion revascularization, recurrent myocardial infarction, stroke or stent thrombosis. Patients on intra-aortic balloon counterpulsation were excluded. **Results:** A total of 275 patients had STEMI and underwent PPCI in year 2008. 239 patients (86.9%) remained in Killip 1 or 2 immediate post PPCI. Mean age was 56.7±11.9 years. Majorities were male (86.2%) and had anterior STEMI (50.2%). PPCI success rate was 99.6%. Average CCU stay, general ward stay and total length of stay (CCU stay and general ward stay) were 1.4 days, 3.5 days and 4.9 days respectively. Event free survival during in-hospital was 98.4%. There were two cardiac deaths (0.8%) in hospital. One patient died of ventricular septal wall rupture and another patient died of probable stent thrombosis. One patient had recurrent myocardial infarction (non STEMI) (0.4%) and another patient had ischemic stroke (0.4%) during index hospitalisation. **Conclusion:** Patients who underwent successful PPCI for STEMI and remained in Killip 1 or 2 immediate post PPCI has low in-hospital MACE (1.6%) and may benefit from observation in step-down unit. This may improve the utilisation of limited resources and result in substantial cost savings.

**P237**

## Review on the need of telemetry monitoring in general ward after transferring out from coronary care unit in STEMI patients who remained in Killip 1 after undergoing successful primary percutaneous intervention

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**Introduction:** With the increasing number of patients with heart diseases requiring telemetry monitoring in general ward after transferred out from Coronary Care Unit (CCU), there is an urgent need to ensure appropriate telemetry allocation in view of limited numbers of telemetry available. **Objectives:** We assess the need of telemetry monitoring in general wards after transferred out from CCU in patients with ST elevation myocardial infarction (STEMI) who remained in Killip Class 1 after undergoing successful primary percutaneous coronary intervention (PPCI). **Methods:** This was a retrospective study over 12-month period. Inclusion criteria including patients presented with STEMI who remained in Killip 1 after undergoing successful PPCI. Study end point was in-hospital occurrence of sustained ventricular tachycardia (>30 seconds) or ventricular fibrillation (VF) post PPCI. Exclusion criteria include patients on intra-aortic balloon counterpulsation (IABP), temporary pacemaker, urgent CABG or unsuccessful PPCI. **Results:** A total of 271 patients had STEMI and underwent PPCI in year 2010. 197 patients (72.7%) patients remained in Killip 1 after PPCI. In the Killip 1 group, mean age was 53.6±11.3 years. Majorities were male (89.8%), smoker (52.3%) and have dyslipidaemia (82.7%). None of the patients developed sustained ventricular tachycardia or VF. 9 patients (4.6%) developed reperfusion arrhythmia (accelerated idioventricular rhythm) post PPCI which were transient in nature and no treatment required. **Conclusion:** STEMI patients who remained in Killip 1 after successful PPCI were not at risk of developing sustained ventricular tachycardia or ventricular fibrillation. They may not require telemetry monitoring in general wards and this may improve utilisation of limited numbers of telemetry.

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## A new 30-day mortality risk score system for patients hospitalized with acute myocardial infarction

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**Introduction:** The mortality of patients hospitalized with acute myocardial infarction(AMI) was high at early stage, but there were no simple risk stratification scoring system predicts risk of 30-day mortality. **Objectives:** To derive and validate a simple scoring system that predicts risk of 30-day mortality in patients hospitalized with AMI. **Methods:** We included 5,524 patients with AMI who hospitalized from January 1, 1993, through December 31, 2009, at Chinese PLA General Hospital in Beijing. Age, sex, comorbidity and in-hospital mortality and complications were examined for patients primarily admitted for AMI. **Results:** The 30-day in-hospital mortality was 9.2% in patients. Cox regression multivariate analysis showed that a history of stroke, the complications, such as cardiac shock, heart failure, ventricular tachycardia/fibrillation, pneumonia, gastrointestinal bleeding and multiple organ dysfunction syndromes, female and age older than 50 years were the only independent predictors of in-hospital mortality. Using the regression coefficient as a benchmark, we calculated a convenient score. In the validation dataset, the 1,677 patients with the lowest scores had a mortality rate of 1.5% and the 1,454 patients with the highest scores had a mortality rate of 24.2%. **Conclusion:** The study illustrates that a history of stroke, the complications, female and age older than 50 years have proved to be a major prognostic marker for immediate poor outcome in the patients with AMI. The score may help to identify patients who are more likely to have a risk of in-hospital mortality within 30-days.

**P239**

## Prevalence of carotid artery disease in candidates undergoing coronary bypass graft seen at madras medical mission

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**Introduction:** Coronary bypass graft(CABG) remains one of the most frequents operation worldwide and patients with co-existence of coronary artery disease and carotid disease are at the risk of developing post-operative stroke. Therefore pre operative non –invasive carotid Doppler ultrasonography, irrespective of cost may still be important. There are few studies in India population that assessed the prevalence of carotid disease in candidate of CABG, hence the need for the study **Objectives:** The study was carried out to determine the prevalence of carotid disease in candidate of CABG and evaluate correlations between carotid artery stenosis and coronary artery disease **Methods:** 73 consecutive patients undergoing elective coronary artery bypass graft between January -July 2007 underwent pre - operative carotid Doppler assessment of level of stenosis and site of the carotid plaque using consensus statements. Significant carotid artery stenosis was diagnosed in patients with greater than 50% lumen diameter narrowing and critical stenosis when equal or greater than 70%. Patients with previous CABG, congestive cardiac failure, and high risk surgery were excluded. **Results:** Mean ±SD age of patients studied was 65.0±7.2 with male-female ratio 9:1. 45(61.1%) patients had carotid artery disease, 4(5.5%) had significant carotid stenosis and 3(4.1%) had critical carotid stenosis. Carotid bulb was the commonest site of plaque formation while left internal carotid artery was the commonest site of both the significant and critical carotid stenosis. Patients with significant carotid artery disease has almost three times the risk of having severe coronary disease(left main disease/triple vessel disease),however it was not statistically

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significant(OR 2.75,p=0.284). **Conclusion:** High prevalence of carotid artery disease in this study underscores the need for routine ultrasonic carotid assessment in candidates of CABG. Early detection and prompt management of carotid disease irrespective of degree stenosis may prevent untoward cerebrovascular events pre- and post CABG. Those with significant and critical carotid stenosis had carotid stents pre -surgery and all the patients had uneventful course in the hospital.

**P240**

## Diabetes does not increase immediate surgical risk in octogenarian patients submitted to coronary artery bypass graft surgery

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**Introduction:** Diabetes is a well known risk factor for early and late adverse outcomes in patients undergoing coronary artery bypass graft surgery (CABG); however, few studies have investigated the influence of this risk factor in the group of older patients, especially octogenarians. **Objectives:** To compare hospitalar mortality and morbidity of diabetic and nondiabetic patients $\geq$ 80 years submitted to CABG. **Methods:** A total of 140 consecutive cases were studied between Jan/2002 and Dec/2007, in a universe of 4,203 CABG procedures performed in the time period (3.3%), being 37 (26.4%) diabetics, in a retrospective cross-sectional study including all patients aged $\geq$ 80 years submitted to isolated/associated CABG. The patients' mean age was 82.5 $\pm$ 2.2 years (range: 80 to 89) and 55.7% were males. In the sample, 72.9% had hypertension, 65.7% severe 3-vessel disease, 32.1% NYHA functional class III/IV and 28.6% severe left main artery disease. From the 140 performed CABG operations, 90 (64.3%) were isolated and 50 (35.7%) associated with other procedures. Aortic valve replacement was the major associated procedure (n = 28; 20%). Comparison between groups was performed by Student's t test for quantitative variables and by chi-square for categorical variables. In situations of low frequency, Fisher exact test was used. Multivariate analysis was performed by logistic regression. The level of significance in all tests was 5%. **Results:** The hospital mortality rate did not significantly differ in multivariate analysis: 16.2% diabetic x 13.6% nondiabetic (p = 0.554), as well as morbidity: 43.2% x 37.9%, respectively (p = 0.533). Regarding operative morbidity, the occurrence of stroke was significantly higher in diabetic patients in the univariate analysis (10.8 x 1.9%, p = 0.042). In multivariate analysis, however, the incidence of stroke was not associated with the presence of diabetes (p = 0.085), but with the presence of atrial fibrillation (p = 0.044). No significant difference in relation to other complications was observed. **Conclusion:** In this small consecutive retrospectively analyzed series, there was no significant increase in hospital mortality and morbidity related to diabetes for CABG in octogenarian patients. Further studies are needed to confirm the low impact of this risk factor in patients at this age group.

**P241**

## Epidemiology, access equity and international risk scores appropriateness in patients undergoing coronary-artery bypass grafting in a developing country

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**Introduction:** In coronary heart disease, the coronary artery bypass grafting (CABG) is used in refractoriness to medical treatment. It remains questions about differences in population epidemiological profile, equity of access and adequacy of international risk scores in developing countries. **Objectives:** To evaluate the epidemiological profile, skin color access equity and appropriateness of the EuroSCORE in CABG in a developing country setting. **Methods:** It was analyzed 1,029 consecutive patients that underwent first CABG. It was consider the preoperative evaluation and the in-hospital outcome (discharge vs. death). Continuous variables were expressed as mean and standard deviation, median and interquartiles range and values. The significance of categorical variables among groups was assessed by chi-square. It was considered significant alpha of 0.05. **Results:** Age 61.2$\pm$10.3 years and 67.3% male. The skin color by self-classification was white 75.8%, 16.5% mulatto and 7.7% black. The expected skin color by National Institute of Geography and Statistic was white 54.3%, 33.8% mulatto and 11.9% black ($p<0.0001$ for observed versus expected). Weight 72.0$\pm$13.6kg, height 1.63$\pm$0.09m, body mass index 26.9$\pm$4.3kg/m2 and body surface area 1.77$\pm$0.19m2. Risk factors: 88.3% hypertension, 66.4% dyslipidemia, 173$\pm$50.2mg/dl serum cholesterol, 50.4% family history, 32.9% diabetes mellitus, 56.6% previous smoking, and 2.82% rheumatic fever history. EuroSCORE 4.91%$\pm$6.81% (quartiles 1.40% and 5.26%). The observed mortality rate (8.89%) was higher than expected (4.91%) ($p<0.0001$). **Conclusion:** Low stature which is related to coronary artery size, and expressive rheumatic fever history may had contributed to higher mortality of the cohort. Better knowledge of risk factors allows the prevention, assists the physician in the decision make and helps the resources allocation. Further studies are needed to adapt the international scores to our population and to know the causes of skin color inequality of access.

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## Management of patients with associated coronary and carotid atherosclerosis

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**Introduction:** Despite the high frequency of combined carotid and coronary atherosclerosis, question about the management of these patients and the sequence of surgery still remains open. **Objectives:** The aim of our study was to determine the optimal treatment strategy for patients with ischemic heart disease (IHD) and significant carotid atherosclerosis. **Methods:** 118 patients with bilateral stenosis of carotid artery 70% or more and symptoms of IHD were included into study. All of them were expected to perform the carotid endarterectomy (CEA). They were divided into two groups: 1 - 82(69%) patients with stable angina Class I-II; 2 - 36(31%) patients with stable angina Class III. Standard examination included carotid arteries ultrasound, Transcranial Doppler, electrocardiography, echocardiography. In addition to the standard examination the stress-echocardiography with transesophageal atrial pacing and coronary angiography were performed to patients of group 2. Perioperatively all patients were treated with statins, acetylsalicylic acid and beta blockers (bisoprolol). The minimal duration of preoperative preparation was 7 days. **Results:** In Group 2 stress-echocardiography was positive with stimulation of 100 per minute in 1 patient, 120 per min in 22 patients, 140 per min in 9 patients. In 5 patients test was not completed due to getting the Venkenbah point at 140 per min. One, two, and three vessel disease and left main stenosis were found in 0, 8(22%), 26(72%) and 2(6%) patients respectively. The indications to CABG were revealed in 31 patients of Group 2. In only one patient with positive test at stimulation 100 per min PCI was performed before CEA. Other patients of group 2 undergoing CEA at the first stage. There were not any myocardial infarctions perioperatively in groups 1 and 2, the transient ischemia was found in 4(5%) and 3(8%) patients, respectively. **Conclusion:** In patients with severe angina and indications for surgical revascularization both coronary and carotid arteries CEA can be performed safely at the first stage. Preoperative medical treatment including at least 3 groups of drugs: beta blockers, statins and antiplatelet agents is obligatory, especially in patients of high cardiac risk. The degree of coronary stenosis is not a determining factor in prediction of cardiac outcomes after CEA. Initial coronary revascularization and coronary angiography before carotid surgery should only be considered in patients with low coronary reserve (positive stress-echocardiography in stimulation 100 per minute).

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## Ankle brachial index as a marker of atherosclerosis in Chinese patients with high cardiovascular risk

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**Introduction:** Peripheral arterial disease (PAD) is an important manifestation of systemic atherosclerosis and is associated with elevated cardiovascular morbidity and mortality. **Objectives:** To obtain reliable data on the epidemiology, co-morbidities and risk factor profile of peripheral arterial disease (PAD), evaluate the clinical significance of the ankle brachial index (ABI) as an indicator of PAD in Chinese patients at high cardiovascular (CV) risk. **Methods:** ABI was measured in 5,646 Chinese patients at high CV risk, and PAD was defined as an ABI $<$0.9 in either leg. Multivariable logistic regression analyses were performed to identify factors associated with PAD. **Results:** A total of 5,263 patients were analyzed, 52.9% male, mean age 67.3 years, mean body mass index (BMI) 24.2 kg/m$^2$, mean systolic/diastolic blood pressure (SBP/DBP) 139/80.7 mmHg. The prevalence of PAD in the total group of patients was 25.4%, and the prevalence was higher in females than in males (27.1% *vs.* 23.9%; odds ratio [OR]: 1.64). Patients with PAD were older than those without PAD (72.3 $\pm$ 9.9 years *vs.* 65.6 $\pm$ 11.7 years; OR: 1.06), and more frequently had diabetes (43.3% *vs.* 31.3%; OR: 2.02), coronary heart disease (CHD) (27.0% *vs.* 18.8%; OR: 1.67), stroke (44.4% *vs.* 28.3%; OR: 1.78), lipid disorders (57.2% *vs.* 50.7%; OR: 1.3) and a smoking habit (42.7% *vs.* 38.6%; OR: 1.52). The ORs for the PAD group compared with the non-PAD group demonstrated that these conditions were inversely related to ABI. Statin, ACEI and antiplatelet agents were only used in 40.5%, 53.6% and 69.1% of PAD patients, respectively. **Conclusion:** The data demonstrated the high prevalence and low treatment of PAD in Chinese patients at high CV risk. A lower ABI was associated with generalized atherosclerosis. Based on these findings, ABI should be a routine measurement in high risk patients. Aggressive medication was required in these patients.

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## Ankle-brachial index as a predictor of all-cause and cardiovascular disease mortality in Chinese patients with high cardiovascular risk

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**Introduction:** Peripheral arterial disease (PAD) is an important manifestation of systemic atherosclerosis and is associated with elevated cardiovascular morbidity and mortality. **Objectives:** to assess the 1-year risk of all-cause and cardiovascular disease (CVD) mortality associated with ankle-brachial index (ABI, as indicator for PAD) in Chinese patients at high CV risk. **Methods:** 3733 patients with high CV risk had bilateral ABI measurements at baseline and were followed up for 1–1.5 years, Low ABI was defined as $<$0.9. Patients were divided to four

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groups: 1) coronary heart disease (CHD); 2) ischemic stroke (IS); 3) diabetes mellitus (DM); 4) very high risk group(VHR). **Results:** A total of 3179 patients were analyzed (52.9% male, mean age 69.3 years.). The prevalence of low ABI was 28.1%. At 1 year, all cause mortality was 8.7%, and 27.6% was attributable to CVD; mortality due to CV events was 4.8% vs 1.5%. After adjusting other risk factors the hazard ratio of low ABI was 1.623 for all-cause mortality and 2.304 for CVD mortality. Similar results were found in four groups. **Conclusion:** ABI is a strong and independent predictor of mortality. Patients with a low ABI have a substantially increased risk of all-cause mortality and CVD mortality.

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## Determination of lower extremity peripheral artery disease: the role for automated oscillometric measurement of ankle brachial index in Nigerians


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**Introduction:** The ankle brachial index (ABI) is the ratio of the systolic blood pressure at the ankle to that at the arm. It is an objective method of screening for the presence of lower extremity peripheral artery disease (LEAD). ABI values $\geq$ 1.0 is normal while values $<$0.90 indicates the presence of LEAD. The gold standard for determination of ABI involves the use of continuous-wave Doppler ultrasound. This method though quite easily performed in the clinic is limited by the time and expertise required to perform the test. Automated oscillometric determination of ABI is an alternative method. **Objectives:** To determine the prevalence of LEAD and compare ABI obtained by automated oscillometric method with that by Doppler ultrasound. **Methods:** This study compared the accuracy of ABI obtained by automated oscillometric method versus that by Doppler among one hundred and fifty three hypertensive patients attending the hypertension clinic of the University of Benin Teaching Hospital, Benin-City. **Results:** Of the 153 patients studied, 64 (41.8%) and 48 (31.4%) had ABI $<$0.9 using hand held Doppler ultrasound and automated oscillometric method respectively, while 39 (25.5%) had LEAD detected by both methods. Assuming the gold standard for diagnosis of LEAD was by Doppler ABI $<$0.9, automated ABI had a sensitivity and specificity of 60.9% and 89.9% respectively. There was a good and positive correlation between ABI obtained by automated oscillometric method and Doppler ultrasound with correlation coefficient of 0.73 and 0.74 for left and right lower limbs respectively ($p<0.001$) **Conclusion:** Automated oscillometric method can be used in determining ABI with accuracy comparable with Doppler ultrasound.

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## Association of serum LDH with aortic dissection, diameter and acuity of presentation in patients with thoracic aortic aneurysm


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**Introduction:** Thoracic aortic aneurysms (TAA), are usually monitored by imaging methods. Clinical characteristics and diameter increase lead to repair. It would be useful to describe a simple, non-invasive method to increase clinical awareness that there are on-going clinical changes in the thoracic aortic aneurysm. Lactate dehydrogenase (LDH) levels are readily available, non-invasive, and empirically have been found to be increased in patients (pts) with TAA. **Objectives:** We sought to evaluate association of elevated serum LDH levels with aortic dissection, increase diameter and acuity of presentation in patients with TAA. **Methods:** We prospectively measured serum LDH levels in patients undergoing elective surgery for thoracic aortic aneurysm. LDH levels were documented on patient's arrival to our hospital and prior to surgery. Clinical, angiographic and imaging variables were recorded. T test analysis was performed for statistical analysis. **Results:** A total of 104 pts with a diagnosis of TAA who were admitted for elective repair were recruited for this study. Of 104, 19 (18%) pts had aortic dissection. All aortic dissection pts showed highly elevated LDH levels compared to pts without aortic dissection (Mean LDH: 251 $\pm$ 142 vs. 205 $\pm$ 122; p value: 0.004). No marked differences in the mean LDH levels were observed among different diameters: diameter $<$50 mm and pts with diameter $\geq$ 50 mm (214 $\pm$ 122 vs. 212 $\pm$ 140; p value: 0.7). There were no significant differences in the mean LDH levels among pts who presented with acute clinical changes and pts who did not present with acute clinical changes (216 $\pm$ 130 vs. 213 $\pm$ 129; p value: 0.25). **Conclusion:** In patients with thoracic aortic aneurysms, LDH levels are associated with aortic dissection. LDH may be a simple, low cost method to increase clinical awareness of aortic dissection in thoracic aortic aneurysms pts.

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## Mortality after carotid artery stenting depends on the presence of coronary artery disease


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**Introduction:** Mortality of patients (P) following carotid artery revascularization depends predominantly on cardiac events rather than neurological events. **Objectives:** The aim of the study was to assess the long-term mortality of P with known coronary artery morphology undergoing carotid artery stenting. **Methods:** In a prospective observational study including 1004 consecutive P undergoing carotid artery stenting, a coronary angiography was performed in a single session unless a recent angiogram (within 3 months) was available. Following the intervention, P were followed prospectively to determine all cause long-term mortality ($>$ 30 days after the intervention). **Results:** Coronary artery disease was present in 68.4% (772 P) including 432 P (43.2%) with and 252 P (25.2%) without current significant ($>$ 70%) stenosis. At a mean follow-up of 35$\pm$29 months, late mortality of all patients was 22.5% (225 p). Mortality was statistically significantly higher in P with coronary artery disease 23.5% (161 P) than in P without (20.3%, 64 P, $p<0.05$). In addition, mortality in P with significant coronary stenoses (27.5%, 119 P) was significantly higher than in P without (16,7%, 42 P, $p<0.005$). Other causes of late mortality, including neurological deaths (1.8 of all P), were distributed equally among all P groups. **Conclusion:** In the long term, outcomes in patients undergoing carotid artery stenting depend on concomitant coronary artery disease rather than on neurological events. Since many patients are asymptomatic, a convinced diagnosis can only be done by routine use of coronary angiography at the time of carotid artery intervention.

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## In-hospital and long-term outcomes of patients with abdominal aortic aneurysm underwent endovascular repair (EVAR)


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**Introduction:** EVAR has gained interest in recent years in order to prevent morbidity and death in patients with abdominal aortic aneurysm, with low rate of complications from procedure. **Objectives:** To analyze the evolution of patients undergoing this treatment at our center. **Methods:** We use the database of patients (pts.)with abdominal aortic aneurysm underwent EVAR and in-hospital variables were recorded. The follow-up was performed using medical records and telephone contact. Statistical analysis was performed using chi-square test or Fisher test; survival was analyzed by Kaplan Meier curves. **Results:** From January 2004 to June 2011, 39 pts. with abdominal aortic aneurysm (AAA) underwent EVAR. Average age was 73 $\pm$ 8 years; the rate of male patients was 93.3%; Hypertension 94.9%; Diabetes mellitus 7.7%; Smoke 28.2%; COPD 23.1%; coronary heart disease 66.7%; Chronic renal faliure 15.4%; Mean aneurysm size was 58.3 $\pm$ 10 mm. The procedure was considered successful in 100% of cases. In two patients (5.2%) was an emergency procedure. Two deaths ocurred during hospitalization (5.2%). Three patients (7.7%) developed renal failure, and three patients had significant bleeding or requiring transfusion. Two patients (5.2%) required reoperation or angioplaty due to kinking of the prosthesis and arterial ischemia. The median hospital stay was 3 days (min 1-max17). Univariate analysis showed that only emergency procedure (p 0.021), renal failure (p 0.024) and reoperation (p 0.004) were associated with hospital detah. The median follow-up was 15 months with a maximum of 65 months and a follow-up rate of 84%. Four deaths were recorded, but only two (6.5%) were cardiovascular. One patient (3.2%) required repair surgery and two patients (6.5%) had acute arterial ischemia that required intervention. Kaplan Meier analysis showed a median survival of 59 months (CI 95% 51.4 - 66.6). After treatment, EVAR successfully prevented rupture-related death in 93.5% at overall follow-up. **Conclusion:** In our center endovascular aneurysm repair is safe, effective and provides lasting protection from AAA-related mortality.

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## Carotid angioplasty and stenting with cerebral protection devices: is really protective?


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**Introduction:** Percutaneus carotid artery stenting (CAS) has the potential of being minimally invasive and safer in patients with high surgical risk than carotid endarterectomy. Althoguh cerebral protection devices (CPD) have been developed, and are widely used to prevent periprocedural cerebral embolization, studies have suggested that CPD may not be effective. **Objectives:** To compare the evolution of patients treated with CAS with and without CPD at our institution. **Methods:** We performed a retrospective analysis from a prospective database of consecutive CAS procedures done in Hemodynamics Department at The Instituto de Cardiología "Juana F. Cabral," Corrientes, Argentina. All CAS procedure were divided into 2 groups, protected (CPD+) and no protected (CPD-) arms, on the basis of the use of the brain protection device. Follow-up was performed by medical records and telephone contact. Statistical analysis was performed by SPSS 18.0 program. **Results:** From July 1997 to June 2011, 162 CAS procedure were performed. Brain protection was used in 124 cases (CPD+), while the remaining 38 cases, this device was not used (CPD-). No significant difference in baseline characteristic were oberved between both groups: Mean age (CPD- 66.9 $\pm$ 7 vs 67.9 $\pm$ 8 years); hypertension (CPD- 84.6% vs CPD+ 85.8% p=0.52); diabetes (CPD- 29.7% vs CPD+

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32.5% p=0.75); previous stroke (CPD- 35.1% vs CPD+ 27.3%); previous transient ischemia (TIA) (CPD- 27.0% vs CDP+ 27.3%); previous myocardial infarction (CPD- 18.9% vs CPD+ 20.0%). CAS procedures CPD- were performed earlier than CPD+, including the very first cases. We found no significant difference in the incidens of perioperative stroke, TIA and death rates between patients treated with or without brain protection: stroke (CPD- 5.3% vs CPD+ 2.4% p=0.38); TIA (CPD- 0% vs CPD+ 1.6% p=1.0), death was no observed in both groups. In the follow-up, the Kaplan Meier analysis showed a median stroke-free survival of 87 months (CI 95% 83.7 - 90.8) and we found no significant difference between both groups (p=0.27). The median of survival was 82.5 months (CI 95% 80.0 - 89.1) and no difference was observed between both groups (p=0.52) **Conclusion:** As recent studies, we observed the lack of protection of CPD used in carotid angioplaty performed at our center. A well-designed multicenter study to determine the value of distal protection in CAS is necesary.

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## Outcomes of carotid artery angioplasty and stenting (CAS) in symptomatic vs asymptomatic patients

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**Introduction:** Asymptomatic carotid stenosis is an independent predictor of vascular death, ischemic stroke and myocardial infarction, predominantly in men with more sever stenosis. However, the endovascular treatment of this patients should have lower risk than the natural evolution to be accepted as an alternative. **Objectives:** To compare the outcomes of CAS procedures performed in asymptomatic vs symptomatic patients. **Methods:** We performed a retrospective analysis from a prospective database of consecutive CAS done at the Instituto de Cardiología "Juana F. Cabral," Corrientes, Argentina. All CAS procedures were divided into 2 groups: symtomatic and asymptomatic patients arm. Patients were considered symptomatic if they had stroke, ipsilateral amaurosis fugax or transient ischemia attack. Follow-up was performed by medical records and telephone contact. Statistical analysis was performed by SPSS 18.0 program. **Results:** July 1997 to June 2011, 162 CAS procedures were performed. 50.6% of CAS procedures were performed in asymptomatic patients (group AS), while the remaining 49.4% were performed in symptomatic patients (group S). Significantly more smokers (AS: 17.5% vs S: 39.0% p= 0.003) and non-significant higher frequency of males (AS: 67.5% vs S: 80.8% p= 0.057) was found in symptomatic group. We found no difference in remaining baseline characteristic: mean age (AS: 67.5 ± 7 vs S: 67.9 ± 8 years p= 0.78), Hypertension (AS: 88.8% vs S: 80.5% p= 0.15), Diabetes (AS: 30.0% vs S: 33.8% p= 0.61), Dyslipidemia (AS: 53.8% vs S: 55.8% p= 0.79), Myocardial infarction (AS: 22.5% vs S: 16.9% p= 0.37). In-hospital outcomes: We found no procedure-related death, Stroke rates was higher (AS: 0.0% vs S: 6.4% p= 0.006) and TIA rates was non-significant higher (AS: 0.0% vs S: 2.6% p= 0.12) in patients with symptomatic carotid disease. In the follow-up, the Kaplan-Meier analysis showed a median stroke or TIA-free survival of 87.2 months (CI 95% 83.7 - 90.8), and we found no significant differences between both groups (p=0.1). The median of survival was 82.5 months (CI95% 80.0–89.1) and no differences were observed between groups (p=0.23). **Conclusion:** CAS performed in asymptomatic patients had lower in-hospital event rate than those performed in symptomatic patients. The abscense of perioperative events in asymptomatic patients, places the CAS as a safe alternative in this setting.

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## Endovascular stenting for palliation in malignant superior vena cava syndrome

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**Introduction:** Superior vena cava obstruction can occur in late or progressive stages of various tumor disease involving the mediastinum. **Objectives:** To assess feasibility, short and long term efficacy and complication rate of interventional therapy, i.e. recanalisation, PTA and stenting of such lesions we analysed 16 consecutive patients with cancer related superior vena cava syndrome. **Methods:** Clinical follow up was performed every 3 months up to 52 months. **Results:** Cancer driven mean survival time after PTA/stenting was 10.2 months (8 days–52 months). Immediate technical success rate and acute clinical success rate was 100%; NYHA class improved from 3.31 (+/-0,60) to 1.8 (+/-0.75). Especially those in class 4 benefited most and improved to class 2. Symptom relief was reached within 24hrs. All patients remained free from restenoses or recurrent superior vena cava syndrome for the entire follow up or for their remaining life span. We did not have any acute or chronic complication (stent migration, penetration, bleeding). Patients were discharged the other day, mainly on aspirin and clopidogrel, in some cases on low molecular heparin or vitamin K antagonists. **Conclusion:** Thus, interventional recanalisation, PTA and stenting of superior vena cava syndrome is technically safe, clinically efficient for rapid and long term symptom relief for palliation in progressive cancer disease representing. It should be considered as first choice treatment.

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## Impact of physical activity, cardiorespiratory fitness and exercise training on inflammation and C-reactive protein (CRP)

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**Introduction:** CRP is a marker of increased risk of coronary heart disease (CHD) and may be a target for intervention. The role of physical activity (PA), cardiorespiratory fitness (CRF) and exercise training (ET) on CRP is controversial. **Objectives:** As part of an Exercise is Medicine (EIM) initiative, we sought to determine the impact of PA, CRF, and formal ET on levels of inflammation and CRP. **Methods:** We reviewed the English-language literature to determine the impact of PA, CRF, and formal ET (both in primary and secondary CHD prevention) on levels of CRP. **Results:** In men and women, a direct relationship between body mass index (BMI) or other assessments of overweight/obesity and CRP were noted. In studies of men, a strong inverse relationship between PA/CRF and CRP was noted. However, in women, the data was mixed, with some studies finding an inverse relationship, whereas others did not. However, in women, fatness was a stronger predictor of CRP that was fitness. In ET studies, some show significant reduction in CRP, whereas others did not. In ET studies in women, significant reductions in CRP were noted only when ET was accompanied by weight loss. In ET studies in secondary prevention, however, where significant reductions in CRP were noted (average 40%; p<0.0001), more significant reductions were noted in overweight/obese patients, especially those with more significant weight loss. **Conclusion:** Considering all of the available evidence, the combination of PA and increased CRF, especially when combined with weight loss, is associated with beneficial reductions in systemic inflammation and CRP, which support the EIM's initiatives in primary and secondary CHD prevention.

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## Making hypertensive inactive patients motivated in exercising

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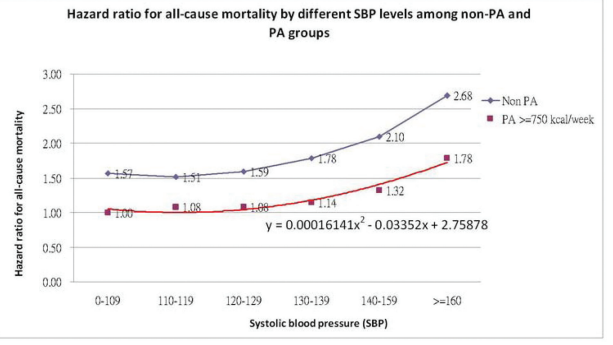
**Introduction:** Physical inactivity and hypertension both have high prevalence. Nearly one out of two adults does not have regular physical activity and two out of five have hypertension. Both are known to be major risk factors for all-cause and CVD mortality. But physical activity and hypertension have been separately managed clinically. Clinicians would normally concentrate on treating hypertension, as patients do not see its relevance to physical activity. **Objectives:** The objective of this study is to express the increased mortality risk from physical inactivity in terms of "blood pressure" so that hypertensive inactive patients are motivated to exercise. **Methods:** In this prospective cohort study, 416,175 individuals (199 265 men and 216 910 women) went through standard medical screening program(s) from 1996 to 2008, with an average follow up of 8.05 (SD: 4.21) years. All-cause and cardio-vascular disease mortality risks of inactive subjects were compared with active subjects in this cohort. The blood pressure equivalence of physical activity was then identified by the difference in mortality risks between physically inactive and active subjects. **Results:** Physical inactivity comprised 54% in this cohort, with 22% low active and 24% medium or above active. The prevalence of hypertension was 13%. All-cause and CVD mortality risks for inactive subjects are larger than active subjects at any level of blood pressure. When comparing to active non-hypertensive subjects, the hazard ratios were from 1.06 to 1.72 among active subjects, and hazard ratios were from 1.64 to 2.78 among inactive subjects. The excess mortality risks of physical inactivity were converted into a "blood pressure equivalence of physical activity." The additional of physical inactive was similar to an increase of mortality risk approximately equivalent to an increase in blood pressure of 50 mmHg.

**Image/graph I:**




**Conclusion:** Physical activity in hypertensive patients could provide a reduction of mortality risks similar to a permanent reduction of 50 mmHg in blood pressure, over and above any antihypertensive medications. Appreciating this relationship enables physicians to bridge the disconnection and motivates hypertensive inactive patients to take exercise.

**Reference:**

Wen CP, Wai JPM, Tsai MK, Yang YC, Cheng TYD, Lee MC, Chan HT, Tsao CK, Tsai SP, and Wu XF. Minimum amount of physical activity for reduced mortality and extended life expectancy: a prospective cohort study. Lancet 2011; published online Aug 16. DOI:10.1016/S0140–6736(11)60749–6.

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## Hemodynamic impacts of synchronization of heart rate and step rate

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**Introduction:** Muscular activity, both voluntary and involuntary, has a strong tendency to be periodic, and the rhythms of several physical and physiological activities are usually in accord.

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Synchronization of heart rate and step rate could create a favorable situation where heart motion and bodily motion are in constant harmony, with one aiding the other, and with stroke volume and cardiac output enhanced, so that oxygen delivery to the tissues is increased over and above that possible with normal cardiac function alone. This is analogous to the hemodynamic effect of Enhanced External Counterpulsation (EECP) happening naturally in the exercising situations. **Objectives:** The primary aim of the present investigation was to determine the impact of synchronization of step rate and heart rate on cardiovascular functions. **Methods:** Twenty three apparently healthy subjects aged 19–39 yrs performed treadmill running in three different conditions in duplicate, one that the step rate was matched with the heart rate (matched condition), one that the step rate was ~10 steps greater than heart rate, and one that the step rate was ~10 steps lower than heart rate (unmatched conditions). Blood pressure was measured using the finger plethysmography. Beat-by-beat results were subsequently analyzed with the Beatscope software, which calculated stroke volume and cardiac output using the validated Model Flow method. **Results:** Average heart rate was not different between 3 conditions. In the matched condition, there was no difference between step rates (160 steps/min) and heart rates (158 beats/min). In the unmatched conditions, the step rate was ~10 steps/min higher or lower than that in the matched condition. Both systolic and diastolic blood pressures were not different among the 3 conditions. A type of "beating" pattern, where pulse pressure rhythmically increases and decreases in pattern, was observed in some subjects. There were no differences in double products or rate-pressure products among the 3 conditions. Stroke volume and cardiac output were higher ($P<0.05$) in the matched condition as compared with the unmatched conditions. **Conclusion:** Our present results are consistent with the idea that synchronization of heart motion (heart rate) and bodily motion (step rate) augments stroke volume and cardiac output, presumably through the mechanism similar to the EECP.

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## Determination of the anaerobic and respiratory compensation thresholds by the leg skin temperature and doppler test of leg blood flow

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**Introduction:** The determination of the anaerobic threshold is impotent for the estimation of physical capacity in healthy subjects and patients with diseases of cardiovascular and respiratory systems. At the present time the determination of the anaerobic and respiratory compensation thresholds occurring by gas exchange at physical exercise. These methods require expensive equipment. **Objectives:** For searching of less complicated non-invasive methods the dynamics of leg temperature and the dynamics of the recovery time of continuous diastolic blood flow in the peripherial arteries at treadmill test were studied. **Methods:** This study involved: 47 healthy subjects, 15 patients with coronary disease and 28 patients with arterial hypertension. Treadmill test was consisted of 7–10 exercise stages by 3 minutes with exercise increasing on 1.0–1.5 MET on every stage. Skin temperature was registered by thermistor, which was fixed on the posterior surface of leg. During the periods of rest after each stage a blood flow in femoral artery was registered within 3–5 min before disappearance of continuous diastolic flow. During the whole test also were registered ECG, were measured values of lung ventilation, concentrations of $O_2$, $CO_2$, oxygen uptake and output of $CO_2$. On every stage of the test among 10 patients were measured the lactate concentration, taken from 1 hand finger. **Results:** In the process of increasing exercise values of temperature were reduced at first and then from certain level of exercise were started to grow progressively. The definite (by Doppler test) time of continuous diastolic blood flow with exercise increasing was rising slowly at first and then there was originated a crisis towards rapid growth. The crisis of temperature dynamics outward to increasing was coincided with lactic threshold and anaerobic threshold that were observed for all subjects. Accuracy of coincidence was 0,6 MET. The crisis of time dynamics of recovering of continuous diastolic flow outward to progressive increasing correct to 0,5 MET was coincide with respiratory compensation threshold. **Conclusion:** These findings specify, that monitoring of skin temperature of leg and arterial blood flow at treadmill test allows determining within small limits the anaerobic and respiratory compensation thresholds.

**P256**

## The athletes heart syndrome and arrhythmias: echo and holter monitoring comparison study

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**Introduction:** The enlargement of left atrium is perceived as a reason of frequent occurrence of atrial fibrillation in older athletes. Also the left ventricle hypertrophy is a known risk factor of ventricular arrhythmias. **Objectives:** The aim of a study was to assess the relationship between 24-hour Holter ECG monitoring findings and echocardiographic signs of athletes heart syndrome. The data concerning this subject in top-level athletes is not widely available. **Methods:** 30 rowers from the Polish National Team (aged 24,5; 27% women) comprised the study group. None of the examined had any known cardiovascular disorder. Holter monitoring was performed in all cases using standard 3 channel system. Monitoring included at least one intensive training and a night time. An echo-exam was performed in all cases the same day using portable ultrasound system. **Results: Supraventricular arrhythmia** was present in 77% of examined, in all cases it was a single supraventricular extrasystole (SVE). Athletes with arrhythmia had 44 SVE/d in average (range 1–795). In 33% cases there were >1 SVE/hour, in 13% there were > 100 SVE/day. There was statistically significant negative correlation between the amount of SVE and right and left atrium area (RAA and LAA; $R=0,56$; $p<0,05$) and intra ventricular septum diastolic diameter ($R=0,43$; $p<0,05$). What is more the only significant difference in those athletes with >100 SVE/day and the rest was smaller indexed LAA (9,3 vs 12,1$cm^2/m^2$; $P=0,03$). **Ventricular arrhythmia** was present in 50% of examined, in all cases it was a single ventricular extrasystole (VE). Athletes with an arrhythmia had 13 VE/d in average (range 1–70/day). Only 1 athlete had >1VE/h. There was weak correlation between amount of VE and systolic diameter of intraventricular septum (indexed to BSA; R 0,34; $p<0,05$). The only significant differences in those athletes with present VE (at least 1) and the rest were: higher mitral E/A (2,5 vs 1,9; $p=0,03$) and thinner IVDd (indexed to BSA; 0,55 vs 0,6 $cm/m^2$ $p=0,03$). There were no differences in arrhythmias occurrence between male and female athletes **Conclusion:** 1. In highly trained, young, healthy athletes there is no correlation between amount of supraventricular arrhythmias and LA enlargement, what is more an opposite trend can be observed. 2. Physiologic hypertrophy of the left ventricle is not correlated with an amount of single ventricular arrhythmias in healthy athletes.

**P257**

## Ambulatory and hospital-based cardiac rehabilitation programmes are more effective than usual care in weight management of overweight and obese revascularised coronary patients

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**Introduction:** Overweight and obesity control is difficult to obtain in usual care, only comprehensive interventions proved to be effective in controlling excessive body weight. **Objectives:** To assess the benefit of cardiovascular rehabilitation (CR) in reducing excessive body weight in coronary patients. **Methods:** We performed an analytic retrospective study which included 227 revascularised coronary patients, split into 3 groups, based on their participation in CR: Group A (ambulatory-based CR, n=77), Group S (hospital-based CR, n=75) and Group C (usual care, n=75). We evaluated life style trends in regard to excessive body weight management using questionnaire method and measured anthropometric parameters at baseline (T0) and after a mean period of 16 months (T1). **Results:** We found a high prevalence of overweight and obesity at baseline in all 3 groups (85% vs 87%, vs 78%, p=ns). More patients in Group A and S declared at T1 that tried to lose weight comparing to Group C (67% vs 60% vs 48%, p=0.02), through diet (64% vs 53% vs 40%, p=0.01), exercise training (58% vs 36% vs 20%, p=0.01) or medication (5% vs 10% vs 2%, p=ns). At T1 the number of obese patients decreased in Group A with 23%, p=0.001 and Group S with 15%, p=0.04, and increased in Group C with 16%, p=0.01. We noticed a significant reduction of body mass index in patients from Group A (from 30.14 kg/m2 to 28.90 kg/m2, p=0.04) and Group S (from 30.44 kg/m2 to 29.13 kg/m2, p=0.02). **Conclusion:** Both ambulatory and hospital-based CR programmes are superior to usual care in accomplishing body weight reduction in obese and overweight patients, through increased awareness regarding excessive weight and better adherence to a healthy lifestyle.

**References:**

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3. Ades P, Savage P, Toth M, et al. High-Calorie-Expenditure Exercise A New Approach to Cardiac Rehabilitation for Overweight Coronary Patients. Circulation. 2009;119:2671–2678.

**P258**

## Aerobic capacity and work performance after cardiac rehabilitation in elderly patients

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**Introduction:** The improved survival in the developed countries is paralleled by the important increase in elderly population. **Objectives:** The aim of this study was to determine in a cohort of cardiac patients (pts) whether training-induced improvements in aerobic capacity and work performance are independent from the age. **Methods:** From January 2008 to July 2010, three hundred five male cardiac pts, referred for outpatient cardiac rehabilitation (CR), after adjustment for age, were divided in two groups : 149 (48.8%) pts no older than 65 years (Group A), mean age 58.2+/-6.7 years, and 156 (51.2%) pts over 65 years (Group B), mean age 72.2+/-3.9 years. All pts performed a cardiopulmonary exercise testing (CPET) before and after a 12 weeks CR program consisting in thrice weekly training sessions. The peak work load (PWL) in watt, the peak oxygen uptake (peak VO2) in ml/Kg/min and the peak oxygen pulse (peak O2 pulse) in ml O2/beat measured during CPET, and the work performance expressed by the ratio between PWL and body weight (PWL/BW) in watt/Kg, were compared at baseline and after CR program using the Primer software.

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**Results:**

**Table 1 legend:** P value=degree of dissimilarity between the two sets of measurements ; *=result statistically significant ; °=result statically non-significant ; for others abbreviations see the text

| Group | Measure | before CR | after CR | P value |
|---|---|---|---|---|
| A | peak VO2 | 20.34+/-5.8 (SEM 0.4752) | 20.99+/-6.0 (SEM 0.4921) | 0.343° |
| A | peak O2pulse | 12.3+/-3.32 (SEM 0.272) | 12.56+/-3.67 (SEM 0.3007) | 0.184° |
| A | PWL | 115.2+/-29.76 (SEM 2.438) | 115.4+/-29.86 (SEM 2.446) | 0.954° |
| A | PWL/BW | 1.46+/-0.35 (SEM 0.02867) | 1.48+/-0.38 (SEM 0.03179) | 0.499° |
| B | peak VO2 | 18.49+/-5.57 (SEM 0.4468) | 21.68+/-5.3 (SEM 0.4243) | 0.000* |
| B | peak O2pulse | 11.81+/-3.74 (SEM 0.2994) | 13.2+/-3.44 (SEM 0.2754) | 0.000* |
| B | PWL | 96.92+/-23.89 (SEM 1.925) | 119.5+/-34.94 (SEM 2.816) | 0.000* |
| B | PWL/BW | 1.26+/-0.33 (SEM 0.02659) | 1.55+/-0.426 (SEM 0.03438) | 0.000* |

**Results:** From the analysis of the data collected, before and after cardiac rehabilitation the results expressed as mean plus/minus standard deviation (SD), standard error (SEM) and P value were showed in table 1. **Conclusion:** On the basis of the above results we can conclude that, after cardiac rehabilitation, the peak oxygen uptake, the peak oxygen pulse, the peak work load sustained and the work performance improved in both groups, but the improvements were highly statistically significant in the patients older than 65 years.

**P259**

## Translational research in action: development of online health professional training in chronic disease self-management

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**Introduction:** Australia has a national strategic policy approach to chronic disease self-management (CDSM). The Heart Research Centre has successfully developed an Integrated Cognitive Behaviour Therapy intervention to enhance self-management of cardiac patients. A number of recent audits of the Australian Primary Health Care (PHC) workforce have found that many health professionals lack the skills to support CDSM. The ICBT patient self management intervention was translated into online health professional training to address workforce needs for training in this area. An online format was chosen to meet the needs of rural and remote health workers. **Objectives:** To assess the impact of online training on health professional's capacity to support self -management in patients with cardiovascular and other diseases. **Methods:** The program was piloted with 55 primary health care staff from a range of professional backgrounds. A missed methods evaluation protocol was adopted using both qualitative and quantitative components including process and outcome evaluation of the training. Quantitative data was collected online and included program acceptability and ease of use. Participants also completed pre and post self report questionnaires that covered CDSM self efficacy and intended practice change. Qualitative data was collected using interviews and focus groups. **Results:** Results of the quantitative evaluation demonstrated that the online training package was found to be very acceptable with clear benefits for the health professionals undertaking the training. Training participants' CDSM self efficacy significantly increased from pre-training (M = 42.84, SD=11.77) to post-training (M= 53.74, SD= 8.48; t (19) = 4.35, p<.001). In addition, participants intended to make numerous changes to their practice, to support CDSM in their work with patients. Qualitative data indicated three main areas of intended practice change, namely, improved communication with clients, adoption of a patient centred approach and use of specific ICBT tools and techniques. **Conclusion:** The online program was well-received by health professionals. There is great potential for this program to increase the accessibility of CDSM training to remote and rural health professionals. Further work with a larger sample size and longer follow up is planned.

**P260**

## Determinants of return to work after acute coronary syndrome

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**Introduction:** The work is not only production or wage; it has become for man a source of profound psychological satisfaction. All work activity implies a lifestyle that influences personal health and satisfaction of psychophysiological and psychosocial needs. One of the characteristics of ischemic heart disease is the inability caused by it and its temporal dimension. Several medical, psychological and sociodemographic variables have been related to the return after a myocardial infarction. Therefore, it has been assigned a higher weight to socio-psychological variables. **Objectives:** Determine the predictive value of factors that influence the return to work after ischemic heart disease **Methods:** It is a quantitative and transversal study. Of 392 patients with ischemic heart disease who were hospitalized during one year in Coronary Intensive Care Unit, we selected our sample with 164 patients aged less than or equal to 65 years. These patients were followed at consultations of Cardiology. We used a form to sociodemographics characterization, Graffar's scale (GS), Apgar Family (AF), Social Support Scale (SSS), Self-Concept Clinical Inventory (SCCI) and the Eysenck Personality Inventory (EPI). **Results:** Of the 164 patients, 96 (58.5%) patients returned to work and 68 (41.5%) did not return. We selected the variables: age, Socioeconomic Status (SES), Family Functioning (FF), Social Support (SS), Ventricular Function (VF), Self-concept (SC) and Personality (P). The *stepwise* discriminant analysis extracted a discriminant function defined by the following variables: SES, FF, informal support of subscale of SS and Impulsivity/activity factor of subscale of SC. These variables explain 100% of variability between the groups (L=0.773; $X^2$(4)38.160; p=0.000). The discriminant analysis by the method *stepwise* allowed to obtain a final model that integrates four variables. These four variables together allow the differentiation of two groups:

- Return to Work=4.615NSE+2.175FF+3.914informalsupport+30.314Impulsivity/activity+(-273.444).
- No Return to Work=4.436NSE+1.856FF+3.743informal support+29.690Impulsivity/activity+(-262.157).

**Conclusion:** The socio-economic, social-familial and self-concept factors seem to be the strongest predictors of returning to work after AMI. The age, cardiac function and personality seem to have no impact on the return to work.

**Reference:**

Boudrez, H.; De Backer, G.; Comhaire, B. (1994). *Return to work after myocardial infarction: results of longitudional population based study.* European Heart Journal. 15. p. 32–36.

**P261**

## Health behaviors and cardiac rehabilitation: impact on quality of life after ischemic heart disease

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**Introduction:** Besides secondary prevention, one of the prime objectives of Cardiac Rehabilitation (CR) in coronary patients is to improve their quality of life. In our study, the patients that benefit from CR had a favorable impact in their quality of life and there was a significantly decrease of risk behaviors **Objectives:** Determine the effects of CR Program on quality of life after coronary ischemic **Methods:** It is a quantitative and transversal study. The sample was not probabilistic, with 96 adult patients with ischemic heart disease (average age=66.75; sd=12.276). 32 individuals attended a CR Program in Clinics of North Portugal. They started the program in average=44.16 days (sd=23.335) after hospital discharge. 64 attended Cardiology follow-up in the Hospital of Viseu. The participants answered a set of tools to characterize the variables: sociodemographic, Family Functioning (FF), Socioeconomic Status (SES), Risk Behaviors (RB) and Quality of Life (QL) **Results:** The patients who participated in the CR Program are less young (67.47; sd=7.535 vs 66.03; sd=15.695; t=0.690 p=0.492), better FF (69.13; sd=1.289 vs 66.03; sd=7.56; t=4.421, p=0.000), better QL (72.53; sd=14.323 vs 49.91; sd=20.274; t=6.919, p=0.000) and less RB (48.66; sd=10.431 vs 62.84; sd=12.358; t=-5.834, p=0.000). The discriminant analysis extracted a discriminant function defined by the following variables: SES, FF, informal support of subscale of SS and Impulsivity/activity factor of subscale of SC. These variables explain 100% of variability between the groups (L=0.153; $X^2$ (7) 169.647; p=0.000) The discriminant analysis (*stepwise*) allowed to obtain a final model that integrates seven variables. These seven variables together allow the differentiation of two groups:

- Group of CR=0.679Age+2.033SES+((0.420Vitality+0.229Social Function+0.098 Health Change) subscales QL)+(0.160 Nutrition+4.945Exercise) RB subscale)+(-81.417)
- Control Group=0.564Age+3.129 SES+((0.621Vitality+0.054Social Function+0.003 Health Change) subscales QL)+(0.462Nutrition+7.547 Exercise) RB subscale)+(-113.310)

**Conclusion:** The behaviors from each individual, work as determinants factors to their state of health. The coronary patient's CR Program must contain specific basis components, with the aim of optimizing the decrease of cardiovascular risk, encourage healthy behaviors and the adherence to these behaviors, reduce dysfunction and promote an active life style in these patients

**Reference:**

Gomes, L., (2008) Sobre a Reabilitação Cardíaca; site da Delegação Norte da Fund. Port. de Card.

**P262**

## Predictors of poor compliance to a cardiac rehabilitation program

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**Introduction:** Cardiac rehabilitation has proven benefits in reducing morbidity and mortality. In order to maximize its effect, it is essential to ensure good compliance to cardiac rehabilitation program (CRP). **Objectives:** Assess the predictors of poor behavioral compliance to a CRP. **Methods:** We evaluated a total of 219 patients referenced to a CRP, after an acute coronary syndrome, recruited between September 2008 and August 2010. Information on sociodemographic, clinical and functional data, as well as psychosocial parameters, was collected. Depression and quality of life were evaluated, through the Patient Health Questionnaire (PHQ-9) and physical and mental components of Short Form 36 questionnaire, respectively. Functional capacity was assessed in metabolic equivalents (METS) and determined by exercise stress testing performed at inclusion in the CRP (EST1). The predictors of poor compliance were analyzed through logistic regression. **Results:** From 219 patients enrolled, 198 were men, average age 54 years, 33 (15%) discontinued the program. There was no significant difference between the two groups (compliant versus not compliant) regarding age, hypertension, smoking and quality of life. Diabetic (OR = 0.400, p = 0.025) and obese patients (OR = 0.364, p = 0.011) showed worse behavioral compliance to a CRP. Women (23.8% vs 14.4%) and depressed patients (15.6% vs 11.9%) also showed a lower likelihood of compliance to the CRP, although the difference wasn't statistically significant (p>0.05). Moreover, the initial functional capacity, measured by the intensity of EST1 (METS), showed a strong relation to behavioral compliance (OR = 1.460, p <0.001) and was an independent predictor of adherence to the CRP (OR = 1.407, p <0.001). **Conclusion:** In this analysis, diabetes mellitus, obesity and lower exercise tolerance were predictors of poor compliance to the CRP. However, these patients are those who will potentially benefit most from secondary prevention strategies,

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provided by CRP. It is therefore crucial to meet these patients needs and gather support strategies in order to prevent dropout and maximize the benefit of the CRP.

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## Short- and long-term effects of physical training in CAD patients with exercise-induced ischemia. A pilot study

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**Introduction:** The literature available provides few data to explain why in some patients (pts) with CAD and positive exercise stress test (EST) who undergo cardiac rehabilitation (CR), physical training (PT) can result in decreased exercise-induced ischemia and in others, it cannot. This phenomenon may be associated with ischemic preconditioning (IP). **Objectives:** The aim of the study was to assess short- and long-term effects of physical training in CAD pts with present or absent ischemic preconditioning. **Methods:** The study comprised 30 pts with positive EST, aged 55.22±10.29 yrs, who entered a CR program one month following MI or CABG. Initially, all subjects underwent two treadmill ESTs, with a 30-minute interval. The pts who had alleviated or no signs of ischemia in the second test constituted Group A (IP present, N=18). Group B consisted of the pts who did not improve during the second test (IP absent, N=12). All pts underwent a two-month interval training on cycloergometer. The pts did their training until the ischemic threshold occurred, i.e. heart rate at which 1-mm ST depression appeared during the initial EST. ESTs were performed at the end, 72 hours, 10 days and one month after completion of PT. The following variables were assessed: walking distance (WD in m), EST duration (min), metabolic equivalent (METs), time to 1 mm ST depression (min). **Results:** After PT, all variables analyzed improved significantly in Group A: WD 578.11±177.28 vs 668.28±145.34, p=0.01, EST duration 9.30±3.24 vs 10.78±3.16, p<0.01, METs 6.89±1.90 vs 8.09±1.48, p= 0.01, time to 1 mm ST depression 8.37±3.43 vs 9.82±2.32, p=0.02. The physical capacity of Group B patients also improved: WD 624.42±217.21 vs 717.17±211.00, p<0.01, EST duration 8.64±3.63 vs 10.49±4.08, p<0.05, METs 7.39±2.06 vs 8.63±1.77, p<0.01. Yet no significant improvement in the time to ST segment depression by 1 mm was observed in this group. After 72 hours Group A results of EST were much better including time to 1 mm ST depression, 10.62±3.54, p=0.01 as a result of late phase IP and were maintained during one-month follow-up. In Group B, the results of consecutive EST were comparable. **Conclusion:** 1. Physical capacity improved in all trained CAD pts, however an anti-ischemic effect was observed only those in whom the phenomenon of ischemic preconditioning was present. 2. Anti-ischemic effect of trainings and good physical capacity were maintained during one month of follow-up.

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## Improved endothelial function after daily physical training in patients with chronic stable angina

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**Introduction:** The endothelium acts to maintain vascular homeostasis and regulates vascular tone by balancing production of vasodilators, including nitric oxide and vasoconstrictors. In the setting of cardiovascular (CV) disease the endothelium loses its normal function and it has been demonstrated that some interventions, known to reduce CV risk also, improve endothelial function. **Objectives:** To assess the impact of regular physical training on the ischemic treshold and endothelial function, through changes of circulating blood markers of endothelial function: the stable end products of nitric oxide (NOx) and S–nitrosothiols (RSNO–reservoir for bioavailable nitric oxide), in patients (pts) with chronic stable angina. **Methods:** 56 pts with chronic stable angina were studied. At baseline and after 3 weeks in all pts exercise test was performed and values of NOx and RSNO were evaluated. After the initial study, pts were randomized to trained (T,n=32) and non-trained (NT,n=24) group. T group underwent a supervised 3 weeks exercise training at residential center while non-trained group received usual community care. Ischemic threshold was defined as first occurrence of angina pectoris and/or ST-segment depression during exercise test. NOx and RSNO concentration were determined according to the modified Saville-Griess method. **Results:** Baseline ischemic treshold, value of NOx and value of RSNO were similar in T and NT group. After 3 weeks ischemic tresholdwas significantly elevated in T group (from 60.0±9.5 to 75.0±11.0 W, P<0.001),which resulted in significantly higher ischemic tresholdin T than in NT group (75.0±11.0 vs 65.0±10.0W, P<0.005). After 3 weeks of exercise training NOx increased significantly in T group (from 32.5±9.9 to 43.0±10.0 μmol/l, P<0.001), and this value was significantly higher than in NTgroup (P<0.01). Significant increase of RSNO in T group during exercise training by 35,4% (P<0.005) resulted in significantly higher RSNO value in Tthan in NTgroup after 3 weeks (4.2±1.3 vs 3.4±1.1 μmol/l, P<0.05). **Conclusion:** In pts with chronic stable angina regular daily physical training, leads to an improvement in endothelial function, expressed through significant increased of NOx and RSNO. These improvement in endothelial functionisassociated with significant elevation in ischemic treshold.

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## Text-messaging program improves outcomes in cardiovascular rehabilitation

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**Introduction:** Longterm adherence to risk factor modification life-style changes during and after outpatient cardiovascular rehabilitation is a nationwide problem. **Objectives:** We sought to determine if a cell phone text-messaging program would improve adherence and result in weight loss, improvement in exercise tolerance, and improvement in quality of life indices at 3 month followup compared with patients who did not have text messaging communication available to them. **Methods:** Patients are given the opportunity to sign up for the text-messaging program during their outpatient cardiac rehabilitation program. Participants receive 2–3 text messages per day and are encouraged to take and report daily medications, daily blood pressure, daily exercise, and body weight. Other messages include dietary information as well as a variety of messages related to management of coronary risk factors. Messages can be sent by any staff member to the entire group or to a selected patient. **Results:** It is our intent ot submit data at a later date prior to the conference as we have collected insufficient data at the present time since the program was started in July 2011. Currently, there are 27 patients enrolled. **Conclusion:** Analysis of limited data at this time indicate a 91% decrease in staff time devoted to contacting patients who have been absent from cardiac rehabilitation and a 31% increase in attendance. An insufficient number of patients have finished the outpatient program at this time to analyze other variables.

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## Systematic cardiac rehabilitation (CR) referral with patient education for percutaneous coronary intervention (PCI) patients at a large tertiary care facility

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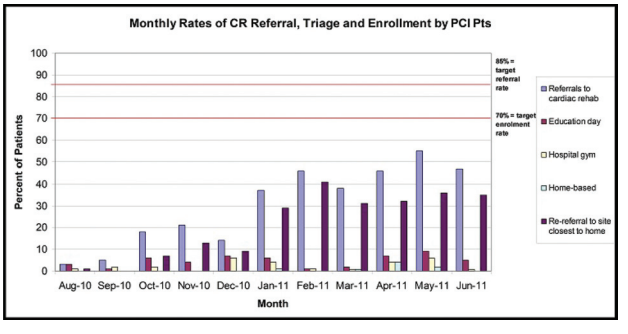
**Introduction:** CR decreases mortality following PCI (Goel *Circ* 2011). However, low rates of CR referral and enrollment are reported. Reasons may include: the short hospital stay which leaves little time for patient education about CR, the lower perceived need for CR when compared to post-surgery or myocardial infarction patients, the short recovery period prior to resumption of paid work, and the necessity for patients to receive care at a specialized center where staff may be unaware of CR programs proximate to patients' homes. Effective systematic referral strategies have been identified to promote universal CR access, however their effect in the PCI population specifically has not been examined. **Objectives:** To investigate the effects of a systematic multifactorial CR referral strategy for PCI patients on CR referral and patient enrollment. This approach included education for healthcare providers, inclusion of CR on the discharge order set, development of an evidence-based motivational letter (Wyer, Suskin), and integration of CR education into the pre-admission clinic for elective patients. The CR program triaged referrals to sites closest-to-home, and augmented early outpatient education. **Methods:** A list of all PCI patients at an academic hospital in Toronto, Canada was obtained from August 2010-July 2011. Patients were cross-referenced with CR charts to audit referral (y/n) and triage closer-to-home. Education attendance and enrollment in the supervised or home-based program was recorded for local patients. CR use was compared before and after the systematic referral implementation in October. **Results:** There were 1324 PCIs performed (median=112/month). CR referral significantly increased from 4(3%) to 56(47%) patients/month (p<.01). Re-referral to sites closer-to-home also increased from 1(1%) to 46(41%) patients/month (p<.008). Of local patients referred, 64(55%) attended early education, and 41(35%) enrolled in the CR program. These rates were unchanged upon implementation of the referral system (p>.05).

**Image/graph I:**




**Conclusion:** The multifactorial CR referral strategy was effective in increasing referral of PCI patients; and while the rate of local patient enrollment remained constant, ultimately this greater referral and geographic triage translates into more patients receiving CR access.

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Further strategies must be implemented to increase patient enrollment to the 70% Canadian Cardiovascular Society-Canadian Association of CR target.

**P268**

## Continuity of care from stroke prevention clinics to outpatient vascular rehabilitation: effect on patient enrollment

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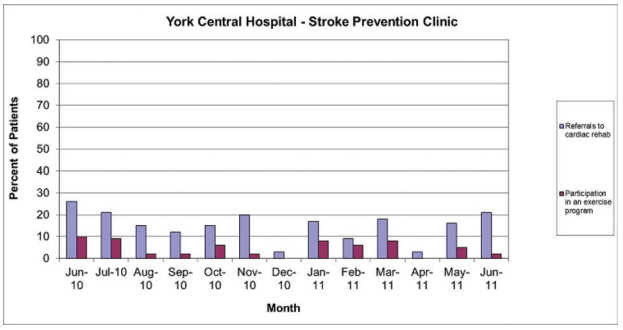
**Introduction:** Cardiac rehabilitation is a chronic disease management program proven to significantly reduce mortality and re-hospitalization. Given the common underlying etiology, integrated models including both cardiac and stroke patients have been developed (vascular rehabilitation; VR). Indeed, preliminary evidence has demonstrated that outpatients with non-disabling stroke or post-transient ischemic attack also benefit from VR. Given these patients are commonly assessed in stroke prevention clinics (SPC), processes to promote referral and flow of patients from SPC to VR may be advantageous. **Objectives:** (1) To determine the feasibility of patient referral from SPC to VR (i.e., percent referred), and (2) to understand patient acceptability of integrated VR (i.e., percent enrolling). **Methods:** Patient lists were collected from the SPC at a Canadian community-based hospital, from June 2010-July 2011. VR records were cross-referenced to ascertain patient referral and enrollment (y/n). Process evaluation through discussion with healthcare providers at both loci were undertaken to interpret the findings. **Results:** 540 patients visited the SPC (mean=42/month). A mean of 6.4±3.4 (15%) patients were referred from the SPC to VR/month. Patient enrollment in supervised exercise ranged from 0–4/month (0–10%), with a mean of 1.8±1.3 (4.6%). Of the 27 patients referred between April-July, 15 (55.6%) attended an orientation session. Overall, a mean of 28±21% of referred patients enrolled in VR. Process evaluation revealed similar barriers to those reported in the cardiac rehabilitation literature, but also revealed patients reporting too much focus on indicated condition rather than common vascular risk reduction. **Image/graph I:**




**Conclusion:** Rates of VR referral are somewhat lower than the ~25–30% reported in the cardiac rehabilitation literature, and almost 1/3rd of referred patients enroll. Because we did not consider patients' clinical characteristics, these lower rates are likely partially-explained by inappropriateness for VR. Systematic referral strategies developed for CR were recently implemented in the SPC to increase these rates. SPC personnel have also been provided program pamphlets, an evidence and theory-based motivational letter to provide to patients, and a script based on the process evaluation to promote patient enrollment. Future research will be undertaken to test the effects of these strategies, as well as patients' perceptions of care continuity.

**P269**

## Impact of a cardiopulmonary training program in patients with chronic pulmonary diseases

Soraya Dalel Kerbage[1], Martín Bruzzese[1], Camilo Capano[1], Jorge Vicente[1], Jorge Caneva[2], Arnaldo Angelino[1], Cecilia Luis[1], Roberto Favaloro[3], Ignacio de Urquiza[4,*]
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**Introduction:** Patients with Chronic Obstructive Pulmonary Disease (COPD) have a decreased exercise capacity, which also correlates weakly with functional impairment and degree of obstruction. Limiting factors of exercise capacity are manifold. In recent years it has been considered peripheral muscle limitation as a factor added to the reduction of ventilatory capacityand limited transport and gas exchange. On the other hand, it has been described a decrease in quadriceps strength, which correlates with the ability to exercise, so it is very important to implement a specific program related to increased muscle strength. **Objectives:** To evidence the impact of a cardiopulmonary training program in relation to muscle strength, muscle mass, aerobic resistance and quality of life in patients with chronic pulmonary diseases. **Methods:** The patients included had a history of chronic pulmonary diseases. They joined a specific cardiopulmonary training and muscle strength program after duly signing an informed consent form and after recording a computerized case report. At baseline, measurements of aerobic resistance as well as Saint George quality of life test, and perimeter and strength measurements of the quadriceps were performed. The training program including muscle strength, and aerobic training was supervised twice a week for six months. Then, all the measurements were reassessed. The results are reported as median values (interquartile range 25–75). The Wilcoxon test was used to evaluate the variables. **Results:** 19 patients were included. The results were as follows: average age: 61.2 years +.

| | Baseline | 6 months | p |
|---|---|---|---|
| Muscle strength (kg) | 33.25 | 39.9 | 0.0006 |
| Leg perimeter (cm) | 43 | 43 | 0.61 |
| Aerobic resistance (Mets) | 3.7 | 4.81 | 0.001 |
| Quality of life test (score) | 42.50 | 35.66 | 0.035 |

**Conclusion:** a specific cardiopulmonary and muscle strength training program for patients with chronic pulmonary diseases evidenced a significant improvement in muscle strength, aerobic resistance and quality of life after six months. A longer period was necessary for changes in skeletal muscle.

**P270**

## Impact of education on secondary prevention in patients undergoing cardiovascular surgery

Soraya Kerbage[1], Sebastian Burgos[1], Lidia Diaz[1], Luis Castañeda.[1], Cecilia Comes[1], Arnaldo Angelino[1], Branco Mautner[2], Roberto Favaloro[3], Ignacio de Urquiza[4,*]
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**Introduction:** It is a global challenge to reverse the problem of poor adherence in the goals of secondary prevention in patients with cardiovascular disease. Current models recommended to change this scenario are based on a multidisciplinary approach based on education, so the early admission to cardiac rehabilitation programs can be a useful tool to improve prevention. **Objectives:** The objective of this study was to show the results of the Integral Education Program (IEP) in patients (pts.) undergoing cardiovascular surgery (CVS) in our center. **Methods:** Patients undergoing cardiovascular surgery. All the pts. completed an IEP from the time of admission (Phase I). Total and partial adherence were assessed during both Phase I and II. Fisher's exact test and the chi-square test were used to make the comparison. **Results:** 2893 pts. were included. 62.5 ± 12.2 years, 74% male; 49% underwent myocardial revascularization; 59% went to Phase II; 69% were included in Phase III. Total adherence at 3 months was 30%; partial adherence was 62%, and the withdrawal rate was 8%. Total adherence at 1 year was 16%; partial adherence was 71%; and withdrawal rate was 13%. At one year, sedentarism went drown from 96% to 18% **(p<0.001)** and smoking went down from 20% to 2 % **(p <0.001).** 99% of the pts. continued on aspirin and statins and 57% returned to work. **Conclusion:** The implementation of an IEP in pts. undergoing cardiovascular surgery led to a good total and partial adherence rate at 1 year; reduction in cigarette smoking and sedentarism, and to a very high rate as for the use of antithrombolytics and cholesterol-lowering drugs

**P271**

## Strength and flexibility measurement in patients in phase II cardiovascular rehabilitation

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**Introduction:** It is known that the improvement in the muscular strength and Flexibility in Patients post cardiac surgery has a positive impact in patient's self-sufficiency in daily activities. Because of the patient's clinical status, sometimes it is difficult to measure these variables, so it is important to design a modified method to be it viable **Objectives:** To measure the muscular strength and flexibility of the lower limb muscle group in patients undergoing cardiovascular surgery before and after joining Phase II Cardiovascular Rehabilitation Programs. **Methods:** Tree hundred ninety seven patients (397 pts.) undergoing cardiovascular surgery were prospectively assessed after completing a supervised 5-session protocol including exercises for the lower limbs. Also, strength and flexibility were measured at the beginning and at the end of the program. In order to evaluate strength, the Epley test was used (maximum number of repetitions with a pre-established load). The "sit and reach test" for trunk and hamstring flexibility was used. The paired t test was used to analyze the data. The data is expressed as a mean value ± Standard error of the mean value (SE). **Results:** Patients' age 62.41 ±1; 79.09% were males. As regards risk factors, 73.04 % of the pts. had a history of hypertension; 20.65 %, diabetes, 58.32 % dislipemia, 35.01 % cigarette smoking; 23.67 % were obese, and 59.19 % had no risk factors.

| Variable | Pre-training | Post-training | P value |
|---|---|---|---|
| Strength | 20,3 ± SE 0,4 | = 24,2 ± SE 0,5 | <0,001 |
| Flexibility | 9 ± SE 0,6 | 14,1 ± SE 0,5 | <0,001 |

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**Conclusion:** Strength and flexibility exercises for the lower limbs in Phase II Cardiovascular Rehabilitation Programs improve fitness for aerobic training and self-sufficiency in activities of daily living in patients undergoing cardiovascular surgery

**P272**

## Findings of cardiovascular risk factors in a preparticipational screening

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**Introduction:** Sudden death is an event with great psychosocial impact on society. It is important to identify risk factors when starting a physical activity to act accordingly. **Objectives:** To determine the prevalence of cardiovascular risk factors in a population wanting to do regular exercise. **Methods:** individuals referred to the exercise performance unit were consecutively included between May 7, 2010 and April 30, 2011. The prevalence of cardiovascular risk factors was assessed: hypertension, dyslipemia, diabetes mellitus, smoking, BMI, a sedentary lifestyle and a family history both in the total population and in the age subgroups (group 1 = <= 40, group 2 = 41–50, group 3 = 51–60, group 4 = > = 61). The categorical variables were compared using the chi-square test, and the quantitative variables were assessed using parametrical or non parametrical tests according to data distribution. A p value $<0.05$ was accepted for statistical significance. **Results:** For a total of 326 patients, the data obtained were as follows: 58% males, 41.7% females. Mean age: 38 years+ 12.7; average weight was 74 kg + -15, with a BMI of 26 +- 4; 8.4% had hypertension, 12.3% had dyslipemia; 0.6% had diabetes mellitus; 5.2% had a family history of cardiovascular risk factors; 13% had a sedentary life and 22.7% smoked. The results for the different age groups are described.

| Age Categorie | Group1 (n) 200 | Group2 (n)67 | Group3 (n)38 | Groupo4 (n)20 | p value |
|---|---|---|---|---|---|
| female | 55.5 | 62.7 | 57.9 | 75 % | 0.32 |
| HTA % | 8.1 | **10.8** | 7.9 | 5 | 0.84 |
| DLP % | **14** | 10.4 | 7.9 | 10 | 0.67 |
| DBT % | 0.5 | **1.5** | 0 | 0 | 0.74 |
| AHF % | 4.5 | **7.5** | 5.3 | 5.0 | 0.82 |
| Sedentary% | **11.4** | 0.94 | 0 | 0.63 | **0.03** |
| TBq % | 19.3% | 26.9 | **31.6** | 25.0 | 0.29 |
| total weight% | 74.1 | 77 | 70.7 | **77.8** | 0.09 |
| BMI | 26 | **26.4** | 25.4 | 26 | 0.65 |

**Conclusion:** The prevalence of cardiovascular risk factors was low in an exercise performance test as compared to the general population except for smoking, which is more prevalent in the young population although it does not reach the community average level, and is not observed in other age groups. This finding underlines the need for more education in the field of prevention.

**P273**

## Value of additional physical activity during cardiovascular rehabilitation

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**Introduction:** The therapeutic value of physical exercise for patients with cardiovascular disease is well known. Global guidelines introduced the added value of 180 minutes a week but Cardiac Rehabilitation Programs (CRPs) don't cover the established goals because the sessions time is short and it is necessary to include another complementary activities. **Objectives:** The objective of this study is to analyze the value of additional physical activity (pa) without direct supervision as an important part of cardiac rehabilitation program to achieve the minimum recommended minutes. **Methods:** One hundred and fifty consecutive coronary patients (p) referred to a cardiac rehabilitation program were included and they were required to complete a questionnaire about physical activity when entering the CRP and 12 weeks after entering the program. If they agree that by entering the CRP they make sure they will exercise for a minimum of 100 minutes a week, the additional physical activity is particularly relevant to achieve the minimum of 180 minutes recommended. The questionnaire allows dividing the total population into two groups taking into account if they could achieve the 90 minutes a week of physical activity or not, Group A being under 90 minutes. Group B more than 90 minutes. The same questionnaire was repeated 12 weeks after admission to CRP so as to compare both results and perform the statistical analysis thereof.
**Results:**

| | Pre-Cardiac Rehabilitation | Post-Cardiac Rehabilitation | P |
|---|---|---|---|
| Group A: Less than 90 min | 37.5 (56 patients) | 25.5 (38 patients) | P<0.0001 |
| Group B: More than 90 min | 63.08 (94 patients) | 75.1 (112 patients) | P<0.0001 |

**Conclusion:** Patients referred to a CRP do not perform physical activity regularly. The CRP does not reach the minimum recommended minutes of physical activity per week. Patients in CRP who perform 30 minutes of additional recreational physical activity three or more times a week, exceed the minimum recommended minutes of physical activity per week.

**P274**

## Would patients adhere to healthy lifestyle habits after cardiac rehabilitation

Suet Ting Lau[1,*], Ngai Yin Chan[1], Sally Chan[1], Sin Hing Chiu[1], Rhoda Leung[1], Shiu Hing Tang[1], Snowball Ip[2], Rebecca Law[3], Agnes Fung[4], M H Law[5] and Cardiac Rehabilitation Team
[1]*Department of Medicine & Geriatrics,* [2]*Physiotherapy,* [3]*Occupatioan Therapy,* [4]*Dietetics,* [5]*Community Nurse Service, Princess Margaret Hospital, Hong Kong, Hong Kong, China*

**Introduction:** All patients graduated from the comprehensive phase 2 cardiac rehabilitation programme in Princess Margaret Hospital attended 5 education and exercise sessions. These patients had been recruited into an on going registry and evaluation protocol. Knowledge about smoking and the need to quit was an essential curriculum in the occupational therapist's session and was reinforced in the other sessions. Education in healthy diet and exercise were conducted by physiotherapists and dietitian. **Objectives:** To study the adherence to lifestyle habits of patients in graduates from the Cardiac rehabilitation programme over the past ten year period. **Methods:** Graduates from the cardiac rehabilitation program from 2000 to May 2010 were assessed with a telephone survey. Questionnaire of the survey consisted of 4 sections of questions on intention to join the reunion activity, smoking, diet and exercise habits. The results of healthy life style were assessed and those from 2000 to 2006 were compared to the more recent graduates 2007 to 2010. **Results:** 362 (189 in 2000–2006, 172 in 2007–2010) candidates completed the survey. 190(57%) would consider to join the reunion party of cardiac rehabilitation patients. The smoking rate decreased from 42% to 11 %. 21% ate more than 3 bowls of fatty food per week. 28% did not take the whole grain cereal. Only 26 % drink the recommended low fat milk. 64% did not take the fatty or fried dim sum. 16% did not eat out while 29% had more than 5 times eating out in the week. 46% (37% in 2000–2006, 55% in 2007–2010) had regular exercise of more than 6 times a week. 77% had light exercise.40% made use of walking as exercise. **Conclusion:** The healthier life style habit had been maintained in the graduates of the rehabilitation program. The exercise habit and frequency was most difficult to adhere to.

**P275**

## Economic benefits of cardiopulmonary rehabilitation program in patients with chronic obstructive pulmonary disease

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**Introduction:** Chronic obstructive pulmonary disease (COPD) is a leading cause of morbidity and mortality world with a crescent and substantial social cost, especially in developing countries. **Objectives:** To evaluate the economic benefits of cardiopulmonary rehabilitation program (CRP) with emphasis on physical exercise in patients with COPD. **Methods:** Controlled clinical trial with 30 patients diagnosed with stable COPD, moderate to severe, randomized into experimental group (EG) and control group (CG). The groups did not differ ($p>0.05$) according to age (EG 69.53 ± 9.12 and CG 68.53 ± 9.43 years) FEV1(EG 0.99 ± 0.32 and CG 1.03 ± 0.35 liters), range from BOPE (EG 6.67 ± 2.19 and CG 5.27 ±2.12), functional capacity (EG 310.73 ± 115.72 x CG 364.29 ± 118.29 meters) and quality of life (EG 54% ± 14.8% x CG 56.8 ± 15.3%, total SGRQ). Assessments occurred at baseline and after four months. EG participated in physical exercise program for eight weeks, with three weekly sessions of 90 minutes each, divided into stretching exercises (20min), aerobic cycle ergometer (35min), resistance training upper limbs by the method of Kabat (20min) and relaxation (15min). The control group was instructed to perform physical activity at home without supervision. During four months after the beginning of CRP it was calculated the treatment cost, of which was estimated the relative risk reduction (RRR), the absolute risk reduction (ARR) and the number needed to treat (NNT), in both groups. Following descriptive analysis, it was applied the Student test for independent samples, being significant $p<0.05$. **Results:** The hospital admissions rate was higher in CG compared to the EG (n=6 vs. n=2). The total cost of the CG had been raised in relation to EG (US$ 13.023,50 vs. US$ 22.870,68, $p<0.01$), as well as the average cost (EG US$ 868,25± 1.341,25 vs CG US$ 1.524,68 ± 1.932,93; $p<0.01$). The CRP has reduced hospital admission with RRR in 67.5%; ARR in 27% and the NNT in 3.7%. **Conclusion:** The CRP with emphasis on exercise promoted economic benefits in patients with COPD.

**P276**

## Clinical benefits of cardiopulmonary rehabilitation program with chronic obstructive pulmonary disease

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**Introduction:** Chronic obstructive pulmonary disease (COPD) is a leading cause of morbidity and mortality in the world with a crescent and substantial social cost, especially in developing countries. **Objectives:** To evaluate the clinical benefits of cardiopulmonary rehabilitation program (CRP) with emphasis on physical exercise in patients with COPD. **Methods:** Controlled clinical trials with 30 patients diagnosed with stable COPD, moderate to severe, were randomized into experimental group (EG) and control (CG). Evaluations of the following variables were performed at baseline (pre) and after two months (post): quality of life (QOL) at St. George's Respiratory Questionnaire (SGRQ); calculus of the predictor mortality index–BODE using the distance of the test six-minute walk (6-MWT), the Medical Research Council dyspnea Score (MRC), the body mass index (BMI) and degree of airflow obstruction forced (FEV1). The groups did not differ ($p>0.05$) according to age (EG 69.5±9.12 and CG 68.53±9.43 years), FEV1 (EG 0.99±0.32 and CG 1.03±0.35 liters), BODE (EG 6.67±2.19 and CG 5.27±2.12), 6-MWT (EG 310.73±115.72 x CG 364.39±118.29 meters) and QOL (EG 54%±14.8 x CG 56.8±15.3% total SGRQ). EG participated in a physical exercise program for eight weeks, with three weekly sessions of 90 minutes

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each, divided into stretching exercises (20min), aerobic cycle ergometer (35min), resistance training in upper limbs by the method of kabat (20min) and relaxation (15min). The control group was instructed to perform physical activity at home without supervision. After descriptive analysis, it was applied one way ANOVA, chi-square and considered $p<0.05$ significant. **Results:** The EG showed improvement in 6-MWT (310±115 and 403±63m, $p<0.01$) and QOL (53±14 vs 41±18, $p=0.005$ total SGRQ), whereas in the CG, there was a reduction of the 6-MWT (364±118 vs 332±141m, $p=0.02$) and no change in QOL ($p>0.05$). The EG showed a lower prognostic index BODE after the CRP when compared with the CG (EG 3.7±2 vs CG 5.5±2.5, $p=0.03$). **Conclusion:** The cardiopulmonary rehabilitation program with emphasis on physical exercise promoted clinical improvement in patients with COPD.

**P277**

## Early resuscitation for better outcome, time is muscle

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**Introduction:** Cardiovascular disease (CVD) is a leading cause of death in the United Arab Emirates. Among those with underlying CVD, out-of-Hospital Cardiac Arrest (OHCA) is a most common cause of death worldwide. Many of these cases are attempted resuscitation by EMS personals. The prognosis for majority of those who got arrested remains poor. Ventricular fibrillation, a disturbance in heart rhythm resulting in uncoordinated contraction of ventricular cardiac muscles, is the most common cause of sudden cardiac arrest. Early defibrillation is the most effective means of resuscitation from cardiac arrest. The success of defibrillation diminishes rapidly with each passing minute from collapse, decreasing the chance of survival by about 5% for each passing minute. By increasing awareness in community and implementing policies, there is an improvement in resuscitation outcome but OHCA remains a challenge for public health. Efforts to improve resuscitation are focused on the links to chain of survival. The chain of survival starts with early recognition of cardiac arrest symptoms and activation of emergency response system and so on. Key words: CVD—cardiovascular disease, OHCA—out of hospital cardiac arrest, EMS—emergency medical system, response time—Time counted since dispatcher received call until the EMS reach by patient side **Objectives:** - Find out correlation of response time with the survival rate of OHCA. - Improvement in ambulance response time increases the chance of survival in OHCA cases. - Comparing other Asian countries with UAE,measuring response time with OHCA survivals **Methods:** Data was collected from 01 April, 2011 until 30 July, 2011 for a period of 3 months from Dubai Corporation for Ambulance Services (DCAS) and receiving hospitals in Emirates of Dubai comparing survival rate with response time. It is a comparative study **Results:** A total 60 reported OHCA cases admitted to hospitals .After 30 days of follow up, 4 cases were survived. Among those who survived, 2 cases had response time of 01 minute. Both had witnessed arrest bystander laypersons. Location was shopping mall and airport. They received early bystander CPR and AED. Comparing with other Asian countries ,Dubai,UAE average bystander CPR(%) 12,EMS response time is 7.7 minutes.
**Conclusion:** A lesser response time improves chance of survival for out of hospital cardiac arrest cases as focused on the links to chain of survival. it indicates "Time is Muscle."

**P278**

## Comparisons of two 'Point of Care' INR tests amongst warfarin patients: a validation study

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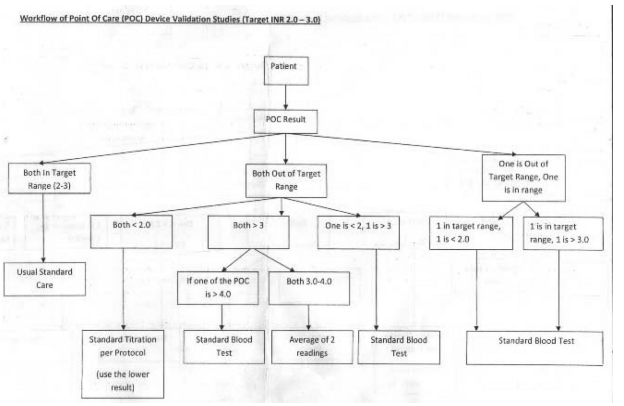
**Introduction:** International Normalised Ratio (INR) is the standard monitoring test for anticoagulant warfarin. Point-of-care (POC) INR tests utilized fingerprick blood sample are more convenient and time-saving. **Objectives:** The objective of this study was to compare the INR derived from POC-A (Coagucheck XS) and POC-B (INRatio) with standard blood test. **Methods:** This was a single-centre, cross-sectional study conducted in August 2011. Consecutive patients attending warfarin clinic at a tertiary cardiac centre were included in this study. Whole blood obtained from finger-pricked was used to test the INR level using both the POC devices. A consensus-based protocol was developed for selection of patients for standard blood test, performed on the same day. Both POC test were compared with the standard blood tests. Verbal informed consent was obtained from the patients. A two-tailed P-value $<0.05$ was considered statistically significant. **Results:** A total of 78 patients were recruited in the study, with a mean age of 53 years (SD 14.38). Forty nine patients had POC-A and standard venous blood tests and 26 patients had both POC-B and standard venous blood tests. There was a stronger correlation between INR derived from POC-A and standard venous blood ($r = 0.961$, $p<0.001$) as compared to INR derived from POC-B and standard venous blood tests ($r = 0.746$, $p<0.001$). Analysis of the Bland-Altman plots and slope of the least squares linear regression analysis confirmed the positive bias with higher INR values. This was more pronounced with POC-B [+0.716 (POC-B) vs +0.581 (POC-A)]. Point-of care-A was moderately sensitive and specific for allocating patient into reaching target group (71.4% and 70% respectively). As for POC-B, its sensitivity and specificity were 12.5% and 80% respectively. Inter-rater reliability, reported as kappa statistics found that POC-A has a fair agreement with the standard venous blood INR ($k = 0.408$). The agreement between POC-B and standard venous blood INR was less than what would be expected by chance along ($k = -0.061$).

**Image/graph I:**




**Conclusion:** Point-of-care-A INR tests have better correlation, higher sensitivity and less variability, compared to POC-B tests.

**P279**

## Cardiovascular risk factors in an aging population (FARCA-PE study)

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**Introduction:** The aging world population today. The improvement in quality of life and modern treatments for chronic diseases has increases life expectancy in most developed and developing countries. This has resulted in a significant increase in the prevalence of cardiovascular disease in individuals over 50 years. Knowlegde of the major risk factors in this population and the characteristics associated with their habits and customs can be an important contribution to improving the quality of medical services provided to this population. **Objectives:** To identify the cardiovacular risk factors affecting a population of subjects older than 50 years. **Methods:** We proceeded to evaluate the epidemilogical characteristics related to cardiovascular disase, 1363 subjects who sought medical assessment to obtain health insurance. Of the total 1247 were older than 50 years who were selected for tihis investigation. They applied a protocol containing the main data about its history and health condition. Underwent a complete physical examination and underwent laboratory tests of blood count, fasting blood glucose, total cholesterol triglycerides and creatinine. Underwent an electrocardiogram at rest in 12-lead and a chest radiograph postero-anterior position. All laboratory tests and procedures were performed in specialist diagnostic center CEDISA and their results were validated by specialist staff. **Results:** A total of 1247 subjects qualified for the study of which 66% were female. The average age in both sexes was 61.8 ± 9.8 years being almost equal in men and women. 43.4%were married and 23.1% single. 56.2% had attended only primary education level and 73% were catholic. 61% present hypertension, diabetes mellitus 16%, 32% had a completely sedentary lifestyle, 6% were smokers, former smokers 18%, 14% reported some degree of alcohol, 31% were obese, 58% cholesterol level less than 200 mg/dl and triglycerides 42%equal to or greater than 150 mg/dl. 32% had some type of electrocardiographic abnormality as 18% in chest radiography and 22% for diagnosis of metabolic syndrome. **Conclusion:** Hypertension, elevated total cholesterol, hypertriglyceridemia and sendetary lifestyle are major risk factors found in the study population over 50 years.

**P280**

## Differences in clinical presentation, management, and outcomes in acute coronary syndrome by age group: results from the egyptian center of excellence registry for acute coronary syndromes

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**Introduction:** The mean age of ACS presentation in middle-income countries such as Egypt is typically 7–10 years younger than in Western registries, leading to premature death and disability. Younger patients may have different presenting clinical characteristics, management, and outcomes than older individuals, thereby impacting preventive strategies. No such characterization of ACS patients has been performed in Egypt to date. **Objectives:** To characterize differences in presentation, management, and outcomes in Egyptian ACS patients ≤45 and >45 years old. **Methods:** We prospectively collected demographic, medical history, clinical, laboratory, and in-hospital event data on 1406 consecutive patients with ACS admitted to 6 major hospitals in Egypt between July 2009 and December 2010 as part of the Egyptian COE Registry for ACS. We divided patients into two groups: ≤45 years old (n=201; 14.3%) and >45 years old (n=1205; 85.7%). Unadjusted and adjusted odds ratios were calculated to

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compare outcomes between these age groups. **Results:** Patients ≤45 years old were more likely to be male (86.6% vs. 76.3%, p<0.001), have a history of smoking (67.3% vs. 48.3%, p<.001) or cocaine use (5.0% vs. 1.0%, p<.001), and present with STEMI (73.0% vs. 62.3%, p<.001). On the other hand, ACS patients ≤45 years old were less likely to have other comorbidities or to take medications. In-hospital management was similar between the two age groups. ACS patients ≤45 years old had lower unadjusted in-hospital mortality rates (3.0% vs. 9.6%, p<0.01) and lower unadjusted in-hospital death/reinfarction rates (3.5% vs. 11.0%, p<0.001). After adjustment for 14 covariates, patients ≤45 years had a substantially lower risk of in-hospital mortality (OR [95% CI] 0.36 [0.14, 0.93]) and mortality/reinfarction (OR 0.31 [0.12, 0.81]). **Conclusion:** These are the first data from Egypt to evaluate age differences in ACS presentation, management, and outcomes. Younger patients were more likely to present with STEMI in the context of more frequent tobacco and cocaine use and lower in-hospital event rates. ACS prevention strategies for individuals ≤45 years old in Egypt should target tobacco and cocaine cessation efforts in this age group.

**P281**

## Strategies for strengthening of EMS survival value chain: does it help in analyzing survival rate in case of cardiac emergencies in India?

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**Introduction:** In healthcare delivery, Emergency Medical Service (EMS) is an important link. Currently, Indian EMS survival value chain focuses on three major components viz., on-scene treatment, en-route care and patient hand-over at hospital without prioritizing the incident time. Though the existing three major components directly or indirectly influence the survival rate of emergency victims, it is challenging to meet the standard management of cardiac emergencies. Cardiac complications form a significant proportion of EMS service usage in both developed and developing countries. **Objectives:** To find out the strategic gaps of EMS survival value chain in handling of cardiac emergencies. **Methods:** The current study is a retrospective study of 6,330 (14.16%) deaths of cardiac emergency patients out of the 44,713 total death cases recorded in GVK Emergency Management and Research Institute (GVK EMRI) in Andhra Pradesh in 2008. Deaths observed *at-scene* (death before/after arrival ambulance), *en-route* (suspected deaths as observed by EMTs during transport) and *in-hospital* (death in-hospital up to 48 hours) were studied by using descriptive statistics. **Results:** Majority (72.05%) cardiac deaths were observed before/after arrival of ambulance, 0.38% suspected deaths were observed en-route and 27.57% deaths cases were in-hospital up to 48 hours. Though, three stages indicate the strategies to improve the survival rate, further categorization of the value chain into six categories would provide higher analytical framework and facilitate stronger strategic management of cardiac emergencies leading to desired outcomes.

**Image/graph I:**

GVK EMRI

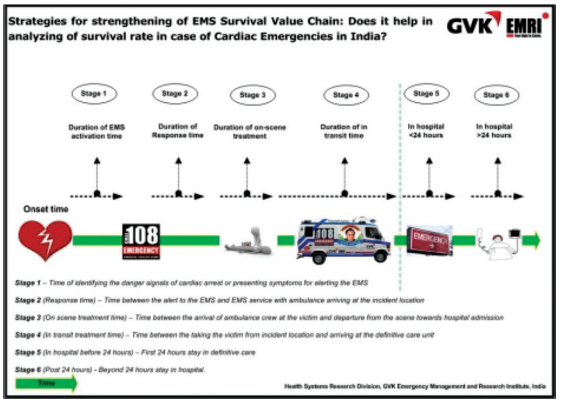
**Strategies for strengthening of EMS Survival Value Chain: Does it help in analyzing of survival rate in case of Cardiac Emergencies in India?**

**Table:** Socio, demographic background of deaths reported at EMS India with people activating EMS with chest pain as chief complaint

| | |
|---|---|
| **Age** | **%** |
| 0 to 19 | 2% |
| 20 to 29 | 3% |
| 30 to 39 | 7% |
| 40 to 49 | 13% |
| 50 to 59 | 20% |
| 60 + | 54% |
| **Gender** | |
| Male | 64% |
| Female | 36% |
| **Social Status** | |
| OC | 32% |
| BC | 44% |
| SC | 20% |
| ST | 5% |
| **Economic Status** | |
| Low-Economic group | 89% |
| High-Economic group | 11% |
| **Response Time** | |
| < = 8 minutes | 24% |
| > 8 minutes | 76% |
| **ERCP advise** | |
| Yes | 16% |
| No | 84% |
| **EMS alert Time** | |
| 0 to 6 | 19% |
| 6 to 12 | 28% |
| 12 to 18 | 25% |
| 18 to 24 | 28% |
| **EMS alert day** | |
| Day time (06 00am to 18 00 pm) | 54% |
| Night time (18 00pm to 06 00am) | 46% |

ERCP: Emergency Response Centre Physician

**Image/graph II:**




**Conclusion:** To understand all risk factors for cardiac deaths three-stage EMS survival value chain has limitations. Research team at GVK EMRI recommends a six-stage EMS survival value chain based in Indian experience through a retrospective study of cardiac emergencies. Stages are 1. Time from identification of danger signals of cardiac arrest or presenting symptoms and time of EMS alert, 2. Time from EMS alert to arrival of ambulance on-scene, 3. On-Scene care time 4. Travel time from scene/site of emergency to hospital 5. First 24-hours stay in hospital 6. Stay beyond 24-hours in hospital. This new strategic six-stage survival value chain can help in higher and accurate identification of risk factors and answer the unexplained questions.

**P282**

## Comparison of risk factor reduction and tolerability of a full dose versus low dose of a polypill (polycap) in individuals at high risk of cardiovascular diseases: a phase II, double blind randomized trial

Alben Sigamani[1,*], Prem Pais[2], Denis Xavier[3], Teo Koon[4], Freeda Xavier[1], Preeti Girish[5], Caley Horsman[6], Rizwan Afzal[7], Salim Yusuf[4] and The Second Indian Polycap Study (TIPS-2) Investigators
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**Introduction:** The Indian Polycap Study (TIPS)(1) evaluated a Polycap™ (aspirin, atenolol, ramipril, thiazide, simvastatin) to demonstrate safety and efficacy among 2053 subjects without CVD but only risk factors for CVD. This polycap used half doses of BP lowering agents and simvastatin compared to the recommended target doses for secondary prevention. There is a need to evaluate the relative efficacy and tolerability of the full dose polycap. **Objectives:** To evaluate the effectiveness and tolerability of two doses of Polycap, compared to a single dose given daily to patients with known stable cardiovascular disease or type 2 diabetes. **Methods:** Double blind randomized active control study. 518 patients with previous vascular disease or type 2 diabetes assigned to low dose polycap or the double dose polycap for 8 weeks. The effects on BP, heart rate, serum lipids, serum K+ and on tolerability were analyzed by intention to treat. Follow ups were done at 2 weeks, 4 weeks, 8 weeks and 12 weeks after randomization. Trial registered at ClinicalTrials.gov (NCT01404078). **Results:** The double dose polycap reduced SBP by an added 2.82 mmHg (-4.70 to -0.95; p=0.003) and DBP by an added 1.73 mmHg, (-2.93, -0.53; p=0.0048). There was no difference in heart rate (0.09 bpm, -0.99 to -1.17; p=0.869). LDL cholesterol was lower by 0.19mmol/L (-0.32 to -0.07; p=0.0033). The rates of discontinuation of the study drug were similar in the two groups (6.9% low dose vs 7.8% double dose). **Conclusion:** The full dose Polycap reduces BP and LDL-cholesterol to a greater extent compared to the low dose (further 25%), with similar tolerability; hence should lead to a proportionately larger clinical benefit.

**Reference:**

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**P283**

## Review of research: potential benefits of yoga in the management of menopausal symptoms and associated cardiovascular risk indices in postmenopausal women

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**Introduction:** Increased cardiovascular disease (CVD) risk observed in post-menopausal women is attributed to the metabolic syndrome (abdominal adiposity, insulin resistance and

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dyslipidemia) that emerges with estrogen deficiency during menopause. Nearly 60 percent of menopausal women seek medical attention for debilitating symptoms (i.e., fatigue, sleep impairment, emotional instability, headaches, and musculoskeletal pain), and/or hot flashes/night sweats, the most common, and distressing symptom among post-menopausal women. Yoga has been reported to reduce vasomotor and other menopausal symptoms, and decrease cardiovascular related indices (i.e., sympathetic activation and obesity) and other factors related to menopause, and may thus hold promise as a cost-effective therapy for women suffering from menopausal symptoms **Objectives:** 1) Systematically review the published research regarding the potential utility of yoga, a popular mind-body practice that incorporates specific body postures (asanas), breathing techniques (pranayama), and meditation, for the management of menopausal symptoms. **Methods:** To identify qualifying studies, the terms yoga and menopause or perimenopause were used to search PuBMed, Medline, and CINHAL (from 2000 to August 2011); and bibliographies of relevant review papers and identified articles were scanned. Methodological quality of identified studies was assessed systematically using predefined criteria. **Results:** Seven eligible studies from Australia, India, Iran, and the United States assessed the effects of yoga on menopausal symptoms, including three randomized controlled trials (*N*= 321 total participants) and four uncontrolled trials (*N*= 87 total participants). Yoga interventions involved at least 1 weekly practice that lasted from 8 to 16 weeks. Perceived improvements in well-being and menopausal symptoms (i.e., anxiety; moodiness, sleep disturbances, hot flashes) represent biased outcome reporting. Small samples and inadequate control groups were methodological concerns limiting the interpretation of findings in all but 2 studies, where in one study observed differences in effects (walking versus yoga group) were partially determined by changes in cardiovascular fitness. **Conclusion:** More rigorous controlled trials are needed to validate existing findings, to evaluate possible underlying mechanisms, and to assess the long term effects of yoga on menopausal symptoms and associated cardiovascular risk indices.

**P284**

## Coronary atherosclerosis, the differences beyond oestrogens

Ana Faustino[1,*], Rui Providência[1], Luís Paiva[1], Paula Mota[1], Sérgio Barra[1], Pedro Gomes[1], Francisca Caetano[1], Inês Almeida[1], Marco Costa[1], António Leitão-Marques[1]
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**Introduction:** Coronary atherosclerosis is not equally distributed among genders, men being more affected than women. Oestrogens are believed to be protective, through higher prevalence is seen in male gender even when comparing with post-menopausal populations. **Objectives:** This study aims to assess the main differences between men and women with intermediate probability of coronary artery disease. **Methods:** A retrospective study of 172 consecutive patients (P) whounderwent cardiac MDCT (Phillips Brilliance, 16-slices): 40.1%men, 66±9years, 25.9% diabetics, 87.3% hypertensive, 63.9% with dyslipidaemia and 12% smokers; men <45 and women <55 years were excluded. P were separated into 2 groups according to gender: M (male: 69P) and F (female: 103P). They were compared regarding cardiovascular risk factors (CRF), cardiovascular risk scores (CRS): Framingham, SCORE and total risk estimation by ATP III (TR), coronary calcium score (CS**c**), coronary atherosclerosis (CAt), detection of significant coronary artery disease (CAD) and thoracic fat tissue volumes ($cm^3$) measured with an Aquarius 3D–TeraRecon workstation: pericardial fat (PF: adipose tissue located within the pericardial sac) and intrathoracic fat (IF: adipose tissue within the chest located outside the pericardial sac). **Results:** Men had higher CRS (Framingham: 20±15% vs 11±7%, p<0.001; SCORE: 4.5±3.6% vs 2±1.4%, p<0.001; TR with high risk for 61.9%M vs 38.6%F and low risk for 12.7%M vs 31.8%F, p=0.007). CSc was also higher in M: 384±845 vs 141±388, p=0.028, as well as the prevalence of CAt: 79.7% vs 54.5%, p = 0.001, and CAD: 31% M vs. 13%, p = 0.001. Smoking was only found in M (29.4% vs 0%, p <0.001) and they had lower HDL-cholesterol levels: 1.2±0.2 vs 1.4±0.4mmol/L, p=0.005. No differences were found regarding other CRF, including age or body mass index. The PF was higher in M: 90±50$cm^3$ vs 63±32$cm^3$, p<0.001 but IF was not significantly different (128±145$cm^3$ in M vs 143±240$cm^3$ in F, pns). **Conclusion:** Compared with women above 55 years old, men had a worse risk profile as shown by the Framingham risk score, SCORE, and ATPIII TR. They had also higher prevalence of coronary heart disease disclosed by CSc, CAt and CAD. Smoking and lower HDL levels were found more often in men, highlighting these as important therapeutic targets. The higher PF in men indicates a possible pathophysiological role of pericardial fat in accelerated atherosclerosis, suggesting PF as a new surrogate marker of coronary heart disease among men.

**P285**

## Testing whether acute coronary heart disease and heart failure events can be classified with electronic medical record data

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**Introduction:** We have developed a decision support tool that identifies the potential population impact of implementing interventions that prevent or treat heart disease. This tool identifies the outcome improvement initiatives that would have the biggest potential impact. Use of the tool requires that acute coronary heart disease and heart failure events be classified as ST elevation myocardial infarction (STEMI), acute heart failure with an ejection fraction <35%, non-ST elevation myocardial infarction (nSTEMI), unstable angina/other acute event (USA), ambulatory/incidental presentation, or chronic stable disease. **Objectives:** To determine whether acute cardiac events can be classified using the data that are available in an electronic record alone or whether further manual review is required. **Methods:** The records of events that occurred between 8–8-2007 and 31–7-2008 were randomly selected using defined criteria and reviewed by one of 2 cardiologists until ≥30 cases of each event had been identified based on clinical notes, left ventricular ejection fraction (EF) data, troponin values, B-type naturetic peptide values, and electrocardiograms. The classification based on medical record data alone was compared to the classification of the cases after they received further review by a cardiologist. **Results:** Cases confirmed by cardiologist review/cases identified by medical record data alone are as follows: STEMI or n STEMI = 60/64; acute heart failure with EF ≤35% = 30/57; USA = 28/70; ambulatory or incidentally identified disease = 15/40; and, chronic prevalent disease = 11/25. Cohen's kappa was 0.48 (95%CI 0.41–0.54). 30 of the cases identified by medical record data were not considered to be either CAD or heart failure with EF ≤35% by reviewing cardiologists. These tended to be patients with heart disease who were hospitalized for non-cardiac reasons. Changing the criteria for USA to "hospitalized with an ICD9 discharge code of 411 or 786.5 increased agreement within this category to 82% and increased Cohen's kappa to 0.54 (95% CI 0.46–0.61) **Conclusion:** Of the six types of events, only acute myocardial infarction can be diagnosed with acceptable accuracy without manual chart review. Unless an ECG analysis program can distinguish between STEMI and nSTEMI ECG patterns, the ECGs must also be manually reviewed. Event classification based on the electronic medical record will need further refinement if it is to accurately classify heart disease cases without the need for manual review.

**P286**

## Developing a strategy to estimate the prevalence of coronary heart disease and heart failure in patient populations

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**Introduction:** We have developed a decision support tool that identifies the potential population impact of implementing interventions that prevent or treat heart disease. This tool can be used to develop outcome improvement initiatives with the greatest potential benefit. To do so, however, the user would need to know the prevalence of coronary heart disease and heart failure (CHD/HF; ICD9 410–414 and/or 420–429) in their population. **Objectives:** To determine the impact of length of enrollment in a health insurance plan, gaps in enrollment, and number of visits with a diagnosis of heart disease on the accuracy of classification when administrative data (AD) are compared to chart audit (CA). **Methods:** The population comprised all patients ages 30+ who were enrolled at any time between 1–8-2007 and 31–7-2008 (n=474,089) in HealthPartners and appeared in the HealthPartners Medical Group electronic record. We compared the entire population to a subpopulation that was also enrolled on 1–8-2005 (n=272,348). We stratified all patients by whether or not they had a gap in enrollment > 31 days and whether they had a) no visits for CHD/HF, b) only one visit for CHF/HF, or c) 2 visits > 31 days apart for CHD/HF. This stratification resulted in 12 distinct classes of patients. We performed a CA of the records of 30 patients in each class. **Results:** 43% of patients enrolled during the period of interest were also enrolled on 1–8-2005. 39% of patients had a gap in enrollment > 31 days. Agreement between AD and CA was 0.88 for all patients and 0.96 for patients who were also enrolled on 1–8-2005. Agreement depending on whether there was a gap in enrollment ranged from 0.87 to 0.96. Agreement for patients with no CHD/HF code ranged from 0.97 to 1.00. Agreement for patients with a CHD/HF code and only one visit ranged from 0.69 to 0.94, and agreement for patients with ≥ 2 visits ranged from 0.89 to 0.97. Requiring only a single visit to be classified as CHD/HF generated a sensitivity of 100% and a specificity of 98%. Requiring ≥ 2 visits 31 days apart dropped the sensitivity to 55% while the specificity only increased to 99.6%. **Conclusion:** In this population, requiring a longer period of enrollment and eliminating patients who have a gap in enrollment results in significantly underestimating the prevalence of CHD/HF without significantly increasing the specificity of diagnosis.

**P287**

## Population based 10 year risk prediction of cardiovascular events

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**Introduction:** Cardiovascular disease (CVD) is the leading cause of death in India. It is known that risk factors do not operate in isolation but have additive and multiplicative effects, making risk estimation relevant especially in resource poor settings like India. The WHO/ISH cardiovascular risk prediction chart is included in the national program for prevention of cardiovascular disease. The advantages of this score are the region specific tables and it can be used even in the absence of laboratory investigations. **Objectives:** To assess the 10 year risk for cardiovascular events in a town of Gujarat using the WHO/ISH cardiovascular risk prediction charts. **Methods:** 521 subjects aged ≥40 years, were randomly selected for the risk assessment survey. Subjects were identified through screening camps in the town of Nadiad in Gujarat. Age, gender, history of smoking and diabetes was recorded. Blood pressure and BMI was measured as per guidelines by trained nurses. The mean age of the population was 56.67yrs (±9.91) and 61.4% were males. **Results:** Diabetes was found in 10.6% of population, smoking in 20%, hypertension in 26.5% (self reported) and 39% were overweight/obese. 9.4% CI (7.6 - 11.1) of the population studied were in the high risk group (≥20%) and 20.5%CI (18.9 - 22.1) were in the moderate risk group (10–20%). The mean age, BMI and systolic BP in the high risk group was 63.4 (±7.78), 25.26 (±5.4) and 161.89 (±24.47) respectively. The risk among men and women was almost the same. **Conclusion:** The WHO/ISH risk assessment charts are easy to apply even in the absence of laboratory investigations. The risk estimates are similar to those reported elsewhere in India using other tools. Risk prediction tools have been proven to be a good tool for prevention. They provide a framework for primary and secondary prevention and should be used frequently.

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## Predictive factors of pulse wave velocity in adolescents

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**Introduction:** The aortic pulse wave velocity (PWV) is a marker of arterial stiffness and, consequently, of cardiovascular outcome. **Objectives:** The aim of this study was to determine a predictor model of PWV values in normotensive adolescents. **Methods:** In 149 normotensive adolescents, 66 males and 83 females. PWV measurements (m/sec) between carotid and femoral (Complior) were made. Demographic data (age, gender), anthropometric parameters [weight, height, body mass index (BMI), waist circumference (WC)] and blood pressure (BP) were recorded. Also, there were determined serum glucose, creatinina, total cholesterol, LDL-cholesterol, HDL-cholesterol and triglycerides. Statistical Analysis: The lineal regression analysis was applied to estimate the predictor model for PWV values. The factors to be included in this model were determined by Pearson correlation analysis. **Results:** The mean PWV value was 7.24 in all adolescents, 7.31 in males and 7.19 in females (P: NS). There were statistically significant associations between PWV values with: creatinina (r=0.28, p=0.001), diastolic BP (r= 0.28, p=0.001), weight (r= 0.27, p=0.001), age (r= 0.24, p=0.002), height (r= 0.24, p=0.004), LDL-cholesterol (r= 0.22, p=0.008), total cholesterol (r=0.22, p=0.008), WC (r=0.19, p=0.02) and BMI (r=0.19, p=0.02). Likewise, the lineal regression analysis evidenced the following main predictor factors for PWV values: creatinina, diastolic BP, LDL-cholesterol and height. Therefore, the predictor model obtained was: PWV = 2.811 + 0.806 (creatinina) + 0.024 (diastolic BP) + 0.005 (LDL-cholesterol) + 1.206 (height) [R2=0.214]. **Conclusion:** This study, involving normotensive adolescents, shows that it is possible to predict PWV values through easy measurements obtained during the routine medical practice. Thus, creatinina serum and diastolic BP appears to be the main determinants of an adverse profile and increased PWV even in normotensive adolescents.

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## Frequency of conventional risk factors in patients with acute myocardial infarction in males and females in durres district population, Albania

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**Introduction:** Myocardial infarction is the leading cause of mortality and morbidity both in men and women. The frequency of conventional risk factors for acute myocardial infarction differs in women compared to men, both in the general population and in patients with acute coronary syndrome. **Objectives:** To find out the frequency of conventional risk factors in patients with acute myocardial infarction in males and females that exists in Durres district patient population. **Methods:** 163 patients with acute myocardial infarction (AMI) who presented in the Cardiology Department, Regional Hospital of Durres,Albania between January 2010 to May 2011were included in the study. All subjects underwent detailed evaluation of cardiovascular risk factors. Patients were screened for the presence of hypertension and diabetes mellitus. Information was also obtained regarding smoking and history of ischemic heart disease in their first degree relatives. Lipid profile was recorded from the investigation chart of every patient. **Results:** Of 163 pts, 125(76.69%) were male and 38 (23.31%) were women. Mean age in men was 59.76±11.6 and mean age in women was 70,57±0,90. Mean ages of men and women did differ significantly p<0,001 .All patients had at least one risk factor. In the men smoking( 67,7 %) and family history (56,5 %)were the most common risk factors of MI. In the women hypertension (84,4 **%),** diabetes mellitus(36,8%) and obesity (51,4 **%)** were the most common risk factors .Hypertension, smoking and diabetes had significant relationship with age and sex p<0.001 **Conclusion:** In our study women were older than men. When compared with men, women with AMI had more prevalence of hypertension ,obesity and diabetes and less prevalence of smoking. In the men with AMI the most common risk factors were smoking and family history. Further research is needed to better understand the gender differences in our population with myocardial infarction.

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## Epidemiology of cardiac arrhythmias in Brazil, 2008–2010

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**Introduction:** Cardiac arrhythmias (CA) form a heterogeneous group of diseases, the causes and consequences can be fatal. In Brazil and the world, one realizes the lack of data on this universe[1-8]. In Europe there are 6 million people affected by atrial fibrillation and it increases by five times the risk of ischemic stroke. The incidence of AF is likely to double in 50 years[9]. In the USA, rhythm diseases represented in 2006, 6.1% of cardiovascular disease and between 1988–2006 the incidence of AF nearly doubled[10]. **Objectives:** Cross-sectional study to examine and compare mortality from cardiac arrhythmias according to gender, age and region of Brazil between the years 2008–2010. **Methods:** Using data from a nationwide population-based registry (DATASUS), We analyzed the variables year, region, age and sex based on the term "cardiac arrhythmias." **Results:** There were 47,024 admissions in 2008, 51,184 and 53,785 in 2009, but the mortality rate was respectively 5.33, 6.24 and 7.32. Those above 60 years, 60% of affected population, 47,956 women and 46,382 men were hospitalized by CA's. The southeast region showed the largest absolute number of admissions (1,914), followed by northeast (1,519), south (278), north (354) and midwest (313). The number of deaths followed the admission ones, with leadership by southeast (5,733), south (1672), northeast (1,138), midwest (803) and north (291). Data from hospitalizations and deaths rose in the three years 2008–2010, but no significant difference. This information will meet the estimate of the ESC, which provides twice the incidence of these diseases in 50 years. Note also, lack both the SUS data - brazilian public health program - as in other countries; American, European and Argentinean guidelines do not show arrhythmias epidemiology in its texts. There is no way to differentiate bradyarrhythmias and tachyarrhythmias, without information about the underlying pathology. **Conclusion:** Cardiac arrhythmias are a heterogeneous group of diseases and, therefore, should have detailed its epidemiology. This occurs in Brazil and worldwide, which makes necessary a more proactive control of the causes and treatment of arrhythmias.

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P291

## Love your heart: a pilot community-based intervention to improve the cardiovascular health of African American women

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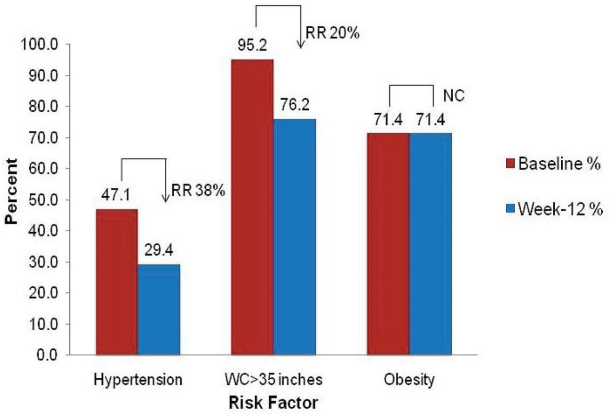
**Introduction:** Cardiovascular disease remains the leading cause of death for women, and racial and ethnic minority groups disproportionately suffer from cardiovascular risk factors. We developed an intensive, culturally-tailored nutrition and physical activity program, Love Your Heart, to reduce cardiovascular risk factors for African-American (AA) women in the Boston area. **Objectives:** To evaluate the impact of a culturally-tailored nutrition and physical activity program in reducing risk for cardiovascular disease in African American women, measured by weight loss and blood pressure reduction. **Methods:** Love Your Heart (LYH) consisted of a 12-week community-based weight management program that included physical activity at a local gym, nutritional counseling, a personalized wellness program, and sessions exploring mind-body connectedness from January to April 2011. Blood pressure, BMI, and waist circumference (WC) were obtained from each participant at baseline, week 6, and at week 12. Additionally, we tracked women's participation in weekly sessions and fitness activities. **Results:** The study sample consisted of 34 AA women with a mean age of 48 years (S.D. 13). At baseline, 41% of the women suffered from hypertension, 79% were obese (BMI≥30kg/m$^2$), and 94% had an elevated WC>35 inches. On average, women attended a total of 8 sessions and lost 9 pounds. Over 12 weeks of follow-up, there were substantial reductions in systolic blood pressure (139 to 131mmHg), BMI (33.8 to 32.5kg/m$^2$), and WC (42.7 to 38.7 inches), on average. Prevalence of hypertension and elevated WC decreased during the study period (Figure).

**Image/graph I:**




**Conclusion:** We found that a culturally-tailored, integrative weight management program reduced weight and resulted in statistically significant reductions in cardiovascular risk factors for AA women in an urban community. While small, our study suggests that targeted community-based interventions focusing on personal wellness have the power to reduce health disparities and improve cardiovascular risk factors in AA women. Larger and longer, multi-site studies of LYH are ongoing to determine whether these results are replicable and sustainable.

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## Establishing a pan african pulmonary hypertension cohort study (PAPUCO) collaboration using mobile internet technology: a methodological overview

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**Introduction:** Pulmonary hypertension (PHT) is a fatal cause of heart failure. HIV, schistosomiasis, tuberculosis, and rheumatic heart disease are major contributors to disease burden, but only limited data exist on PHT in Africa. **Objectives:** To study the epidemiology, aetiology, clinical features and outcome of PHT in Africa and to interlink more than 20 cardiovascular centres from Cameroon, Kenya, Malawi, Mozambique, Namibia, Nigeria, Rwanda, South Africa, Sudan, Tanzania, Uganda, and Zimbabwe using mobile Internet technology for data management; and to develop a communication and resource platform (Pan African Pulmonary Hypertension Cohort study, PAPUCO). **Methods:** integerafrica (www.integerafrica.org) developed an easy-to-use web-enabled tool that assists medical researchers to track, analyse, and report on an individual-case level. The platform allows researchers to enter data from multiple sites using one centralised database and provides tools for real-time data analysis. Using a geo-location aware data system, research can be undertaken to study disease distribution and to identify risk factors. integerafrica is an open-source inspired medical research data and tool-sharing platform committed to training and long-term projects in resource-constraint settings. This will create a strong network of researchers on the African continent and easily bridges the long physical distances. integerafrica implements appropriate administrative, physical and technical safeguards to ensure the confidentiality, integrity and security of electronic health information. **Results:** The online platform is 24 hours accessible (www.papuco.org). The architecture is developed according to clinical workflows and chronological procedures. Data are validated at the point of data entry. Multimedia data formats, i.e. electrocardiogram, chest x-rays, and echocardiography can be uploaded on the platform allowing storage of complete clinical records, which guarantees completeness of data. Tools for education, training, and communication are installed within the web-portal. The design is mobile and touch screen friendly. By the end of July 2011, 13 centres had been trained and registered on the system. **Conclusion:** Mobile technology is the key to multi-site research projects in Africa, which allows researcher in remote areas to participate in research collaborations. The next step is the successful expand to more than 20 centres through web-based training sessions and weekly online meeting to ensure high quality standards.

P293

## The beneficial effect of physical activity on endothelial function in middle-aged and elderly habitants in an area with increased rates of longevity: IKARIA study

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**Introduction:** Physical activity (PA) has substantial vascular and cardiac health benefits and can ameliorate cardiac risk. **Objectives:** In the present study we evaluated the effect of habitual physical activity on endothelial function in middle aged and elderly residents of Ikaria Island; as the inhabitants of this island show increased longevity and high prevalence of healthy aging. **Methods:** The study was conducted from June to October of 2009, on a subgroup population of IKARIA study consisted of 327 subjects (155 men) aged 40–91 years, permanent inhabitants of Ikaria Island. Endothelial function was evaluated by ultrasound measurement of flow-mediated-dilatation (FMD). We evaluated PA using the shortened version of the self-reported International Physical Activity Questionnaire (IPAQ). Overall the study sample was divided in three groups according to the categorical score achieved in IPAQ questionnaire: low PA ($n=75$), moderate PA ($n=200$) and vigorous PA ($n=48$). Subjects in the low PA group were recorded as physical inactive and the rest as physical active. **Results:** Mean FMD ($5.79\pm3.19\%$) was inversely associated with age ($r=-0.242$, $p<0.001$). Inactive subjects had significantly lower FMD compared to active subjects ($4.95\pm3.02\%$ vs. $6.06\pm3.23\%$, $p=0.008$). Multiple linear regression analysis after adjustment for several known confounders (age, diabetes mellitus, hypertension, smoking, hypercholesterolemia, cardiovascular disease, body mass index) revealed significant differences in FMD values between moderate vs. low PA group [$b=1.24$, 95%CI: (0.28, 2.20), $p=0.011$] whereas a trend was evident between vigorous and low PA group [$b=1.11$, 95%CI: (-0.16, 2.38), $p=0.089$]. Moreover subjects walking for more than 10 minutes less than two times weakly had significantly lower FMD compare with subjects walking three to five days weakly or almost every day ($5.13\pm2.82\%$ vs. $6.95\pm3.84\%$ vs. $6.00\pm3.23\%$, $p=0.005$). **Conclusion:** The present study revealed another cardioprotective mechanism of habitual moderate PA through beneficial modification of endothelium function.

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## Minor oral surgeries and teeth extractions in patients taking antivitamin k and antiplatelet drugs: a prospective study about 940 acts and a literature review

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**Introduction:** Since the begenning of the use of oral anticoagulants, the question about their stopping, reducing or maintaining before teeth extractions and minor oral surgeries, has been a controversial subject. Stopping these drugs expose to a high thrombotic risk, their maintainance expose to a *"theorical risk of bleeding"* **Objectives:** The main objectives of this study, were to evaluate the efficacy of local hemostasis technics in patients taking oral anticoagulants, undergoing teeth extractions and oral surgeries, without modifying their anticoagulants treatment. **Methods:** Teeth extractions (multiples and simple), and minor oral surgeries, were performed after evaluation of INR. When INR were ranged in [2, 4,5], antivitamin K have not been changed. Patients whom were taking antiplatelet drug, did not have coagulation tests before teeh extractions. Local hemostasis technics were systematically applied after extractions. **Results:** 940 surgical acts (580 on antivitamin k, 262 on aspirin, 98 on aspirine and Clopidogre), were performed on 388 patients (268 on antivitamin k, 45 on Clopidogrel and aspirin, 75 patients on aspirine only). 17 post-operative bleeding were observed (1,8%). 14 in antivitamin K group (2,41%), 01 in aspirine group (0,38%), 02 in plavix and aspirin group (2,04%). All bleeding cases were treated by local measures, INR value were not a risk factor of bleeding after these surgeries. Others risk factors have been identified (surgical trauma,use of mouthwash solutions, . . . . ). **Conclusion:** Antivitamin k and antiplatelet drugs (Aspirin and Clopidogrel) should not be stopped or reduced before teeth extractions and oral surgeries. These acts can be performed without altering treatment by anticoagulants drugs. In patients taking antivitamik K, INR value must be less or equal to 4,5. Bleeding can be easily prevented by local hemostasis technics. Tthrombotic risk is higher than haemorragic risk in anticoagulated patients undergoing teeth extractions and oral minor surgeries.

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## Inquiry into the forms of prescription of the anticoagulants and knowledge of the patients of their treatment at the university hospital Ibn Roch of Casablanca (540 cases)

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**Introduction:** The iatrogénie of the antivitamins K (AVK) is a public health problem. **Objectives:** The patients' ignorance of the basic rules concerning this treatment constitutes an important risk factor at the same time hemorrhagic accidents and thrombotic recurrences. **Methods:** The study proceeded by a preliminary evaluation of the patient's knowledge to be able to formulate effective methodologies of the therapeutic education **Results:** The results of the inquiry were as follows: 19% of the patients were unaware of the interest of the AVK for their pathologies; 87% of the subjects knew of the need for a regular biological surveillance. The note present in the box was read by 17% of the subjects. 64% of the subjects knew of the risks of an overdose in AVK and 46.7% those an insufficient treatment. Only 38.5% of them knew of the risks due to an overdose and to an insufficient treatment at the same time. Only 14% of the subjects know that it is necessary to report the treatment to the doctor, the dentist, and the pharmacist at the same time. Only 8% of the subjects understood the presence of drug interactions. With the AVK, 54% of them know which analgesic they can take in case of pain. 22% of the subjects paid attention to foodstuffs rich in vitamin K. **Conclusion:** The education of the patients under AVK constitutes the pillar of the therapeutic effectiveness and the decrease of AVK accidents. For that reason, we have created a schematized notebook in Arabic with the hope of developing an audio-visual education of these patients

P296

## First results from an innovative community-based vascular prevention programme in Ireland

Irene Gibson[1,*], Gerard Flaherty[2], Anne Marie Walsh[1], Claire Kerins[1], Susan Connolly[3], Jenni Jones[4], Jim Crowley[5]
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**Introduction:** Cardiovascular disease (CVD) is the leading cause of death in Ireland, yet there is limited focus on comphrensive prevention programmes. **Objectives:** To investigate the impact of a community-based vascular prevention programme on medical and lifestyle risk factors in patients at high risk of cardiovascular disease (CVD).The evidence base for this programme evolved from the EuroAction study[1]. **Methods:** Patients (Heart SCORE $\geq$ 5%, Type 2 diabetes, peripheral arterial disease) and their partners were invited to attend the 16-week programme delivered by a multidisciplinary team (nurse, dietician, physical activity specialist, medical doctor) in a community setting. The key elements of the programme were lifestyle modification, medical risk factor management and the prescription of cardioprotective medication where appropriate. Smoking and dietary habits, physical activity levels, waist circumference and BMI, and medical risk factors (blood pressure and lipids) were measured at the initial assessment (IA) and at end of programme (EOP).

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**Results:**

| | Patients Initial (n=208) | Patients EOP | Partners Initial (n=108) | Partners EOP |
|---|---|---|---|---|
| **Mean (SD) BMI (kg/m²)** | 32.8 (6.7) | 31.4 (6.5) p<0.001 | 29.7 (5.5) | 28.6 (5.1) p<0.001 |
| **Mean (SD) waist circumference (cm)** | | | | |
| Men | 115.9(15.0) | 110.3(14.6) p<0.001 | 113.2 | 108.2 p<0.001 |
| Women | 106.4(15.7) | 101.5(16.1) p<0.001 | 96.5 | 92.5 p<0.001 |
| **Mean(SD) Mediterranean Score** (max 14) | 4.1 (2.2) | 8.4 (2.4) p<0.001 | 4.3 (2.1) | 8.6 (2.4) p<0.001 |
| **%Achieving physical activity targets** ( ≥5x/week ≥ 30 minutes) | 9.3 | 63.2 p<0.001 | 19.4 | 61.2 p<0.001 |
| **% Smoking** | 12.6 | 6.5 p<0.001 | 8.8 | 8.8 p=1.00 |
| **% Blood Pressure** <140/90mmHg for high risk individuals & <130/80mmHg for coronary/diabetes | 52.1 | 77.6 p<0.001 | 77.9 | 88.4 p=0.05 |
| **% Lipids** (TC <5mmol/l & LDL <3mmol/l) | 32.1 | 69.5 p<0.001 | 38.5 | 55.2 p<0.001 |

The above table shows outcomes for patients and partners who attended both inital assessment and end of programme assessment.

**Conclusion:** This study demonstrates that this model of prevention is acceptable to patients, with high adherence rates and substantial improvements in both lifestyle and medical risk factors for CVD.

**Reference:**

Wood DA, Kotseva K, Connolly S et. Nurse Co ordinated multidisciplinary, family based cardiovascular disease prevention programme (EUROACTION) for patients with coronary heart disease and asymptomatic individuals at high risk of cardiovascular:a paired, cluster-randomised controlled trial. Lancet, 2008; 371 (9629): 1999–2012.

**P297**

## Prevalence of cardiovascular risk factors in urban and rural population of guatemala

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**Introduction:** Guatemala has the second highest rate of mortality from diabetes mellitus (26.5%) have an highest proportion of premature mortality due to cerebrovascular diseases. In 2009, acute myocardial infarction was ranked second leading cause of mortality and cerebrovascular event in fifth place. In Guatemala there are few studies to date on cardiovascular risk factors, and there is no data that are nationally representative, only have urban data. **Objectives:** To compare the prevalence of cardiovascular risk factors in the population of Guatemala over 19 years, between urban and rural population during the period from June to July 2010 **Methods:** We evaluate people aged 19 years residing in private homes located in urban and rural settings, surveyed people in his home and proceeded to measure weight, height, waist circumference, blood pressure, lipid profile, glucose. **Results:** Studied 1517 people, 692 from reside in urban area and 825 in rural area, with regard to sex 588 (38.76%) male and 929 (61.24%) female, average age 42.93 in urban and 41.43 rural areas; abdominal circumference 86.74 urban and rural 83.95cms cm ($p < 0.0001$), HDL cholesterol 33.24mg% urban and rural 35.48 mg%, triglycerides 147.33 mg% urban and rural 162.06 $p < 0.0001$, mean preprandial glucose 119.8mg% rural and rural 111.37mg% ($p < 0.0001$), mean body mass index 26.88 Kg/mt2 urban and 25.32 Kg/mt2 rural, average systolic blood pressure in urban 122.68mmHg vrs rural 113.93mmHg $P < 0.0001$ **Conclusion:** Despite being a poor country we are in the epidemiological transition, confirming the differences in risk factors between urban and rural areas in Guatemala and the need to implement educational policies for primary prevention cardiovascular both urban and rural, but principally in Urban area, because actually the Cardiovascular disease represent the leader cause of morbidity and mortality in urban zones.

**P298**

## Design and baseline characteristics of a coronary heart disease prospective cohort: 2-year experience from the strategy of registry of acute coronary syndrome study (ERICO study)

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**Introduction:** Acute coronary syndrome (ACS) is an important cause of hospitalization. Although most patients are treated at local hospitals, the vast majority of registry studies are set in tertiary facilities[1]. The ERICO study (Strategy of Registry of Acute Coronary Syndrome) was created to verify the frequency of ACS and its subtypes, the role of known or potential risk factors and long-term event rate in a community teaching hospital in the southeastern region of Brazil. **Objectives:** To describe the design and baseline characteristics during the two initial years of ERICO enrollment. **Methods:** The ERICO study is an ongoing prospective cohort. It is conducted at a secondary general hospital in Sao Paulo, Brazil. All consecutive patients, 35 years-old or older, with a diagnosis of ACS who agree to participate are enrolled in the study. Sociodemographics, medical history, clinical exam and information about hospital treatment are obtained. A brief depression questionnaire is also applied for an ancillary study. Blood samples are drawn at admission and stored. In 30-day follow-up visit, data on medical history and occurence of depressive symptoms are updated and additional blood and urinary samples are collected. Retinography, carotid intima-media thickness, heart rate variability and pulse wave velocity are performed. Questionnaires about food frequency, physical activity and sleep apnea are applied. At six months, and annually after acute event, participants are followed by phone. **Results:** From February 2009 to January 2011, 570 patients were enrolled. Of these, 156 (27.4%) had ST-elevation myocardial infarction (STEMI), 233 (40.9%) non ST-elevation myocardial infarction (NSTEMI) and 181 (31.7%) unstable angina (UA). Median age was 62 (interquartile interval: 54–73) years. 332 (58.2%) were men and 451 (79.1%) had 8 years or less of education. Most common primary cardiovascular risk factors were hypertension and sedentarism. Among 455 individuals who could adequately inform about previous coronary disease, only 126 (27.7%) had a prior positive history. Compared to the subgroup with STEMI, individuals with UA and NSTEMI had a higher frequency of known hypertension ($p<0.01$), dyslipidemia ($p=0.01$), sedentarism ($p=0.01$), prior coronary heart disease (CHD, $p<0.01$) and heart failure ($p<0.01$). **Conclusion:** In contrast to studies performed in tertiary hospitals, this community-hospital based sample has a less frequent prior history of CHD, which possibly reflects more closely a community-based setting.

**P299**

## The incidence of acute myocardial infarction in the permanent residents of Beijing During 2007–2009

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**Introduction:** As the dramatic improvements of medical care for acute myocardial infarction (AMI), more AMI patients survive from the heart attack and compose a larger and larger high risk population for the secondary prevention in China. Therefore, it becomes increasing importance to monitor AMI incidence rates instead of mortality which underestimate disease burden and increased demands for medical resources. **Objectives:** To examine the recent incidence rates of acute myocardial infarction (AMI) in the permanent residents of Beijing from 2007 to 2009. **Methods:** The Beijing Acute Myocardial Infarction Surveillance Platform was established by linking the routinely collected data from the Hospital Discharge Information System and Cause of Death Register System in Beijing. All AMI cases occurred during study period in this population were caught from either hospital admission records or death registration records through the two systems. Age-standardized incidence rates of AMI were calculated after a systematic quality check. **Results:** A total of 52357 AMI aged 25 or over were identified among permanent residents of Beijing during 2007–2009. The age-standardized incidence was 123.9, 133.9, and 137.7 per 100, 000 population for the year 2007, 2008, and 2009, respectively. The rate increased by 11.2% in the year 2009 compared to 2007, with a greater increase noticed in men (13.7%) than in women (5.9%). The incidence raised by 27.1% for the 35–39 year age group in the year 2009 compared to 2007, the largest increase in all age groups. In 2009, the incidence was 111.2, 124.3, and 172.0 per 100, 000 people in urban, suburban, and exurban area, respectively. Compared to 2007, the relative increase was 8.6% in urban, 6.7% in suburban areas, and 16.9% in exurban areas, respectively. **Conclusion:** The incidence of AMI increased notably among the permanent residents of Beijing aged 25 years and over during 2007–2009. The poorer cardiovascular health in men, in younger age groups, and the exurban areas, should be investigated. Current data may guide future policy-making for public health and help to determine priorities for the prevention of heart disease in large cities, like Beijing, which leads rapid socioeconomic changes with profound effects on health.

**P300**

## Pharmacotherapy and blood pressure control post myocardial infarction: the FARIM registry

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**Introduction:** The FARIM registry (Pharmacotherapy after Myocardial Infarction) is a web side based database. Included were patients who visited a policlinic in a stable condition and had a history of myocardial infarction more than 30 days before the inclusion visit. We have examined 2 500 patients with the history of myocardial infarction from September 1st 2009 to March 31st 2010 Medication was recorded, patient's history was controlled, blood pressure (BP) and heart rate were measured and basic metabolic parameters were analyzed. **Objectives:** Open label epidemiology registry. **Methods:** web sampling. **Results:** Results: 2500 (1790 males, 710 females) were included, mean age 67.1±0.02 years (1 491 below 70 years, 1 009 above 70 years, males were 6 years younger than females, mean age at first myocardial infarction was 59.2±0.2 for males and 65.9±0.2 for females and mean time from the last myocardial infarction was 5 years. Only 13% were NYHA II and more. 83% had a history of hypertension. Mean blood pressure was 132.4±0.2/78.8±0.2 mmHg for males 131.8±0.4/78.9±0.2 mmHg and 133.9±0.6/78.4±0.3 mmHg for females (ns). Mean BP of patients ≤ 70 years was 131.4+0.4/79.4+0.3 mmHg and of patients > 70 years 134.4±0.5/77.9±0,3 mmHg ($p<0.001$). Mean heart rate was 68.1±0.2 per minute. 21% of patients had BP <130/80 mmHg, 41% 130–139/80–89 mmHg and 38% ≥ 140/90mmHg (23% had isolated systolic hypertension–more frequently females - 27%) and patients over 70 years - 29%). ACE-I or ARB were prescribed in 90% of patients, beta blockers in 86%, calcium blockers in 15% and diuretics in 29%. Statins were prescribed in 87%, acetylsalicylic acid in

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93%. Mean cholesterol was 4.5+0.1 mmol/l, 69% had cholesterol below 5.0 mmol/l. High (recommended) dose of ACE-I and statins was used in less than 10% of the patients. Better BP and cholesterol control was in patients treated by cardiologists than by general practitioners. **Conclusion:** Conclusion: We have confirmed a high adherence to international guidelines in the treatment of blood pressure and cholesterol in patients post myocardial infarction. We did not found gender differences; older people are more frequently undertreated. The dose of ACE-I and statins were lower than recommended.

**P301**

## HealthTracker: does electronic decision support improve identification and management of cardiovascular risk in australian primary health care

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**Introduction:** The high prevalence of cardiovascular disease (CVD) risk factors and disease burden experienced by Aboriginal people underscores the importance of evidence based management in primary health care. **Objectives:** To test the effectiveness of *HealthTracker*: an electronic decision support (EDS) tool that assists Australian health professionals in Aboriginal Medical Services (AMSs) and general practice in guideline implementation for cardiovascular disease (CVD) risk management. **Methods:** *HealthTracker* is being evaluated in a cluster randomised controlled trial involving 20 AMSs and 40 General Practices. Services are allocated to the *HealthTracker* intervention or 'usual care' for 12 months. The intervention comprises four features: automatic pre-population of essential risk factor and treatment information from the electronic medical record; provision of a CVD risk assessment and tailored management plan at the point of care; an interactive risk communication interface for discussion with patients about current and projected risk; a data extraction facility which allows services to assess performance on key CVD care processes/activities. All clinicians in the intervention services (doctors, nurses, Aboriginal Health Workers) will be provided with training in use of the tool and the web based portal to review service performance and participation in a Clinical Quality Improvement program, aimed at improving CVD management and prevention. Primary outcome measures focus on improved detection and management of individuals at high CVD risk. Economic and process evaluations will also be conducted. **Results:** By September 2011, 27 health services have been recruited and automated data extractions have been performed. Baseline performance for CVD risk identification and management will be presented. Preliminary data reviewing the acceptability and utility of *HealthTracker* will also be discussed. **Conclusion:** Initial AMS response to the project has been positive and the project represents a culture change in clinical health care. It demonstrates the capacity for AMSs to lead the implementation and rigorous evaluation of a complex health system intervention. If found to be effective in improving health service performance for best practice cardiovascular care this could make a substantial contribution to improved health outcomes for Aboriginal people. The lessons learnt could be readily translated to improved care for other under-served populations.

**P302**

## Insomnia and the risk of heart failure, a population study

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**Introduction:** Insomnia is highly prevalent among heart failure patients, however, only a few small studies have investigated the prospective association of insomnia symptoms and incident heart failure. **Objectives:** To assess the prospective association between self-reported insomnia symptoms and the risk of incident heart failure in a large Norwegian cohort. **Methods:** Data on insomnia symptoms, socio-demographics and health status were collected between 1995 and 1997 from 54,279 men and women aged 20–89 free of previous heart failure in Nord-Trøndelag County in Norway. We followed the cohort for incident heart failure from baseline to 2008. We used a Cox proportional hazard model to assess the association of baseline insomnia symptoms and heart failure hospitalization or death due to heart failure during the follow-up. In our models, we adjusted for age, sex, marital status, education, shift-work, blood pressure, lipids, BMI, physical activity and smoking. **Results:** A total of 1489 cases of heart failure accrued in the cohort during 11.3 years of follow-up. The multiadjusted hazard ratios for incident heart failure were 1.37 (1.06–1.77) for people with difficulties initiating sleep almost every night, 1.37 (1.02–1.84) for those with difficulties maintaining sleep almost every night, and 1.22 (0.85–1.75) for those with a feeling of non-restorative sleep more than once a week, compared to those who never have these symptoms. When combining the symptoms, a dose-dependent association between the number of insomnia symptoms and risk of heart failure were found (p for trend 0.004). **Conclusion:** Insomnia is associated with an increased risk of incident heart failure. Evaluation of insomnia symptoms may provide useful information in clinical risk assessment.

**P303**

## The association of insomnia and peak oxygen uptake

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**Introduction:** Several studies suggest that insomnia might increase the risk of cardiovascular diseases. The underlying mechanism for this relationship is largely unknown but cardio-respiratory fitness has been suggested as a possible pathway. The association of insomnia and cardio-respiratory fitness have been investigated both in observational studies on self-reported physical activity and in smaller experimental studies. However the results have been contradictory. No previous studies have examined this relationship in a large cohort using the "gold standard" measure of cardio-respiratory fitness that is peak oxygen uptake ($VO_2$peak). **Objectives:** To assess different aspects of self-reported insomnia symptoms and the association with $VO_2$peak in a large Norwegian cohort. **Methods:** Data on insomnia symptoms, socio-demographics and health status were collected between 2006 and 2008 from about 51,000 participants aged 20–89 in Norway. Within this cohort, a sub-sample of 4,637 participants free from known cardiovascular and pulmonary diseases where randomly selected to participate in an exercise study where they were tested for $VO_2$peak. The cross-sectional data were analysed using general linear models. All models adjusted for age, sex, marital status, blood pressure, lipids, BMI, smoking and alcohol consumption. **Results:** $VO_2$peak decreased with increased frequency of the insomnia symptoms. The adjusted mean $VO_2$peak values were 40.40 L/min/kg (95% CI 40.03–40.56), 39.99 L/min/kg (95% CI 39.68–40.30) and 39.08 L/min/kg (95% CI 38.38–39.79) among those without sleep initiation problems, among those occasionally experiencing and among those frequently experiencing such problems, respectively (p for trend 0.004). The corresponding values for participants that never, occasionally, or frequently experienced difficulties maintaining sleep were 40.47 L/min/kg (95% CI 40.15–40.79), 39.95 L/min/kg (95% CI 39.67–40.23), and 39.45 L/min/kg (95% CI 38.96–39.95), respectively (p for trend 0.001). When combining the symptoms, an association between the number of insomnia symptoms and $VO_2$peak was found (p for trend $<$0.001). **Conclusion:** Insomnia symptoms were associated with decreased $VO_2$peak in this relatively large cohort. Although we could not establish causality in the present study, decreased cardio-respiratory fitnessamong those suffering from insomnia symptoms frequently might represent a plausible pathway for the adverse cardiovascular effects of insomnia.

**P304**

## Cardiovascular risk awareness and knowledge in women in a middle income Latin-American country

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**Introduction:** Stroke and coronary heart disease are the first and second leading causes of death among Chilean women. Since 2007 the Chilean Society of Cardiology started a national campaign to raise women's awareness of CVD risk. **Objectives:** To assess awareness of CVD risk and the knowledge about CVD in chilean women. **Methods:** Cross-sectional survey in women from Santiago, Chile. A representative urban random sample was obtained in two steps, through a probability sampling of schools (n=20) and mothers of students into each school (n=981), representing women $\geq$ 25 years living in Santiago. Awareness, knowledge, and perceptions were evaluated applying a standard questionnaire (provided by the American Heart Association) during August and September 2010. **Results:** 69% were $<$45 years old; 70% were married or cohabitating and 54% had at least 12 years of education; 9% had previous diagnostic of diabetes. The reported prevalence of heart attack and stroke were 2% and 1% respectively. A minority identified CVD (heart diseases and cerebrovascular diseases) as the first cause of death in women (22%), by contrast with 41% that mentioned breast cancer as the leading killer in Chilean women; 17% indicated CVD as the main health problem in women and 32% perceived to be at risk for CVD. Overweight, high blood pressure and family history were identified as the main causes of CVD. The majority of respondents had knowledge about the mayor risk factors for CVD and strategies to prevent CVD: quit smoking (91%), exercise (90%), lose weight (85%), adequate blood pressure control (79%), reduce dietary cholesterol (88%), reduce dietary salt (82%); reduced stress (72%). However 74% indicated had heard about CVD in the past 12 months, only 17% indicated to be very well or well informed about heart disease in women. Television was the most common source of information. Nearly 80% recognized chest pain as a symptom of heart attack, but a minority identified atypical symptoms (nauseas or shortness of breath) as symptoms of heart disease. Two of every three women would go to a hospital or call the emergency number if they were with someone who has having symptoms of heart attack. **Conclusion:** Awareness of CVD risk in Chilean women is still suboptimal, despite a high level of knowledge about risk factors and preventive strategies for CVD. National campaigns have to highlight the link between cardiovascular risk factors and heart disease and stroke.

**P305**

## Depressive symptoms increase risk of death in patients after acute myocardial infarction

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**Introduction:** Many studies suggest that depression affects coronary heart disease (CHD) prognosis, some studies did not confirm this. **Objectives:** To assess the influence of depressive

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symptomson clinical outcomes in patients after acute myocaradial infarction (MI). **Methods:** 209 patients hospitalized for acute MI (98 (47%) men and 111 (53%) women, aged 37–90 years, mean 65.7±10.1 years) were included. The diagnosis of MI was based on generally accepted criteria. The presence and severity of depression were assessed at discharge from the hospitalby means of the Beck Depression Inventory (BDI) and confirmed by a clinical interview according to the ICD-10diagnostic criteria. The BDI standard cut-off points were: 12–18 for minimal depressive symptoms, 19–26 - mild depression, 26–35 - moderate depression and ≥36 - severe depression. Clinical outcomes (cardiovascular events or death) were assessed at1 year follow-up. **Results:** 32,5% pts had subclinical depression (12–18 BDI) and 28,7% - mild, moderate and severe depression (≥19 BDI). Even subclinical depression increased the risk of death at 1 year follow up 2.5 times, recurrent acute MI -4.4 times, and combined endpoint (death and/or recurrent MI) 3 times (table 1). Depression in post-MI patients was related to higher hospital re-admission rates.

Table 1. Relative risk of cardiovascular events and/or death in post-MI patients with subclinical and clinical depression.

| Events | Subclinical depression (12-18 BDI) | | | Clinical depression (≥19 BDI) | | |
|---|---|---|---|---|---|---|
| | OR | 95% CI | p | OR | 95% CI | p |
| Recurrent MI | 4.38 | 1,71-11,22 | 0.002 | 3,29 | 1,56-6,95 | 0,002 |
| Combined endpoint (recurrent MI and/or acute coronary syndrome) | 2,45 | 1,25-4,77 | 0,009 | 2,19 | 1,15-4,16 | 0,017 |
| Hospitalizations on cardiovascular reasons | 2,53 | 1,42-4,53 | 0,002 | 2,86 | 1,51-5,39 | 0,001 |
| Combined endpoint (recurrent MIand/or death) | 2.92 | 1,45-5,89 | 0.003 | 3,88 | 2,04-7,38 | 0,001 |
| Death | 2,44 | 1,06-5,59 | 0.036 | 4,37 | 2,12-9,04 | 0,001 |

**Conclusion:** Depression, even subclinical, has a significant negative impact on cardiovascular prognosis in post-MI patients.

**P306**

## Knowledge of risk factors for heart disease among yoruba community of Nigeria

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**Introduction:** Studies on knowledge about cardiovascular diseases (CVD) risk factors in the general population are lacking in Nigeria. Identification of gaps in knowledge can aid in the development of health education and health promotion materials that can be utilized in this community. **Objectives:** We set out to examine the level of basic knowledge and understanding of CV risk factors using hypertension as an entry point among people living in rural south western Nigeria. **Methods:** A population based cross-sectional survey was conducted using structured questionnaire to interview 2000 subjects in order to assess knowledge of various aspects of modifiable CV risk factors. Descriptive analysis of the variables was performed to process the data as tables. Continuous variables were described by calculating the means and SD. Categorical variables were described using frequency tables. **Results:** A quarter of the respondents had no formal education, 67% had primary, whilst 8% had above primary level education. The commonest source of medical information was family/friend/opinion leaders of trusted groups in 1198(59.9%), media (radio, public enlightenment programmes, newspapers) in 492(24.6%), and doctor/nurse/health worker in 183(9.1%) of the respondents. Overall knowledge of CVD and its risk factors was poor. About 56% of the respondents could not identify a single risk factor. Of those who were able to, only a few could correctly identify the relationship between CV risk factors and CVD. The common CV risk factors known in decreasing order of frequency were stress (42.7%), tobacco use (36.2%), hypertension (16.2%), diabetes (5.4%), excessive salt intake (2.8%), low consumption of fruits and vegetables (1.7%), obesity (1.6%), lack of exercise (1.2%), and dietary fat (1.1%). About 99% of the subjects were unaware that excess weight around the waistline increased the risk of CVD. Predictors of good knowledge were: tertiary education 3.11 more than uneducated (95% CI 2.06–7.14); positive family history of CVD 1.76 more than no family history of CVD (95% CI 0.69–8.50); and history of diabetes mellitus 1.52 (95% CI 0.16–3.70). **Conclusion:** Our study confirms a limited knowledge of CVD and its risk factors in this population. Early detection and preventive practices were lacking. There is need to design and implement culturally appropriate public awareness, health educational and health promotional programmes about CV risk factors for this community.

**P307**

## Biobank aided epidemiological study on cardiovascular diseases: the BudakalÁsz cardiovascular health examination survey

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**Introduction:** The Budakalász Cardiovascular Health Examination Survey (BCHES) is a cardiovascular examination survey designed to serve as a demonstration project for data collection on the prevalence of cardiovascular diseases and their risk factors at the country level of a Central European country, Hungary. **Objectives:** A biobank and its related data-bank had been developed for prospective collection of tissue specimen in a population-based cardiovascular screening. **Methods:** The cohort population in a Central Hungarian suburban town with 8000 adult inhabitants (age ≥ 20 years) has been selected and the phenotyping protocol included a comprehensive health interview survey, and health examination survey with cardiac ultrasound, carotid intima-media-thickness, ECG and ankle-brachial index measurement. This study generates a significant quantity of raw medical data (approx. 100 records per individual), 17 specimen tubes (plasma, serum, and DNA). DICOM images (8 per inhabitants) are being collected and all files have been directly connected to the database. Therefore a new, high-performance platform has been developed to provide an web-based database, importing laboratory data form the existing clinical database used in a university clinic and provides a searchable platform using with relevant keywords. **Results:** Data entry includes clinical records with full personal coverage and in parallel anonymized data are generated and entered in the web-based platform using a 5-digit coding system, according to the Hungarian legal regulations on genetic research. Different access levels, including system administrators and users have been generated to prevent unauthorized modification or misuse of the archived data. Web-based databank provides a novel platform for outside researchers for combined search with limited access level in the anonymous database. This flexible feature of the biobank data leads to a more effective outsourcing of the data and specimen and therefore may improve international scientific cooperation between researchers and clinicians in the field of cardiology. **Conclusion:** The Budakalász Cardiovascular Health Examination Survey is among the first country-level cardiovascular examination survey to be conducted in Central Europe. By using a highly affective patient management and sample organizing application the survey provide valuable country-level data and information for screening program design and delivery.

**P308**

## High prevalence of cardiovascular risk factors in urban asian indians: results from nationwide India heart watch study

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**Introduction:** India is coronary capital of the world due to its high mortality and prevalence. **Objectives:** To determine prevalence and geographic variations in cardiovascular risk factors we performed a nationwide study in unselected populations. **Methods:** Study was performed at eleven medium sized cities in India using cluster sampling. Study subjects (n=6198, men 3426, women 2772) were located in northern (Jammu, Chandigarh, Bikaner, n=1321), western (Ahmadabad, Jaipur, n=1814), southern (Madurai, Belgaum, Nagpur, n=1237) and eastern (Lucknow, Patna, Dibrugarh, n=1826) regions. They were evaluated for demographic, biophysical and biochemical risk factors using uniform protocol. Descriptive statistics are presented. Regional differences in risk factors were evaluated using multivariate logistic regression. **Results:** In men/women age-adjusted prevalence (%) of smoking was in 12.0/0.5, other tobacco use 12.7/6.3, visible fat ≥20 g/day 51.2/48.2, fruit/vegetables ≤2 helpings/day 60.2/64.6 and sedentary lifestyle 41.2/39.1. Overweight was in 41.1/45.2, obesity in 8.3/15.8, high waist-hip ratio in 40.0/72.6, hypertension in 32.5/30.4, cholesterol ≥200 mg/dl in 24.8/25.3, low HDL cholesterol in 34.1/53.0, triglycerides ≥150 mg/dl in 41.2/31.5, diabetes in 16.7/14.1 and metabolic syndrome in 17.2/22.7 respectively. Compared with the national average, prevalence of most risk factors was not significantly different in the southern, northern, eastern or western regions (age-adjusted logistic regression, p>0.05). **Conclusion:** There is high prevalence of multiple lifestyle and cardiometabolic risk factors in Asian Indian urban populations with no significant regional variation.

**P309**

## Dependence of disability and decreased capacity for work from gender and age after unstable angina or acute myocardial infarction

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**Introduction:** The medicine advances leads to better treatment during myocardial infarction and unstable angina. However functional recovery after myocardial infarction is a lenthy process that not always lets the patient gain the same health they had before their ilness. The disability after myocardial infarction or unstable angina is a common issue. It is important to indentify the magnitude of this problem and try to implement new strategies to influence it. **Objectives:** The aim of this study was to identify the dependence of disability and decreased capacity for work from gender and age after after unstable angina (UA) or acute myocardial infarction (MI). **Methods:** It is a descriptive statistical study. 9409 patients were enrolled who had applied for establishing disability and decreased capacity for work at government disability establishment agency in Lithuania during 2001 - 2009. The patients were divided into two groups: according to sex, age and were classified into two sets: group A-patients up to 44 years old and group B-patients over 45 years old. **Results:** From 2001 to 2009 prevalence of disability establishment applications after MI increased among males. In 2001 the disability was established for 9.3/100000 male inhabitants and in 2009 for 21.29/100000**.** Among females the disability rate during 2001 - 2009 remained similar-around 2.4/100000 female inhabitants. The application rate for establishing disability after unstable angina increased during 2001–2009 period. Among males in 2001 disability after UA was verified for 40,5/100000 male inhabitants and in 2009 for 117.58/100000. Among females in 2001 disability after UA was established approximately for 24,5/100000 female inhabitants and in 2009 it increased to 58.58/100000 female inhabitants. Among people after MI in group A, 1,67/100000 inhabitants applied for establishment of disability in 2001. The rate increased to

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11,29/100000 inhabitants in 2009. In group B the establishment of disability increased from 84.83/100000 in 2001 up to 194.5/100000 inhabitants in 2009. **Conclusion:** More men than women after unstable angina or MI are applying for disability establishment. Older age is a risk factor for disability establishment after MI or UA. It was observed that the UA rate among young people aged less than 44 years is increasing every year.

**P310**

## Cardiovascular diseases rates during 2001–2010 are increasing among women in Lithuania

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**Introduction:** Cerebrovascular diseases are the most common cause of women deaths in the world. **Objectives:** To identify morbidity and mortality rates and distribution by age of females in Lithuania, who, based on the ICD-10 classification were diagnosed E10-E14 (diabetes), I10-I15 (hypertension), I20 (angina pectoris), I21-I22(myocardial infarction), I26-I28 (pulmonary embolism, pulmonary heart disease, pulmonary vascular diseases), I60-I69 (cerebrovascular diseases). **Methods:** A descriptive research was done. Compulsory health insurance fund information systems "SVEIDRA" was used to gather morbidity and mortality data of 2001–2010. The patients were classified according to disease, gender and age. Female mortality was analyzed based on a cause of death. **Results:** The morbidity of females with cardiovascular diseases is increasing. In 2001 diabetes melitus was diagnosed to 1310,27/100000 females and in 2010 - to 2631,35/100000. Arterial hypertension in 2001 was diagnosed to 10114,38/100000 and in 2010 - 17.368.72/100000. The morbidity of females with angina pectoris during 2001 - 2010 increased from 3179,24/100000 to 4140,21/100000. In 2001 acute myocardial infarction was diagnosed to 138,92/100000 and in 2010 - 176,0/100000. During 2001–2010 the morbidity of patients with pulmonary vascular disease increased from 30,21/100000 to 62,26/100000 and cerebrovascular diseases from 2955,57/100000 to 4050,38/100000. Female mortality from cardiovascular diseases accounts for about 65% of all causes of death in Lithuania. In 2010 56,62% women died from coronary heart disease, 48,7% of them - due to heart attacks. Deaths resulting from hypertension were diagnosed to 57,47% of women, cerebrovascular diseases - 57,12%. **Conclusion:** Female morbidity and mortality from cardiovascular diseases is higher than male in Lithuania, like the rest of the world. In order to reduce female morbidity and mortality, it is necessary to intensify the prevention and involve more women in clinical studies to determine specific risk factors and treatment.

**P311**

## Impact of smoking cessation on 10-Year risk of CHD in Aleppo, Syria

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**Introduction:** Smoking is a well-known coronary heart diseases (CHD) morbidity leading cause worldwide. Smoking cessation is an important component of CHD primary prevention programs **Objectives:** To estimate the theoretical impact of smoking cessation on absolute risk reduction of developing CHD among adults in Aleppo, Syria **Methods:** This study's data come from the second Aleppo population-based household survey which conducted in 2006 among people aged 25 years and over. 712 subjects (53.2% men, mean age 44.6 $\pm$ 11.9 years; representing approximately 712000 Syrian adults aged 25 years and over) provided information about socio-demographics and medical history, blood pressure measuring as well as fasting blood samples to analyze serum levels of total cholesterol and high density lipoprotein-cholesterol. We applied the risk prediction algorithm used by the National Cholesterol Education Program Adult Treatment Panel III guidelines to data from the subjects who had no CHD or diabetes (Model 1). Then we re-applied the same algorithm after assuming that smoking score is zero (Model 2). **Results:** In general, 74.9% of the studied population (approximately 528000 adults of community) had no CHD or diabetes, of which 44.1% (233000 of community) were current smokers. Model 1 showed that 16.7% (88000 adults of community) had a 10-year risk for CHD of $>=$20% and 83.3% (444000 adults of community) of $<$20%, with mean of 10-year risk for CHD was 4.78$\pm$6.71% (8.07$\pm$8.16% in smokers and 2.21$\pm$3.65% in non-smokers). In model 2, only 8.4% of the study population (45000 adults of community) had a 10-year risk for CHD of $>=$20% and 91.6% of $<$20% (488000 adults of community). Mean of 10-risk for CHD decreased significantly down to 2.67$\pm$4.45% in the study population and 3.26$\pm$5.24% in smokers, $P<0.001$ for both according to paired-samples T test. Relative risk reduction was 44.1% among population and 59.6% among smokers. **Conclusion:** Although smokers would still be at higher 10-year risk for CHD than non-smokers, more than half CHD cases during next 10 years would have been prevented if people had quit smoking in Syria.

**P312**

## Screenig for self-reported exertional chest pain in general population

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**Introduction:** Ischemic heart disease (IHD) is a well-known mortality leading cause worldwide. Primary prevention and early detection are the best way to decrease the disease burden. **Objectives:** To investigate how serious is self-reported exertional chest pain among people with no previously-established IHD and how important is conducting a simple screening strategy for such a symptom for identifying groups with increased risk of IHD in general population. **Methods:** This study's data come from the second Aleppo population-based household survey which conducted in 2006 among people aged 25 years and over. Information was collected about socio-demographics and physician-diagnosed IHD, hypertension, hypercholesterolemia and diabetes, as well as smoking and self-reported of exertional chest pain. Blood pressure, weight and height were measured. Fasting blood samples were obtained to analyze glucose and cholesterol. Exertional chest pain was defined as complaining of any type of chest pain which always comes with a specific level of exertion. People who reported IHD were excluded from analysis, yielding 1062 subjects with no IHD (47.6% men; mean age 43.7 $\pm$ 12.5 years). **Results:** Exertional chest pain was reported by 20.6% of the study population higher in women than in men (24.8% vs. 16%, $p<0.001$). People with chest pain had higher rates of hypertension (60.3% vs. 45.7%, $P<0.001$), diabetes (18.7% vs. 13.9%, $p<0.05$), hypercholesterolemia (28.8% vs. 21.8%, $P<0.05$), obesity (58.8% vs. 42.5%, $P<0.001$) but not for smoking (29.7% vs. 31.0% $P=0.714$). Compared to non-chest pain group, more new cases of risk factors were detected among chest pain group especially for hypertension among people with no previously diagnosed hypertension (47.6% vs. 35%, $P<0.01$). Moreover, among non-diabetic people, chest pain associated with increased likelihood of having impaired fasting glucose (38.5% vs. 28.5%, $P<0.05$). Including all study risk factors and age and gender as predictors, multivariate logistic regression analysis showed that chest pain was significantly related to only hypertension and female gender ($p<0.05$ for both). However, using continuous variables of the study risk factors, multivariate linear regression showed that chest pain was significantly correlated with increased diastolic blood pressure, fasting blood glucose level, BMI in addition to female gender ($P<0.05$ for all). **Conclusion:** Self-reported exertional chest pain may seriously imply IHD and may increase power of early detection of the disease in screening strategies.

**P313**

## Prevalence of cardio-metabolic risk factors in young employees of information technology (IT) industry in Pune

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**Introduction:** There has been an increasing trend in non-communicable diseases worldwide[1]. Lifestyle factors contribute to this rising prevalence. IT industry workers face many health challenges due to odd working hours, erratic eating habits, sedentary lifestyle & constant stress levels; which can hamper their work performance. This study throws light on current health scenario of IT industry employees in India.

**Objectives:**

1. To establish prevalence of cardio-metabolic risk factors in employees of IT industry.
2. To observe clustering of cardio-metabolic risk factors within body mass index (BMI) & age groups. **Methods:** Data were obtained from Cardio-Awareness Initiatives organized for the employees of 2 leading IT industries in Pune. Prevalence of cardio-metabolic risk factor clustering ($\geq$2 risk factors from: Triglycerides (TG) $\geq$150mg/dl; High-density lipoprotein (HDL) $<$40 in males or $<$50mg/dl in females; Blood pressure (BP) systolic $\geq$130 or diastolic $\geq$85mmHg; Fasting plasma glucose (FPG) $\geq$100mg/dl) was determined within WHO-defined BMI groups for Asians (Underweight $<$18.5, normal weight 18.5 to 22.99, overweight 23 to 24.99, Pre-obese 25 to 27.49, Obese $\geq$27.5kg/m$^2$) and within 4 age groups ($<$30, 30–39, 40–49, $\geq$50 years). American Diabetic Association (ADA 2011) criteria & Joint National Committee (JNC-7) guidelines were used to categorize blood sugar levels (BSL) & BP. **Results:** Total 1350 young employees (Mean Age= 33$\pm$6 years) were studied (78% males). Overall prevalence of cardio-metabolic risk factor clustering was 28.9% and was similar in both the genders ($p=0.411$). Prevalence of obesity, hypertension, hypercholesterolemia and pre-diabetes was 22.5, 19.3, 19.2&10 respectively. Prevalence of cardio-metabolic risk factor clustering showed an increasing trend with increasing age ($p=0.010$) & BMI categories ($p=0.000$). It was 28.6, 27.5, 33.8, and 55.2% across given age groups whereas 9.1, 18.3, 21.6, 23.3, and 41.3% across BMI categories (from minimum to maximum). **Conclusion:** There is a high burden of cardio-metabolic risk factors in young employees working in IT industry. The prevalence of risk factor clustering increases with increasing age & BMI. With India being globally recognized for its back-office support in software, there is a need to spread awareness among IT employees about far-reaching effects of these health problems & to initiate Workplace Health Promotion programs.

**Reference:**

1. World Health Organization, Noncommunicable diseases now biggest killers, Geneva, Switzerland: World Health Organization; 2008.

**P314**

## Prediction of mortality through cardiovascular risk factors in type 2 diabetic patients treated with insulin

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**Introduction:** Type 2 Diabetes Mellitus (DM) is a metabolic disorder with strong impact on public health, both in terms of morbidity and mortality analysis, as well as in the analysis of economic indicators. In seeking resource optimization with the best possible cost-benefit ratio, it is important to accurately identify those patients at increased risk of complications and make use of all possible prevention tools in their treatment. **Objectives:** To establish risk factors with ability to predict mortality in a population of type 2 diabetic patients treated with insulin. **Methods:** We included patients with type 2 diabetes (N = 12,147), whose data had been recorded in full when they entered the *PRODIABA* program (Program for the prevention, diagnosis and treatment of diabetic patients sponsored by the Ministry of Health of the Province of Buenos Aires), between 1996 and 2009. Death was considered an event; and age, sex, cholesterol (> 200 mg%), triglycerides (> 150 mg%), blood pressure (BP), considering two levels, (a) > 140/90 mm Hg (b) > 130/80 mm Hg, smoking, and history of hypertension were considered risk factors. Statistical analysis included simple risk calculation, stratified Mantel-Haenzsel test and multivariate logistic regression. **Results:** Out of 12,147 patients with type 2 DM, 1858 died -showing a higher frequency of deaths in men than in women (17.5% vs. 13.5%) (OR = 0.71; 95% CI, 0.66 to 0.81). The BP level > 140/90 mm Hg was a statistically significant predictor of death (OR = 1.17; 95% CI, 1.05 to 1.32). In turn, the value of BP > 130/80 mm Hg was not statistically significant (OR = 1.10; 95% CI, 0.90 to 1.12). History of hypertension (OR = 1.24; 95% CI, 1.10 to 1.39), triglyceride levels > 150 mg% (OR = 1.14;

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95% CI, 1.02 to 1.26), smoking (OR = 1.15; 95% CI, 1.02 to 1.29) and age (OR = 1.05; 95% CI, 1.04 to 1.06) were statistically significant factors. Overall, the multivariate model predicted a 70% (95% CI, 0.68 to 0.73) probability of dying. **Conclusion:** The statistically significant predictors of death in this population of patients with diabetes were: a history of hypertension, blood pressure > 140/90 mm Hg, level of blood triglycerides > 150 mg%, smoking, age and male sex. The multivariate model predicted a 70% chance of dying.

**P316**

## Burden of ischaemic heart disease and stroke in Serbia

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**Introduction:** In Europe, cardiovascular diseases (CVD) are the main cause of death (48% of all deaths) and the main cause of years of life lost (YLL) (about 30% of the total YLL). As a cause of Disability Adjusted Life Years - DALY lost, CVD are on the second place in Established Market Economies (18% of the total DALY), and on the first place in Formerly Socialistic Economies (23% of the total DALY). **Objectives:** To provide estimates of disease burden which should guide future health strategies and interventions and would enable to monitor the improvements in health and the performance of the health care system. **Methods:** Study was performed in Serbia for the year 200. DALY was used to provide a comprehensive assessment of premature mortality (YLL) and disability attributable (YLD -years of life with disability) to ischaemic heart disease (IHD) and stroke, and to estimate attributable and avoidable burden of these diseases due to smoking, hypertension, overweight/obesity, physical inactivity, alcohol consumption and inadequate consumption fruit and vegetables. **Results:** IHD was responsible for 15,889 DALY (16.28 per 1,000 population), and stroke was responsible for 136,090 DALY (14.49 per 1,000 population). There were more considerable YLL lost for both IHD (23.73 per 1,000 for males and 12.63 per 1,000 for females) and stroke (16.65 per 1,000 for males and 16.68 per 1,000 for females) than YLD (IHD: 2.40 per 1,000 for males and 1.52 per 1,000 for females; stroke: 2.26 per 1,000 for males and 1.45 per 1,000 for females). For both diseases DALY rates increased with aging in males and females. For IHD and stroke burden the most responsible were smoking (18.5% of total IHD DALY and 17.9% of total stroke DALY), physical inactivity (24.2% and 27.9%), hypertension (21.2% and 44.7%) and overweight/obesity (14.9% and 12.0%). There were sex and age differences in burden attributable to various risk factors. **Conclusion:** Despite obvious limitations, the DALY estimates represent a useful measure of the size of the health problem. These estimates can be used as a guide for prevention of IHD and stroke as well as for evaluation of the scope of future health gains obtained by reducing population exposure to various risk factors.

**P317**

## Stress as risk factor for primary nonfatal myocardial infarction in Serbia

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**Introduction:** Data about independent risk factors for IHD are inconsistent although more than 300 risk factors have been recognized. It is estimated that conventional risk factors are responsible for 75% of CVD diseases occurrence. **Objectives:** The aim of this study was to investigate which one among possible stress factors are independently related to primary nonfatal myocardial infarction (MI) in Belgrade population. **Methods:** Case-control study was conducted in Belgrade during the period 2005–2006. Case group comprised 100 subjects 35–80 years old who were hospitalized because of primary nonfatal MI at the coronary care unit in Urgent Center**,** Belgrade. Control group consisted of 100 persons chosen among patients treated during the same period at the Institute of Rheumatology, Institute for Gastroenterology, and Clinic for Orthopedics, Belgrade, Serbia. Cases and controls were individually matched by sex, age (± 2 years) and place of residence (urban/rural communities of Belgrade). **Results:** Cases and controls did not differ by sex, age and place of residence since they were matched on these variables. Among participants about one third were men, 52% were younger than 60 years, and 86% were from urban communities of Belgrade. Compared groups also did not differ in nationality, marital status, education and occupation. Significantly more cases (34%) than controls (6%) reported "good" socio-economic conditions. During the year preceding the diagnose of disease, cases, in comparison with controls, more frequently experienced as stressful the following life events: death of a close relative, death of a close friend, hospitalization of some family members, great and small financial problems, and "other" stressful events. Controls more frequently reported their own disease and hospitalization as stressful events. The number of stressful events was significantly greater in cases than in controls. According to the multivariate analysis independent risk factors for MI occurrence were stress because of close relative "s death, great financial problems and small financial problems. **Conclusion:** The results of the present study support the hypothesis that emotional stress may play a role in the development of MI and can be of help in development of strategy for coronary heart disease prevention in Serbia.

**P318**

## Unique risk factors of myocardial infarction in the Taiwanese general population

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**Introduction:** The risk factors for acute myocardial infarction (AMI) have been well established in the Caucasian populations. Whether these so-call traditional risk factors also predispose to AMI in the Asian population remain unknown. **Objectives:** We aimed to identify the risk factors for AMI in the Taiwanese general population. **Methods:** A total of 63129 patients were enrolled into KCIS (Keelung Community-Based Integrated Screening) screening program and were prospectively followed up from 2001 to 2004. The baseline characteristics and biochemistry data were collected. The incident AMI data were retrieved from the National Health Insurance dataset. The association between incidence AMI and baseline factors was analyzed using the Cox proportional hazards model. **Results:** At the end of follow-up in 2004, 305 patients were documented to have AMI attacks. Patients with myocardial infarction (MI) were older, and more percentages of them were male and smoked cigarette. Patients with MI also had higher blood pressure, low-density lipoprotein (LDL) and total cholesterol, triglyceride, AC sugar, body mass index, abdominal waist, and lower high-density lipoprotein (HDL). However, after multivariable adjustment, the developing of AMI was only positively associated with male gender (adjusted harzard ration [aHR] 1.49, 95% confidence interval [CI] 1.07 to 2.08), older age (70–79 years old vs 20–49 years old, aHR 7.89, 95% CI 4.30 to 14.50), higher AC sugar (aHR: 2.17, 95% CI 1.64–2.86), and higher uric acid (aHR: 1.52, 95% CI 1.15 to 2.01). Increasing HDL was also reversely associated with AMI (HDL > 60, aHR: 0.23, 95% CI 0.15 to 0.35). Interestingly, the traditional risk factors of AMI identified in the Caucasian populations, such as hypertension, smoking or high triglyceride, were not associated with the risk of AMI after multivariable adjustment. **Conclusion:** The risk factors for AMI are unique in the general Taiwanese population. Low HDL is more important than high triglyceride. High uric acid level is more important than high blood pressure level.

**P319**

## Estimated glomerular filtration rate and proteinuria independently predict risk for acute myocardial infarction in a northern Taiwanese population: a community-based study in Keelung, Taiwan

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**Introduction:** Estimated glomerular filtration rate (GFR) and proteinuria are two makers of kidney function and have recently been proven to be associated with increased risk of adverse cardiovascular outcomes in the general population. **Objectives:** We sought to evaluate the independent roles of proteinuria and reduced estimated GFR in the development of acute myocardial infarction (AMI) in Taiwanese people. **Methods:** We conducted a community-based prospective cohort study in Keelung, the northernmost county of Taiwan. A total of 63129 subjects (63% women) aged 20 years and above who were free of a coronary heart disease history were recruited between 2001 and 2004. Univariate and multivariate proportional hazards regression models analysis was performed to assess the association between proteinuria and estimated GFR and the risk of AMI. **Results:** There were 305 cases of AMI, 114 women and 191 men, documented during a four-year follow-up period. Heavier proteinuria (dipstick urinalysis reading 3+) and estimated GFR of less than 60 ml/min/1.73 $m^2$ independently predicted increased risk of developing AMI after adjustment for available confounding variables. The adjusted hazard ratio (aHR) of heavier proteinuria for occurrence of AMI was 1.85 (95% confidence intervals [CI], 1.17–2.91). The aHR of estimated GFR of 30–59 ml/min/1.73 $m^2$ for occurrence of AMI was 2.4 (95% CI, 1.31–4.38), and that of estimated GFR of 15–29 ml/min/1.73 $m^2$ was 5.26 (95% CI, 2.26–12.26). **Conclusion:** We demonstrate that both heavier proteinuria and lower estimated GFR are significant independent predictors of developing future AMI in the Taiwanese general population.

**P320**

## A study of coronary artery disease in the young in India (the CADY study)

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**Introduction:** There is increasing incidence of coronary artery disease in the young in India. CAD in the prime years of life not only affects the individual and family but also negatively impacts country's economy. **Objectives:** To study the demographic factors, risk factors, clinical, angiographic and management profile of young patients with CAD. **Methods:** Patients aged 40 years and less who attended Srinivasa Heart Centre, Warangal, Andhra Pradesh, India with CAD ((n-157), during November 2008 and July 2011 formed the cases. Controls are 158 patients aged 40 years and less with atypical symptoms and absence of CAD on noninvasive evaluation (negative TMT). Data of demography, risk factors, clinical,biochemical profile, ECG, echocardiography, angiography and management were collected and entered in M.S.Excel database. Statistical analysis is done with Epi Info (TM) 3.5.3 of CDC USA and MedCalc version 11.6. Group differences in quantitative data are analysed with appropriate (equal & unequal variance) t-test. Difference in Qualitative data are analysed by O.R with Chi-square tests; 95% C.I and Fisher exact P-values are calculated. A p value of $<0.05$ is considered significant. **Results:** Table 1: Duration of tobacco use and Waist/Hip ratio are more and BMI is less in CADY group. Table 2: Tobacco

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use (smoking & nonsmoking form) was strongly associated with CADY (O.R 5.0). Males have more risk of CAD (O.R 4.5). Employment is protective (O.R 0.11). Residence, Family history, Diabetes, Hyperlipidemia, hypertension are not associated with CAD. 38 in CAD group–No conventional risk factors. Observations in CAD group are Anterior wall MI (95% CI 51.1–67%); normal LV function in 76%; Angiographic evidence of single vessel disease in 72%, LAD being the commonest vessel (95% CI 59–77.9%). Despite not receiving thrombolysis, in 7 the LAD had recanalized

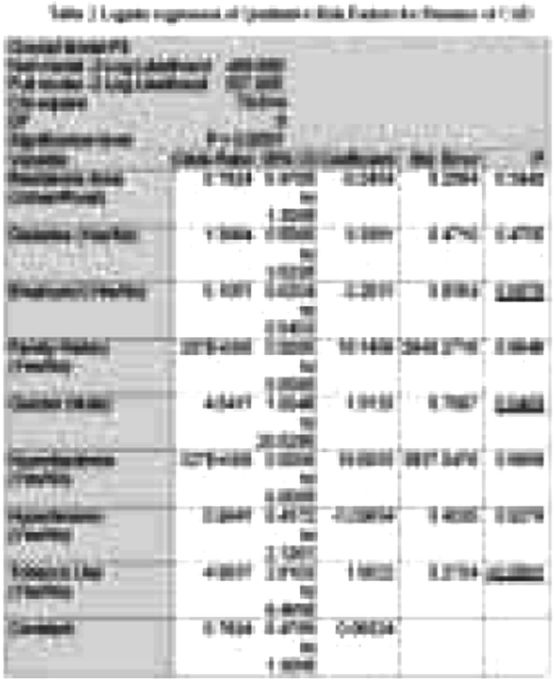
**Image/graph I:**

Table 1 Description & Comparison of Quantitative Data (CADY & Control Groups)

| | CADY=Y Control=N | N | Mean | Std. Deviation | Std. Error Mean | Levine's Test F | Levine's Test Sig. | t-test t | t-test df | t-test Sig.(2 tailed) | t-test Mean Difference | t-test S.E Difference | t-test F | 95% CI LOWER | 95% CI UPPER |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AGE OF PRESENTATION | Y | 157 | 35.32 | 4.544 | .363 | .066 | .798 | 2.021 | 313 | .044 | 1.027 | .508 | .027 | 2.028 | .066 |
| | N | 158 | 34.30 | 4.479 | .356 | | | | | | | | | | |
| DURATION OF TOBACCO USE | Y | 141 | 6.52 | 6.951 | .585 | 165.782 | .000 | 10.329 | 160.265 | .000 | 6.264 | .607 | 5.067 | 7.462 | 10.329 |
| | N | 119 | .26 | 1.729 | .159 | | | | | | | | | | |
| QUANTITY OF TOBACCO USE | Y | 96 | 9.58 | 7.662 | .782 | | | | | | | | | | |
| | N | 0* | . | . | . | | | | | | | | | | |
| BMI | Y | 128 | 24.30177 | 3.643642 | .322056 | .600 | .440 | -2.380 | 213 | .018 | -1.271123 | .534070 | -2.323862 | -.2183 84 | .600 |
| | N | 87 | 25.67289 | 4.121287 | .441848 | | | | | | | | | | |
| W H RATIO | Y | 93 | .95756 | .055729 | .005779 | 9.303 | .003 | 3.548 | 97.676 | .001 | .025798 | .007272 | .011367 | .0402 29 | 3.548 |
| | N | 24 | .93176 | .021624 | .004414 | | | | | | | | | | |
| TOT CHOL | Y | 48 | 167.50 | 40.136 | 6.983 | .068 | .810 | -2.004 | 82 | 0.05 | -17.526 | 8.747 | -34.925 | -.126 | .068 |
| | N | 39 | 185.03 | 39.797 | 6.373 | | | | | | | | | | |
| LDL | Y | 44 | 97.47 | 31.079 | 4.685 | 1.579 | .212 | -1.763 | 82 | 0.08 | -11.138 | 6.318 | -23.707 | 1.431 | 1.579 |
| | N | 40 | 108.60 | 26.336 | 4.164 | | | | | | | | | | |
| TRIG | Y | 44 | 190.57 | 89.356 | 13.471 | .531 | .468 | 1.047 | 81 | 0.3 | 20.543 | 19.621 | -18.496 | 59.581 | .531 |
| | N | 39 | 170.03 | 89.052 | 14.260 | | | | | | | | | | |
| HDL | Y | 44 | 39.94 | 11.782 | 1.776 | 4.253 | .042 | -.829 | 55.121 | 0.4 | -1.576 | 1.901 | -5.385 | 2.234 | -.829 |
| | N | 39 | 41.51 | 4.234 | .678 | | | | | | | | | | |
| EF | Y | 151 | 48.95 | 11.569 | .941 | | | | | | | | | | |
| | N | 0* | . | . | . | | | | | | | | | | |

*a t-test not done as EF is measured in CADY group only.

**Image/graph II:**



**Conclusion:**

1. Tobacco is a very significant risk factor for CAD in young.
2. Conventional risk factors like diabetes, hypertension and hyperlipidemia are not associated with CAD in young.
3. Aggressive tobacco preventive efforts are important to reduce the burden of CAD in young.
4. Further studies are needed in young CAD patients without conventional risk factors.

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**P321**

## Arterial stiffness and central hemodynamics in apparently healthy residents with impaired glucose regulation or high-normal blood pressure

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**Introduction:** Increased arterial stiffness may explain, at least in part, the increased cardiovascular risk associated with the impaired glucose regulation (IGR) and high normal blood pressure (HNBP). However, whether the IGR or HNBP equally contribute to increased central or peripheral arterial stiffness, and their relationship with central blood pressures and wave reflections are far from conclusive and incompletely understood. **Objectives:** The aim of this cross-sectional study was to investigate regional arterial stiffness and central hemodynamics in subjects with HNBP and/or IGR. **Methods:** A total of 266 consecutive subjects (146M and 120 F, 46.25±13.33 years) with either HNBP, IGR, or both were studied. Regional arterial stiffness was assessed by non-invasively measuring carotid-femoral (PWVcf) and carotid-radial pulse wave velocity (PWVcr). Central blood pressures and heart rate corrected augmentation index (Alx-75) were estimated by pulse wave analysis. Traditional CVD risk factors (including waist circumference, blood pressure, smoking, lipid profiles, oral glucose tolerance test (OGTT) and renal function were measured. **Results:** 98 subjects (60M and 38F) were classified as HNBP, 145 subjects (71M and 74F) as with IGR and 23 subjects as with both HNBP and IGR. Although subjects in the IGR group had the lowest mean brachial blood pressure and pulse pressure, they had highest central systolic blood pressure, pulse pressure, augmentation pressure (AP) and PWVcf. In addition, Alx-75 showed higher in the IGR group when compared with the HNBP group, while comparable in comparison with the combined group. The combined IGR and HNBP group had higher PWVcf and Alx-75 compared with the HNBP group, but didn't differ in peripheral and central blood pressure profiles. The three groups did not differ by central diastolic blood pressure, transit time (Tr) and PWVcr. Multivariate stepwise regression analysis revealed that 2h post-load glucose level was independently associated with PWVcf and Alx-75. IGR status other than HNBP is an explanatory variable for PWVcf ($\beta$=0.363, p<0.001) and Alx-75 ($\beta$=0.266, p <0.001). **Conclusion:** Early stage of diabetes or hypertension has different impact on central or peripheral haemodynamics and arterial stiffness. IGR preferentially impaired central systolic pressure and PP, which might be the underlying reason for its stiffer central arteries over peripheral ones. The presence of HNBP dose not synergistically increase artery stiffness along with IGR.

**P322**

## Association between blood pressure and anthropometric indicators in Brazilian adults

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**Introduction:** Overweight through activation of the sympathetic nervous system contributes to pathogenesis of hypertension. **Objectives:** This study intends to determine the prevalence of hypertension and association with anthropometric measures **Methods:** In a cross-sectional study were evaluated 3.286 Brazilian adults (aged 18–60 years) of both sexes. Measured variables for each subject included anthropometric [height, weight and circumference (WC)] and calculated body mass index (BMI), waist-height ratio (WHtR). The blood pressure was classified in normotensive, pre-hypertension (Pre-HBP) and hypertension (HBP) according Brazilian Society of Cardiology. **Results:** Prevalence (%) of HBP was higher among men, and those with values above the cut-off point ofanthropometric parameters (WC; WHtR; BMI) (Table 1). According multivariate regression analysis(Odds Ratio: OR), men presented twice probability to develop Pre-HBP and HBP (OR: 2.3; IC95%: 1.9–2.9). When compared to eutrophics, overweight individuals presented 1.7 (IC95%:1.3–2.7) to 1.9 (IC95%:1.2–2.3) major risk to develop Pre-HBP and HBP, respectively. Already in the obese the chances of having pre-hypertension is 1.8 (IC95%:1.1–3.0) and hypertension 3.5 (IC95%: 2.4–5.1).
**Image/graph I:**

**Table 1. Prevalence pre-hypertension and hypertension in Brazilian adults from gender and antropometric measures.**

| | | Normotensive n=2537 | | Pre-HBP n=276 | | HBP n=473 | | Total N=3.286 |
|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | N |
| Gender | Male | 1.703 | 83.1 | 132 | 6.4 | 214 | 10.4 | 1.237 |
| | Female | 834 | 67.4 | 144 | 11.6 | 259 | 20.9 | 2.049 |
| WC | Normal | 1.662 | 83.0 | 148 | 7.4 | 193 | 9.6 | 2.003 |
| | High | 875 | 68.2 | 128 | 10.0 | 280 | 21.8 | 1.283 |
| WHtR | Normal | 1.501 | 86.1 | 116 | 6.7 | 126 | 7.2 | 1.746 |
| | High | 1.035 | 67.2 | 159 | 10.3 | 347 | 22.5 | 1.541 |
| BMI | Normal | 1.526 | 86.8 | 104 | 5.9 | 129 | 7.3 | 2.537 |
| | Overweight | 758 | 69.9 | 129 | 11.9 | 197 | 18.2 | 275 |
| | Obesity | 253 | 57.2 | 42 | 9.5 | 147 | 33.3 | 442 |

**Conclusion:** The hypertension was highly prevalent between individuals overweight/obesity, and between the obese the risk of hypertension is three times higher.

**P324**

## Public health and lifestyle interventions to reduce cardiovascular risk in macedonia: evaluation and recommendations

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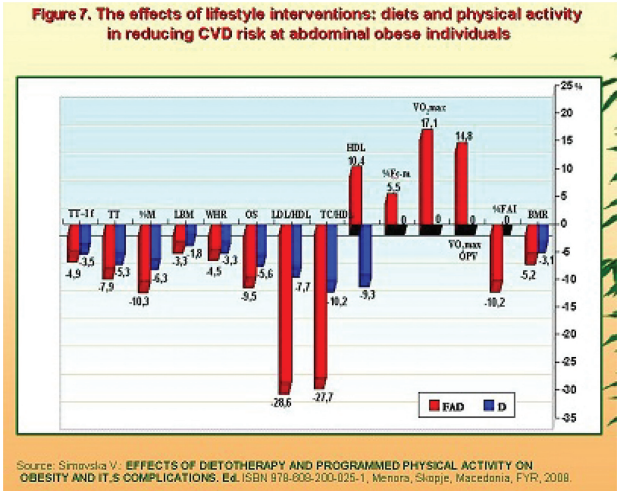
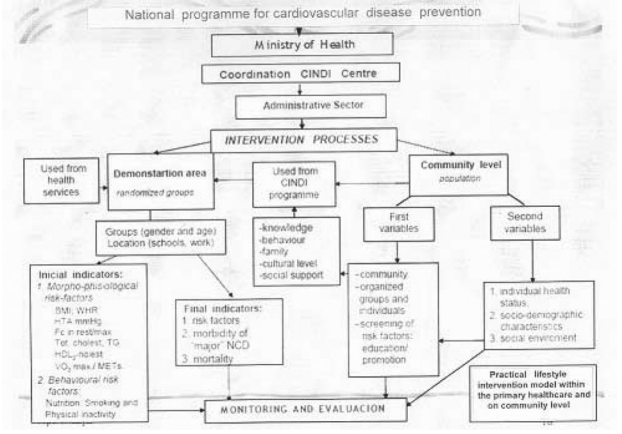
**Introduction:** The greatest disease burden comes from cardiovascular disease(CVD). It's consequence of an interaction between genes and lifestyle, environmental factors and community situation in Macedonia.

The main biological factors(RF's) related to unhealthy lifestyle increase the CVD risk. From public health perspective, it is of key importance to prevent CVD through surveillance of cases and to promote lifestyle interventions. **Objectives:** To analyze and evaluate the results of cross-sectional studies for dietary habits, physical activity levels(PALs) monitoring, smoking and main biological RF's(1991–2011) (http://sc-healthreform.org.mk/web/committee/info-submissions/3933.html); To evaluate the efficiency of a randomized controlled trial at high-risk groups aiming to reduce biological RF's for CVD through lifestyle intervention(http://posters.f1000.com/p882); To develop a comprehensive approach with a practical lifestyle intervention model that would be feasible within the primary healthcare and on community level using different settings(http://www.cindi-.makedonija.com). **Methods:** The results of six cross-sectional studies for dietary habits, PALs monitoring, smoking and main biological RF's conducted among generaral population(7–65y) were collected from 1991–2011. With aim to estimate the highest research reduction of modifiable biological RF for CVD using lifestyle interventions, four randomized controlled trials were analyzed(1). **Results:** The complex results indicate that lifestyle interventions to reduce cardiovascular risk should be focused on younger age groups of girls and adult over 50 years old, especially women. Concerning the changes of dietary habits, most important is the radical food market and food production changes. The highest results against smoking habits was achieved through creating tobacco-free communities(http://www.nosmoking.cjb.net ).

**Image/graph I:**




**Image/graph II:**




**Conclusion:** To reduce the prevalence of CVD, our practical lifestyle intervention model emphasizes primary care, multisectoral action and community participation on a population level(graph II).

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**P325**

## Prevalence of vascular stiffness, a marker of future vascular events in age matched population in normal population versus hypertension population and diabetic population

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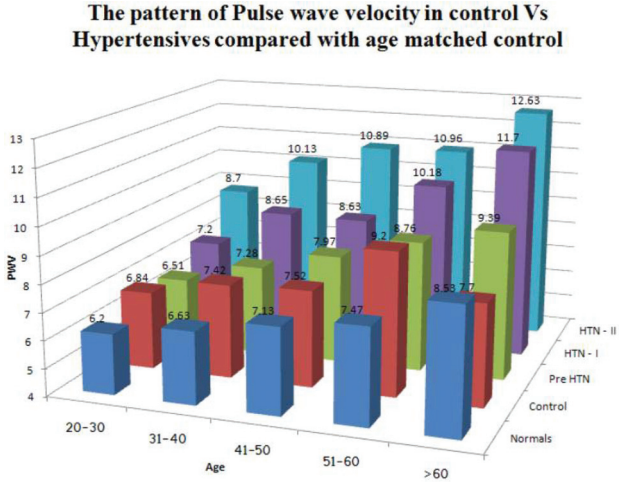
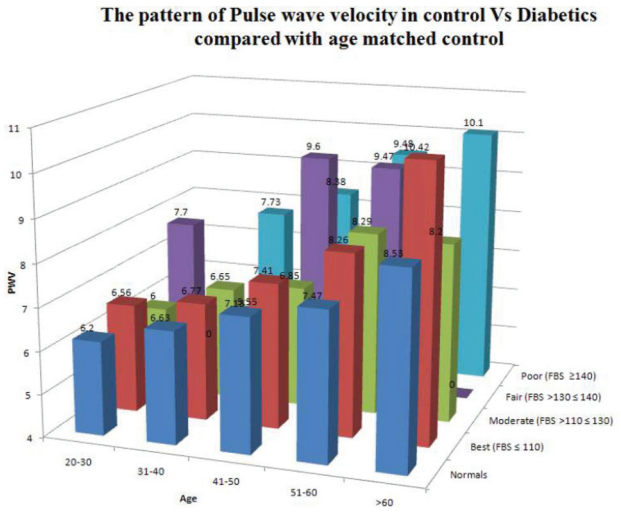
**Introduction:** There is a paradigm shift in the modality in the assessment to predict future vascular events. Pulse wave velocity (PWV), Pulse Pressure, Aortic Augmentation Index (AAI) assessment have evolved to a great extent to be applied to identify high risk group for vascular events. **Objectives:** To Study the vascular stiffness especially at the level of aorta in chronic diabetics & hypertensives and to compare the data in age matched control group. Subjects who have evidence of high vascular stiffness to receive multi prong intervention to reduce or prevent acute vascular events **Methods:** Subjects from well structured and executed epidemiological study, PURSE-HIS Study for Diabetes Mellitus & Hypertension were taken up for the study. Pulse wave velocity(PWV), Pulse Pressure, Aortic augmentation pressure (AAP), Aortic augmentation index(AAI) were assessed in established diabetic subjects (N=264), subjects who had Hypertension (N=745) and subjects who donot have any risk factors like diabetes or hypertension or dyslipidemia (N=875). The vascular stiffness parameters obtained in Diabetes Mellitus & Hypertension were compiled with normal population age matched. **Results:** On comparing the pulse wave velocity in population having different stages of hypertension with increasing age groups, it is very clear that the chance of increase in vascular stiffness is higher in people with high BP compared to those of similar age group who had normal BP. On comparing the pulse wave velocity in population having diabetes with abnormally increased fasting blood sugar(FBS) levels, it is very clear that the chance of increase in vascular stiffness is higher in people with uncontrolled FBS levels compared to those of similar age group who had good control and those with out any risk factors like diabetes or hypertension or dyslipidemia. 32.7% of Diabetics and 39.3% of Hypertensive subjects had abnormal Pulse wave velocity. 23.4% of Diabetic subjects and 29% of Hypertensive subjects had high Aortic Augmentation Index. 64.25% of population had abnormal aortic pulse pressure (APP). 51.77% of population had abnormal aortic augmentation pressure (AAP)

**Image/graph I:**




**Image/graph II:**



**Conclusion:** Vascular disease manifestation has longer gestation period before acute vascular event happens, which means the prime youth increase the morbidity & mortality. Assessment of vascular stiffness (with all these components) can serve as a marker to identify high risk group & to intervene early to forestall vascular events by appropriate intervention.

**P326**

## Prevalence of risk factors for coronary artery disease in middle income group in South Indian population

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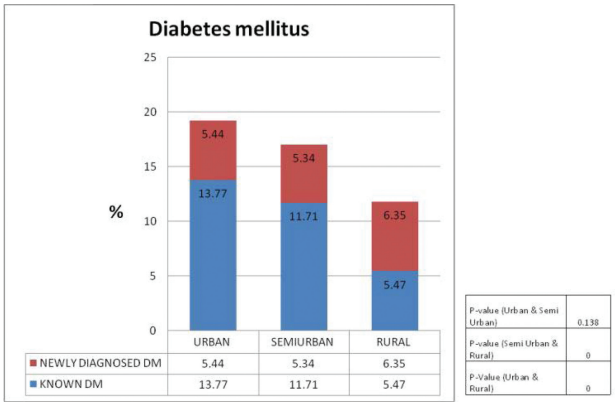
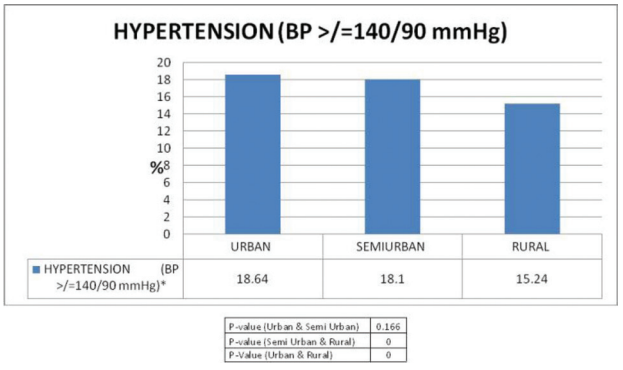
**Introduction:** There is paradigm shift in the pattern of diseases in India. The incidence of acute coronary syndrome & chronic unstable angina are increasing in Indian population affecting prime youth. The present study is to assess the prevalence of risk factors for vascular diseases. **Objectives:** To study the prevalence of conventional risk factors or other risk factors which are conducive to coronary artery disease to attempt for primary prevention of vascular diseases. **Methods:** A cross sectional study population involving 8080 subjects which includes Urban (n=2221), Semi Urban (n=2821) & rural (n=3038) areas. The study sample was 8080 subjects. After written informed consent they were submitted to biochemical tests, demography, nutritional analysis, physical activity, anthropometric & psychological assessment, clinical examination, ECG, TMT, carotid artery intima medial thickening & vascular stiffness assessment were assessed. **Results:** 19.32% urban, 17.82% semi urban & 12.05% rural population had Diabetes Mellitus. 5.44% urban 5.34% of semi urban & 6.35% rural population were found newly diabetic with oral glucose tolerance test. 18.64% people in urban, 18.1% in Semi urban & 15.24% in rural area had BP140/90 mmHg.72.21% of urban 61.26% of Semiurban & 61.17% rural population had some form of lipid abnormality. 23.29% of urban, 22.60% semi urban & 12.49% of rural population satisfied the criteria of metabolic syndrome. On an average 20 to 30% of urban, semi urban & 17.4% in rural population had insulin resistance. Hyperhomocysteinemia was found in 28.03% of urban, 27.81% of semi urban & 28.32% of rural population. 33.17% of urban, 39.72% of semi urban, 34.11% rural population had abnormal Lp(a). 20.51% of urban, 13.94 % of Semi urban & 16% of rural population had abnormal ApoA/ApoB ratio. 8.71% of subjects had normal Intima medial thickness. 19.72% of urban, 13.36% of Semi urban & 10.14% of rural population had abnormal pulse wave velocity, 19.29% of urban, 18.57% of Semi urban & 18.29% of rural population had abnormal aortic augmentation index, 23.67% of urban, 18.32% of Semi urban & 22.26% of rural population had abnormal aortic pulse pressure, 16.02% of urban, 13.16% of Semi urban & 22.59% of rural population had abnormal aortic augmentation pressure.

**Image/graph I:**




**Image/graph II:**




**Conclusion:** The high prevalence of risk factors conducive to vasculopathy in South Indian population offer a reason for high incidence of early vascular changes which necessitates intervention at population level to reduce the vascular disease burden.

**P327**

## Length of stay for patients hospitalized with coronary heart disease in beijing from 2007 to 2009

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**Introduction:** The average length of stay of coronary heart disease (CHD) patients is an important indicator for the efficiency of use of medical resource. However, little information is available in China. **Objectives:** To assess the efficiency of utility of hospital resources of CHD patients by examining the length of stay from the year 2007 to 2009 in Beijing, the most economic advanced area of China. **Methods:** We analyzed data from Beijing Hospital Discharge Information System, which covers all cases of hospital admissions in Beijing. The data of total of 182,791 patients who hospitalized for CHD during Jan. 1, 2007, to Dec. 31, 2009 were extracted. The length of stay was obtained from each of the patients from this database. **Results:** The numbers of patients hospitalized for CHD were 54,710, 60,545 and 67,536 respectively in the year 2007, 2008 and 2009. The number of beds occupied by patients with CHD increased from 759,396 in 2007 to 809,786 in 2009. Mean length of stay decreased from 13.9 days in 2007 to 12.0 days in 2009 ($p<0.001$). Mean length of stay for men was significantly shorter than that for women (12.7 days vs. 13.3 days, $p<0.001$). Mean length of stay increased with age in a linear trend ($p<0.001$). Among the patients with CHD, 35 486 (19.4%) patients were diagnosed as acute myocardial infarction, 63 543 (34.8%) patients were unstable angina and 83762 (45.8%) patients were chronic CHD. Mean length of stay was 12.8 days, 12.6 days, and 13.2 days for the three subtypes of CHD respectively ($p<0.001$). **Conclusion:** CHD patients in China have longer length of stay than the average levels in some developed countries. The efficiency of utility of medical resource for CHD patients should be improved.

**P328**

## Predictive value of QTc interval for ten-year risk of cardiovascular disease in a prospective cohort study in China

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**Introduction:** Currently, there is a lack of consistence on the association between QT interval and the risk of cardiovascular disease (CVD). Moreover, the accuracy and generalizability of different formulas for heart rate corrected QT interval (QTc) in different populations are also in controversy. **Objectives:** To identify a formula for QTc interval estimation with the best goodness of fit and to study the association between the QTc intervals based on identified formula and long-term CVD risk in Chinese. **Methods:** Totally 7068 participants aged 35 to 64 years in Beijing were recruited in 1992 and all participants were followed up annually or biannually for CVD events and total deaths from 1992 through 2002. Traditional CVD risk factors and electrocardiograms were measured at baseline. Six available formulas included Bazett's, Fridecicia, linear, logarithmic, exponential and reciprocal formulas for QTc interval estimation were compared by the goodness of fit for the relation between QT and heart rates. And a Cox proportional model was established for the association between QTc interval and CVD risk. **Results:** The linear formula had the best goodness of fit for the relationship between QT interval and heart rates. The ten-year cumulative person-year rates of coronary event, CVD event (coronary heart disease + stroke), CVD death and all-cause death were 12.89%, 42.70%, 13.64% and 31.05% respectively. After adjusted the impacts of other risk factors, prolonged QTc interval (> 424.89 ms) was significantly associated with increased risk of CVD death [Relative Risk (RR) =2.18, 95% confidence interval (CI): 1.08–4.41], all-cause death (RR=1.61, 95% CI: 1.06–2.44), and possibly associated with risk of the incidence of coronary event (RR=1.41, 95% CI: 0.70–2.82) and CVD event (RR=1.28, 95% CI: 0.88–1.87). **Conclusion:** The linear formula had the best goodness of fit for heart rate corrected QT interval estimation in Chinese. Moreover, the QTc interval was an independent predictor for the long-term risk of CVD death.

**P330**

## Value of exercise workload in predicting ischemia on myocardial perfusion scintigraphy

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**Introduction:** Exercise workload (EW) is a powerful predictor of cardiovascular events. Patients (pts) reaching ≥10 metabolic equivalents (METs) show low rates of all-cause mortality, cardiac death, nonfatal myocardial infarction and revascularization. **Objectives:** To assess the value of EW in predicting significant ischemia (SgISC) on myocardial perfusion scintigraphy (MPS). **Methods:** We retrospectively reviewed the results of all exercise/rest gated single-photon emission computed tomography (SPECT) MPS, done from January to November 2009, in a central hospital. Demographics, comorbidities, exercise test (ET) and SPECT results were recorded. Pts were divided according to EW (**Results:** We analyzed 173 pts; 76% were men and mean age 57±10 years. Forty-five percent of pts had dyslipidemia, 43% hypertension, 19% diabetes mellitus and 17% were obese. More than half (53%) had known coronary artery

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disease (CAD)and 43% prior coronary revascularization. Fifity-four percent of pts were takingbeta-blocker (BB), 17% nitrates and 16% calcium channels blockers (CCB) in the day of MPS. ET mean duration was 7±2 min, 56% pts reached 85% of maximum age-predicted heart rate (MAPHR) and 70% pts$^3$10 METs. Ischemic electrocardiographic (ECG) changes were present in 24% pts. Fixed perfusion defects were present in 15% pts, any reversible ischemia in 46% and SgISC in 25%. Mean left ventricular ejection fraction (LVEF) was 57±12%. Pts achieving ≥ 10 METs had less SgISC, comparing to pts with <10 METs, although the difference wasn't statistically significant (23%vs29%, pNS). Known CAD, BB therapy and lower LVEF were associated with SgISC on univariate analysis. On multivariate analysis only the latter was predictor of SgISC (OR 1,04; 95% CI 1.012–1.073; p=0.007). In the group of pts with ≥85% MAPHR, achieving ≥ 10 METswas not associated with less SgISC (26%vs27%, pNS). In these pts BB (OR 4.36; 95% CI 1.53–12.47; p= 0.006) and CCB (OR 5.40; 95% CI 1.46–19,90; p=0.011) were predictors of SgISC on multivariate analysis. In the group of pts with ischemic ECG changes, those achieving ≥ 10 METs had less SgISC although that difference wasn't statistically significant (25vs43%; pNS). No predictors of SgISC were found in these pts. **Conclusion:** In our pts, achieving ≥ 10 METs was not significantly associated with less SgISC on MPS, even when reaching ≥ 85% MAPHR or in those with ischemic ECGchanges. Lower LVEF, BB and CCB therapy were predictors of SgISC.

**P331**

## Left ventricular asynchrony and its concordance with the infarcted region in patients with ischemic heart disease in dilated phase, analyzed with gated-SPECT

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**Introduction:** Asynchrony induces a series of adverse effects in the heart: LV end-diastolic pressure increment, diastolic filling time decrement, ventricular relaxation delay, SV and BP decrement, favoring mitral regurgitation and leading to pathologic ventricular remodeling which further deteriorates ventricular function. **Objectives:** Analize LV asynchrony and its concordance with the myocardial infarction region in patients with ischemic heart disease in dilated phase with Gated-SPECT. **Methods:** We studied patients with ischemic heart disease in dilated phase with Gated-SPECT, using Cedars Sinai QPS and QPG software. Patients were distributed in 2 groups according to the concordance between the most asynchronic zone and the infarcted region. We calculated LVEF, EDV, ESV, bandwidth, SD, entropy, mean, SSS, SRS and SDS. We analized LV perfusion and synchrony of contraction with polar maps. **Results:** We studied 32 patients (27 men and 5 women), age 59.31±11.6 years, QRS 125.03±40.60 ms, LVEF 24.18±8.32%, EDV 244.40±87.20 ml. As well, we observed ECG conduction abnormalities in 81% of the patients (15 patients with LBBB, 11 with LAFB and 1 with RBBB). 100% of the patients presented asynchrony indexes: bandwidth 83.53±48.16°, mean 142.93±23.47°, SD 22.06±14.51°, entropy 55.09±11.57. QRS duration did not correlate with any asynchrony parameter: bandwidth (p=0.602), SD (p=0.613) and entropy (p=0.668). We observed a great correlation between entropy and bandwidth (rho=0.934, p 0.005); and SD (rho=0.935, p 0.005). We didn't find correlation between LVEF and the asynchrony parameters: bandwidth (rho=0.013, p=0.942), SD (rho=0.026, p=0.889) and entropy (rho=.016, p=0.931). There is a high concordance between the maximum delay zone and the infarcted region (78%), with no statistically significant difference if there was a transmural infarction or not (p 0.05). **Conclusion:** We found high concordance between the maximum delay zone and the infarcted region. Nor the QRS duration, the LVEF and the LV volumes are able to predict the presence of LV asynchrony. Entropy predicts system asynchrony effectively. Demonstrating that the maximum delay zone in the myocardial contraction corresponds with an area of infarction is of great importance because it can predict a lack of response to resyncronization therapy, when the stimulator is placed over the infarcted area.

**P332**

## Are there racial differences in the prognostic value of normal SPECT myocardial perfusion imaging?

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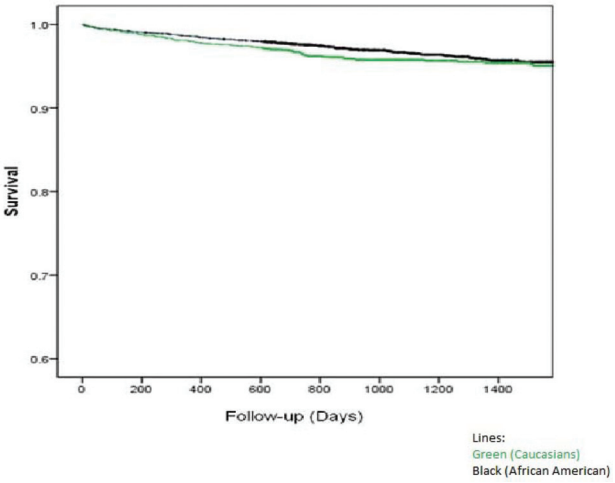
**Introduction:** Normal SPECT myocardial perfusion imaging (MPI) has been shown to be associated with low event rate. The aim of this analysis is to investigate racial differences in the prognostic value of normal SPECT MPI. **Objectives:** The aim was to find if there was racial difference in the prognostic value of a large cohort of patients with normal SPECT examinations. **Methods:** We included 4847 patients (1841 African American (AA) patients, 38%) who had normal SPECT MPI and were followed for a median duration of 2.8 years. A normal scan was defined as Sum Stress Score<2 and normal left ventricular ejection fraction. The primary endpoint of the analysis was cardiac death or non fatal myocardial infarction (CD/MI). Multiple="Multiple" Cox Proportional Hazard models were used to determine whether AA race is an independent predictor of outcomes. **Results:** African American patients were older, with higher prevalence of hypertension, diabetes and dyslipidemia. However, AA patients had less often known coronary artery disease. After a median follow-up duration of 2.8 years, 189 patients experienced CD/MI (annual event rate of 1.4% for both Caucasians and AA). In both univariate and multivariate Cox Proportional Hazard analysis, AA race was not associated with increased hazard of CD/MI (HR 1.16, 95% CI 0.8–1.6, p=0.33). Survival analysis is shown in the graph.

**Image/graph I:**




**Conclusion:** The analysis shows that there was a very low event rate (cardiac death and non fatal myocardial infarctions) in patients with normal SPECT independant of race.

**P333**

## Comparison of magnetic resonance imaging and transthoracic echocardiography in identifying aortic valve morphology in patients with thoracic aortic aneurysm

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**Introduction:** Current ACCF/AHA guidelines recommend surgical correction of thoracic aortic aneurysm (TAA) when the diameter of either aortic root or ascending aorta exceeds 5.0 cm in patients with bicuspid aortic valve (BAV), compared to >5.5 cm in patients with tri-leaflet aortic valve. **Objectives:** To assess whether Magnetic Resonance Imaging (MRI) is more sensitive than TTE at identifying BAV and whether this would translate into a difference in clinical management for patients with TAA. **Methods:** Data was prospectively collected for patients undergoing MRI for assessment of aortic diameter. The aortic diameter and aortic valve morphology obtained from MRI were compared with TTE. **Results:** Out of 36 patients, 11 were found to have BAV on echocardiography compared to 17 on MRI. Using MRI as the gold standard in identifying BAV, TTE was found to have 64.7% sensitivity, 94.7% specificity. 3 of the 6 patients with BAV unidentified by TTE had aortic dimensions between 5.0 and 5.5 cm and would have been referred for surgery under current guidelines.

| | MRI | | |
|---|---|---|---|
| **TTE** | BAV (+ve) | TAV (-ve) | **Total** |
| BAV (+ve) | 11 | 1 | 12 |
| TAV (-ve) | 6 | 18 | 24 |
| **Total** | 17 | 19 | |

**Conclusion:** TTE underestimates the prevalence of BAV with important clinical consequences for patients with TAA. We suggest that assessment of aortic valve morphology should be performed routinely in all patients referred for MRI of TAA.

**Reference:**

2010 ACCF/AHA/AATS/ACR/ASA/SCA/SCAI/SIR/STS/SVM Guidelines for the Diagnosis and Management of Patients With Thoracic Aortic Disease: Executive Summary. Circulation. 2010;121:1544–79.

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## Late gadolinium enhancement in hypertrophic cardiomyopathy: a comparison with pathological and normal myocardial wall thickening

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**Introduction:** Hypertrophic cardiomyopathy (HCM) is a genetic disorder and its early detections is important because it's one of the most common cause of sudden cardiac death in young athlete. As several studies showed that Delayed hyperenhancement(DHE) by C-MRI is a marker of nonviable myocardium and development of arrhythmia and can be used as a prognostic factor in these patients . **Objectives:** This study was designed to evaluate the rate of correlation between Delayed hyperenhancement (DHE) in different segments of cardiac muscle with pathological myocardial wall thickening and also in segments with normal wall thickness . **Methods:** forty one patients (23 men) with HCM underwent CMRI study with different protocols for functional and flow study, using T1,retro IPAT, phase sensitive techniques on different planes and MRA with Gadolinium performed for DHE evaluation . **Results:** DHE most commonly seen in septal segments specially in zone 1, 7 (48%) of cardiac muscle. the most common pattern of DHE was midmyocardial type and focal/patchy appearance (36%) and rarely distributed subendocardially that associated with LV clot more commonly .our study showed independent association between the entity of DHE and maximum LV wall thickness. also more extensive and diffuse DHE distribution associated with lower Ejection fraction(<35%) in 56% of cases. but further studies required to clarify the role of DHE type and extension for primary prevention of SCD in HCM patients with LVEF more than 35–40%. **Conclusion:** Our study shows an independent association between myocardial wall thickness and late Gadolinium enhancement, furtheremore LGE is mostly seen in patients with burned out Hypertrophic cardiomyopathy cases. further studies are required to clarify the role of LGE type and extension for primary prevention of SCD in HCM patients with LVEF more than 35–40%

**References:**

1. Caitlin J. Harrigan, BA et al, Hypertrophic Cardiomyopathy: Quantification of Late Gadolinium Enhancement with Contrast-enhanced Cardiovascular MR Imaging, Radiology, September 2011, 260 (3)
2. Bruder et al,Late Gadolinium Enhancement and Sudden Cardiac Death in Hypertrophic Cardiomyopathy, JACC Vol. 57, No. 12, 2011

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## Prediction of global left ventricular functional recovery in patients with heart failure undergoing revascularisation, based on late gadolinium enhancement and low dose dobutamine cardiovascular magnetic resonance

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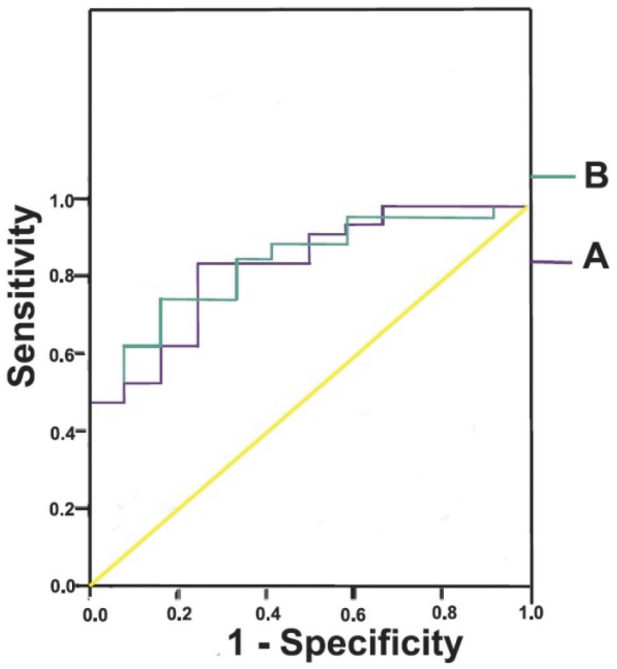
**Introduction:** The combination of the low dose dobutamine - CMR (LDD-CMR) and the late gadolinium enhancement - CMR (LGE-CMR) can be used for the prediction of global functional recovery in patients with ischemic left ventricular dysfunction (LVD) undergoing revascularisation [1]. **Objectives:** The goal of this research was to determine the optimal LDD-CMR- and LGE-CMR-based predictor of significant LVEF improvement 6 months after revascularisation in patients with chronic CAD and LVD. **Methods:** We analysed 55 patients with LVD (LVEF 35% ± 8%) before they underwent surgical (n=43) or percutaneous (n=12) revascularisation. The extent of regional contractility and LGE were determined by CMR before and 6 months after revascularisation. A segment was considered viable if it had no LGE or had any LGE and produced contractile reserve during LDD-CMR. The number of viable segments divided by the total number of dysfunctional and revascularised segments in a patient was expressed as a percentage was used together with the baseline LVEF (LVEF) and the LVEF measured during administration of LDD (10$\mu$k/kg/min) (LDD LVEF) to predict a significant (≥5%) LVEF improvement [1]. **Results:** The AUC value of LDD LVEF was 0.74 ($P$=0.013), slightly lower than the AUC value of the percentage of viable segments (further percentage) (0.76, $P$=0.007). For the prediction of significant LVEF improvement after revascularisation, two logistic regression models were compared (**Image 1**): A) model, using LVEF, LDD LVEF, and the percentage as independent variables (AUC, 0.82, $P$=0.001); B) model, using the linear regression model 0.427×LDD LVEF–0.393×LVEF+0.092×percentage ($R^2$=0.820; $R^2$(adj.)=0.810) as an independent variable (AUC, 0.82; $P$=0.001). The model B) had a sensitivity of 74% and a specificity of 83%, meanwhile the model A) had a sensitivity of 83% and a specificity of 75% (but the percentage was an insignificant variable).

**Image/graph I:**




**Conclusion:** Our study suggests that the variable 0.427×LDD LVEF–0.393×LVEF+0.092×percentage of viable segments predicts significant recovery of LVEF with a sensitivity of 74% and a specificity of 83% in patients with ischemic LVD undergoing revascularisation. This finding may provide a sophisticated approach to identify those patients who derive functional and prognostic benefit from revascularisation.

**References:**

1. Glaveckaite S, Valeviciene N et al. Value of scar imaging and inotropic reserve combination for the prediction of segmental and global left ventricular functional recovery after revascularisation. J Cardiovasc *Magn Reson* 2011;13:35.

P337

## Application of a new generation high resolution T1 mapping with MOLLI (hrMOLLI) to differentiate patients with diffuse and regional myocardial disease from healthy subjects

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**Introduction:** Cardiac magnetic resonance (CMR) is increasingly the first line investigation into the causes of cardiomyopathy. Although regional fibrosis is easily imaged on late gadolinium enhancement, characterisation of diffuse fibrosis remains challenging. **Objectives:** Gadolinium-enhanced (CE) myocardium shows an inverse relationship between T1 relaxation times and amount of fibrotic tissue on histology. No studies characterised the T1 values in non-CE myocardium with either diffuse or regional fibrosis, nor evaluated post-contrast T1 values consistently in a clinical setting. **Methods:** 36 subjects (age 47±7.4 yrs) who underwent a routine CMR protocol for investigation of cardiomyopathy (hypertrophic cardiomyopathy: n=6; longstanding hypertension: n=7, previous myocardial infarction: n=12) were included. 11 subjects served as controls. Single breath-hold high-resolution modified Look-Locker inversion recovery was performed on a 3T clinical scanner in an equatorial short axis slice prior and at 5,10,20 and 40 minutes following administration of 0.2 mmol/kg gadolinium-DTPA contrast. Imaging parameters were FOV 320x320; TR/TE 3.2/1.57 ms, interpolated voxel size 0.9x0.9x8mm, PE steps n=166, TD:450msec, 11 inversion delays, acquisition time~14 sec. In patients with myocardial scar, ROIs were derived from both remote and scarred areas pre- and 20min postcontrast only. **Results:** In comparison to healthy myocardium, native T1 values were shorter than in diffuse fibrosis or scarred areas P<0.01), whereas T1 values in remote areas did not differ significantly. Postcontrast T1 values in diffuse fibrosis were shorter at 5–20 minutes (p<0.05), but not at 40 minutes. At 20 minutes, T1 values in scarred areas were shorter than in healthy myocardium or diffuse fibrosis (p<0.01). A cut-off value of 1135 ms for native T1 identified healthy myocardium with 100% sensitivity and 91% specificity (AUC=0.96, 95%CI: 0.91–1, p=0.001). For CE myocardium a cut-off of 380 ms 10min post injection provided the greatest distinction between healthy myocardium and diffuse fibrosis (sensitivity 88%, specificity 79%, AUC=0.85, 95%CI:0.68–1,p=0.004) Distinction of normal and fibrotic tissue was significantly better with native than with contrast enhanced images (p<0.001). **Conclusion:** We demonstrate that T1 mapping of native and CE myocardium can serve to differentiate between healthy myocardium and diffuse fibrosis with better accuracy than after contrast administration.

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## Application of a high resolution T1 mapping with MOLLI (hrMOLLI) in patients in clinical setting: a reproducibility study

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**Introduction:** Myocardial fibrosis is associated with myocardial dysfunction and remodelling leading to adverse outcomes. Myocardial T1 values by cardiovascular magnetic resonance is potentially valuable for evaluation of myocardial fibrosis. **Objectives:** We propose that imaging by a new generation high-resolution modified Look-Locker inversion recovery sequence (hrMOLLI) of native and post-contrast myocardium can provide a robust tool in the clinical setting. **Methods:** Fifty subjects (age 47 ± 7.4 years) underwent a routine CMR protocol on 3T clinical scanner with dual 32 channel coil and multi-transmit system. A single breath-hold hrMOLLI imaging was performed in an equatorial short axis slice prior and at selected intervals following administration of 0.2 mmol/kg gadolinium-DTPA contrast (10, 20, 40 minutes). Imaging parameters were FOV 320x320; TR/TE 3.2/1.57 ms, FA 50°, interpolated voxel size 0.9x0.9x8mm, PE steps n=166, Trigger delay: 450 msec, 11 inversion delays, acquisition time ~14–17 sec. T1 map values were obtained by 3 independent observers by placing the region of interest (ROI) within the septal myocardium. In patients with myocardial scar on late gadolinium enhancement, ROIs were derived from the remote areas only. A subset of healthy subjects (n=6) had a repeated native hrMOLLI imaging for interstudy reproducibility within 3 weeks of the original scan. Agreement between and within observers was examined by paired t-test and linear regressions. **Results:** T1 maps could be analysed in 94% of all images obtained. Intra-observer mean differences (MD) for T1 values were 1.3ms (95%CI:-12.4–15.4) for native scans and 0.7 ms (-7.9–12.3) for overall postcontrast scans, whereas interobserver MDs were 0.3 ms (-6.3 -5.3) and 0.1 (-3.4 to 4.2), respectively. We further demonstrate an excellent overall (pre- and postcontrast) intra-and interobserver agreement in T1 relaxation times (intraobserver: r= 0.94, p<0.0001; interobserver: R=0.91, p<0.0001). When assessed separately the postcontrast data showed better agreement within and between observers, respectively (r~0.94, p<0.0001 for both) than in the precontrast native scans (intraobserver r= 0.81, p <0.0001; interobserver r=0.79, p<0.001). We further revealed close agreements between repeated studies (r=0.91, p<0.001; MD: 2.4 msec (95%CI: -3.1–10.2) **Conclusion:** We demonstrate that imaging with hrMOLLI as a single breath-held scan pre and postcontrast administration provides a robust tool to reproducibly derive T1 relaxation times in clinical setting.

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## Impact of myocardial viability assessment with CMR on management strategy and 1-year outcome in patients with triple vessel disease and impaired left ventricular function

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**Introduction:** Patients with dysfunctional but viable myocardium benefit from myocardial revascularization while revascularizing non-viable myocardium is unlikely to derive prognostic benefit and subject patients to unnecessary procedural risks. The impact of cardiac magnetic resonance imaging (CMR) to guide revascularisation strategy, utilising coronary bypass surgery (CABG), percutaneous coronary intervention (PCI), or medical therapy only (MT), in patients with triple vessel disease (3VD) and significant left ventricular dysfunction (LVD) has not been established. **Objectives:** To compare the rate of management strategies (CABG vs PCI vs MT) in patients who underwent CMR before revascularisation, against those who did not, and their survival outcomes at 1 year. **Methods:** Patients with non-left main 3VD and significant LVD (defined as LV ejection fraction <40%), and no significant valve disease, diagnosed with coronary angiography between 2004 and 2009 at Sarawak General Hospital were enrolled. Patients were grouped into CMR and non-CMR arms. The rates of CABG, PCI and MT, and 1-year survival outcomes were compared between the groups. **Results:** 24 patients were enrolled into the CMR group, and 32 patients into the non-CMR group. The mean age was 57.75 + 10.14 and 57.19 + 10.32 years in the CMR and non-CMR groups respectively (p 0.84). There were no significant differences between both groups in baseline clinical, biochemical, and echocardiographic characteristics. Among patients who underwent CMR, 50% were treated with CABG, 17% PCI and 33% medical therapy, compared to the non-CMR group, with 63% treated with CABG, 22% PCI and 15% medical therapy. Overall 1-year survival was 96% and 94% in the CMR and non-CMR groups respectively (p 0.61). There was also no statistically significant difference in survival outcomes between the 2 cohorts in subsets of CABG (p 0.431), PCI (p 0.428) and MT (p 0.411). **Conclusion:** While CABG remained the prevalent treatment strategy for patients with 3VD and significant LVD, the addition of CMR to guide revascularisation strategy resulted in a 20% reduction in CABG, and a 2-fold increase in MT, with no significant difference in 1-year survival. CMR should be the modality of choice to refine assessment of patients with severe ischaemic cardiomyopathy.

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## Aortic valve calcium scoring by computed tomography: a new marker of significant coronary artery disease

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**Introduction:** The aortic valve calcification is believed to share the pathogenesis and risk factors with coronary atherosclerosis (AT). However its impact on cardiovascular risk (CVR) and association with significant coronary artery disease (sCAD) is not well established. **Objectives:** To evaluate the significance of aortic valve calcification in CVR assessment and sCAD association. **Methods:** A retrospective study of 196 consecutive patients (P) who performed a cardiac MDCT (Phillips Brilliance, 16-slices): 38.8%men, 63±13years, 23.7% diabetics, 82.7% hypertensive, 61.6% with dyslipidemia, 47.2% with chronic kidney disease and 8.2% with aortic stenosis (6.6% mild, 0.7% moderate, 0.7% severe). Aortic valve calcium score (AC) was measured with an Aquarius 3D TeraRecon workstation using the same method as for coronary calcium score (CS).The association between AC and sCAD was assessed through ROC curve analysis and compared with that of CS.P were separated into 2 groups: Group AC+ (AC≥0.72; 41.8%) and Group AC- (AC<30.72;58.2%), which were compared regarding demographics, analytical parameters, CVR factors (CVRF), CVR scores (CVRS), AT and sCAD. **Results:** On the ROC curve analysis there was a clear association between AC and sCAD (AUC 0.70, 95% CI 0.60–0.80, p = 0.001), resembling the CS curve (AUC: 0.88, 95% CI 0.80–0.90, p<0.001). The best threshold of AC for identifying sCAD was 30.72 (76% sensibility, 65% specificity). P with AC+ were older (71±8 vs 57±12, p<0.001), had higher systolic blood pressure (SBP:150±23 vs 142±23mmHg, p<0.001) and lower glomerular filtration rate (GFR-MDRD): 78±22 vs 87±52mL/min/1.73m2, p=0.029). No differences were found regarding other CVRF. CVR was higher in group AC+ (as showed by the CVRS Framingham:(16±12% vs 11±11%, p = 0.023, and SCORE: 4±3% vs 2±2%, p=0.001). There was a higher prevalence of AT (83.8% vs 43.4% for SV, p <0.001) and sCAD (27.2% vs 6.2%, p <0.001) in this group. The number of vessels (v) with sCAD was also higher in AC+ (0v:74.3 vs 92.5%; 1v: 18.6 vs 3.7%; 2v: 2.9 vs 2.8%; 3v: 4.3 vs 0.9%, p = 0.004). **Conclusion:** According to these data, there is an association between AC and sCAD, confirming AC as a valuable marker for sCAD assessment, although not as strong as CS. The AC≥ 30.72 identified P with higher CVR and more extensive and severe coronary artery disease, suggesting the outstanding threshold to be of additional value in CVR stratification. Age, renal function and SBP seem to be the CVRF related with the association identified for AC and sCAD.

P341

## Assessing the diagnostic value of coronary calcium scoring in patients over age 70 by using multidetector CT coronary angiography

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**Introduction:** Coronary calcium testing uses in asymptomatic patients to refine their Clinically predicted risk of incident coronary heart disease. and its typically present in direct proportion to overall extent of atherosclerosis. calcium score depends on age, gender and standard cardiac risk factors. There have been several studies supporting the role of CAC score for prediction of myocardial infarction and cardiovascular mortality. CAC score of 0 markedly reduces the likelihood of >50% stenosis (19% vs. 71% for CAC >10), but not sufficiently to use CAC to definitely exclude important CAD. But their results showed excellent prognosis seen with CAC = 0 in the asymptomatic screening population. **Objectives:** The purpose of this article is to evaluate zero calcium score in patient over age 70 with low or intermediate probability for CAD . **Methods:** 250 patients over age 70 with low and intermediate probability for CAD (excluding those with the Diagnosis of Acute coronary syndrome) underwent the measurement of coronary arteries caclicum scoring and MDCT angiography there after in the outpatient setting. High-resolution, ECG synchronized Computed Tomography of the heart with attention to the coronary arteries was performed using Siemens Heart View CT with prospective ECG-gating. Coronary calcification was analyzed using Siemens calcium scoring software . **Results:** Our study shows that the NPV of CAC score for Excluding significant obstructive CAD is 99% In patients over 70yrs old. In our cross sectional study Patients were categorized as zero CAC group (83patients)and Non-Zero CAC group (167patients) with mean age of 74±2 years, including 163 female patients(65%) .We have found that there is a siginificant relation between having zeroCAC and non-obstructive coronary lesion (p value= 0.02) **Conclusion:** In this study we suggest to use CAC measurement, that is fast, non invasive and cost beneficial in patients older than 70 years of age with low or intermediate likelihood for CAD, in order to exclude CAD .it is important to know several co-morbidities associated with this age group limits the applicability of other modalities for the diagnosis of CAD. If the Calcium score is zero, no other time-consuming, invasive or expensive modalities are needed in this age group, and life style modification and risk factor management is recommended. Further study for the evaluation of Calcium score role in low or intermediate risk ACS patients over the age of 70 is recommended .

P342

## Coronary computer tomography indications in adherence to published appropriateness criteria: a critical evaluation in clinical practice

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**Introduction:** The use of cardiac computed tomography is significantly increasing. Therefore a more sophisticated definition of indications and patients suitable for this non-invasive imaging method is mandatory. **Objectives:** Guidelines which were raised for appropriate use of Coronary Computer Tomography (CCT) in 2006 underwent clinical assignment, shown by an update 2010. We sought to examine the implementation of these principles by applying them into real world practice. **Methods:** Data from patients (pts) undergoing invasive coronary angiography were collected retrospectively. Pts with CCT findings, recorded at intra-and extramural sites, were referred to us. We reviewed the individual allocation to CCT and classified indications (ind) as appropriate (A), uncertain (U) or inappropriate (I) in regard to published criteria of 2006 and 2010 respectively. If ind were not listed, they were classified as undefinable (UD). For each pt risk factors and CAD pretest probabilities (pp) were determined.

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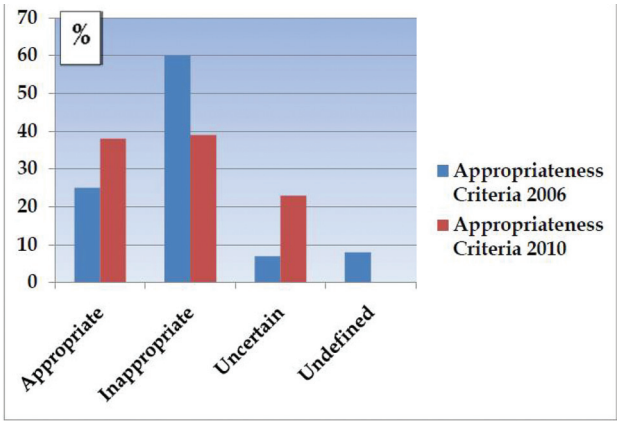
**Results:** We included 150 pts with an average age of 64.0 ± 9.9 (103 male). Overall ind compared using criteria of 2006/2010were A in 25/38%, U in 7/23%, I in 60/39% and UD in 8/0%. The most common A ind was for pts with equivocal stress test 76/51% of total A. A exams prevail in pts with an intermediate pretest probability. The most common I ind was for pts with a positive stress test 52/78% of total I. I exams prevail in pts with a high pretest probability 46/19% of total I. The significant shift to U ind is represented by pts with the constellation of high pp, not able to undergo stress testing or uninterpretable ECG. Prior UD exams, limited to pts with negative results on stress test, are now listed and defined as A.
**Image/graph I:**




**Conclusion:** Updating the CCT Appropriateness Criteria of 2006 now implies ind former not listed. In addition we found a shift of appropriateness from prior I to U and U to A. Nevertheless we conclude that the existing criteria need a more refined implementation into clinical practice to prevent avoidable inappropriateness.

**P343**

## Zero calcium scores is not reliable to rule out coronary artery disease in the emergency room

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**Introduction:** Several diagnostic tools have been proposed to investigate patients with acute chest pain in the emergency room. Recently, coronary computed angiotomography (CTA) has been studied for this purpose. Since CTA has some limitations including the use of ionizing radiation, iodine contrast and the need of drugs such as beta blockers and nitrates to achieve good image quality some authors have suggested that a negative calcium score would yield those patients with very low risk in which CTA could be safely avoided. **Objectives:** Evaluate the diagnostic accuracy of a negative calcium score when compared with CTA in the acute setting and subsequent downstream evaluation **Methods:** 65 patients (32 female) with acute chest pain, normal eletrocardiogram and cardiac biomarkers who underwent calcium score and CTA which had a negative calcium score were included. The exams were performed in a 64 detectors CT device with standard settings, and the CTA was performed using prospective acquisition, after beta blocker and nitrate unless contraindicated. The calcium score exams were compared to the CTA results. The CTA was considered positive if any lesion >50% was identified. **Results:** 65 patients were evaluated from February to August 2011. The mean age was 53.8±14.7 years and mean heart rate was 62 bpm. 2 of these zero calcium scores had non obstructive disease (<50%), 3 of these zero calcium scores had obstructive disease and 1 patient had an invaluable CTA due to motion artifacts. These last 4 patients were further stratified with invasive coronary angiography and all 4 underwent coronary angioplasty. **Conclusion:** 8.2% of the patients with coronary artery disease would be misdiagnosed if coronary calcium score was used as the sole imaging strategy in this sample. Not only that, 4 patients which had an intervention performed would remain untreated.

**P344**

## One year outcome experience using high-resolution computed tomography in patients with atypical chest pain

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**Introduction:** Atypical chest pain(ACP) is a cluster of symptoms and can have cardiac and non-cardiac cause. About one-fifth of patients with ACP actually have myocardial ischemia. **Objectives:** With the knowledge that 64-row multi-detector computed tomography(MDCT) has high specificity and negative predictive values for detecting significant coronary stenosis, we would like to know the impact and one year outcome after undergoing MDCT for ACP. **Methods:** Ninety eight patients with ACP presentation were subjected to MDCT of coronary arteries. The patients were briefed on proper breath-holding technique and given betablockers to achieve relative bradycardia. Clinically significant MDCT scans are coronary stenosis >50%, calcium score >400 Agatston or dense localised calcium deposits. They were evaluated through case notes and phone contacts for events at one year in terms of acute coronary syndrome(ACS) events, further cardiac investigation, revascularisation intervention and mortality. Analysis was done using SPSS software. **Results:** Forty four(44.9%) patients had essentially normal scans, twenty(20.4%) patients had minor lesions, fourteen(14.3%) patients had significant coronary stenosis, fifteen(15.3%) patients had significant coronaries calcification and two(2%) patients noted to have intramuscular bridging. mLAD, LMS, pRCA and caicium score variables contribute to the prediction of further investigations{conventional coronary angiogram(CCA), MRI, stress test} while mLAD, pLAD, D1 and heart rate variables contribute to further intervention(CABG or PCI). Twelve patients with calcium score >400 Agatston with nine patients not having any CCA didn't have any ACS events and were alive at one year post MDCT. Thirty one(31.6%) patients with preliminary significant coronary lesions had to undergo further cardiac tests with seven(7.2%) eventually needing CABG or PCI. There were no ACS events and mortality at one year post MDCT. **Conclusion:** MDCT highly accurately identifies significant coronary lesions and together with high calcium score make it a valuable initial screening tool to 'rule out' those patients with normal or minor coronaries disease having probable myocardial ischemia. It leads to appropriate further investigations and revascularisation strategy leading to zero ACS events and mortality. MDCT also correctly identifies intramuscular bridging.

**P345**

## Multi detector computed tomography utility in detecting coronary artery disease in women

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**Introduction:** Cardiovascular disease (CVD) is the leading cause of death worldwide including Malaysia. However, the prevalence of coronary artery disease(CAD) is generally low in pre-menopausal women. Hence, little evidence exists to justify the increasing use of Multi Detector Computed Tomography(MDCT) to screen for subclinical CAD in this group of individuals. **Objectives:** A)To determine the prevalence of significant CAD using 64-MDCT in women <55 years old, B)To assess the role of MDCT as a routine non-invasive screening tool for CAD, C)To evaluate the outcome of women who had undergone MDCT screening. **Methods:** 272 consecutive women <55 years old over a 3 year period underwent CTA using 64-MDCT according to clinical indications. Framingham Risk Scores (FRS) were also calculated. Significant CAD was defined as the presence of either (a) coronary artery stenosis >50% and/or (b) total calcium score >400 Agatston and/or (c) dense localised calcium deposits. Outcome events were obtained from clinic follow up files and phone calls **Results:** The mean age was 46.7 years (range 31–55 years). The indications were atypical chest pain 34%, high cardiovascular (CV) risk 26%, low CV risk 25%, positive exercise stress test (EST) 9%, pre-operation angiogram 3% and others 3%. Technical problems which interrupted MDCT were calcium score >400 Agatston 2% (n=5) and breathing/motion artefacts 25% (n=69). 92% (n=180/196) with FRS <20% had stenosis <50%. 74% (n=180/244) of patients with stenosis <50% had FRS <20%. Overall, 34 patients were detected to have stenosis >50% with a further 12 patients having stenosis >75%. Only 26 patients went on to have conventional coronary angiography (CCA) which confirmed lesions identified by MDCT in 5 patients. 1 patient with minor stenosis died from arrhythmia and 1 patient with severe CAD had emergency CABG and survived. **Conclusion:** There is increasing concern about radiation risk with MDCT. However, 64-MDCT has proven high sensitivity and specificity in detecting CAD and conversely to rule out CAD. With a detection rate of 13% (n=34) only in this cohort with low FRS, the prevalence of CAD in women (<55 years old) in East Malaysia is relatively low. Hence, more stringent criteria are needed to select appropriate female candidates for MDCT screening.

**P346**

## Impact of an abnormal body mass index on patient demographics, procedure indications and distribution of coronary artery disease with appropriate, inappropriate and uncertain indications based upon the published appropriateness criteria

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**Introduction:** Contemporary non-invasive imaging for evaluation of CAD includes Cardiac CT Angiography (CTA). Appropriateness criteria for CTA were published in 2006 by the ACCF/SCCT. **Objectives:** We intend to study the impact of an abnormal Body Mass Index (BMI) on procedure indications, distribution of CAD and patient (pts) demographics in a cohort with appropriate, uncertain and inappropriate criteria for CTA. **Methods:** A cross-sectional review of 182 pts referred for CTA in a large New York based cardiology practice was performed. All pts were divided into three categories; appropriate, uncertain or inappropriate based on the published criteria. CTA results were further divided into three groups: Obstructive CAD (defined as at least one lesion with stenosis >50%), non-obstructive CAD and normal. A BMI of > 25 was considered abnormal. A P-value of <0.05 was considered significant. **Results:** Among all pts referred for CTA, pts with abnormal BMI constituted 77 %( n=140) of the population. Compared to the cohort that had a normal BMI, pts with abnormal BMI were more likely to be males (P=0.01) and had a higher prevalence of dyslipidemia and diabetes (P values <0.05). They also had a higher mean calcium score (232 vs. 178) and younger age (62 vs. 67) although the differences were not statistically significant. Chest pain, asymptomatic CAD and equivocal stress study were the most common indications in both the cohorts. According to the published

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appropriateness criteria, both groups had similar number of pts with appropriate (26% vs. 21%), uncertain (27% vs. 21%) and inappropriate indications (57% vs. 47%). Both cohorts had similar prevalence of obstructive CAD and non-obstructive CAD. However, pts with normal BMI had significantly higher rates of normal scans (P<0.05). **Conclusion:** In this study, we did not find an association of abnormal BMI with elevated calcium score. Indications for CTA were similar in both cohorts. Similar number of CTA scans was performed in both BMI groups when classified into the three pre-defined subgroups according to the published appropriateness criteria.

**P349**

## Evaluating the Impact of gender on the incidence of non-diagnostic studies in 64-slice multislice computed tomography coronary angiography over a 36 month period

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**Introduction:** CT coronary angiography (CTA) with 64 slice multi-detector CT (64-MDCT) has rapidly evolved into a well-established clinical tool for the assessment of coronary artery disease. However, several factors contribute to reducing the diagnostic accuracy of 64-MDCT and the influence of gender specific differences are not well known. **Objectives:** This study aims to examine the influence of gender in assessing the prevalence of "non-diagnostic" studies over a thirty six month period using 64-MDCT. **Methods:** This retrospective study evaluates 64-MDCT examinations from July 2006 to 2009, for a total of 402 patients (220 men, 182 women; mean age 56.8 years ± 13.2). "Non-diagnostic" studies were characterized as any coronary artery segment that was not well visualized due to the following parameters: Agatston calcium score (CAS), motion artifact, metal artifact, body mass index (BMI), arrhythmia, diminutive vessel size, contrast opacification, and image acquisition. **Results:** The results were determined from a retrospective study in which 96 or 23.9% of the 402 MDCT studies were determined to be "non-diagnostic" in both men and women. The presence of nondiagnostic studies was associated with age (OR: 1.08, 95%confidence interval [CI]: 1.05–1.12, p<0.001), heart rate (OR:1.35 per 10 beats/min, 95%CI:1.11–1.67, p=0.003). Chi square demonstrated significant differences of age and BMI, of 0.02 and 0.001, respectively. The difference in the average BMI and age of men and women between diagnostic vs. non-diagnostic were found to be 28.30 vs. 31.35 and 55.96 vs. 59.55, respectively.

| "Non-Diagnostic" Parameters | Percentage of Non-Diagnostic Cases | P Value (statistical difference (p<0.05) |
|---|---|---|
| Agatston calcium scores (0-4250) | 32.2 | *p*<.05* |
| Motion Artifact | 10.4 | *p*<.05 |
| Metal Artifact | 9.4 | *p*<.05 |
| BMI (14-63kg/$m_2$) | 7.3 | *p*<.05 |
| Arrhythmia | 7.3 | *p* <.05 |
| Diminutive Vessel Size | 3.1 | *p* =.002 |
| Contrast Opacification | 2.1 | *p*=.012 |

**Conclusion:** These findings confirm an impaired diagnostic yield in patients with multiple risk factors of an elevated CAS230, BMI >36, limited breathhold cooperation, presence of metal artifacts, underlying arrythmias, diminutive vessel size, and inadequate contrast opacification, in both male and female patients. The use of noninvasive CTA with 64-MDCT in these patients may require careful patient preparation and optimization of CT scanning protocols. In establishing these limitations, we believe that a greater number of non-diagnostic MDCTA will be reduced and thus decrease the burden of escalating healthcare costs.

**P350**

## Left ventricular structure and function in haemoglobin ss (sickle cell anemia) subjects in ibadan, nigeria

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**Introduction:** Cardiovascular system abnormalities are prominent features of sickle cell anaemia. Previous studies have been inconclusive on the diastolic and systolic function in sickle cell anaemia patients. There is limited literature on their left ventricular geomertric patterns in SCA subjects. **Objectives:** To assess the left ventricular structure and functions in patients with sickle cell anaemia seen at the University College Hospital, Ibadan and to compare with controls of comparable age and sex. **Methods:** One hundred and sixty-one subjects were recruited into the study. There were 90 SCA subjects in steady state and 71 controls. The groups were of comparable age and sex. They all had clinical evaluation and Echocardiographic examination, including M-mode, Doppler echocardiography and tissue Doppler imaging. **Results:** The mean age of SCA subjects was 26.10 years while the mean age for the control group was 25.95 years. The sickle cell anaemia subjects had smaller baseline clinical characteristics and also lower systolic and diastolic blood pressures. Twenty eight patients (29.83% had dyspnoea, None of the controls had dyspnoea. The SCA subjects had larger cardiac dimensions. There was no difference in the LV systolic load dependent indices and load independent indices between the two groups. There was diastolic dysfunction among the SCA subjects with a prevalence of 16.6% using TDI and 10% using transmitral flow indices. The $E/E^{i}$ which is a measure of of left ventricular filling pressure and myocardial stiffness was higher among the SCA subjects. The predominant abnormal LV geometric pattern in SCA subjects was eccentric LV hypertrophy. **Conclusion:** This study has shown that there is normal systolic function in sickle cell anaemia patients. There is evidence of diastolic dysfunction among SCA subjects and they may have increased myocardial stiffness. The predominant abnormal LV geometric pattern in SCA subjects is eccentric LV hypertrophy. There is need for long term prospective longitudinal studies in among SCA subjects in Nigeria to determine the prognostic implication of diastolic dysfunction and abnormal LV geometry

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**P351**

## Prevalence of the right ventricular dysfunction in STEMI patients

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**Introduction:** Right ventricular (RV) function provides strong prognostic information in patients treated with primary percutaneous coronary intervention for myocardial infarction. **Objectives:** The aim of this study was to assess the prevalence of the RV systolic dysfunction in ST-elevation myocardial infarction (STEMI) patients. **Methods:** Consecutive patients admitted with first STEMI treated with primary percutaneous coronary intervention underwent echocardiography within 72 hours of admission to assess left ventricular and RV function. Studies were carried out with GE Vivid 7 Ultrasound Systems. Left ventricular ejection fraction was calculated using the biplane Simpson method. RV function was quantified with RV fractional area change (RVFAC), tricuspid annular plane systolic excursion (TAPSE), S wave, Right Ventricular Outflow Tract fractional shortening (RVOTfs), and Isovolumic Acceleration (IVA). RV dysfunction was defined as a presence of the dysfunction in 2 out of 5 echocardiographic methods for evaluation of RV function. **Results:** Results: A total of 82 patients (mean age 61,02±11,88 SD, 72% males) were included. RV dysfunction was present in 33 (40,2%) patients (25/33 TAPSE; 23/33 RVOTfs; 20/33 S wave; 16/33 IVA; 14/33 RVFAC). In patients with and without RV dysfunction, the right coronary artery was the infarct-related artery in 45,5% and 42,9% of patients, respectively. There was no significant difference in left ventricular ejection fraction between subgroups (50,10±8,33% vs. 51,22±8,23%). In the multiple logistic regression analysis, acute chest pain above 3 hours [odds ratio (OR) 3,43, 95% confidence interval (CI): 0,92–12,81; p=0,066], B-type Natriuretic Peptide on admission above 187,5 pg/dl (OR 16,69, 95%CI: 4,36–63,82; p<0,0001), and Body Mass Index >30 kg/m2 vs. **Conclusion:** RV dysfunction was highly prevalent in STEMI patients. Cardiologists should routinely screen and evaluate myocardial infarction patients for RV dysfunction. Combining more than one measure of RV function can be more reliably distinguish abnormal from normal function.

**P352**

## Relationship between B-type natriuretic peptide plasma level on admission and right ventricular function in patients with acute coronary syndrome

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**Introduction:** Brain Natriuretic Peptide (BNP) levels strongly correlates with left ventricular dysfunction. Few data are available for BNP levels in patients with acute ST-elevation myocardial infarction (STEMI) treated with primary percutaneous coronary intervention and right ventricular (RV) function. **Objectives:** To evaluate relationship between RV systolic dysfunction and BNP plasma levels in STEMI patients. **Methods:** Consecutive patients admitted with first STEMI treated with primary percutaneous coronary intervention underwent echocardiography within 72 hours of admission to assess left ventricular and RV function. Studies were carried out with GE Vivid 7 Ultrasound Systems. Left ventricular ejection fraction was calculated using the biplane Simpson method. RV function was quantified with RV fractional area change (RVFAC), tricuspid annular plane systolic excursion (TAPSE), S wave, Right Ventricular Outflow Tract fractional shortening (RVOTfs), and Isovolumic Acceleration (IVA). RV dysfunction was defined as a presence of the dysfunction in 2 out of 5 echocardiographic methods for evaluation of RV function. Peripheral blood samples for BNP estimation were obtained on admission. BNP was measured with the use of the Triage BNP Test (Biosite Incorporated,San Diego, Calif) within a 15-minute period. **Results:** A total of 82 patients (mean age 61,02±11,88 SD, 72% males) were included. There was no significant difference in left ventricular ejection fraction between patients with and without RV dysfunction (50,10±8,33% vs. 51,22±8,23%). RV dysfunction was present in 33 (40,2%) patients. Patients with RV dysfunction have significant higher mean BNP levels on admission compared to the patients without (298,18±115,39 pg/ml vs. 157,85±64,90 pg/ml). There was a significant correlation between plasma BNP levels on admission and TAPSE (rho = -0,482; p<0,0001), IVA (rho = -0,233; p<0,05), RVFAC (rho = -0,297; p<0,05), and S wave (rho = -0,481;p<0,0001). In the multiple logistic regression analysis, admission BNP above 187,5 pg/dl [odds ratio (OR) 16,69, 95% confidence interval (CI): 4,36–63,82; p<0,0001) acute chest pain above 3 hours (OR 3,43, 95%CI: 0,92–12,81; p=0,066), and Body Mass Index >30 kg/m2 vs. **Conclusion:** BNP levels obtained on admission are a powerful, independent predictor of RV dysfunction in STEMI patients and may be particularly useful in risk stratification.

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## Cardiac involvement in patients with ankylosing spondylitis: an echocardiographic study

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**Introduction:** Ankylosing Spondylitis is a common inflammatory rheumatic disease that mainly cause back pain and stiffness. Cardiovascular involvement is more frequent than in matched controls and has been associated with the immunogenetic marker HLA-B27. However; previous studies have been inconsistent with regard to the prevalence of cardiac abnormalities. The access to a sensitive and relatively preload independent technique, such as tissue Doppler imaging, allows a more accurate evaluation of cardiac function beyond measuring left ventricular ejection fraction. **Objectives:** The aim of this cross-sectional study was to investigate cardiac involvement in an Ankylosing Spondylitis cohort of which 86% were HLA-B27 positive. **Methods:** All patients (n= 188, 106 men, 82 women) were studied with echocardiography, including colour, continuous and Tissue Doppler imaging. Mean age (SD) was 51 (12) years and mean duration of disease 15 (11) years. **Results:** Mild aortic regurgitation (AR; grade 1–2/4) was detected in 21%. Two patients had significant AR (grade-3/4). Left ventricular ejection fraction ≤50% was found in 13%, without difference between patients with vs. without AR. Left ventricular diastolic dysfunction was present in 30%, and right ventricular diastolic dysfunction in 40%. Comparing patients with vs. without AR using Tissue Doppler imaging, reduced systolic and diastolic function was observed: systolic velocity [9.4 (2.0) vs. 10.5 (1.7) cm/s],and early diastolic velocity [12.1 (2.1) vs. 13.5 (12.1) cm/s], $p<0.01$ respectively. Furthermore, the width of the proximal annular aorta was significantly larger in patients with AR [3.11 (0.44) vs 2.83 (0.39) cm; $p<0.001$]. **Conclusion:** Cardiac involvement was common in this cohort and not confined to the proximal part of the aorta including the valve. Reduced myocardial systolic and diastolic function was also common. These observations demonstrate the importance of sensitive echocardiographic methods in order to follow the disease related inflammatory process involving the heart in patients with Ankylosing Spondylitis and efforts to prevent further myocardial deterioration.

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## Preoperative echocardiographic ventricle modeling for post-infarction aneurysmal repair

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**Introduction:** There is still problem in post operative systolic and diastolic left ventricular function after post-myocardial infarction aneurysm suregical repair. **Objectives:** The aim of this study was to evaluate a new echocardiographic approach for the surgical management of these patients. **Methods:** Thirty patients scheduled for post-infarction aneurysmal repair were included. In 15 patients (group 1, mean age: 53.2 ± 8.6 years), the best ventricle volume for the patients' body mass index was determined; and based on scar orientation, six echocardiographic landmarks were obtained from three views (four-chamber, two-chamber, and the apical long axis) so as to measure the distances of the landmarks to the mitral valve. The other 15 patients (group 2, mean age: 53.8 ± 7.2 years) underwent routine left ventricle reconstruction at the surgeons' discretion. **Results:** The mean follow-up was 30.3 ± 9.8 months in group 1 and 32.7 ± 6.2 months in group 2. The mean ejection fraction increased from 31.33 ± 4.41% to 46.07 ± 3.49% by the last follow-up in group 1 and from 28.33 ± 5.56% to 40.36 ± 4.58% in group 2; the changes between the two groups were significant (P-value=0.007). The mean NYHA class decreased from 2.93 ± 0.46 to 1.36 ± 0.63 in group 1 and from 2.8 ± 0.68 to 1.43 ± 0.51 in group 2. The sphericity index decreased from 65.27 ± 7.62 to 53.79 ± 4 in group 1 and from 65.13 ± 3.11 to 59.57 ± 2.95 in group 2; the changes between the two groups were statistically significant (P-value = 0.03). **Conclusion:** Reserving the optimal left ventricle volume during the post-infarction aneurysmal repair would result in a better postoperative cardiac shape and function.

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## The ten commandments for a totally non-invasive detection of coronary atherosclerosis when anamnesis and electrocardiography fail to conclude

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**Introduction:** Undoubtedly ischemic heart disease will affect life expectancy of our population. Improved medical opportunities and innovative interventional techniques proved their efficacy. However more important is early recognition of ischemic heart disease before appearance of specific complaints. **Objectives:** To screen the widest possible population,we are obliged to use non-invasive investigation techniques. Demographic,economic and organizational reasons forced us to renounce too expensive and not always risk-free invasive explorations. The aim of our study is to organize a 45 minutes cardiologic consultation,resulting in a correct diagnosis by means of non-invasive needle-free exploration techniques. **Methods:** 1212 male patients were equally divided in healthy controls(I) and in coronary patients(II);both groups subdivided in three age groups:A:40–59y;B:60–79y;C:80–99y. By speckle-tracking echocardiography we examined the entire wall of left ventricle:global longitudinal peak systolic strain average(GLPSSavg)and average strain of 5 myocardial segments with the lowest strain values(Avg5LSS), calculated by automated function imaging(AFI). For the contractile function of left atrium we assessed by strain reservoir function(RF)and conduit function(CF). Maximal exercise tests were performed to calculate the percentage maximal exercise capacity:performed load/calculated expected load x100 in %(PL/EL)and to measure heart rate at end-exercise minus heart rate at rest(HR). **Results:** Significant decrease($p<0.001$)of GLPSSavg for all age groups in II compared with I:IA-20, IIA-15;IB-19,IIB-15;IC-19,IIC-14. Same findings($p<0.001$)for Avg5LSS:IA-15,IIA-9;IB-14,IIB-9;IC-13, IIC-8. Significant decrease($p<0.01$)of RF and CF in II:RF/CF:IA:100/61,IIA:82/42;IB:84/45,IIB:75/42;IC:70/27,IIC:70/26. Significant decrease($p<0.001$)of PL/EL in II:IA116,IIA92;IB115,IIB91;IC110,IIC83. Same findings($p<0.001$)for HR:IA85,IIA61;IB66,IIB52;IC50,IIC35. Waist size significantly higher($p<0.001$)in II:IA95,IIA107;IB94,IIB102;IC93,IIC102. E/E' and sum left ventricle left atrium(LVLA)higher in II. Ejection fraction(EF)lower in II. **Conclusion:** When anamnesis and electrocardiography fail to conclude in the non-invasive setting of a classic cardiologic consultation, we dispose of five fundamental parameters, resulting with a high probability in a correct diagnosis of coronary atherosclerosis:GLPSSavg<-17;Avg5LSS<-11, PL/EL<100;RF<84;waist size>100. Five other parameters provide arguments to consolidate the diagnosis:EF<65;E/E'>11;LVLA>9.5;CF<45;HR<62.

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## Automated function imaging of the left ventricle as a possible provider in the risk stratification of life-threatening cardiac events

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**Introduction:** Ischemic heart disease is mostly a male problem. Genetic, hormonal and environmental factors are undoubtedly decisive but intrinsic myocardial qualities could also be important. **Objectives:** Strain measurement give a correct idea about the contractile reserve of the myocardium. Automated function imaging(AFI) is a novel algorithm based on speckle-tracking imaging that can be used for assessment of segmental and global longitudinal strain of left ventricle(GLPSSavg). **Methods:** Study population of 1040 subjects, divided in 26 groups of 40 patients. 480 females(I) divided in 8 age groups healthy subjects(H) and in 4 age groups coronary patients(C); 560 males(II) divided in 8 age groups healthy subjects(H) and in 6 age groups coronary patients(C); (1:10–19years; 2:20–29y; 3:30–39y; 4:40–49y; 5:50–59y; 6:60–69y; 7:70–79y; 8:80–89y). All subjects underwent AFI for determination of GLPSSavg and for assessment of average strain of the 5 myocardial segments with the lowest strain(Avg5LSS). **Results:** GLPSSavg in I is in all age groups higher than in II. In all age groups GLPSSavg is significantly($p<0.001$) lower in coronary patients. Same findings significantly ($p<0.001$) different between males and females for Avg5LSS. In all age groups left atrium and left ventricle diameters are smaller in females and are increased in coronary patients. GLPSSavg: IH1:-20.45; IH2:-20.53; IH3:-23.9; IH4:-19.99; IH5/IC5:-20.41/-16.10; IH6/IC6:-19.30/-16.61; IH7/IC7:-19.80/-15.38; IH8/IC8:-19.59/-15.65; IIH1:-18.47: IIH2:-17.65; IIH3/IIC3:-19.67/-15.90; IIH4/IIC4:-17.68/-16.40; IIH5/IIC5:-18.91/-15.57; IIH6/IIC6:-18.77/-16.25; IIH7/IIC7:-18.03/-14.88; IIH8/IIC8:-18.85/-14.28. Avg5LSS: IH1:-16.15; IH2:-17.33; IH3:-21.4; IH4: -16.83; IH5/IC5:-16.88/-9.90; IH6/IC6:-14.71/-8.96; IH7/IC7:-13.83/-10.58; IH8/IC8:-13.60/-10.18. IIH1: -15.27; IIH2:-14.70; IIH3/IIC3: -15.63/-10.70; IIH4/IIC4:-13.97/-9.87; IIH5/IIC5:-15.07/-10.28; IIH6/IIC6:-13.86/-9.36; IIH7/IIC7:-13.26/-8.21; IIH8/IIC8:-13.58/-8.04. **Conclusion:** The contractile reserve and the deformation capacity of the myocardium, measured by strain and AFI are for all age groups undeniably higher in females compared with males, resulting in smaller diameters of left atrium and left ventricle in females. This could be an explanation for a lower incidence of life-threatening cardiac events in females.

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## Update on the risk assessment of coronary atherosclerosis by ambulant non-invasive cardiac investigation: importance of "automated function imaging" of left ventricle

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**Introduction:** Early detection of coronary atherosclerosis is imperative in the prevention of myocardial infarction and ischemic heart complications. To reach a large population safe, easy accessible and reliable non-invasive investigation methods are required. **Objectives:** Automated function imaging(AFI) is a novel algorithm based on speckle-tracking, allowing calculation of segmental strain for automated evaluation of left ventricular function. The aim of this study is to prove that assessment of global longitudinal peak systolic strain average(GLPSSavg) by AFI is able to discern healthy people from patients with ischemic heart disease. **Methods:** We examined 660 male ambulant subjects, equally divided in 10 subgroups: 330 healthy subjects(I) and 330 coronary patients(II), each divided in 5 age groups:A:40–49y; B:50–59y; C:60–69y; D:70–79y; E:80–89y. The entire myocardial wall of left ventricle was subdivided in 24 segments and totally examined by speckle-tracking echocardiography: GLPSSavg and average strain of the 5 myocardial segments with the lowest strain values (Avg5LSS) were calculated. Maximal exercise tests were performed to calculate the percentage maximal exercise capacity: performed load/calculated expected load x 100 in % (PL/EL). Waist size completed our investigation. **Results:** For all age groups significant decrease ($p<0.001$) of GLPSSavg in group II compared with I: IA:-18.08; IB:-19.40; IC:-18.99; ID:-18.84; IE:-19.01; IIA:-15.90; IIB:-15.67; IIC:-15.78; IID:-15.28; IIE:-15.62. Significant differences($p<0.001$) for Avg5LSS between I and II. IA:-14.48; IB:-15.49; IC:-14.33; ID:-13.40; IE:-13.53; IIA:-9.87; IIB:-10.52; IIC:-9.42; IID:-8.98; IIE:-9.20. For all age groups significant decrease($p<0.001$) of

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PL/EL in II: IA:116; IB:112; IC:119; ID:108; IE:107; group IIA:98; IIB:95; IIC:96; IID:91; IIE:86. Significant($p<0.001$) higher waist size in II for all age groups: IA:96,36; IB:93,83; IC:94,91; ID:90,81; IE:93cm; IIA:105,67; IIB:104,23; IIC:100,35; IID:102,02; IIE:100,9cm. By constructing figure graphics of GLPSSavg or Avg5LSS on X axis and PL/EL or waist size on Y axis, we observed 2 totally different, separated and independent clusters. **Conclusion:** AFI of left ventricle permits us to discern non-invasively coronary patients from healthy subjects. By GLPSSavg lower than -17 and AvgLSS lower than -11 the diagnosis of ischemic heart disease is highly probable. Combined assessment of waist size more than 100cm and PL/EL lower than 100 enhances the probability of underlying coronary atherosclerosis.

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## In obese patients epicardial fat thickness correlates with left ventricular remodelling and diastolic dysfunction

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**Introduction:** Epicardial fat has a role in the development of cardiovascular disease. It may influence coronary atherogenesis and myocardial function. Epicardial fat may be measured using two-dimensional echocardiography that has the advantage over other imaging modalities of being widely available. **Objectives:** This study aimed to evaluate the relation of epicardial fat thickness determined by echocardiography with systolic and diastolic left ventricular (LV) function in obese patients. **Methods:** We included 28 patients with body mass index (BMI) $\geq$30, without structural heart disease that underwent clinical and echocardiographic evaluation. The epicardial fat thickness echocardiographic measurement was made in parasternal long axis view and perpendicular to the right ventricular free wall. The systolic and diastolic LV function was assessed by conventional 2D and Doppler parameters and also by speckle tracking strain and strain rate analysis. **Results:** Most patients enrolled were female (79%), mean age 46$\pm$13 years. The body mass index (BMI) was 39$\pm$5kg/m$^2$, the % of body fat mass was 42$\pm$6% and waist circumference was 118$\pm$10cm. The epicardial fat thickness was 4 $\pm$ 2 mm. All patients had preserved systolic function (LV EF 50%) and global peak systolic strain was -17$\pm$4%. Blood glucose was 97$\pm$12mg/dL. Pericardial fat thickness was directly correlated with BMI ($R=0.53$; $p=0.01$), % of body fat mass ($R=0.53$; $p=0.03$) and blood glucose ($R=0.64$; $p=0.03$). The pericardial fat thickness was found to be inversely correlated with LV end-diastolic diameter ($R=-0.47$; $p=0.02$). It was also directly correlated with the a wave velocity of LV filling flow and with peak global telediastolic strain rate ($R=0.49$; $p=0.02$). **Conclusion:** Our data indicate that, in obese patients, pericardial fat thickness correlates to parameters of diastolic dysfunction assessed by conventional Doppler and speckle tracking ultrasound techniques. These changes occur with small cavity LV remodelling.

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## Quantitative assessment of regional left ventricular function using real time - three dimensional echocardiography in patients with asymptomatic LBBB

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**Introduction:** Real time three dimensional echocardiography( RT3DE) and quantitative analysis of regional volume and ejection fraction (EF) may provide a more robust method of assessing regional function. **Objectives:** 3 D assessment of regional time-volume curves provide additional data for hemodynamic evaluation by allowing measurement of true ventricular regional volumes **Methods:** We analyzed 23 patients (mean age 63$\pm$ 3 years) with left bindle branch block (LBBB) - 18 of them with asymptomatic LBBB (EF $>$ 50 %) and 5 with symptomatic LBBB (systolic heart failure, EF $<$35 %) and 10 normal volunteers (mean age 35$\pm$ 2 years). Transthoracic RT3DE datasets were acquired using X5 matrix area transduser (frame rate 18$\pm$4) in all subjects and images were analyzed off-line, using commercial software (3DQ Advanced) for quantification a global ventricular function (EDV, ESV, EF%) and regional myocardial function- to generate volume over time curves. Following manual tracing with triplane projections, the software generated regional - time volume curves. These were exported and used to determine regional volumes and EF for each segment. From these the systolic dyssynchrony index (SDI) were delivered. All patients are analyzed using speckle tracking methods from 2D images for assessing regional myocardial deformation too. **Results:** QRS duration of LBBB between both LBBB groups is not different ($p=0.52$), but is significant different with normal group ($p<0.001$). The global left ventricular parameters of the three groups was shown. In a normal's a SDI was 4,6 $\pm$3,6 and we found significant differences between asymptomatic LBBB (7.7$\pm$3,3; $p<0,0001$) and symptomatic LBBB (13,7$\pm$5,5; $p<0,0001$) patients. Significant differences for SDI were found between both LBBB groups too ($p<0.0001$).Global longitudinal strain for asymptomatic LBBB pts (-17.6 %$\pm$3.5) is a significant different when compare with symptomatic LBBB pts (-7.6 %$\pm$ 4.2, $p<0.001$). However, a time to peak segmental contraction analysis ($>$ -55 ms ), based on 17 segments regional 3D analysis show significant difference between basal inferoseptal segment and basal anterolateral segment for normals and asymptomatic LBBB ($p<0.05$) and symptomatic LBBB groups ($p<0.001$) **Conclusion:** RT3DE provides fast, visual and reproductival determination of LV regional function in patients with asymptomatic LBBB, compare to 2DE. Time to peak segmental contraction analysis may have good predictor for new onset heart failure in patients with asymptomatic LBBB.

**P360**

## Echocardiographic pattern of acute heart failure in Aminu Kano Teaching Hospital, Kano, Nigeria

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**Introduction:** Acute Heart Failure (AHF) is the most common reason for hospital admission in patients over the age of 65years in the western world, and is associated with staggering management costs. Furthermore, the prognosis of patients admitted with AHF remains dismal, with over 20% of the patients being readmitted with HF and over 20% dying during the first year after initial admission. Echocardiography is a major mode of cardiovascular imaging with versatile applications. Modern echocardiographic techniques provide a comprehensive means for evaluating virtually all forms of heart diseases. It can classify the type of heart failure as well as delineate the its aetiology. **Objectives:** to describe the echocardiographic pattern of acute heart failure in Aminu Kano Teaching Hospital, Kano, Nigeria. **Methods:** it was a cross sectional study carried out on eligible patients aged 15 years and above, who presented with acute heart failure and were consecutively recruited. Detailed history and physical examination were obtained from all patients. Baseline blood chemistry, full blood count, and electrocardiography were carried out on all the patients. Echocardiography was performed in all patients using ALOKA SSD-4000 machine. **Results:** A total of 120 patients were studied. Sixty six (55%) of them were females, 54 (45%) were males and the mean age of the patients was 49.88 $\pm$ 18.87. Hypertensive heart disease was the commonest aetiology of acute heart failure among patients accounting for 44.2% of patients. Cardiomyopathies (including peripartum cardiomyopathy) were the commonest cause of AHF in females (45.5%). Rheumatic heart disease was the cause of AHF in 6.7% while acute myocardial infarction was present in only 5%. The mean left ventricular ejection fraction (LVEF) for all patients was low (37%). Sixty nine (57.50%) had both diastolic and systolic dysfunction, while 24 (20%) had pure diastolic dysfunction and 27 (22.5%) had pure systolic dysfunction. Arrhythmia was the commonest precipitant of AHF (59.2%), followed by hypoalbuminaemia (58.3%), chest infection (53.3%) and anaemia (49.2%). **Conclusion:** Patients with acute heart failure in this study were relatively young. Hypertensive heart disease and cardiomyopathies were the most common causes of AHF in all patients and females respectively. Acute myocardial infarction was rare. Most patients had both systolic and diastolic dysfunction.

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## Correlation between speckle tracking echocardiography and single photon emission computed tomography in post-myocardial infarction patients

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**Introduction:** Coronary heart disease caused 7.2 million deaths worldwide in year 2006. In Egypt; coronary heart disease is the first cause of death in top ten medical causes of deaths in all ages. **Objectives:** To evaluate the efficacy and accuracy of non-invasive assessment of global and regional left ventricular functions using automated functional imaging (speckle tracking) echocardiography in comparison with single photon emission computed tomography in post MI patients. **Methods:** 2 groups: - Group 1 included 40 post MI patients, group 2 included 20 ages, sex and weight matched normal controls. Both groups were subjected to echocardiography study to perform conventional echocardiography study and speckle tracking by recording three views:-Apical 4 chambers, apical 2 chambers and apical long axis then exporting those views to external work station (Echo Pac). Only group 1 had been subjected to Cardiac single photon emission computed tomography scan. **Results:** There was highly significant correlation between ischemic areas by SPECT and regional strain in STE with average regional strain is -9.84$\pm$1.132% and cutoff regional strain value $>$ -12 % with sensitivity 98.3% and specificity 67.5%. There was highly significant correlation between mixed ischemic and scar tissue areas detected by SPECT and regional strain values by STE ($p<0.001$) with average regional strain was -7.45$\pm$1.323% and cutoff regional strain value $>$ -11 % with sensitivity 98.7% and specificity 69%. There was highly significant correlation between scar tissue by SPECT and regional strain in speckle tracking. (P value $<0.001$). Subgrouping statistical analysis of scar areas by SPECT based on regional strain by speckle tracking findings resulted in subdividing scar areas into 2 groups:-Group A scar tissue with regional strain $\leq$ 0 % i.e hypokinesia and Akinesia, Group B scar tissue with regional strain $>$ 0 %i.e. dyskinesia. There was highly significant correlation between scar tissue in SPECT and regional strain in group A ($p<0.001$) with regional strain value -3.88 $\pm$ 1.711% and cutoff regional strain value is $<$-7% with both sensitivity and specificity 98%. There was a highly significant correlation between scar tissue in SPECT and regional strain in speckle tracking in group B ($p<0.001$).The average value for regional strain in dyskinetic scar tissue is +4.11$\pm$2.381%.

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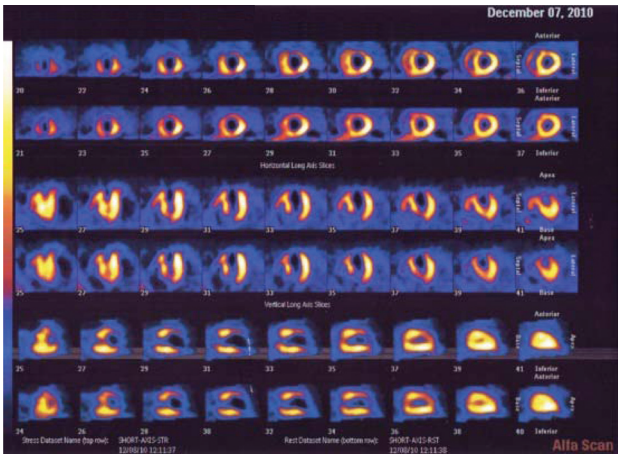
**Image/graph I:**




**Image/graph II:**

**Conclusion:** STE is a promising, valid, bedside, cheap and feasible diagnostic modality for myocardial viability and ischemia

**References:**

(World Heart Organization; 2006).

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## Echocardiography in Saudi patients with metabolic syndrome

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**Introduction:** Metabolic syndrome MS is clustering of abdominal obesity, insulin resistance, dyslipidemia, and elevated blood pressureBP and is associated with other comorbidities. **Objectives:** detect echo abnormalities in such patients **Methods:** 105 Saudi patients met the criteria of MS according to National Cholesterol Education Program's Adult Treatment Panel 3 (group 1) were compared to 30 normal subjects(group2)Both groups were subjected to clinical examination ,echocardiographic examination including left ventricular dimensions, tissue Doppler examination of the mitral valve annulus, grading of diastolic function, filling pressure as E/e and epicardial fat(end-systolic thickness of echo free space in front of the free wall of right ventricle). **Results:** All patients were males with the mean age of 40±12 compared to 30 normal sex and age –matched subjects.Patients have higher waist circumference 110±7 vs 98± 3 in group2, $p<0.05$,higher triglycerides level 187±47 vs 120±30, $p<0.05$, higher systolic BP 149±11,vs 123± 9, higher diastolic BP 104±10 vs 85± 4 ,$p<0.05$, higher fasting blood sugar 116± 13 vs 98 ± 8, $p<0.05$ higher uric acid 11 ± 3 vs 8± 1.$p<0.05$ and higher alanine ttransaminase 89±19 vs 45±7 $p<0.05$ and only (21%) of patients in group 1 had a high CRP.Adequate echo assessment was feasible in 100/105 patients and all normals.In patients;interventricular septumIVS ranged from 10 to 13 mm with the mean of 11± 1, posterior wall PW 8 to 12 with the mean of 10± 0.9, filling pressure 8–12 with the mean of 11± 2, the normals had significantly thinner IVS as it ranged from 8 to 10 mm with the mean of 8± 1, $p<0.05$, thinner PW 7–10 with the mean of 9± 2p$<0.05$, lower filling pressure 4–6 with the mean of 5±1p$<0.05$. 24%of patients in group 1 have normal, 62 % showed grade 1 while 14% showed grade 2 diastolic dysfunction,while all normals have normal diastolic function.88/100 patients in group 1 showed epicardial fat that ranged from 2 to 8 mm with the mean of 6 ± 2 while none in group 2 showed epicardial fat.There was no significant difference between the two groups concerning left ventricular end diastolic or end systolic dimension or ejection fraction . **Conclusion:** patients with MS showed abnormal echo findings as left ventricular hypertrophy, diastolic dysfunction, high filling pressure and epicardial fat, whether these findings are due to metabolic syndrome itself or its individual components as hypertension or diabetes is unknown and further research is needed.

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## Correlation of right ventricle echocardiography doppler parameters and left ventricle ejection fraction

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**Introduction:** assessment of right ventricle (RV) function by echocardiography is challenging. Several studies had shown that Tricuspid annular displacement (TAD) and newer techniques such as Tissue Doppler echocardiography: Peak systolic velocity (Peak S) and Integral time velocity S (ITV S) correlates well with isotopic RV ejection fraction. However, TAD has been reported to be influenced by Left ventricle ejection function (LVEF). **Objectives:** The aim of this study is to determine the correlation between different RV echocardiography parameters and their correlation with LVEF. **Methods:** Doppler echocardiography (including measurement of LVEF, TAD on M Mode, Peak S and ITV S on tissue Doppler of the tricuspid annular) was performed in 140 patients, mean age 58 ± 14 admitted to the ICU during the study period. A correlation was performed between RV echocardiography parameters and between RV parameters and LVEF. **Results:** A strong correlation was found between TAD and ITV S ($r^2$=0.79, p= 0.0001), between TAD and Peak S ($r^2$ =0.52, p= 0.0001) and between ITV S and peak S ($r^2$ = 0.76, p= 0.0001). No correlation found between LVEF and RV tissue Doppler parameters (Peak S and ITV S, respectively $r^2$= 0. 024, p= 0.87 and $r^2$= 0.12, p= 0.43), however a statistic significant correlation was found between TAD and LVEF, $r^2$= 0.35, p= 0.005. **Conclusion:** Tissue Doppler indices of RV function (PeakS and ITV s) correlate well with TAD and seems to be independent from LV systolic function.

**P364**

## Hypercholesterolemic diet worst left ventricular function evaluated by echocardiography in rats subjected to an experimental infarct model

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**Introduction:** A better comprehension of the hypercholesterolemic diet role in the set of acute myocardial infarct is fundamental. **Objectives:** Evaluation of the role of hypercholesterolemic diet in the determination of the hemodynamics patterns by echocardiography. **Methods:** Sixty three anesthetized rats were subjected to occlusion of the left anterior descending (LAD) coronary artery and divided in six groups: G1–just normal diet (ND); G2–ND and treatment with rosuvastatim for 30 days began after infarct and G3–ND and 30 days previously to infarct treated with rosuvastatim until 30 days after it; G4 –just hypercholesterolemic diet (HD); G5–HD and treatment with rosuvastatim for 30 days began after infarct and G6 –HD and 30 days previously to infarct treated with rosuvastatim until 30 days after it. Echocardiography was performed using bidimensional image in the paraesternal long axis. The planimetry of the left ventricle areas in the end of the diastole (LVEDA) and systole (LVESA) were realized before the infarct (pre) and 30 days after the infarct (post). A p value $<0.05$ was considered significant. **Results:** see table

| | LVEDA ($cm^2$) (pre) | LVEDA ($cm^2$) (post) | LVESA ($cm^2$) ( pre) | LVESA ($cm^2$) (post) |
|---|---|---|---|---|
| G1 | **0.48*** | **0.88*** | **0.16*** | **0.6*** |
| G2 | **0.39*** | **0.8*** | **0.12*** | **0.55*** |
| G3 | **0.58*** | **0.75*** | **0.21*** | **0.52*** |
| G4 | **0.59*** | **1.02*** | **0.18*** | **0.78*** |
| G5 | **0.67*** | **1.05*** | **0.26*** | **0.84*** |
| G6 | **0.7*** | **1.06*** | **0.28*** | **0.86*** |
| P | **< 0.05*** | **< 0.05*** | **< 0.05*** | **< 0.05*** |

**Conclusion:** The hypercholesterolemic diet worst the hemodynamics parameters–LVEDA and LVESA - in comparison with the normocholesterolemic group treated with rosuvastatim.

**P365**

## Right ventricular function in heart failure patients

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**Introduction:** Tricuspid annular plane systolic excursion (TAPSE) and tricuspid annular systolic velocity (R-S') are widely recognized, clinically useful and feasible marker of right ventricular dysfunction. **Objectives:** We aim to assess TAPSE and R-S' in patients with heart failure, and the association of these two parameters with other clinical factors. **Methods:** All patients

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underwent full echocardiographic examination. TAPSE, R-S', left ventricular ejection fraction (LVEF), systolic velocity (S') of mitral annulus, early diastolic and late diastolic of mitral annulus velocities (E' and A') at septal, pulmonary artery systolic pressure (PASP), mitral flow E deceleration time (DT) and other parameters were measured by using 2-D mode, color Doppler imaging and Tissue Doppler Imaging (TDI). **Results:** 65 patients with heart failure (mean age 63.7±10.3y) and 30 controls (mean age 62.5±8.2y) were included in our study. Patients with heart failure were divided into two groups: those with EF50% (14) and EF≤50% (42). TAPSE and R-S' were significantly lower in patients with heart failure compared to the controls (15±4.5 vs. 23.5±3.2 and 0.083±0.029 vs. 0.131±0.02 p<0.05, respectively). In heart failure patients both of them were also significantly lower in those with EF≤50% compared to EF50% (14.2±4.61 vs. 17.5±4.12 and 0.077±0.026 vs. 0.098±0.027, p<0.05, respectively). Independently, TAPSE and R-S' were associated with mitral flow A velocity (p=0.0017 and p=0.0018, respectively), septal S' (p<0.001 and p<0.001, respectively), septal E' (p<0.013 and p<0.001) and septal A' (p<0.001 and p<0.001, respectively). The corresponding correlations were displayed in Table 1.

Table 1. Univariable analysis of the relations of Echocardiographic parameters and TAPSE and R-S'

| | TAPSE | | R-S' | |
|---|---|---|---|---|
| | r | P value | r | P value |
| E | -0.06 | 0.97 | -0.02 | 0.92 |
| A | 0.54 | <0.01 | 0.60 | <0.01 |
| S' | 0.61 | <0.001 | 0.60 | <0.001 |
| E' | 0.36 | 0.013 | 0.45 | <0.001 |
| A' | 0.51 | <0.001 | 0.51 | <0.001 |
| E/E' | -0.18 | 0.27 | -0.13 | 0.41 |
| PASP | 0.24 | 0.19 | 0.18 | 0.32 |
| DT | 0.31 | <0.05 | 0.34 | <0.05 |

E: mitral flow early diastolic peak velocity; A: mitral flow late diastolic peak velocity; S': mitral annulus systolic peak velocity; E': mitral annulus early diastolic peak velocity; A': mitral annulus late diastolic peak velocity; PASP: pulmonary artery systolic pressure; DT: mitral flow E deceleration time

**Conclusion:** TAPSE and R-S' were reduced with left ventricular dysfunction in heart failure patients. LVEF seems to have an impact on these two parameters.

**P366**

## Left ventricular impaired diastolic function in patients with thyrotoxicosis: echocardiographic assessment and possible clinical implications in a developing economy

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**Introduction:** Patients with thyrotoxicosis may be asymptomatic for cardiac disease but have abnormalities that can be assessed by echocardiography. Impaired diastolic function may be the first indication of echocardiographically detectable cardiac disease in thyrotoxicosis. **Objectives:** This study sets out to study the pattern of diastolic impairment in thyrotoxicosis patients in our Centre in Nigeria and to evaluate the possible clinical implications. **Methods:** Thyrotoxicosis patients from main hospitals in Enugu urban were sent to the Department of Medicine, University of Nigeria Teaching Hospital, Enugu. Fifty adult patients were recruited consecutively and diagnosis confirmed following clinical assessment and thyroid function tests. Echocardiography was done to assess enhanced left ventricular diastolic function (LV E >72cm/sec, LV A>59cm/sec, IVRT <76msec,EDT <179msec) and left ventricular diastolic function (LV E/A <1.1, IVRT90msec ,EDT >210msec, PFR <5) in the thyrotoxicosis patients and age and sex matched control. **Results:** Thyrotoxicosis patients were leaner, had no significant difference in blood pressure when compared with controls. The mean values for left ventricular E-wave (in 34% of thyrotoxicosis patients) and left ventricular A-wave (in 10%) were increased and IVRT (in 30%), EDT (in 30%) were reduced when compared with control (p<0.01) in keeping with enhanced diastolic function. There were significantly prolonged Left ventricular IVRT (in 28% of the patients), EDT (in 28%), reduced E/A ratio (in 34%) and PFR (in 34%) in thyrotoxicosis patients when compared with values obtained from the control (p value <0.01) in keeping with diastolic dysfunction. The thyrotoxicosis patients were asymptomatic for cardiac disease. **Conclusion:** This study showed that there is significantly enhanced diastolic function and diastolic dysfunction in patients with thyrotoxicosis. It also showed that echocardiography is a sensitive and invaluable tool in detecting cardiac abnormalities.

**P367**

## Echocardiographic assessment of right heart function in patients on chronic haemodialysis

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**Introduction:** Assessment of right heart function remains challenging despite rapid technological echocardiographic developments. Conventional echocardiographic parameters of right ventricular (RV) function have been shown to be load-dependent. There are few data about impact of loading conditions on tissue Doppler (TDI) parameters of RV function. **Objectives:** We evaluated the utility of conventional echo and TDI parameters for the assessment of RV function in patients on chronic haemodialysis. **Methods:** Thirty patients (age 55+/-11 years) with end-stage renal failure on chronic haemodialysis (HD) underwent conventional 2D and Doppler tissue (TDI) echocardiography before and after HD; total fluid volume removed (FVR) was measured. Exclusion criteria included patient with LV systolic dysfunction (ejection fraction<50%), RV dysfunction, systolic pulmonary hypertension >50 mmHg, more than a small pericardial effusion, acute intercurrent illness, neoplasia, history of coronary artery disease, or significant valvular disease. **Results:** Haemodialysis led to significant reduction in RV end-diastolic and end-systolic volume (p=0.033, p=0.0001, respectively), peak early (E wave) transtricuspid flow velocity (p=0.004) and early diastolic (E') TDI velocities on the tricuspid annulus and mid level of RV inflow tract (p=0.039, p=0.025, respectively). Mid level of RV inflow tract seems to be less resistant to loading changes according to late diastolic (A') TDI velocity (p=0.05), specially in the subgroup of patients who sustained significantly larger fluid volume lost following HD (p=0.045). The RV Tei Index, derived by TDI measurements, was independent of preload reduction when measures taken on tricuspid anulus level (p=0.18), whereas measurements taken in mid part of RV inflow tract significantly changed after HD (p=0.01). **Conclusion:** The Tei (or myocardial performance) index is a measurement of global myocardial function that has been used to evaluate both left ventricular and RV function. It correlates well with RV ejection fraction. RV Tei index appears to be a useful parameter in HD population of patients considering its independence of FVR. Estimation of diastolic function remains challenging given the variability of pulsed and tissue Doppler parameters depending on the loading conditions.

**P368**

## Assessment of systolic and diastolic left ventricular function in patients with metabolic syndrome according to the number of metabolic syndrome risk factors: tissue doppler study

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**Introduction:** The metabolic syndrome (MetS) appears to directly promote the development of atherosclerotic cardiovascular disease. This syndrome consists of at least 3 parameters assessing central obesity, hypertension, high-density lipoprotein cholesterol, triglycerides, and impaired glucose metabolism **(Ford et al., 2002)**. It is unclear whether persons with 1 or 2 risk factors are at higher risk than those without risk factors and whether those without MetS but with 1 or 2 risk factors warrant therapy. **Objectives:** To characterize the extent to which the number of MetS risk factors can predict the deterioration of left ventricular (LV) structure and function using conventional Echocardiography and tissue Doppler Imaging (TDI). **Methods:** MetS risk factors were assessed in 70 subjects who was grouped according to the number of risk factors: (1) Control group (0 risk factor, n = 25); (2) Pre-MetS (1–2 risk factors, n = 25); and (3) MetS (3–5 risk factors, n = 20). All subjects were evaluated clinically, laboratory, by ECG, conventional Echocardiography, and pulsed wave TDI to assess LV structure and function. Subjects with age older than 55 years old, cardiovascular anomalies, valvular heart diseases, ischemic heart disease, and major arrhythmia were excluded. **Results:** Our results has shown that there is no statistically significant difference in the EF between all groups (P >0.05). But there is a statistically very high significant decrease in Sa-wave velocity detected by TDI in MetS group when compared to control group (P <0.001). There is a statistically very high significant decrease in E/A ratio of the mitral flow and Ea/Aa ratio in MetS group when compared to Pre-MetS and control groups (P <0.001) with stepwise deterioration of diastolic function from the control to Pre-MetS to MetS groups. **Conclusion:** Diastolic dysfunction develops early in Pre-MetS and becomes more deteriorated in MetS, while the systolic function detected by TDI is normal in Pre-MetS then become deteriorated in MetS. TDI was more sensitive to diagnose systolic and diastolic dysfunction than conventional Doppler.

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**P369**

## Atrial fibrillation makes mitral valve annulus flattened

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**Introduction:** Mitral annulus dilatation is usually associated with atrial fibrillation (AF). Recent three dimensional echocardiography reveals mitral annulus anatomy precisely. There is few detailed report of relationship between mitral annulus dilation and AF. We performed three dimensional transesophageal echocardiography(TEE) to assess mitral valve complex. **Objectives:** To compare mitral valve annulus anatomy in chronic AF patients with non-AF patients. **Methods:** From 2010 January to 2010 August, 37 patients were enrolled in this study. Detailed analysis of mital valve anatomy was performed by QLAB software (Phillips, ver 6.0). We compared annular circumference length, anterior-posterior dimension, lateral-medial dimension and height of mitral valve in end-systole between patients with chronic AF and non-AF. **Results:** There is no difference of circumferential length and anterior-posterior dimension between patients with chronic AF(n = 15, 8 male) and non-AF(n = 24, 10 male)(128.6±15.1 vs 122.4±17.0mm;p=0.252 and 36.0±6.0 vs 32.7±7.2mm;p=0.143, respectively). Higher lateral-medial dimension and lower height of mitral valve annulus in chronic AF patients were observed (40.7±4.0 vs 37.5±5.6mm p=0.05, and 4.6±3.5 vs 7.0±3.0mm P=0.038,

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respectively). **Conclusion:** This study showed chronic AF did not develop mitral valve annular dilatation but chronic AF may cause the mitral valve annulus flattening.

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**P371**

## Assessment of left atrial function by tissue doppler strain imaging in mitral stenosis before and after balloon mitral valvotomy

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**Introduction:** Assessment of regional Left Atrial function may provide insight in atrial electromechanical remodeling. New echocardiographic techniques, such as Tissue Doppler imaging and Strain (rate) imaging allow a non invasive measurement of regional function of the myocardium. Both techniques have been well validated for assessment of regional LV function. Recently these techniques have also been used for the assessment of LA function. **Objectives:** To assess Tissue Doppler Velocities and Strain variation of Left Atrial lateral wall and Interatrial septum in patients with severe Mitral Stenosis and effect of Balloon Mitral Valvotomy on strain parameters. **Methods:** Twenty five symptomatic patients with severe Mitral Stenosis were evaluated by Echo, Doppler studies along with Left Atrial function by Tissue Doppler Imaging for Velocity and Strain, measured at mid point of Interatrial septum and Lateral Left Atrial wall. All patients were assessed before and 24 hours after Balloon Mitral Valvotomy. Twenty five age matched controls were also evaluated. **Results:** Pulsed Tissue Doppler velocities, E' and A' of Interatrial Septum were lower in patients of severe Mitral Stenosis (E'=6.9±3.5 vs 9.8±2.7cm/sec,p=0.002;A'=7.1±2.6 vs 9.2±2.9 cm/sec, p=0.01). Left Atrial Lateral wall velocities were also statistically less in Mitral Stenosis as compared to Controls (E'=6.6±1.9 vs 15.9±4.3cm/sec,p<0.0001;A'=7.4±2.9 vs 13.1±3.6 cm/sec,p<0.001)). Left atrial Strain at ventricular end systole was lower in patients of MS when compared to controls as measured at Interatrial Septum (11.4% ± 6.3 vs 29.6%±10.5,p<0.001) and Left Atrial lateral wall(18.2%±8.8 vs 28.4%±14.0,p=0.004).Systolic Strain at interatrial septum improved significantly after Balloon Mitral Valvotomy (18.0%±10.6 vs 11.4% ± 6.3,p=0.02) and that measured at Left Atrial lateral wall showed a trend towards improvement (22.8%±10.6 vs 18.2%±8.8,p=0.07). **Conclusion:** Left Atrial function as assessed by Tissue Doppler derived velocities and Strain is lower in patients with severe MS. Left atrial reservoir function assessed by Strain imaging improves within 24 hours after BMV.

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## Remodeling and dyssynchrony in elite athletes

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**Introduction:** Elite athletes may develop functional and structural changes of the heart described as physiologic remodeling, the athlete's heart syndrome. It is of high clinical priority to distinguish pathologic conditions leading to sudden cardiac death. **Objectives:** The aim of the study was to evaluate left ventricular function, remodelling and dyssynchrony in elite athletes compared to sedentary volunteers and hypertrophic cardiomyopathy patients. **Methods:** 57 endurance-strength elite athletes (A), a control group of 20 sedentary volunteers (S) and a group of 12 HCM patients underwent transthoracal echocardiography. Left ventricular (LV) end-diastolic and end-systolic diameters, LV wall thickness and LV systolic ejection fraction were measured. LV hypertrophy index and remodeling indices were also evaluated. Systolic and diastolic dyssynchrony were measured using color coded tissue Doppler imaging as the delay of the first and the latest basal myocardial segments in systole and diastole. **Results:** LV end-diastolic diameter was significantly higher in elite athletes and lower in HCM as compared to the control group (A 54,5±4,4, S 50,3±4,5, HCM 39,3±6,6mm; p<0,001). The end-systolic diameter was not significantly different in elite athletes, while lower in HCM patients (A 34,3±4,0 vs. S 32±3,8 vs. HCM 22,3±7,8mm, p=0,09; p<0,001). The left ventricular ejection fraction did not differ in elite athletes compared to controls (A 66±7, S 65,4±7,2%; p=NS). The LV mass index was lower in the control group (A 137,1±21,9, S 101,2±24,8, HCM 203,8±36,2g/m2; p<0,001). No significant differences were found either in the systolic and diastolic sphericity indices or in the LV remodeling index in elite athletes or in the control group, while HCM patients showed significantly different values. Systolic and diastolic dyssynchrony was not found in any of the three groups (systolic A (n=40) 32,5±15,1, S 30±19,5, HCM 33,2±25ms; p=NS; diastolic A (n=40) 58±36,3 S 58,3±42,8; HCM 60,5±23ms; p=NS). **Conclusion:** Left ventricular remodeling did not alter the LV geometry and did not result in systolic and diastolic dyssynchrony in elite athletes.

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## Dynamics of left ventricular longitudinal function assessed by 2d strain echocardiography in patients with coronary artery disease during squatting

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**Introduction:** The choice of valid stress test echocardiography modality is still controversial. **Objectives:** To evaluate the dynamics of left ventricular (LV) longitudinal function by 2D strain imaging during squatting in patients with coronary artery disease (CAD). **Methods:** We examined 53 consecutive men (age 53.02±0.95 years) with indications for coronary angiography (CA). Based on the results of CA patients were divided into 2 groups: the first group without CAD (n=18) and the second group with CAD (n=35). During squatting the peak septal annular displacement (TMAD1) (mm) and peak lateral annular displacement (TMAD2) (mm) were assessed by 2D strain echocardiography. **Results:** In the first group at the baseline the TMAD1 and TMAD2 were significantly higher in the lying position (12.07±1.13 mm and 9.86±0.66 mm, p=0.03; 12.17±0.89 mm and 9.52±0.51 mm, p=0.007, respectively) and in the squatting (10.70±0.96 mm and 6.92±0.72 mm, p=0.002; 10.94±0.89 mm and 7.43±0.88 mm, p=0.03, respectively). In the squatting TMAD1 and TMAD2 decreased significantly only in the second group (p=0.001 and p=0.008, respectively). **Conclusion:** 2D strain echocardiography revealed impairment of LV longitudinal function in patients with CAD during squatting. Probably, assessment of LV longitudinal function by 2D strain echocardiography can be used for the screening of CAD patients during squatting stress.

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## Right and left atrial appendages in patients with valvular and nonvalvular chronic atrial fibrillation

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**Introduction:** Atrial fibrillation (AF) is associated with increased risk of thrombus formation in the atria and their appendages *. However, the relations between the cause of AF, right atrial appendage (RAA) and left atrial appendage (LAA) dysfunction and thrombi are still unalleviated. **Objectives:** Assessment of LAA & RAA in chronic valvular and non valvular AF. **Methods:** 50 patients subjected to transesophageal echocardiography to assess the cause of AF,right and left atrial diameters (RAD&LAD),RAA area, LAA area, Doppler flow profile ,smoke and thrombi. The patients retrogradely divided into group (I): 25 patients with valvular AF and group (II): 25 patients with non valvular AF. **Results:** There were significant differences between both groups as regard the incidence of heart failure, coarse AF, mean pulmonary artery pressure,LAD, LAA area, RAA area and grade 3 left atrium (LA) and LAA smoke while there were no significant differences between two groups as regard the presence of different grades of RAA, and right atrial (RA) smoke, grades 1, 2&4 LA and LAA smoke and LAA and RAA emptying and filling velocities. In group (I) the thrombi was found within LAA in 28 %, LA cavity in 8 % and RAA in 4 %. In group (II) the thrombi was found within LAA in 12 % and RAA in 8 %.

**The differences between LAA and RAA areas, emptying and filling flow velocity between both groups.**

| | *Valvular* | *Nonvalvular* | *P* |
|---|---|---|---|
| *LAA area ($cm^2$)* | 9.4 ± 1.71 | 7.94 ± 1.66 | < 0.05 |
| *RAA area ($cm^2$)* | 5.48 ± 1.22 | 6.9 ± 1.03 | < 0.05 |
| *P* | < 0.00001 | < 0.05 | |
| *LAA empting V (cm/s)* | 20.7 ± 5.15 | 22.4 ± 3.28 | > 0.05 |
| *RAA empting V (cm/s)* | 21.4 ± 5.18 | 21.6 ± 3.15 | > 0.05 |
| *P* | > 0.05 | > 0.05 | |
| *LAA filling V (cm/s)* | 21.7 ± 5.15 | 22.4 ± 3.28 | > 0.05 |
| *RAA filling V (cm/s)* | 22.4 ± 5.18 | 21.6 ± 3.15 | > 0.05 |
| *P* | > 0.05 | > 0.05 | |

**The incidence and the grade of LA, LAA, RA and RAA smoke in valvular (V) and nonvalvular (N) AF groups.**

| *Site* | *Group* | *Grade 1* | *P* | *Grade 2* | *P* | *Grade 3* | *P* | *Grade 4* | *P* |
|---|---|---|---|---|---|---|---|---|---|
| *LAA* | *V (n17)* | 4 (16%) | >0.05 | 5 (20%) | >0.05 | 5 (20%) | <0.05 | 3(12%) | >0.05 |
| | *N (n4)* | 3 (12%) | | 1 (4 %) | | 0 (0 %) | | 0 (0 %) | |
| *LA* | *V(n15)* | 3 (12%) | >0.05 | 4 (16%) | >0.05 | 5 (20%) | <0.05 | 3(12%) | >0.05 |
| | *N (n2)* | 1 (4 %) | | 1 (4 %) | | 0 (0 %) | | 0 (0 %) | |
| *RAA* | *V (n4)* | 2 (8%) | >0.05 | 1 (4 %) | >0.05 | 1(4 %) | >0.05 | 0 (0 %) | >0.05 |
| | *N (n3)* | 2 (8 %) | | 1 (4 %) | | 0 (0 %) | | 0 (0 %) | |
| *RA* | *V (n2)* | 2 (8 %) | >0.05 | 0 (0 %) | >0.05 | 0 (0 %) | >0.05 | 0 (0 %) | >0.05 |
| | *N (n1)* | 1 (4 %) | | 0 (0 %) | | 0 (0 %) | | 0 (0 %) | |

**Conclusion:** The assessment of RAA as well as the LAA in patients with AF may add incremental value in assessment of the thromboembolic risk in cases with AF.

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**P375**

## Value of transthoracic coronary echocardiography in diagnosing of coronary heart disease – 2152 case reports

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**Introduction:** The diagnosis of CAD mainly relies on coronary angiography or CT. Uninjured methods are being paid attention to more and more. This study showed that TTE could determine CAS of LAD, LCX, and PRD with measuring the flow velocities. **Objectives:** To study clinical value in diagnosing of coronary heart disease (CAD) with transthoracic echocardiog-

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raphy (TTE ), explore routine application of CAD screening. **Methods:** There were 2152 cases whose ages ranged 35–92 years. Scan LM, RM and LAD, LCX, PRD of coronary artery, show them in two dimension (2D) image or color flow image, then measure flow velocities, and compared between each of them .The results of examination were compared with between TTE and coronary angiography or computed tomography in 201 cases. The 2D image characteristics of coronary artery atherosclersis (CAA) were analyzed. Those cases who were verified negative by coronary angiography or computed tomography were regarded as normal group, and those positive by coronary angiography or computed tomography were considered as abnormal group. All the cases were divided into two groups: normal group and coronary artery stenosis (CAS) group. **Results:** Flow velocity range was 20–40cm/s in normal group, Flow velocity range was 45–201cm/s in CAS group. There was significantly statistical difference between the normal group and the CAS group. The coincidence rate of TTE with coronary angiography or computed tomography was 82.7% in detecting obvious stenosis in the CAS group. In CAS group, color flow velocity of CAS was measured, whose characteristics was increment of flow velocity in stenostic artery segments. The 2D image of coronary artherosclerosis mostly manifests: (1) thickening of local vessel wall □2□maculation fine particles.□3□gobbet, irregular or regular in appearance.□4□sliver plaque echo enhancement and wall thickening (5□diffuse sclerosis, irregularly long along the vessel wall. **Conclusion:** Increment of local flow velocity was a sensitive index to CAS, 2D image can show CAA directly and analyze size, shape and natures of the plaques further. The results showed that CAA could be detected early by TTE. Extents of CAS could be judged further according to increment degrees of local flow velocities. Valuable messages could be offered for clinical diagnosis of CAD, including whether intervention treatments are needed or not. TTE should be regarded as a routine examination method in clinic, and TTE had practical value, which will play an important role in CAD screening.

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## Right ventricle echocardiographic assessment in patients with acromegaly

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**Introduction:** Acromegaly is commonly associated with 2–3 fold increased mortality particularly for cardiovascular reasons. Structural and morphological changes are observed as well as left ventricle hypertrophy and diastolic dysfunction. Limited data is available concerning right ventricle. **Objectives:** The aim of this study was echocardiographical assessment of right ventricle (RV) in patients with acromegaly. **Methods:** We investigated n=17 pts (male 9, female 8), mean age 49 ± 9 years. All patients were diagnosed with acromegaly, with mean duration of the disease at 12,6 ± 9,7 years. Mean BMI was 32,36± 3,7 kg/m$^2$. Standard 2D and Dopller echocardiography with evaluation of the right ventricle was performed. **Results:** Right ventricle free wall thickness above 5 mm (mean 6,25±1,61 mm) was found in 10/14 pts (71%). Quantification of the right ventricle showed enlarged longitudinal RV dimension above 86 mm in 9/17 pts (53%, mean 85±10 mm), basal diameter above 42 mm in 6/17 pts (35 %, mean 38,7±5,8 mm), RVOT (right ventricle outflow tract) proximal diameter above 33 mm in 11/17 pts (64,7%, mean 34,7±4,2 mm). The majority of the patients (10/17, 58,8%) had enlarged end-systolic area of right atrium above 18 cm$^2$ (mean 19,8±4,8 cm$^2$) but the values oscillated near upper reference value. Right ventricle dysfunction defined as decreased velocity of tricuspid lateral annular (S') below 8 cm/s was observed in 1/17 pts (5,8%, mean 13±4 cm/s). All patients had TAPSE above 16 mm (mean 23,4±4,4 mm). Pulmonary artery diameter above 25 mm was noted in 12/16 pts (75%, mean 27,9±4,4mm). The tricuspid regurgitation peak gradient above 30 mmHg was noted at 2/15 pts (13,3%, mean 19,2±7,7 mmHg). 2/14 patients had estimated mean systolic pulmonary artery pressure above 25 mmHg (mean 15,7±5,6 mmHg). **Conclusion:** The majority of the patients had impairment of the right ventricle thickness, higher than referential values of RVOT proximal diameter, width of pulmonary artery and RA end-systolic area. In opposition to this findings systolic function expressed by TAPSE and tricuspid lateral annular velocity (S') was correct. In addition, estimated right ventricle and mean pulmonary artery pressures tend not to be elevated.

## P378

## Assessment of exercise E/E' ratio may improve stress echocardiography detection of myocardial ischemia

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**Introduction:** The assessment of E/E' after exercise echocardiography may identify diastolic dysfunction in patients (pts) who complain of exertional dyspnea. However, the role of exercise E/E', for the detection of myocardial ischemia, is still an open question. **Objectives:** The aim of the study was to assess whether changes of exercise E/E' may improve stress echocardiography detection of myocardial ischemia. **Methods:** In the study group of 85 patients (70 men; mean age 57 years), with suspected coronary artery disease, submaximal or symptom limited bicycle exercise stress echocardiography (ESE) was performed (25W, 3-min increments). In all patients (pts) mitral inflow and mitral annulus velocities were measured at rest and during bicycle exercise. Ischemia was identified by ESE induced wall motion abnormalities (WMA) - positive ESE. In pts with ESE induced WMA and in pts with increased exercise E/E' multislice computed tomography was performed. **Results:** During ESE 57(67%) pts had new WMA, while 28(33%) pts had not WMA. Value of E/E' ratio at rest was similar in pts with positive and pts with negative ESE (6.9±1,2 vs 6.6±0.95, ns). In pts with positive ESE exercise E/E' rised from 6.9±1.2 to 8.7±1.2 (P<0.001; difference 26%). Out of 28 pts without ESE induced WMA, exercise E/E' rised in 8(28%) pts (from 6.4±0,90 to 7.7±1,0, P<0.025; difference 20%), while in 20 pts exercise E/E' did not increased. Multislice computed tomography confirmed presence of coronary artery disease in all pts with ESE induced WMA and rised E/E' and in 6 (75%) out of 8 pts without ESE induced WMA, but with rised exercise E/E'. **Conclusion:** Stress induced myocardial ischemia is associated with raised exercise E/E'. Therefore, stress echocardiography detection of myocardial ischemia can be improved if E/E' measurement is added to the 2D assessment of regional WMA.

## P379

## Echocardiographic evaluation of papillary muscle function in ischemic mitral regurgitation

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**Introduction:** Ischemic MR has been attributed to dysfunction of papillary muscle .The experimental and clinical data emphasize the importance of changes in the geometry of the LV. **Objectives:** To assess the mechanisms of ischemic mitral regurgitation in patients with old myocardial infarction **Methods:** The study cohort comprises 30 consecutive patients with old myocardial infarction and Mitral regurgitation. Group 1 has old inferior wall myocardial infarction and Group 2 has old anterior wall myocardial infarction. Patients with increased left ventricular sphericity belong to Group Ia and with normal left ventricular sphericity belongs to Group Ib.Echocardiographic evaluation of all patients was done using Philips iE33 machine. **Results:** The incidence of moderate to severe mitral regurgitation is high in group Ia and II compared to Ib(50%and 40%vs. 20% p<0.01). The average left ventricular sphericity is high in group Ia compared to group Ib & groupII (66%VS 49.1%&58.2) .Mitral annular area is increased in patients with moderate to severe mitral regurgitation than patients with mild mitral regurgitation (46.8mm vs. 41.2mm, p<0.01). The incidence of MR in patients with increased LV sphericity to normal LV is 50% vs. 20% p<0.01. In all groups of patients, the leaflet tethering distance with moderate to severe MR compared to mild MR is 24.09 mm Vs. 17.84 mm [P<0.01]. The papillary muscle systolic peak velocity does not have consistent correlation with ischemic mitral regurgitation in all groups. In group Ia papillary muscle systolic peak velocity has linear correlation between mild and moderate to severe ischemic mitral regurgitation(5.98m/s vs 7.9 m/s.p<0.05) **Conclusion:** 1. Mitral leaflet tethering distance is consistently directly proportional to severity of Ischemic mitral regurgitation. 2. Papillary muscle dysfunction is not an independent determinant of ischemic MR in all cases.

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## P380

## Left ventricular mass index is an independent predictor of mortality following CABG

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**Introduction:** Increased left ventricular mass index (LVMI) may be the result of extreme left ventricular hypertrophy (LVH) or low body surface area (BSA). Severe left LVH is associated with an increased operative risk, mainly in valvular surgery. LVH poses a considerable limitation for adequate cardioprotection during surgery. **Objectives:** We sought to determine the value of LVMI as a predictor of 30-day mortality following coronary surgery. **Methods:** A total of 791 consecutive patients (28.2% females) that underwent surgical myocardial revascularization were included in this prospective study. The mean value of logistic EuroSCORE was 3.42% (mimum 0.8%; maximum 41.8%). LVMI was calculated based on the echocardiographic measures using Penn cube formula: (1,04x[(LVIDd+IVST+PWT)$^3$-LVIDd$^3$-13,6])/BSA, where LVIDd was left ventricular internal diametar in diastole; IVST–interventricular septum thickness, PWT–posterior wall thickness and BSA–body surface area. Univariate analysis was used to establish 30-day mortality predictors. **Results:** The average value of BSA was: 1.96±0.2 m$^2$; LVIDd 5.24±0.53 cm, IVST 1.17±0.12 cm and PWT 1.17±0.12 cm. The average calculated LVMI was 149.29±32.23 g/m$^2$. There was no difference in LVMI between female and male patients (p>0.05). Mean ejection fraction for the entire group was 53.3±9.3%, with 66.12% of the patients having had ejection fraction >50%. The average number of distal anastomoses was 2.61±0.89, while the average extracorporeal circulation time was 67.64±30.36 min. Overall 30-day mortality was 2.15%. Univariate analysis showed that following factors can not be regarded as an independent predictior of the outcome: LVIDd (OR = 1.454, 95% CI 0.321–3.401, p>0.05), IVST (OR = 3.343, 95% CI 0.386–28.923, p>0.05), PWT (OR = 4.976, 95% CI 0.524–47.277, p>0.05). However, LVMI alone has been confirmed as a predictor of 30-day mortality (OR = 1.018, 95% CI 1.006–1.03, p=0.004). **Conclusion:** Increased LVMI is an independent predictor of poor outcome after coronary surgery. Correlation between LVMI and probability for poor CABG outcome revealed that most of the patients, who did not survive the surgery, have had LVMI greater than 175 g/m$^2$ which may be regarded as a cut-off point regardless the gender. In patients with CAD and increased LVMI operative cardioprotection should be optimized in order to improve outcome.

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## Genetic variants in the mthfr gene in children with conotruncal heart defects and their mothers

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**Introduction:** Several studies of methelene tetra hydro folate reductase (MTHFR) gene polymorphism in conotruncal heart defects have yielded conflicting results. These variations might be due to ethnic differences. **Objectives:** To study the association between maternal and infant *MTHFR* 677C/T (exon 4) and 1298A/C (exon7) polymorphism in the *MTHFR* gene as maternal risk factors for conotruncal heart defects (CTD) in Egyptian children. **Methods:** Thirty patients with CTD and their mothers and thirty healthy age and sex matched child/mother diad were included in the study. Complete medical and nutritional histories for all mothers were taken with special emphasis on folate intake. CTD were diagnosed by 2-echocardiography. Single neocotide polymorphism to MTHFR gene using PCR amplification was done at exons 4and 7. **Results:** Folic acid intake from food or supplements was significantly below the Recommended Daily Allowance ($p<0.05$) in the group of case mothers compared to control mothers. There was no statistical significant difference ($p>0.05$) between patients and control group nor their mothers as regards MTHFR gene polymorphism at exon 4. On the other hand, there was a highly significant statistical difference ($p<0.001$) between patients/mother diad and control group diad as regards MTHFR gene polymorphisms at exon 7. The mothers of patients had significantly increased frequency of homozygous gene polymorphism(CC) at exon 7 than the mothers of control group. **Conclusion:** Egyptian mothers of infants with CTD have a high incidence of MTHFR 1298A/C (exon7) polymorphism rather than 677C/T (exon 4). Since these mothers had significant folate deficiency, preconception folate intake might decreasing the MTHFR polymorphism at exon 7 and hence risk for CTD in this population.

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## Genotype-Phenotype Analysis of Three Chinese Families with Jervell and Lange-Nielsen Syndrome

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**Introduction:** Long QT syndrome (LQTS) is characterized by QT prolongation, ventricular arrhythmias, syncope and sudden death. Two forms of LQTS have been identified: autosomal-dominant Romano-Ward syndrome (RWS) without deafness and rare autosomal recessive Jervell and Lange-Nielsen syndrome (JLNS) with deafness. So far□only three mutations were reported from Chinese JLNS individuals among 31 mutations worldwide. **Objectives:** This study aims to explore the causes, clinical manifestations and therapeutic outcomes of JLNS in Chinese individuals. **Methods:** Three JLNS kindreds from the Chinese National LQTS Registry were investigated. Mutational screening of *KCNQ1* and *KCNE1* genes was performed by polymerase chain reaction and direct DNA sequence analysis. LQTS Phenotype and therapeutic outcomes were evaluated for all probands and family members. **Results:** We identified 7 *KCNQ1* mutations. A372fs+9X and T439fs+25X were novel, causing JLNS in a 16-year-old boy with QTc of 620 ms and recurrent syncope. D202sp and G272D caused JLNS in a 12-year-old girl and her 5-year-old brother, showing QTcs of 590 to 600 ms and recurrent syncope. The fourth JLNS case, a 46-year-old man carrying R190Q and A344sp and with QTc of 465 ms, has been syncope-free since age 30. His 16-year-old daughter carried novel missense mutations R192C and A344sp and presented with a severe phenotype of RWS characterized by QTc 530 ms, recurrent syncope with normal hearing. Both the father and daughter also carried D85N, a rare single nucleotide polymorphism on *KCNE1*. All three JLNS families are not consanguineous. Marked QT prolongation associated with bizarre T waves (broad, bifid, notched or biphasic) were seen on 3/4 JLNS patients. These ECG abnormalities were more prominent when patients were symptomatic and become less abnormal after appropriate therapy such as $\beta$-blockers and left cardiac sympathetic denervation, or pacemakers. **Conclusion:** This study broadens mutation and phenotype spectrums of JLNS. Compound heterozygous *KCNQ1* mutations can result in both JLNS and severe forms of RWS in Chinese individuals. Furthermore, we have documented clinical outcomes and salient ECG irregularities from our patients that with further research may potentially prove to be useful in evaluating the clinical severity of JLNS.

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## LINE-1methylation status and its association with risk of developing TOF in Chinese children

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**Introduction:** Tetralogy of Fallot (TOF) is the most common conotruncal congenital heart defect causing cyanosis. Although treatment has evolved dramatically in the last few decades, a genetic explanation, especially epigenetic mechanism, for the disorder of cardiac development is lacking. **Objectives:** We analyzed the LINE-1 methylation level which can serve as a surrogate marker for global genomic DNA methylation and its association with risk of developing TOF in Chinese children. **Methods:** Heart tissues of TOF patients were collected in surgical operation from Children Hospital, Fudan University. Normal heart tissues of non-cardiac cause death were obtained from Department of Forensic Medicine, Fudan University. The research program is approvaled by Fudan Ethics Committee. To acquire more accurate information of the epigenetic changes, we employed MassARRAY EpiTYPER platform. The primers for these amplicons were designed from the website, which allows simple design of primers for bisulfite treated genomic DNA and recommends primer pairs for individual assays. **Results:** Using case-control study design, we measured the methylation level of the LINE-1, NKX2–5, HAND1 and TBX20. The results showed that the mean methylation level of LINE-1 in TOF subjects was statistically significant lower than that in the control (57.64 +0.4827% VS 60.10+0.4261%; respectively; $p=0.0021$). The CpG_5.6.7□CpG_15□CpG_18.19□CpG_21 and CpG_26.27 show nominally significant lower methylation level ($p<0.001$), as well as a significant decrease methylation level at CpG_24 ($p<0.05$) in TOF patients, whereas no significant differences were found at other measured CpG units. Compared with the highest quartile (methylation level □ 61.3%), The risk of TOF increased with decreasing levels of LINE-1 methylation (OR:14.67; 95%CI:0.9206–4.006; p=0.0024) for the lowest quartile (methylation level□59.0%). ROC curve (AUC=0.781,P=0.002,95%CI: 0.651–0.912) was plotted to confirm the discriminatory accuracy of presence of TOF by LINE-1 methyaltion level. The higher methylation level for NKX2–5 and HAND1 and lower in TBX20 were also found in TOF subjects, but their associations with LINE-1 hypomethylation were not observed. **Conclusion:** These data suggested that global genomic DNA methylation abnormality may contribute to the TOF development but may not be associated with the tissue-specific gene DNA methylation. Lower LINE-1 methylation levels are potentially related to an increased risk of TOF.

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## The role of connexin 43 in the pathogenesis of tetralogy of fallot patient

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**Introduction:** Connexin 43 (CX43) plays an important role in heart development. It was reported that both CX43 knockout mice and over-expressed CX43 mice existed similar phenotype of right ventricular outflow tract obstructionwhich is the most important clinical characteristic of Tetralogy of Fallot (TOF). In the previous study, we found that abnormality of CX43 might cause the abnormal migration, expression of neural crest cell and reduce apoptosis of proximal outflow cells, resulting the obstruction of right ventricular outflow tract. However, less is known about the underlying role that CX43 plays in human TOF. **Objectives:** We want to sequence the coding and 2000 bp promoter region of CX43, detect the expression level of CX43 in myocardium tissue of TOF patients, and to find the regulation mechanism of CX43 in TOF patients. **Methods:** DNA sequencing was used to identify the mutation in the coding and promoter region of CX43.The expression of CX43 mRNA and protein were detected by real-time PCR and immunohistochemistry. To clarify the cause of the expression difference of CX43, methylation states of 12 CpG points in the promoter region were detected by MassARRAY. Real-time PCR was also used to detect the expression of miRs and transcription factors which were predicted to regulate the expression of CX43. **Results:** Two novelheterozygous mutations were identifiedin 2 of 174 TOF children. Both were Synonymous mutations. Another three heterozygous mutations were identifiedin the promoter region of 3 TOF children, which were not present in 200 controls. The expression of CX43 mRNA in the right ventricular outflow tract cardiomyocytes is significantly higher in TOF patients (n=30) than in controls (n=10) ($P<0.01$) which was also confirmed by immunohistochemistry. None of the 12 CpG points in the promoter region of CX43 was found to be lower methylation in TOF patients (n=10) compared to the controls (n=6) ($p>0.05$). No expression difference was observed in two transcription factors including Nkx2–5 and p53 between TOF patients (n=30) and controls (n=10) ($p>0.05$) ,which were predicted to be correlated with Cx43 and reported to be related to heart development and heart failure. Real-time PCR results show that the expression of miR1–2 and miR206 is significantly lower in TOF group ($p<0.01$), which were consistent with the Cx43 expression. **Conclusion:** MiR1–2 and miR206 may play an important role in the regulation of CX43 expression and may be a crucial process in the pathogenesis of TOF.

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## Copy number variation (cnv) in Chinese non-syndromic sporadic tetralogy of fallot patients

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**Introduction:** Copy number variation (CNV) is a new type of genetic polymorphism emerged recently that may lead to human diseases. Local duplication and deletion events occurring at kb ($10^3$ bases) or Mb ($10^3$ bases) scales are the cause of CNV. **Objectives:** Our aim is to elucidate the CNV in Chinese Tetralogy of Fallot (TOF) patients and analysis the role of CNV in the pathogenesis of TOF. **Methods:** Forty-six Chinese non-syndromic sporadic TOF cases were selected to perform whole genome copy number variation analysis utilizing Affymetrix Array and one hundred normal people data were released from Affymetrix company. The data analysis using Affymetrix Chromosome Analysis Suite (ChAS) software, and then re-run in Nexus software version 5.1 by imputing CYCHP files produced by the ChAS. Finally, 57 loci larger than 50kb were selected to do more analysis. Then, two multiplex ligation-dependent probe amplification (MLPA) validation kits were designed to verify the reality and disease specificity for those smaller size loci. Three pair of probes were designed for each loci. At the same time, five cases were screened for running Agilent SurePrint G3 Human 4 $\times$ 180K array CGH according to the same probe distribution to prove some gain or loss regions. **Results:** In this study, we found five cases are 22q11 micro deletion, the deletion length range from 2.3Mb to 2.7Mb, and later these cases were confirmed by commercial MLPA kit (P-250) for typical 3M 22q11 micro deletion. After compare to normal population and DGV database, we found some loci are TOF patient special and not reported before. Sixteen regions are larger than 200Kb (fourteen gain and two loss), thirty seven 50Kb-200Kb region (thirty gain and seven loss, four loss regions have no gene covered). In one case, a 96kb gain in chr10p14 containing FLJ45983 and GATA3 gene was confirmed and in another case B239, a 69kb gain containing DCD gene in chr12q13.2 was confirmed by MLPA experiment. The detected CNVs in cases B58 and B93 was re-confirmed by Agilent array CGH encompassed seven genes in a small histone gene cluster within 119.4kb gain region in chr6p22.1. **Conclusion:** Our studies defined several new CNV loci in Chinese sporadic non-syndromic TOF patients. The genes contained within these unique CNVs will be need to do validation in more larger population and the function of these CNV in cardiac development need to be explored by experiment in animal model.

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## Rho kinase (ROCK) activity correlates with changes in pulmonary artery pressure and severity of atrial septal defect

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**Introduction:** Congenital atrial septal defect (ASD) causes increased pulmonary blood flow, which can lead to pulmonary arterial hypertension (PAH). Rho kinase (ROCK) may play an important pathophysiological role in PAH. **Objectives:** We aimed to test the hypothesis that the increased PA flow from ASD could activate ROCK. **Methods:** We enrolled 60 consecutive patients (mean age 42$\pm$32; female: 76%) who received clamshell device for ASD, with additional control ones (n$=$30). In the ASD group, ROCK activity was measured before and after ASD clamshell procedure. ROCK activity was defined as the phosphorylation ratio of myosin binding subunit by Western blot measurement. **Results:** At baseline, the mean ROCK activity was higher in ASD patients (0.48$\pm$0.21 vs. 0.35$\pm$0.14, p$<$0.01). Following procedure, the PA pressure decreased from 76.4$\pm$24.2 mmHg to 46.3$\pm$15.8 mmHg (p$=$0.02), and the ratio of pulmonary to systemic blood flow (Qp/Qs) was reduced from 3.5$\pm$2.1 to 1.1$\pm$1.8 (p$=$0.01). Following ASD closure, ROCK activity decreased and remained stable for the subsequent 24 hours. The size and duration of ASD as well as the baseline PA pressure were correlated with increased ROCK activity (p$<$0.05 for all). By multiple regression analysis, ROCK activity$>$0.48, ASD size$>$2cm, and Qp/Qs$>$2.3 were independent risk factors for increased PA pressure of $>$35mmHg (odds ratio: 2.5, 2.3 and 1.9 respectively; p$<$0.05 for all). **Conclusion:** These findings indicate that ROCK activity is increased in patients with ASD and correlates with ASD size and PA pressure. The decrease in ROCK activity and PA pressure following clamshell insertion suggests that ROCK may be an important biomarker for ASD closure.

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## Relationship of systolic parietal stress and cardiac mass in children with ventricular septal defect

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**Introduction:** The ventricular septal defect (VSD) is the most common congenital heart disease and is an abnormal heart overload. LV parietal stress is a modulator of ventricular hypertrophy in overload conditions. Ventricular geometry also influences the degree of parietal stress. The understanding of afterload has diagnostic, prognostic and therapeutic implications that are essential in the decision-making in these patients. **Objectives:** Quantify LV systolic wall stress in patients with VSD according to the geometric pattern to establish its behavior with other hemodynamic variables. **Methods:** Between August 2006 and June 2008, 120 patients with VSD were studied, aged 1 month - 15 years, (4.71$\pm$3.72) male sex (54.2%). Demographic variables, anatomical and functional characteristics of the LV and the VSD were considered. According to anatomic pattern LV were classified in normal, geometric remodeling, concentric hypertrophy and eccentric, at the same time as a) No hypertrophic b) hypertrophic. Systolic parietal stress were calculated: 0.86x (0.334xPASxDVItd)/[PPVItd (1 $+$ (PPVItd/DVItd))]$^2$ (x$10^3$dinas/cm$^2$), cardiac mass index: 1.04 ($+$ PPVItd DVItd SIVtd $+$)$^3$ - (DVItd)$^3$) * 0.825 $+$0.6 and relative wall thickness after 2xPVItd ERP/DVItd. With random probability sampling, continuous variables (M $\pm$ SD), qualitative frequency distribution. For association analysis simple linear regression and t test for comparison were used. **Results:** The most frequent VSD was the perimembranous (82.2%), size: 9.84 $\pm$ 3.32mm, Qp/Qs: 2.76$\pm$1.15, gradient: 44.32$\pm$24.34 mmHg, DVItd: 35.69$\pm$7.62 mm, VFVItd: 57.37$\pm$28.44cm$^3$with 117.44$\pm$46.60 gr/m$^2$/scmass index and WRT: 0.36$\pm$0.11. The most common anatomical pattern was eccentric: 44/36.70%, followed by normal: 41/34.20%, PASP: 51.98$\pm$20.57mmHg, SAP: 98.03$\pm$11.67 mmHg, EF: 68.36$\pm$7.56 %, SPS: 84.80$\pm$34.53 x10$^3$dins/cm$^2$. The comparison between groups found that patients with hypertrophy had a higher SPS and was higher according to the anatomical pattern. SPS was correlation between the mass *r$=$0.877, p$=$0.001*, and the anatomical pattern. Also was correlated with SAP *r$=$0.522, p$=$0.001*. **Conclusion:** In patients with VSD, the SPS is correlated with hypertrophy and PAS. The SPS is a modulator of left ventricular hypertrophy in overload conditions. Ventricular geometry also influences in the degree of SPS. His understanding has prognostic and therapeutic implications.

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## Placement of central catheters in patients with congenital heart and central venous disorders, imaging, methods, techniques, results

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**Introduction:** Central venous catheterization (CVC): a well-established procedure for hemodialysis, total parenteral nutrition, IV access, blood draws, plasmapheresis, apheresis, among others. Procedures are simple and straightforward in "normal" or "conventional" cardiac and/or central venous anatomy patients. Sometimes we place CVCs in patients with various congenital cardiac and venous vascular abnormalities, both congenital and acquired. A review in these circumstances is in order. **Objectives:** We briefly illustrate and provide information for successful CVC insertions. **Methods:** Patients with different and central venous cardiac anomalies, i.e., transposition of great vessels, double SVC, left-sided SVC, anomalous venous return, Tetralogy of Fallot, post-Fontan and post-mustard and others, are illustrated. Since patients with left ventricular-assist devices, aortic balloon pumps, and "artificial hearts" are seen more frequently, we illustrate some of these in this scientific exhibit. **Results:** Successful CVC placements can be achieved in most, if not all, patients with different cardiac and central venous vascular anomalies, vascular venous anatomy and cardiac malformations. We must have partial or complete information about the different operations and procedures done to "correct" these problems. **Conclusion:** Placement of CVCs in congenital cardiac and central venous anomalies patients is relatively easy and safe. Basic knowledge of the anatomical configuration is needed. Noninvasive imaging - US, CTA, MRA - are the main imaging methods. Digital subtraction venography is useful in complicated cases. We present a brief review with different examples and describe the "tricks-of-the-trade" for a successful placement of CVCs in some of these uncommon situations.

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## Impact of chylothorax on the post operative outcome after pediatric cardiovascular surgery

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**Introduction:** Chylothorax is the accumulation of chyle in the pleural cavity, usually develops after disruption of the thoracic duct along its intra-thoracic route. In the majority of cases this rupture is secondary to trauma (including cardio thoracic surgeries). Chylothorax is a potentially serious complication after cardiovascular surgeries that require early diagnosis and adequate management. **Objectives:** The study aim to determine the risk factors, the impact on the post operative course, and the different ways of management of these cases. **Methods:** A retrospective study of all cases Complicated with chylothorax after pediatric cardiac surgery in King Abdulaziz Cardiac Center between January 2007 and December 2009 was conducted. Chylothorax was certainly suspected if milky fluid drainage from the pleura in the post-operative period, it is also suspected if excessive drainage of non-milky fluid, and in all cases the diagnosis was confirmed by laboratory analysis of the pleural fluid. **Results:** We have 1135 cases operated during the study period, 57 cases (5%) were complicated with chylothorax in the post operative period, 30 patients (54%) were males, while 27 cases (47%) were females, the age ranged from 4 days to 2759 days. The most common Surgeries complicated with chylothorax were the single ventricle repair surgeries (Glenn-Fontan) 15 cases (27%), followed by the arch repair cases 10 cases (18%), the ventricular septal defect cases 10 cases (18%), the Atrioventricular septal defect cases 7 cases (12%), the arterial switch cases 6 cases (11%), and others 8 cases (14%). The ICU stay, the length of hospital stay and the bypass time were significantly longer in the chylothorax group, also the ventilation time, the inotropes duration and number were higher in the chylothorax group. **Conclusion:** Chylothorax after pediatric

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open heart surgery is not an uncommon complication, it occurs more commonly with single ventricle repair and Aortic arch repair surgeries, it has a significant impact on the post operative course and post operative morbidity.

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## Trends in common inflammatory markers after infant heart surgery and their relation to blood stream sepsis

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**Introduction:** Limited information exists on impact of cardiac surgery-related SIRS on inflammatory markers in infants, and their utility in identifying early post-operative sepsis. **Objectives:** To determine trends of common inflammatory markers after infant heart surgery and their role in identifying concurrent sepsis. **Methods:** 275 consecutive infants under going closed (44) and open (231) heart surgery were enrolled prospectively. Daily trends (0–4 day post-operative) in C-reactive protein (CRP), platelet counts, Total and Differential Leucocyte counts were monitored. Blood culture were obtained whenever sepsis was suspected clinically. **Results:** CRP and absolute neutrophil count showed a consistent rising trend and peaked on day 2 and 1 respectively ($p<0.001$). The elevation persisted until post operative day (POD) 4, which was similar in both open and closed heart surgery. There was a consistent decline in platelets (both open and closed heart) with nadir on day 2 ($p<0.001$), the platelets remained low until day 4. No consistent pattern was seen in WBC counts. Septic infants ($n = 28$, 10.2%) showed lower platelet count on all PODs ($p<0.005$), while CRP was higher on POD 3 and 4 ($p = 0.005$). Low platelets ($p = 0.005$) and raised ANC ($p = 0.042$) was also seen preoperatively in infants with post operative sepsis. The percentage change in the markers from day 1 to day 2 was not associated with sepsis. No satisfactory cut-off value of platelets and CRP or their combination could be identified for it to be of diagnostic value for sepsis. Low platelets (day 2) was also associated with prolonged ICU stay of $> 7$ days ($p = 0.003$) after exclusion of septic patients. **Conclusion:** A decline in platelets and rise in CRP is consistently seen after infant heart surgery. Although septic patients have lower platelet counts on all days after surgery and higher CRP (POD 3 and later), these are of limited diagnostic value in individual infants.

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## Elevated red cell distribution width and recovery after correction of Tetralogy of fallot

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**Introduction:** Increased red cell distribution width (RDW) indicates dysregulated erythropoiesis and predicts survival in critical illnesses that include idiopathic pulmonary artery hypertension and chronic heart failure. Myocardial injury and oxidative stress induced by cardiopulmonary bypass hemolysis (potentiated by dyserythropoesis) can contribute to prolonged recovery in post TOF repair patients. **Objectives:** To study the impact of red cell distribution width (RDW) on post-operative recovery after correction of Tetralogy of Fallot (TOF). **Methods:** Retrospective analysis of data of on 103 consecutive TOF patients undergoing corrective repair (January 2010 to March 2011) was collected as a part of a prospective registry. RDW was substantially higher for the study population ($17.74\pm3.76$) when compared to 100 acyanotic patients with VSD ($16.2\pm4.2$). The mean RDW obtained from a 100 separate age-sex-weight matched TOF patients (17.88) was chosen as a cut-off. Outcome measures included ICU stay, ventilation duration, hospital stay, surgical site infection and sepsis. **Results:** Of 102 survivors (median age: 12 (4 - 552) months, weight: 8.96 (3.2 - 72) Kg), 35 needed a trans annular patch and 3 (2.91%) needed conduits. The 31 patients with higher RDW ($\geq$17.88) had longer ICU ($155.45 \pm 68.96$ hrs vs. $119.83 \pm 59.50$ hrs, $p = 0.001$) and hospital stay ($18.65\pm10.28$ days vs. $13.40\pm6.28$ days, $p= 0.01$), ventilation time ($55.41\pm41.43$ hrs vs. $36.18\pm30.07$ hrs, $p = 0.01$) and more surgical site infection (22.60% vs. 5.60%, $p= 0.01$). On multivariate analysis only elevated RDW (other variables included hematocrit, age, weight, and surgical support times) showed a significant association with hospital stay. **Conclusion:** Elevated RDW is a potentially useful biomarker that appears to be associated with prolonged recovery after TOF repair. Additional prospective and mechanistic studies are required to understand the precise underlying mechanisms.

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## Atrioventricular septal defects: echocardiographic insights

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**Introduction:** Atrioventricular septal defect (AVSD) is a common congenital heart defect especially in patients with Down's syndrome. **Objectives:** The classical echocardiographic views may miss diagnosis of some cases of AVSD. **Methods:** We describe 2 echocardiographic measurements: the first is the left ventricle inlet to outlet ratio (IOR) and the second is the percentage of left atrioventricular valve guarded by the mural leaflet (PAVM). We used these measurements in 15 infants with Down's syndrome and large ventricular septal defect(VSD) associated with mitral valve cleft (MVC) aiming to identify those with AVSD and no primum ASD. **Results:** For patients who had AVSD, the ratio was 0.82 6 0.06 (95% confidence interval [CI] 0.180 to 0.237, p 5 0.001). The percent left AVV guarded by the posterior leaflet was 56 6 1.4 in normal patients and those with isolated mitral clefts. For patients who had AVSD, it was significantly lower (43 6 1.1). Using these measurements we were able to identify 7 patients with AVSD and intact atrial septum (16% of patients with Down's syndrome and AVSD). **Conclusion:** These measurements are helpful to diagnose AVSD especially when associated with intact septa. In addition it helped to differentiate AVSD from isolated mitral valve clefts.

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## Experience of surgical intervention for left-side late complication after arterial switch operation

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**Introduction:** The late complication and subsequent procedure may be required after arterial switch operation (ASO). Majority of the late complication was right-sided, such as pulmonary stenosis. Early pathology was focused on the coroanry lesion. **Objectives:** To report our experience in managing the left-sided late complication (> 5 years) after arterial switch operation, including left ventricular obstruction, aortic regurgitation, residual VSD, coarctation or the coronary insufficiency. **Methods:** According to retrospective chart review, there were 6 patients requiring further surgical intervention for the significant left-sided lesion after ASO, age of reintervention for $12 \pm 3$ years. The residual lesion for surgery included aortic coarctation (2), aortic regurgitation (3), residual VSD (2), left ventricular outflow obstruction (LVOTO) (3), and coronary insufficiency/stenosis (2), and associated right ventricular outflow obstruction (2). **Results:** Five of them received corrective procedure for the anatomical lesion, including arch reconstruction (2), aortic valve replacement (2), VSD repair (2), David procedure (1), patch augmentation of coronary orifice (1), resection of LVOTO (3), and RV-PA conduit (2). They survived the procedure and discharged uneventfully. One patient with stenotic left coronary artery and poor ventricular function experienced CPR and rescued by ECMO. He was listed for heart transplantation for weeks, but died because of multiple organ failure. The survivors all stayed at function status I. **Conclusion:** Left-sided lesion after ASO usually presented multiple level (intracardiac, aortic valve, aorta) defects and the one-stage corrective procedure may provide an acceptable outcome and result.

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## Torsion as an echocardiographic predictor for management of the late referred patients with transposition of the great arteries with intact ventricular septum

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**Introduction:** The left ventricle (LV) is rapidly regressing after neonatal period in patients with transposition of the great arteries with intact ventricular septum (TGA-IVS). **Objectives:** We investigated the LV torsion of the late referred children and aim to identify the suitable echocardiographic predictor for surgical management. **Methods:** 15 children older than 2 month with TGA-IVS were enrolled. According to the intraoperative LV/RV systolic pressure ratio, 8 children received arterial switch peration (ASO group) and 7 received pulmonary artery banding (PAB group). 8 body surface area matched healthy children were severed as control group. Clinical standard echocardiography was performed. **Results:** All patients had a right to left bulging of the ventricular septum. There were no differences in the end diastolic diameter, wall thickness, ejection fraction and end diastolic volume. Using the speckle tracking imaging (STI) technique, the rotation curves at apex and base was analyzed. All the patients discharged eventually.The difference of segmental peak systolic radial and circumferential strain and strain rate between 3 groups was not observed. Compared with the control group, the hyperplasia of LV in PAB and ASO group was associated with a decreased basal rotation and global torsion. Torsion in PAB group was much lower than that in ASO group. No difference of apical rotation was observed between ASO and control group. However, apical rotation in PAB group was decreased by 3-fold as compared with ASO and control groups (Table).

**Image/graph I:**

**Table Patients Characteristics and Different Rotational Variables before Operation**

| | PAB | ASO | Control |
|---|---|---|---|
| Age(mo) | $5.1\pm1^{\#\&}$ | $3.5\pm0.49^{\&}$ | $5.12\pm1.07^{\#}$ |
| Weight (Kg) | $5.7\pm0.46^{\#\&}$ | $5.1\pm0.38^{\&}$ | $5.9\pm0.51^{\#}$ |
| LV/RV Ratio | $0.32\pm0.04^{*}$ | $0.65\pm0.19$ | N/A |
| LV Apical Rotation | | | |
| peak rotation(°) | $1.09\pm0.54^{*\$}$ | $3.6\pm0.24^{\&}$ | $3.1\pm0.45^{\#}$ |
| time to peak ro.(%) | $58.1\pm5^{*\$}$ | $82.8\pm2.9^{\&}$ | $90.2\pm1.8^{\#}$ |
| LV Basal Rotation | | | |
| peak rotation(°) | $-1.3\pm0.94^{\#\$}$ | $-1.88\pm0.41^{\$}$ | $-4.09\pm0.43^{*}$ |
| time to peak ro.(%) | $132\pm3^{\#\$}$ | $131\pm2.6^{\$}$ | $109\pm2^{*}$ |
| Torsion(°) | $2.3\pm0.82^{*\$}$ | $5.3\pm0.29^{\$}$ | $6.9\pm0.37^{*}$ |

All the data was expressed as Mean $\pm$ SE. RV: Right Ventricle; ro.: Rotation
* vs. ASO $p<0.05$; # vs. ASO $p>0.05$; $ vs. Control $p<0.05$; & vs. Control $p>0.05$

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**Conclusion:** LV torsional deformation plays an important role during LV hyperplasia. STI showed apical rotation might be a valuable echocardiographic predictor to identify the borderline or regressed LV for the older children with TGA-IVS. A significant decreased apical rotation strongly indicated an unprepared LV for LV retraining as the first stage palliation.

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## Early results of pulmonary valve replacement on right ventricular function after tetralogy of Fallot repair

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**Introduction:** Tetralogy of Fallot (TOF) is the most common form of cyanotic congenital heart disease and regarding to favorable results of total correction nowadays we are facing with an increasing number of patients with residual pulmonary regurgitation (PR) which may lead to progressive right ventricular( RV) dilatation, dysfunction and an increased incidence of severe arrhythmias and sudden death. **Objectives:** The hemodynamic effect of pulmonary valve replacement (PVR) in adults late after TOF repair is unclear. We aimed to evaluate the early outcome of PVR on functional capacity, RV volume and RV function in patients with severe PR. **Methods:** 43 consecutive patients (mean age 27 $\pm$ 8.7 years) who underwent PVR for severe PR and RV dilatation were included. One month before PVR and 3 months after PVR the following data were obtained ;New York Heart Association (NYHA) functional class, RV size and RV function based on tricuspid annular plane systolic excursion (TAPSE) and tricuspid annular tissue Doppler *peak systolic velocity( PW DTI).* **Results:** There was no perioperative mortality. Mean RV diameter decreased from 5.0$\pm$0.85 to 3.54$\pm$0.59 cm. There was significant improvement in RV dimension ($p<0.05$). No significant change was found in RV function based on PWDTI (7.84$\pm$1.0 vs 7.81$\pm$1.1 cm/sec, $p = 0.195$) and TAPSE (15.33$\pm$2.82 mm against 17.26$\pm$1.59 mm, $p=0.256$). There was significant improvement in NYHA functional class 3 months after PVR ($p<0.05$). **Conclusion:** PVR can be performed with low mortality. We found significant improvement in patient's symptom and RV size, However there was no significant change in RV function 3 months after surgery.

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## Exercise capacity in young people after surgical correction of d-transposition of great arteries by Senning atrial switch

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**Introduction:** In patients with d-transposition of great arteries treated with Senning atrial switch (SAS) right ventricle (RV) works as systemic ventricle. Long term after SAS dilatation of RV with relative tricuspid insufficiency occur which my disturbing the functional status of circulatory system. **Objectives:** Evaluation of physical efficiency and function of circulatory system in young people, long term after surgical correction of d-transposition of great arteries by Senning atrial switch. **Methods:** We observed 26 pts (22 men, 4 women) at age 21–25 (mean 22,1) after SAS of transposition of great arteries. Senning procedures were performed within 3–7 months of life. All pts underwent 12-lead standard ECG, 24-hour ECG Holter monitoring, echocardiography examination, cardiac MRI and cardiopulmonary exercise treadmill test (ETT). Left and right ventricle function, ETT duration and workload, and max oxygen uptake (VO2max) and anaerobic threshold (AT) were evaluated. VO2max, ETT work were also expressed as % of predicted values. Serum level of NT-proBNP was also assessed in all pts. **Results:** Episodic or sustain bradycardia was observed in all pts, 5 pts had an escape nodal rhythm, 2 pts had registered asymptomatic tachycardia-bradycardia syndrome. There were no RR pauses longer than 2,5 s. Left ventricle function was not reduced in all pts (LV diastolic diameter 46$\pm$4,2; LV EF 68$\pm$14,7%). Right ventricle dilatation RV 38,2$\pm$ mm with moderately reduced ejection fraction (RV EF 47$\pm$13,9%) was observed in pts after TGA correction. Cardiac MRI discovered significant RV dilatation with hypertorophy of right ventricle walls with magnified trabeculation. Exercise was well tolerated by all pts.–they achieved about 100 % of predicted workload (207,6 $\pm$ 65,3 W; 12$\pm$2,5 METS). Value of VO2max was decreased in all pts. [24,3$\pm$9,1 ml/kg/min] - about 42,8% of predicted values. The level of AT was decreased in comparison to predicted values (0,97$\pm$ 0,12 l/min; 26,8$\pm$9,6 %VO2max). Serum level of NTproBNP was moderately increased (328$\pm$127,8 pg/ml). These results indicate mild to moderate reduction of exercise capacity. **Conclusion:** 1. Young people after surgical treatment of d-transposition of great arteries by Senning atrial switch revealed good exercise toleration. 2. In spite of good exercise toleration, mild to moderate reduction of exercise capacity and function of circulatory system was observed in these patients.

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## Structured education of adolescents and adults with congenital heart disease improves patients' level of knowledge on their condition, treatment and preventive measures

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**Introduction:** Previously, patients with congenital heart disease (CHD) were found to have poor knowledge in certain domains. Good knowledge is required to adopt adequate health behavior. Therefore, we implemented a structured education program at our Adult Congenital Heart Disease (ACHD) program. **Objectives:** We (i) evaluated the level of knowledge in patients who previously received education at the ACHD program [education group]; (ii) compared this with the knowledge of patients who were just transferred from pediatric cardiology to the ACHD program (i.e. did not receive education yet) [comparison group]; and (iii) investigated whether knowledge was determined by the education or was a function of age. **Methods:** In a cross-sectional study, we included 317 patients, 226 [54% males; median age 27.5y] of the education group, and 91 [53% males; median age 17y] of the comparison group. Knowledge was assessed using the "Leuven Knowledge Questionnaire for Congenital Heart Disease." **Results:** Patients of the education group had adequate knowledge (>80% correct answers) about frequency and need of follow-up; diet; dental hygiene; and proper use of antibiotics for fever. Knowledge was moderate (50–80% correct answers) about the name of their heart defect; purpose of follow-up; prior treatment; current medication regimen; vocational choices; appropriate physical activities; and suitability of the contraceptive pill. Poor knowledge (<50% correct answers) was observed for the anatomy of the lesion; symptoms of deterioration; the definition, characteristics, recurrence risk and risk factors of endocarditis; the impact of smoking and alcohol; the inheritance risks of the heart disease; the maternal risk in case of pregnancy; and suitability of an intra-uterine device. The mean knowledge score in the education group [57 ($\pm$17)] was significantly higher than that of the comparison group [43 ($\pm$12)] ($t=8.737$; $p<0.001$). Multivariable linear regression analysis showed that knowledge was determined by the education received (Beta=0.72;p=0.023), but was independent of age (Beta=0.75;p=0.274). Neither there was an interaction effect (Beta=-0.98;p=0.278). **Conclusion:** This study showed that structured education is associated with a better level of knowledge. However, patients who received education still lack knowledge about specific aspects of their condition. Hence, continuous efforts in teaching patients, and the development of alternative education methods are pivotal.

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## Initial experience with a dedicated cardiac MRI program for congenital heart disease in a limited resource environment

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**Introduction:** Poor awareness, infrastructural costs and need for expertise have limited use of cardiac magnetic resonance imaging (CMR) for congenital heart disease (CHD) in India and other developing nations despite its rapidly growing acceptance internationally. **Objectives:** To discuss clinical impact, challenges and pitfalls in establishing a CMR program for CHD in India. **Methods:** Dedicated CMR unit for CHD was established in January 2010 comprising 1.5 Tesla GE scanner, dedicated personnel (Pediatric Cardiologist and Cardiac Radiologist). All patients undergoing CMR were prospectively included in a database. **Results:** Hundred patients; median age: 11 years (1year-65years) underwent CHD-CMR (January 2010 - August 2011). Twenty required general anesthesia. 56% had unoperated or palliated complex CHD, including 11 with complex double-outlet right ventricle (DORV); 33% were older than 10 years. Protocols for sequences and imaging planes were customized according to information desired. Accurate anatomical information (intracardiac and extracardiac) was obtained in all. In 10%, new anatomic details (not identified by other modalities) were noted. Physiological information obtained included ventricular function, shunt ratios, and blood flow dynamics. Data withstood internal cross-validation in 97%. Additional imaging was requested-for in 4 patients after CMR. 19 underwent cardiac surgery on basis of information obtained/augmented by CMR, including double-switch (Senning + Rastelli) (2), conversion after Glenn shunt to biventricular repair in complex DORV (3), direct 2-ventricle repair in complex DORV (2), conduit placement/replacement (3), Bentall operation (1), Fontan (3). Complex repairs were significantly aided by CMR. Challenges included need for specialized training, learning curve influenced by a unique patient-subset, relatively long procedure (45–90 min) and post-processing time, logistics of sharing MRI scanner with radiology, poor initial acceptance by professional colleagues, and financial considerations. **Conclusion:** Cardiac MRI is a powerful tool in assessment and follow-up of complex CHD. In developing nations like India, with large burden of older children/adults with complex unoperated lesions, CMR can play critical role in planning management. Establishment of a dedicated CHD-CMR unit is feasible and advantageous in a center looking after patients with CHD.

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## Pediatric cardiac MDCT: more benefits and less risks

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**Introduction:** MDCT has been recently used for assessment of congenital cardiac anomalies, yet the radiation risk is a major concern. **Objectives:** Applicability of low-radiation MDCT

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protocol in assessment of congenital heart diseases. **Methods:** Scanning of 250 patients was done using 64-MDCT scanner in a low-radiation non-ECG gated protocol. **Results:** Mean age was 3 years and 8 months; the youngest patient was 15 days, the oldest was 35 years. Body weight ranged from 2.7 kg to 87 kg, average was 13.5 kg. Reasons for referral included assessment of pulmonary arterial tree anatomy (n=153/250), aortic anomalies (n=69/250), suspected pulmonary venous anomalies (n=15/250), aorto-pulmonary connections (n=10/250) and systemic venous anomalies (n=3/250). MDCT accurately described pulmonary artery anatomy in untreated, palliated and repaired patients with pulmonary atresia (n=74), TOF (n=29), DORV-VSD-PS (n=18). Aortic anomalies were fully assessed in all 69 patients. Incidental aortic anomalies were reported in additional 35 patients: supra valvular AS (n=3), double arch (n=1), arch vessels arrangement abnormalities (n=29) and coarctation (n=2). Pulmonary venous anomalies were excluded in 3 patients and incidentally detected in 13 patients. Systemic venous anomalies were associated findings in 34 patients. Persistent truncus arteriosus (n=1), AP window (n=2) and lung sequestration (n=3) were adequately assessed. Scanning was repeated in 23 patients due to: marked motion artifact due to light sedation (n=16) contrast related artifact (n=3) and late acquisitions (n=4). Despite large scanned body volume and the repeated scanning, radiation dose was successfully reduced down to 1.65 mSv in infants 3 to 12 months, 2.44 mSv in infants less than 3 months and up to 4.25 mSv in adults, few procedure related complications were encountered (n=5/250): extravasations (n=2), early contrast reaction (n=2) and delayed febrile reaction (n=1). **Conclusion:** MDCT has a great value in assessment of congenital heart diseases and could be conducted safely using a low-radiation non-ECG gated protocol.

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## Correlation of the right atrium anatomical changes to the development of pulmonary hypertension in atrial septal defect secundum

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**Introduction:** Unlike other aortopulmonary defects, incidence of Eisenmenger reaction was significantly lower in ASD secundum. The chronic left to right shunting resulted in not only an increase in pulmonary blood flow and its vasculature resistance but also anatomical changes to the right atrium (RA). **Objectives:** To investigate the correlations between the RA anatomical changes indexed to the body surface area (BSA), ASD age, shunt size and mean pulmonary arterial pressure (mPAP) changes in secundum ASD. **Methods:** This was a historical observational study in a single tertiary referral centre. All the patients with ASD secundum from 2004 till 2010 were enrolled. 53 patients with ASD secundum was enrolled. Transthoracic echocardiographic studies were utilized to obtain the RA area, RA volume and ASD shunt diameter. These parameters were indexed to the body surface area. Tricuspid regurgitation (TR) peak velocity and pressure gradients were also acquired using the transthoracic echocardiography. All the subjects undergone invasive right heart catheterization to obtain the intravascular pressure measurements of the pulmonary artery. Pearson's, Kendall's and Spearman's correlation tests were used to analyze the relationships between the parameters **Results:** 53 ASD lesions were analysed. Mean ASD age was 39.80 +/- 15.46 years old. The mean shunt diameter was 23.60 +/- 10.34mm. The RA area and volume indexed to the body surface area showed linear correlation to the ASD shunt diameter with Pearson's correlation value of 0.708 and 0.688 respectively. The indexed RA area and volume showed poor correlation with the mean pulmonary arterial pressure with Spearman's correlation value of 0.387 and 0.269 respectively. Similarly, the ASD age and its shunt diameter did not correlate well with the mean pulmonary arterial pressure with value of 0.384 and 0.258 in Kendall's tau correlation analysis. However, the TR pressure gradient correlated well with the mean pulmonary pressure with Pearson's correlation value of 0.674. **Conclusion:** The pulmonary arterial pressure does not correlate neither to the age and diameter of the ASD nor with the RA anatomical changes. The size of the ASD shunt may contribute to the RA anatomical changes but does not explain development of pulmonary hypertension. The use of indexed RA volume and ASD shunt cannot predict the development of pulmonary hypertension in ASD secundum.

**P404**

## Stent implantation for the dysfunctional right ventricular outflow tract: acute and long-term results

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**Introduction:** Right ventricle to pulmonary artery conduits are used in several heart defects. Conduit malfunctions are a limiting factor for their durability. Stent implantation relieves stenosis prolonging conduit life span for future percutaneous pulmonary valve insertion. **Objectives:** To evaluate the immediate and long term outcomes of stent implantation for dysfunctional RV-PA conduits. **Methods:** Retrospective, observational, non-randomized study of 11 patients (p), 54% female, undergoing stent implantation for a dysfunctional RV-PA conduit between October 2005 and May 2011 with a mean follow-up of 25.3 months (3–72). Median age and weight for stent placement were 14.8 years (6–26) and 49 kg (14–82) respectively. Original diagnosis were tetralogy of Fallot 4, PA/VSD 3, truncus arteriosus 2, TGA/VSD/PS one, and severe AI requiring Ross operation one p. All p were symptomatic in functional classes II and III, one requiring stenting during pregnancy. Three p had already required conduit replacement. Five p had previous balloon dilation of pulmonary arteries (3) and of the conduit (2). **Results:** Median interval from conduit insertion to intervention was 8.6 years (2–14.5). All p received a single C-P® stent insuflated with a BIB® balloon (NuMed Inc). Two of them were covered. Median balloon diameter and stent length were 17 mm (12–22) and 36.8 mm (28–45) respectively. All stents crossed the conduit valve without causing relevant increase in pulmonary incompetence as assessed by Doppler studies.The smallest conduit diameter, RV pressure, and gradient across the RVOT pre intervention were 8.5 mm ± 3.1 (4–13.2), 75.5 mm Hg ± 21 (52–125), and 49.6 mm Hg ± 19 (27–90) respectively and following the procedure, were 15.5 mm ± 2.7 (12–20), 55.2 mm Hg ± 7.3 (45–70), and 22.5 mm Hg ± 9.8 (5–36) ($p<0.001$ for all variables). The RV/systemic pressure ratio dropped from 81% ± 24.7 (49–126) to 55% ± 10 (44–75) ($p<0.001$). Freedom from reintervention was 91% at 2 years. One p was redilated 4 years after stenting and another is awaiting redilation. The remaining p were in functional class I at the last clinical visit. **Conclusion:** This limited experience with stent implantation for dysfunctional RV-PA conduits showed that the procedure is feasible, safe, and effective. This strategy is palliative with the goal to postpone conduit replacement. Pulmonary incompetence did not increase relevantly and all patients improved their functional class.

**P405**

## Percutaneous closure of patent ductus arteriosus using the Nit-Occlud PDA-R (reverse) device: initial experience reporting immediate and short-term results

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**Introduction:** The Nit-Occlud® PDA-R (pfm Medical, Germany) is a new device developed for closure of the patent ductus arteriosus (PDA) between 2 and 8 mm in size. It is a self-expandable, mushroom shaped device, made from one nitinol wire presenting a distinct "reverse" reconfiguration of the distal retention disc. **Objectives:** The aim of this study was to evaluate its performance reporting the immediate and short–term results after the antegrade implantation of the device. **Methods:** Prospective-descriptive and observational study. The device was selected by the interventional cardiologist as alternative to the standard use of other available coils/devices. Echocardiographic follow-up was obtained at 24 hs, 1 month and 3 months after closure. **Results:** From May 2010 to December 2010, 20 consecutive pts (15 female) underwent an attempt of antegrade transcatheter closure of a PDA using the Nit-Occlud® PDA-R. Median age was 4.7 years (6 months to 21 years) and median weight was 16.4 kg (6–49). Ductal types were classified as: A 16 pts (80%), E 2 pts (10%) and C–D 1 pt each (5% each). The mean PDA diameter at its narrowest point, usually the pulmonary end, was 2.92 ± 0.61 mm (2.1–4.5), the mean length was 7.05 ± 1.17 mm (4.7–9.2) and the mean diameter of the aortic ampulla was 9.52 ± 1.62 mm (6–13). The median pulmonary artery mean pressure was 20.6 ± 4.49 mm Hg (14 - 28) and the mean Qp/Qs ratio was 2.0 ± 0.29 (1.6 - 2.5). The implantation success rate was 100%. All closures were achieved from the venous side using either a 6 or 7F long Mullins sheath. The median fluoroscopy time was 7.12 min (5–13). The median cylinder diameter of the device was 6.53 ± 1.05 mm (5.5–8.5) leading to a final selected device 124% larger (cylinder diameter) than the narrowest PDA diameter. Assessed by transthoracic echocardiography with color Doppler, at 24 hours from implantation complete closure was achieved in 12 pts (60%), at 1 month increased to 18 pts (90%), at 3 months to 19 pts (95%) and in the remaining pt showed a small leak at 3 month follow-up. There were no complications. **Conclusion:** The initial experience with percutaneous closure of PDA′s using the Nit-Occlud® PDA-R device was feasible, safe and effective. Longer follow-up time and larger number of patients are required to assess its ultimate clinical performance and efficacy profile.

**P406**

## Transcatheter atrial septal defect closure in infants and young children weighing ≤10 kg: immediate and short term results

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**Introduction:** Transcatheter closure of atrial septal defect (ASD) is the procedure of choice for central fossa-ovalis defects. The immediate and follow up results are excellent in older children and adults. However, there is limited information on safety and follow-up of transcatheter closure of ASD in young children. **Objectives:** To describe our institutional experience on transcatheter closure of atrial septal defect in infants and children weighing ≤10 kg. **Methods:** Records of 40 patients weighing ≤10 kg (mean age: 28.05 ± 10.16 months, range 4–50 months; mean weight: 8.80 ± 1.45 kg, range 4.4–10 Kg) who underwent transcatheter closure of ASD in our Institute (January 2007- April 2011) were reviewed. Follow up data was collected at 3–6 months and yearly thereafter. **Results:** The study population represented 3.2 % of our total experience in this period. Indications for closure included failure to thrive (82.5%), recurrent respiratory infections (45%) and heart failure (5 %). Case selection was through trans-thoracic echocardiography. The mean ASD size was 14.1±3.47mm (range 9–24 mm) and mean pulmonary artery systolic pressure was 31±9.42 mm of Hg. Closure was achieved in all (mean fluoroscopy time: 8.64±6.43 minutes; device size ranged from 9 to 22 mm. The largest device was 22 mm that was deployed in a 8 Kg child with 24 mm defect. General anesthesia and transesophageal echo guidance was utilized in 14(35%). Complete closure in all but one (small additional defect) was achieved. Transient ECG abnormalities included first degree AV block (2) and junctional rhythm (3). All had normal sinus rhythm at 24 hrs after procedure. On follow up (median - 7 months; range 1–53 months)all were symptom free with over all improved weight Z scores (from - 1.98±0.08 to -1.57±0.57; $p<0.001$), normal ECGs and satisfactory device positions on echocardiograms. There were no instances of impingement of the device on the mitral valve, mitral regurgitation, or pericardial effusion. **Conclusion:** The immediate and short-term follow up results of transcatheter device closure of ASD in young patients are encouraging and suggest that the indications can be broadened to include selected children ≤10 Kg.

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## Transcatheter fenestration closure after fontan procedure

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**Introduction:** Extracardiac Fontan surgery is the definitive conventional palliative procedure for the complex univentricular heart defect. Fenestration is the artificial connection between the extracardiac conduct and the systemic atrium. This surgical procedure has had invaluable effects in improving the immediate post surgical condition. **Objectives:** To prove that Extracardiac Fontan surgery has had invaluable effects in improving the immediate post surgical condition. **Methods:** Between January 2000 and June 2011, 98 patients underwent Fontan procedure in different univentricular heart anatomic conditions. Before reaching 1 year since surgical procedure the Classic Occlusion Test was performed. Fenestration at the extracardiac conduict was closed in 59 patients based on tests results. **Results:** Oxygen saturation changed significantly without increasing mean venous pressure. Amplatzer PFO, ASD and Multifenestrated devices were used in 26 patients Helex device was implanted in 21 patients. Gianturco coil was used in two cases. The occlusion rate was 100 % in the initial 24 hours after the procedure. Only one patient suffered an adverse event. Based condition was mild AV valve insufficiency in hipoplastic left heart syndrome, after procedure patient progressed to moderated insufficiency and six months later required surgical repair. **Conclusion:** We consider fenestration very important in the initial post-surgical moments but needs to be closed during the first year. The initial and late outcome of the procedure is very successful and the adverse events are insignificant. We don't find clinical differences between the devices that were used in our experience.

P412

## Interventional closure of muscular VSDs at a young age

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**Introduction:** The presence of muscular ventricular septal defects (mVSD) may pose an high circulatory burden in young patients. Surgical closure is difficult because of the multilayer structure of these malformations. **Objectives:** We present the course of 13 patients (age 10 days–7.3 years, median 9 months; bodyweight 2.2 and 18 kg (median 8.7 kg) undergoing transcatheter closure of such defects. **Methods:** All closures were assisted by transesophageal echo guidance. Entrance sites and routes of delivery were chosen according to the anatomic presentation of the defect. For transvascular closure of 5 singular and 8 multiple mVSD 5 Amplatzer PDA II occluder, 6 Amplatzer VSD occluder and 4 Amplatzer vascular plugs IV were used. Follow-up time ranges from 23 days to 2.8 years (mean 1.2 years). **Results:** 3 defects were observed closed immediately. 9 mVSD showed a residual shunt immediately after the implantation procedure, which further reduced during follow-up in all patients. In one patient a second defect opened up after closure of one defect and was closed in a second attempt. Two intra-procedural complications occurred. A sudden complete AV-Block led to transcatheter explantation of the device in one patient. This patient with a restrictive cardiomyopathy died during follow-up. In one patient on ECMO a left ventricular perforation with the device already in place had to be over sewn in an emergency operation. **Conclusion:** With some of the newer devices available, which pass through smaller delivery sheaths of 4 to 6 F, interventional closure of mVSD has become a feasible option in the treatment of patents of all ages and a bodyweight from 2.2 kg on, who present with elevated right ventricular pressures and high shunt volume. The procedure is challenging in newborns and infants and severe complications may occur.

P415

## Streptococcus pneumoniae purulent pericarditis in a neonate

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**Introduction:** Purulent bacterial pericarditis is an uncommon infection in childhood and *Streptococcus pneumoniae* is an unusual cause. Since 1980, there have been thirteen published cases in the English language literature with age ranging from six months to thirteen years. **Objectives:** To present the first reported case of neonatal *S. pneumoniae* pericarditis. **Methods:** Retrospective chart review. **Results:** A seven day old male presented to his pediatrician's office with fever, decreased oral intake, respiratory distress and lethargy noted over the previous twenty-four hours. In the emergency room, he was hemodynamically unstable and apneic. Intubated and started on milrinone and dobutamine infusions. Transferred to Mount Sinai Hospital. Ehocardiogram soon after admission (figure 1) demonstrated a pericardial effusion with fibrinous strands. Pericardiocentesis performed and 30 mL fluid evacuated from the pericardial space. Initial blood culture and the pericardial fluid culture were positive for *S. pneumoniae,* serotype 7F, sensitive to penicillin (MIC = 0.032). The patient improved the next three days and was extubated. Subsequently his WBC count increased and his C - reactive protein rose to 143.7 mg/L. Echocardiogram showed a re-accumulation of pericardial fluid and pulsed Doppler suggested constrictive physiology. Thereafter he underwent pericardial debridement. The right ventricle was adherent to the anterior pericardium and fibrinous material surrounded the right and left atria and the cardiac apex. The pericardial space was debrided and irrigated and a pericardial chest tube was left in place. He remained in the hospital to complete a four-week course of IV ampicillin. An echocardiogram prior to discharge showed no residual pericardial effusion and normal respiratory variation in mitral and tricuspid valve Doppler inflows. **Conclusion:** *S. pneumoniae* is a rare cause of purulent pericarditis in children and the current report of neonatal infection is unique. This case emphasizes the importance of early diagnosis, initiation of appropriate antibiotic therapy and surgical intervention in minimizing the morbidity and mortality associated with this infection.

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## Association between obesity and treatment of primary arterial hypertension in children

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**Introduction:** Primary arterial hypertension (PHA) is relatively rare disorder in children population. Obesity seems to be an important factor influencing PHA development and treatment. **Objectives:** Evaluation of influence of obesity on the severity of primary arterial hypertension and its pharmacological treatment in children. **Methods:** Study group consists of 48 patients (38 boys and 10 girls) at the age 9–17 yrs (mean age–13,9 yrs) with arterial hypertension diagnosed as primary after specific diagnostic evaluation. Methods: systolic and diastolic pressure were evaluated before (SBPpre, DBP pre) and after (SBPpost, DBPpost) at least 3 months of introduction of hypotensive treatment. All patients were treated with beta-blocker and ACE-inhibitor. In case of insufficient control of blood pressure, calcium antagonist or diuretic were added to the treatment. Anthropometric parameters (weight, height and body mass index BMI) as well as serum cholesterol and triglycerides concentration were evaluated at the initiation of the treatment. The values of measured SBP and DBP and effectiveness of pharmacological treatment of PHA were analyzed in relation to presence of overweight or obesity. **Results:** In all pts satisfactory blood pressure control was achieved. There were no significant differences between blood pressure values before treatment in pts with normal and increased values of BMI. Significant correlation between systolic blood pressure before and after treatment and BMI was noticed (SBPpre vs BMI: r=0,51; SBPpost vs BMI: r=0,50 ; p=0,01). Effectiveness of the hypotensive treatment was related to the presence of overweight or obesity. In pts with BMI > 25 kg/m2 SPBpost and DBPpost were significantly higher than in patients with normal weight (normal weight–122,6/76,1 mHg; overweight–130,0/82,9 mmHg; obesity 136,3/81,3 mmHg) Serum cholesterol concentration was higher in patients with obesity then in patients with overweight or normal BMI (respectively: 4,7; 3,7 and 3,4 mmol/l). There were no correlation between BMI and serum triglycerides concentration. **Conclusion:** 1. Overweight or obesity have an important influence in the development of the primary arterial hypertension in children. 2. Overweight or obesity negatively influenced on the effectiveness of the pharmacological treatment of the primary arterial hypertension in children.

P417

## Influence of sick sinus syndrome on exercise capacity in children

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**Introduction:** Sick sinus syndrome may diminish exercise capacity in children mainly by reduction of cardiac reserve due to chronotropic incompetence. **Objectives:** The aim of the study was evaluation of exercise capacity in children with. **Methods:** We observed 24 patients (17 boys and 7 girls) aged from 11,7 to 18,9 years (mean age 15,4 years) with sinus node dysfunction, diagnosed in Out-Patient Cardiology Clinic of Children University Hospital - Group I. Control group (Group II) consisted of 21 patients without any cardiac disorder, sex and age matched to diagnosed children. Group I consisted of: 5 children (20,8%) without organic cardiac disorder, 2 patients (8,3%) with rheumatic fever, 10 patients (41,7%) after Senning correction of transposition of great arteries; 5 children (20,8%)after correction of tetralogy of Fallot and 2 persons (8,3%) after correction of sinus venosus atrial septal defect. Exercise treadmill test according Bruce protocol was performed in all patients. Maximal heart rate (HRmax) and metabolic workload (METS) during exercise were assessed. Results were compared between two groups. **Results:** Exercise test was well tolerated in all patients. Exercise duration did not differ significantly between group I and group II (15,2 vs 14,8 min). All patients achieved submaximal HR limit (85% HRmax) assessed according to age, sex and body weight. Metabolic workload in children with sinus node dysfunction did not differ significantly in comparison to healthy children(13,6 vs 13,5 METs). **Conclusion:** 1. Chronotropic incompetence was not detected in children with sinus node dysfunction, which proofed intrinsic nature of the sinus node dysfunction. 2. Fine exercise capacity was observed in children with sinus node dysfunction.

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## Myocardial ischaemia in perinatal asphyxia: a correlation of biochemical and clinical findings

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**Introduction:** Asphyxia is a leading cause of perinatal morbidity and mortality in sub-Saharan Africa. Serum cardiac troponin–T assessment is a reliable method of eliciting post asphyxia

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myocardial cellular injury. Many health facilities in developing countries are resource–limited and may not be able to afford troponin assay. It is pertinent that clinical findings be used to enhance diagnosis of hypoxic myocardial cellular injury especially in the resource poor health facilities. **Objectives:** To relate selected clinical signs with the presence of elevated serum cardiac troponin-T in asphyxiated term neonates. **Methods:** Thirty term asphyxiated neonates and thirty gestational age, birth weight and sex matched controls were studied. Asphyxia was identified by low umbilical arterial blood pH $\leq$7.20 and low five minute Apgar score $\leq$ 6 while controls were term non–asphyxiated neonates with umbilical arterial blood pH $\geq$7.20 and five minute Apgar score $>$ 6. The umbilical arterial blood pH was done soon after delivery; serum cardiac troponin was assayed within first 4–24hours of life while all babies were examined between 1–6 hours of life for heart rate, heart rhythm irregularities, peripheral pulse volume, respiratory rate, pallor, cyanosis, heart murmur and sensorium. **Results:** Subjects and controls were similar in terms of mean gestational age, mode of delivery, gender and birth weight ($p = 1.0, 0.07, 1.0$ and 0.87 respectively). Two thirds of the asphyxiated subjects had elevated serum cardiac troponin-T ($>$0.1ng/ml) while all the controls had normal serum cardiac troponin–T levels $<$0.1ng/ml. Central cyanosis, reduced pulse volume, pallor, depressed sensorium; tachycardia and tachypnea were all associated with increased odds ratios for abnormal cardiac troponin T levels. (0.0, 0.0, 107, 0.0, 0.11, 0.24 respectively). **Conclusion:** Central cyanosis, depressed sensorium, pallor and reduced pulse volume, tachypnea and tachycardia are high risk pointers to elevated serum cardiac troponin–T and hence myocardial cellular injury among asphyxiated neonates. Clinicians working in resource–limited health facilities should have a high index of suspicion for myocardial cellular injury when these signs are elicited.

**P419**

## Epicardial adipose tissue in obese and overweight children and its correlation with left and right ventricle function and structures

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**Introduction:** Epicardial adipose tissue (EAT) is commonly increased in obese subjects. EAT is related to cardiovascular risk factors in adults. Hoverer, a direct effect of obesity on cardiac function has not been well studied in children. **Objectives: Aim** of our study was to compare EAT and left and right ventricle structure and function in obese and normal weight children and its correlateation. **Methods:** 20 (mean age 12.95 +/- 3.38 years) obese and overweight subjects and 24 age- and gender matched lean controls underwent transthoracic echocardiogram to evaluate EAT cardiac structure and systolic and diastolic function. **Results:** EAT were significantly higher ($p<0.01$) in obese and overweight children compared to normal weight children. In obese and overweight left ventricle (LV) size, wall thickness ($p<0.05$) and LV volume and stroke volume ($p<0.01$) as well as left ventricle mass (LVM), and left ventricle mass index by height$^{2.7}$ (LVMIV) ($p<0.01$) were higher. Significantly different were indexes of LV diastolic function ($p<0.01$). Right ventricle (RV) size, thickness and volume did not differ in obese compared to normal weight children. In evaluating of diastolic RV function in obese children peak A flow velocity of tricuspid valve were higher ($p<0.05$) and E/A ratio lower ($p<0.01$). Positively correlation was found between EAT and LV size, wall thickness and LV and stroke volume ($p<0.01$; $p<0.05$). EAT positively correlated with LVM, LVMIV and RWTh ($p<0.01$) and with peak A-wave velocity ($p<0.05$) as well as with RV size, RV wall thickness and RV volume ($p<0.01$; $p<0.05$). **Conclusion:** Childhood obesity is accompanying by increased EAT, LV size and change LV morphology and by impaired indexes of diastolic LV and RV function.

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**P420**

## Cardiac evaluation of children and adolescents with rheumatic fever in a public general hospital in Rio De Janeiro, Brazil

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**Introduction:** Rheumatic fever (RF) is still the most important cause of acquired heart disease in children and adolescents. Heart is affected as a pancarditis, but endocarditis, especially mitral valve (MV) regurgitation, is the most prevalent damage. **Objectives:** to analyze the frequency and severity of rheumatic heart disease (RHD)in children and adolescents with RF of a public hospital in Rio de Janeiro. **Methods:** Medical recordsof patients in a first visit to Pediatric Cardiology Departmentof Bonsucesso Federal Hospital between jul/2007 and jul/2011 werereviewed. Sex, age, clinical presentation, echocardiographic data, severity of valvar disease, surgery and recurrence wereaccessed. All diagnosis were based on Jones Criteria and color-*Doppler*-echocardiographic examination. **Results:** Of 74 new patients with RF (6 were excluded for incomplete data), 68 were analyzed. Most patients presented as the first attack of acuteRF. 54% were male, average age 12 ($\pm$ 3,77), 86% with RHD. MV was affected in all patients with RHD, 40,1% had also aortic damage; 8,5% aortic and tricuspid lesions. No isolate tricuspid or aortic valve diseasewas found. MV damage (most regurgitation) was severe in 27,1%, moderate in 18,6%, mild in 32,2% and minimal in 22,1%. Concomitant mitral regurgitation and stenosis was present in 3 patients. Aortic regurgitation was severe in 12,5%, moderate in 25%, and mild in 62,5%. Tricuspid regurgitation was moderate in 20% and mild in 80%. 6 patients (8,8%) stopped prophilaxis during follow-up, with 2 recurrences (recurrence rate–2,9%). 5 patients had cardiac surgery, all mitral valve repair, with no deaths. **Conclusion:** Although preventable, RHD is still an important cause of severe acquired heart disease in children and adolescents in Brazil, even in great centers like Rio de Janeiro. Echocardiogram was a very important diagnostic tool in patients with RHD, especially those with subclinical (silent) valvar damage. Mitral valve repair was successful in all patients, and seems to be the best surgical procedure nowadays, as it avoids use of prothesis, anticoagulation therapy and its challenging complications.

**P421**

## Exercise capacity and incidence of ventricular arrhythmias in children presenting to moderate sport

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**Introduction:** Benign arrhythmias are usually observed in children and teenagers. We try to evaluate the prevalence of arrhythmias in population of children presenting to moderate sport. **Objectives:** The aim of study was evaluation of exercise capacity and presence of arrhythmias in children presenting to moderate sport. **Methods:** We observed 78 children, 64 boys and 14 girls at mean age 13,4 yrs (5,5–18 yrs). All patients underwent exercise treadmill test with evaluation of maximal metabolic workload, maximal achieved heart rate (expressed as max bpm as well as percentage of age predicted maximal heart rate) and pressure response to exercise were evaluated. Presence of ventricular arrhythmias and their pattern during exercise were also evaluated in all patients. Applied sports: Volleyball (12 pts, 15,4%); Football (44 pts, 56,4%); basketball(5 pts, 6,4%); Rowing (2 pts, 2,6%); Athletics (3 pts, 3,8%); Sport dancing (1pt, 1,3%); Jockey (1 pt, 1,3%); Gymnastics Sports (3pts, 3,8%); Handball (2 pts, 2,6%); Tennis (1pt, 1,3%); Racing (1 pt, 1,3%); Swimming (1 pt, 1,3%); Fitness (2 pts, 2,6%). **Results:** Exercise was very good tolerated by all patients. Mean exercise duration was 12 minutes and 26 seconds. Mean metabolic workload was 15,2 METS. Mean maximal achieved heart rate was 181,1 bpm (103,0% of age predicted max HR). Mean systolic blood pressure was 142,6mmHg and diastolic blood pressure– 88,2mmHg. Exaggerated pressure response was noticed in 9 pts: 2–regarding SBP ($>$160 mmHg) and 7–DBP ($>$95 mmHg). Ventricular arrhythmias was observed in 32 children (41,0%) mainly class II according Lown scale (3 pts–3,8% had ventricular arrhythmias classified as IVA acc Lown sc.). Observed arrhythmias disappeared during stress test in 21 from 32 pts (65,6%). **Conclusion:** 1. Benign ventricular arrhythmias, usually disappearing during exercise, were presented in approximately 40% of children presenting to moderate sport. 2. In spite of presence of ventricular arrhythmias, children presenting to moderate sport had excellent exercise capacity. 3. Inappropriate pressure response during exercise was observed in about 1/10 of children presenting to moderate sport

**P422**

## Aerobic fitness related to composite risk factor score for CVD in children

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**Introduction:** Low aerobic fitness ($VO_{2PEAK}$) is prognosticator for poor health in adults. The relationship between $VO_{2PEAK}$ and other risk factors for CVD has not been extensively studied in young subjects on a population-base with the use of objective methods. **Objectives:** We assessed if $VO_{2PEAK}$ is related to composite risk factor score for CVD in children aged 8 to 11 years on a population-base. **Methods:** Cross-sectional study of 243 (136 boys and 107 girls) children aged 8 to11 years, recruited from a population-based cohort. $VO_{2PEAK}$was assessed by indirect calorimetry during a maximal exercise test and scaled by body mass (ml/min/kg). Total fat mass (TBF) and abdominal fat (AFM) were measured by Dual-energy x-ray absorptiometry. Total body fat was expressed as TBFs percentage of total body mass (BF%), and body fat distribution as AFM/TBF. Systolic and diastolic blood pressure (SBP, DBP), and resting heart rate (RHR) were measured. Mean artery pressure (MAP) and pulse pressure (PP) were calculated. Echocardiography, 2-dimensional guided M-mode, was performed and left atrial diameter (LA) was measured and left ventricular mass (LVM) and relative wall thickness (RWT) were calculated. Z-scores (Value for the individual-mean value for group)/SD were calculated, by sex. Sum of z-scores for DBP, SDP, PP, MAP, RHR, LVM, LA, RWT, BF%, AFM, and AFM/TBF were calculated in boys and girls, separately, and used as composite risk factor score for CVD. **Results:** Pearson correlation revealed significant associations between $VO_{2PEAK}$ and composite risk factor score in both boys ($r=-0.48$ $P<0.05$), and in girls ($r=-0.42$, $P<0.05$). One-way ANOVA analysis indicated significant differences in composite risk factor score between the different quartiles of $VO_{2PEAK}$ ($P<0.001$), thus higher $VO_{2PEAK}$ was associated with lower composite risk factor score for CVD. **Conclusion:** This population-based cohort of young children shows that low $VO_{2PEAK}$ is associated with an elevated composite risk factor score for CVD in both boys and girls.

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## A comparative study between two types of groin dressing securements on post cardiac catheterization outcomes

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**Introduction:** Post cardiac catheterization puncture site care is usually done with a tight pressure dressing in many institutions due to the belief that it should prevent the bleeding. The practice is uncomfortable to the patients. Nurses have also described difficulty in assessing the sheath insertion site in the groin when a pressure dressing is in place. A new way of dressing using transparent film dressing (TFD) has approved and rated better with regard to : comfort, less pain, decrease hematoma formation and facilitates nurses' assessment of puncture wound

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site after femoral sheath removal. **Objectives:** The aim of this study was to determine the efficacy of a small transparent non pressure dressing compared with the traditional controlled pressure dressing applied to the femoral artery puncture wound to maintain haemostasis with respect to 3 outcomes: patient satisfaction, bleeding or hematoma formation, and nurse-reported ease of observation of the groin puncture site after the procedure. **Methods:** 80 post cardiac catheterization patients were randomized to have their groins dressed either with pressure dressing or TFD. Five instruments were used for data collection:1) Demographic and medical data sheet, 2) Hematoma Formation and Bleeding Scale. 3) Skin Integrity Scale.4) Patient Discomfort and Pain Scale. 5) Nurses Ease of Assessment Scale. **Results:** Results of the study show that 100% in TFD group vs 55% in pressure dressing group reported feeling very comfortable (p value of 0.003). Hematoma formation was equal in the two dressing groups with no incidence of bleeding complications. Nurses rated the ease of assessing the groin significantly higher for TFD than for pressure dressings (p value of 0.000). **Conclusion:** Dressing of the puncture site after cardiac catheterization with TFD was more comfortable than the conventional pressure dressing without any difference in hematoma or bleeding complications. So TFD can be used safely and comfortably after achieving hemostasis.

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**P424**

## 43% reduction of scatter radiation to scrub nurses during invasive coronary angiography with use of a lead free radiation shield, Radpad®

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**Introduction:** With the ever increasing complexity of invasive cardiac procedures, occupational radiation exposure has increased significantly and is potentially deleterious to medical staff. Radpad® scatter protection is a sterile, disposable bismuth-barium radiation shield drape that aims to decrease the dose of operator radiation during coronary angiograms. However, such radiation shields have not been tested on scrub nurses before. **Objectives:** The aim of this study was to determine whether the use of Radpad® would decrease scatter radiation exposure to our nurses. **Methods:** 4 patients undergoing coronary angiography were recruited. The same scrub nurse was asked to assist in all 4 procedures. Radpad® was placed around the area of arterial sheath insertion site and extended medially to the patient's trunk. Radiation exposure during each procedure was measured using thermo luminescence dosimeters positioned next to the scrub nurse. Radiation dosages were recorded in four different angiographic views of each patient for three seconds during cine acquisition and background dosages were recorded for twenty seconds during fluoroscopic screening, with and without the use of Radpad®. Two angiograms were done via radial approach and the other two via femoral approach. **Results:** Radiation dosage was lower when Radpad®was used–left anterior oblique cranial view: 0.616±0.572 mSv vs. 0.944±0.721 mSv, p = 0.037; spider view: 0.310± 0.218 mSv vs. 0.695± 0.796 mSv, p = 0.283; right anterior oblique view: 0.111±0.056 mSv vs. 0.147±0.072 mSv, p = 0.026. Background radiation was also reduced: 0.098±0.116 mSv vs. 0.234±0.157 mSv, p = 0.012. Overall there was 43.2% decrease in radiation exposure to the scrub nurses after the use of Radpad®.

**Conclusion:** This preliminary study shows that Radpad®significantly reduces occupational radiation exposure to scrub nurses during coronary angiography. Further studies should be conducted in a larger cohort to validate our findings.

**References:**

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**P425**

## The influence of knowledge about the illness on adherence to therapy after heart ischemia

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**Introduction:** The adherence to therapy plays a particularly important role in patients with chronic diseases, especially in ischemic heart disease. Therefore, its absence is a serious public health problem with enormous repercussions on the incidence and prevalence. The treatment of ischemic heart disease aims to reduce cardiovascular morbidity and mortality. Thus, adherence to the therapeutic process is a challenge for health professionals. Several factors interfere in adherence to treatment, especially the patient's knowledge about the disease and his behaviour. **Objectives:** Relate knowledge about the illness and adherence to therapy. **Methods:** It is a quantitative and transversal study. We used a self-administered questionnaire for sociodemographic characterization, schooling (ES) and Measure Adherence to Treatment (MAT). The sample was not probabilistic, with 196 subjects with ischemic heart disease in follow-up consultation at Health Centers in Viseu, Portugal. 61.2% are men with aged between 37 and 90 years (62.39 ± 12.67). The majority (66.3%) is "Married" and 57.1% live in "rural." 49.0% have four years of schooling and only 7.1% have higher education, 9.2% of patients are illiterate. We used the Student t test, ANOVA one -way and linear regression in SPSS. **Results:** Most patients (52.0%) show a "Good Adherence" to the treatment, 20.4% "Reasonable Adherence" and 27.6% present "Low Adherence." Men are more adherent than women (5.36 ± 0.66 vs 5.21 ± 0.72, p=0.092). As to knowledge about the disease (COHD), most patients (59.2%) reveals a "low knowledge" level and only 40.8% "high knowledge." Men have less information then women (2.42 ± 1.40 vs 2.84 ± 1.12; t= -2.347 p=0.02). The education influences significantly the MAT (F=2.45, p=0.048; R2=4.88%) and CONHD (F=4.05, p=0.004; R2=7.82%). Of the variables Age, COHD and Sex (SX), only the last two present predictive value of MAT. About 11.2% of the variation of MAT is explained by COHD ($\beta$ = 0.189; t=4.595; p = 0.000) and SX ($\beta$ = 0.189; t=-2.486; p = 0.014), which explanatory model is - MAT=5.206+(0.164 COH)+(-0.239 SX). **Conclusion:** The knowledge about the disease is a key factor for patients participate in decisions about their treatment. This influences positively the level of patient's adherence to therapy.

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**P427**

## Death; not a second before, not a second after. life after myocardial infarction from the perspective of muslim patients and carers in Malaysia

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**Introduction:** Life after myocardial infarction (MI) is never the same. Often patients and carers suffer major complications resulting in lifestyle changes and psychosocial adaptation. **Objectives:** To explore the experience of Muslim patients and carers in Malaysia following MI and to discover the influence of religion and culture on the perception of illness and way of living after MI. **Methods:** Twelve patients and carers to patients who had been hospitalized for MI within the past one year were purposively sampled from the National Heart Institute, Kuala Lumpur. Data were collected using semi-structured interviews and analysed using content analysis. **Results:** Five themes emerged from the study; 1) faith, beliefs and hope, 2) emotional distress, 3) responsibilities, 4) lifestyle changes and adaptations and 5) relationship and communication. Muslim patients and carers' experiences in living after MI were different from non-Muslim patients and carers. The disparity was the influence of the divine will and decree on the acceptance of the illness and death among Muslims. Acceptance of the illness was commonly referred to as 'fate', 'blessing' or as a 'test'. Death was not feared; it was embraced, regarded as inevitable while acknowledging its associated loss. Carers tended to suffer in silence and sacrifices were made whenever necessary. **Conclusion:** This study provides an understanding of the influence of religion and culture in the response of Muslim patients and their carers to MI. It should assist health professionals to respond more effectively to the health care of patients who follow Islam.

**P428**

## Assessing the effects of yoga on cardiovascular disease (CVD) risk in postmenopausal South Asian women: methodological challenges

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**Introduction:** In Canada, South Asians suffer disproportionate rates of cardiovascular-related morbidity and mortality. Postmenopausal South Asian women are at even greater risk due to the elevated prevalence of hypertension, physical inactivity, and obesity in this population. Current evidence suggests that yoga, an ancient mind-body practice that is a long-standing part of the Indian culture and tradition may reduce psychological and physiological CVD risk factors, and represents a safe, acceptable, and feasible intervention for inactive older women. Yoga may thus have particular promise in CVD prevention and management in this population. **Objectives:** 1) Outline our planned, funded pilot study to examine the potential utility of yoga practice for reducing CVD risk in sedentary postmenopausal South Asian women; and 2) Detail key methodological challenges in the context of our future study. **Methods:** In this pilot RCT, we will investigate the effects of a structured, gentle, 12 week yoga program on -e.g., primary change in fasting lipid profiles and blood pressure at 12 weeks and secondary change in glycemia, blood pressure, BMI in a population of postmenopausal, sedentary, overweight South Asian women. A total of 50 eligible women will be recruited from the community and randomized to participate in either a yoga or educational film program designed to control for time, attention, and setting. Participants will attend two 90 minute film sessions per week; yoga

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group participants will also complete at least 30 minutes of home practice on non-class days by referring to a booklet or DVD illustrating the yoga routine. Outcomes will be evaluated by blinded assessors at baseline, 6, and 12 weeks; and at 3 and 6 months post-intervention. Analysis will be intent-to-treat, and between group differences will be assessed using linear mixed models. **Results:** Methodological concerns about assessing the effects of active mind-body interventions on CVD risk, including control group design, participant retention and compliance will be discussed; and the special challenges of conducting a community-based yoga trial in an ethnic minority population, including those related to cultural sensitivity will be addressed. **Conclusion:** This funded, pilot study will be the first to rigorously examine the specific effects of yoga therapy on CVD risk profiles among postmenopausal, sedentary, South Asian women in a Western, industrialized country, and among the first to investigate the effects of yoga on CVD risk in older women.

**P429**

## A global perspective on prevention & management of risk for cardiovascular disease: what are the directions needed for nursing research?

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**Introduction:** Cardiovascular Disease (CVD) is the leading non-communicable disease that contributes to premature death and disability and reduced quality of life. This epidemic is likely to increase if it remains unchecked. Despite considerable efforts to gain the scientific information for evidence based interventions, much of the research evidence comes from a relatively few countries and from practice settings that are dissimilar to the examples needed for global initiatives for international or global risk factor reduction. There is a relative lack of systematic research suitable to improve global health taking into consideration epidemiology, natural history of disease, eating and physical activity practices and smoking habits. Furthermore, most of the research comes from high income countries and it's applicability to low and middle income countries remain untested. Therefore, it is important to identify the type of research agenda for global CVD risk reduction. **Objectives:** To identify existing research that is be applicable to the global risk reduction agenda, and formulate new methods and approaches suitable to advance global health. **Methods:** A systematic literature review will be carried out to identify suitable examples of research for low and middle income countries. As well as identify emerging new approaches and mechanism to conduct research that takes geography, language, literacy, culture, gender and local conditions into consideration. **Results:** The results from the literature review will be presented according to strength of evidence for each of the specific risk factors as well as multifactorial risk reduction examples that have been effective. Needs for further research about behavior change models and policy priorities for funding of research will be identified according to the regions of the World Health Organization with a particular emphasis on nursing research that addresses CVD risk factor reduction. **Conclusion:** This presentation will highlight what is known and not-known about low and middle income countries risk reduction and health promotion interventions. Future research priorities will be identified. Policy implications will be required for the infusion of research monies to establish suitable culturally appropriate interventions for systematic CVD risk reduction.

**P430**

## iCARDEA: personalized remote monitoring of patients with electronic implanted devices

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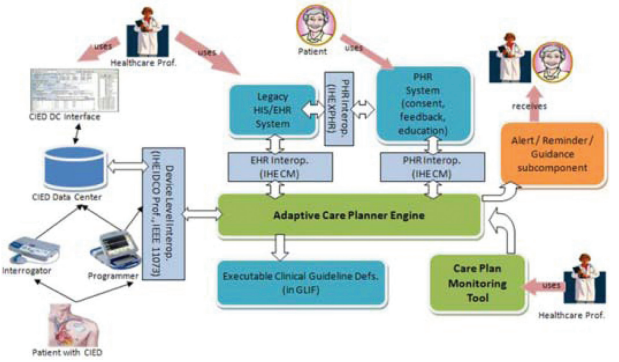
**Introduction:** Cardiac implanted electronic devices (CIEDs) have become part of the standard therapy in patients who are at risk of life-threatening cardiac arrhythmias. CIEDs require patients to follow regular scheduled hospital visits every 3 to 6 month to monitor device parameters, adverse events and anomalous device behaviour. Additionally, a substantial number of patients require extra non scheduled visits due to arrhythmic events or system-related complications. This calls for new methods of long-term surveillance with a view to optimizing patient safety and care, alleviating the burden of caregivers, and lowering health care costs through IT support. **Objectives:** iCARDEA is a European Project that aims at developing an intelligent platform to semi-automate the follow-up of CIED patients using adaptable computer interpretable clinical guideline models. **Methods:** Data from hospitals' electronic health records (EHR), from patient maintained personal health records (PHR) and the CIED device readouts, provided by the remote monitoring services, are collected and correlated. This abstract describes the system architecture of this project. **Results:** In order to provide the Adaptive Care Planner, the CIED data obtained from the device's telemonitoring system is converted into a vendor independent standard format, and EHR and PHR data are converted to HL7 Clinical Document Architecture format, in order to be connected to the iCARDEA system. The data presented is enriched by automatically generated patient-specific warnings and suggestions based on statistically valid patterns extracted using state-of-the-art data analysis techniques applied to reference case knowledge bases. An adaptive care planner employing clinical guidelines automates risk assessment generating alarms as appropriate. Patients are empowered with integrated PHR that enable informed and responsible participation in their health care and education.

**Image/graph I:**




**Conclusion:** Leveraging the remote management capabilities available in the latest generation of ICD/CRT-Ds heightens clinician awareness of device status and disease progression, allowing more timely and effective treatment for the patient, while also reducing the burden of in-office device follow-up visits. Remote monitoring in conjunction with iCARDEA is expected to reduce the time from a clinical event to a clinical decision in response to arrhythmias and device issues compared to patients receiving in office care only. A clinical trial is planned after completing all the system components.

**P431**

## ELISA detects SK2 channel protein expression in human chronic atrial fibrillation

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**Introduction:** Small-conductance $Ca^{2+}$-activated $K^{+}$channels (SK channels) are widely expressed in different tissues, including the brain, peripheral nervous system, skeletal muscle and smooth muscle .SK channels are encoded by at least three genes: SK1, SK2, SK3. SK2 channel plays a crucial role in human and mouse cardiac repolarization, especially during the late phaes of the cardiac action potential. **Objectives:** To detect the differences of SK2 channel protein expression in atrial tissue from patients with chronic atrial fibrillation or sinus rhythm. **Methods:** Total protein of atrial tissues was extracted by lysis buffer, protein concentration was detected by BCA, SK2 protein level was measured by ELISA kit. **Results:** Under the same condition of the total protein 0.1 mg per well, sinus rhythm group ($n=12$) and chronic atrial fibrillation group ($n=10$), SK2 protein concentration were $1.13\pm0.12$ ng/ml and $3.98\pm0.48$ ng/ml respectively. There is a significant difference between SR group and AF group in SK2 protein expression level ($p<0.05$). **Conclusion:** SK2 protein expression levels in two groups from patients with sinus rhythm or atrial fibrillation were different. SK2 protein expression levels of chronic atrial fibrillation were significantly higher than that of sinus rhythm group. It may be involved molecular mechanism of ion channel remodeling in atrial fibrillation.

**P432**

## Left ventricular false tendon as a novel predictor of ventricular fibrillation in patients with myocardial infarction

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**Introduction:** Predictors of ventricular fibrillation used in clinical practice are not very reliable. **Objectives:** To assess the factors of ventricular fibrillation prediction and to identify novel predictors of ventricular fibrillation in patients with acute myocardial infarction. **Methods:** In coronary care unit 16 patients with acute myocardial infarction and ventricular fibrillation were compared with 291 patients after acute myocardial infarction without arrhythmia. **Results:** Left ventricular false tendon evaluatedby echocardiography was detected in 93.7% of patients in ventricular fibrillation group compared to 16.5% in control group ($p<0.001$). Mathematical model based on binary logistic regression has shown the significant relationship between ventricular fibrillation and left ventricular false tendon, high Killip class and extent of left ventricular wall motion abnormalities. Model was tested in the other group of 152 patients with acute myocardial infarction: with ($n=16$) and without ($n=136$) ventricular fibrillation. Model showed 83.3% sensitivity and 92.7% specificity in prediction of ventricular fibrillation. **Conclusion:** The model can effectively predict ventricular fibrillation in patients with acute myocardial infarction. Left ventricular false tendoncan be considered as a novel significant predictor of ventricular fibrillation in patients with acute myocardial infarction.

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## P433

### Increased susceptibility to ischemia-induced ventricular tachyarrhythmias in depressed rats

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**Introduction:** Connexin43 (Cx43) has been reported to contribute to the occurrence of ventricular arrhythmias during myocardial ischemia (MI). **Objectives:** This study investigated the expression of connexin43 (Cx43) and the incidences of ventricular tachyarrhythmias [i.e. ventricular tachycardia (VT) and ventricular fibrillation (VF)] during acute MI in chronic mild stress (CMS) rats. **Methods:** Male Sprague-Dawley (SD) control and CMS rats were assigned into sham operation (SO) group and myocardial ischemia (MI) group. Ventricular tachyarrhythmias was assessed and Cx43 protein were measured by western blotting. **Results:** During 30-minute ischemia, the incidence of VT (7/12, 58.3%) and VF (5/12, 41.7%) in CMS-MI group were significantly decreased compared to those in Control-MI (12/12, 100.0% and 11/12, 91.7%) (both $P<0.05$). The amount of total Cx43 of CMS-SO group was significantly decreased to ~ 50% compared to that of Control-SO group ($P<0.05$). The 30-minute ischemia did not result in significant change of amount of total Cx43 (total Cx43 = nonphosphorylated Cx43 + phosphorylated Cx43) compared to that of SO group in CMS rats ($p>0.05$). The amounts of nonphosphorylated Cx43 in CMS-MI group were markedly increased compared to that of CMS-SO group ($P<0.05$), suggesting that the relative amount of phosphorylated Cx43 was significantly decreased in CMS rats. **Conclusion:** The present study suggested that the incidence of ischemia-induced ventricular tachyarrhythmias was markedly increased in CMS rats, which may be associated with the reduction of Cx43 protein expression in the ventricle of CMS rats.

## P434

### Investigations on the Tpeak-Tend interval and the tpeak-tend interval dispersion in healthy individuals

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**Introduction:** At present, the research for the Tpeak-Tend interval (TpTe) found TpTe and its dispersion relate to cardiac arrhythmias, especially ventricular tachycardia of torsades de pointes. But for its normal value, and the definition of its extension, no large sample study was reported. **Objectives:** To investigate on TpTe, TpTe dispersion, the heart rate-corrected Tpeak-Tend interval (TpTe/R-R), TpTe/R-R dispersion, and the correlation between the heart rates and TpTe in healthy people. **Methods:** The standard 12 leads electrocardiogram of 1012 healthy individuals was taken. TpTe, TpTe dispersion, TpTe/R-R and TpTe/R-R dispersion was calculated. The linear correlation was used to analyse to the correlation between the heart rates and TpTe. **Results:** □ TpTe and TpTe dispersion were 84.29 ± 9.91 milliseconds (ms) and 3.52 ms, respectively. TpTe was the shortest in lead II (81.66 ± 9.84 ms) and the longest in chest leads V4 and V5( V4 = V5 = 85.18 ± 9.76 ms). TpTe in lead II was significantly shorter than those in lead V3 and in leads V4–5($q = 7.98$□$p < 0.01$□$q = 8.07$□$p < 0.01$. respectively). But TpTe was not significantly different between lead V3 and leads V4–5($q = 0.09$□$p > 0.05$). □ TpTe/RR and TpTe/RR dispersion were 91.77 ms and 3.85 ms, respectively. TpTe/RR was the shortest in lead II (88.92 ± 11.23 ms) and the longest in chest leads V4 and V5( V4 = V5 = 92.82 ± 11.34 ms). TpTe/RR in lead II was significantly shorter than those in lead V3 and in leads V4–5($q = 7.70$□$p < 0.01$□$q = 7.58$□$p < 0.01$. respectively). But TpTe/RR was not significantly different between lead V3 and leads V4–5($q = 0.124$□$p > 0.05$). □ The negative correlation between the heart rates and the QT interval and the no correlation between the heart rates and TpTe was identified in healthy people with the heart rates from 60 to 100 beats per minute. **Conclusion:** □ The study provides values of TpTe and TpTe dispersion and TpTe/RR and TpTe/RR dispersion in healthy individuals. □ It was not necessary that TpTe was corrected by the heart rates, when the heart rates were increasing from 60 to 100 beats per minute.

## P437

### Prevalence of fragmented QRS and right precordial T wave inversions in normal children

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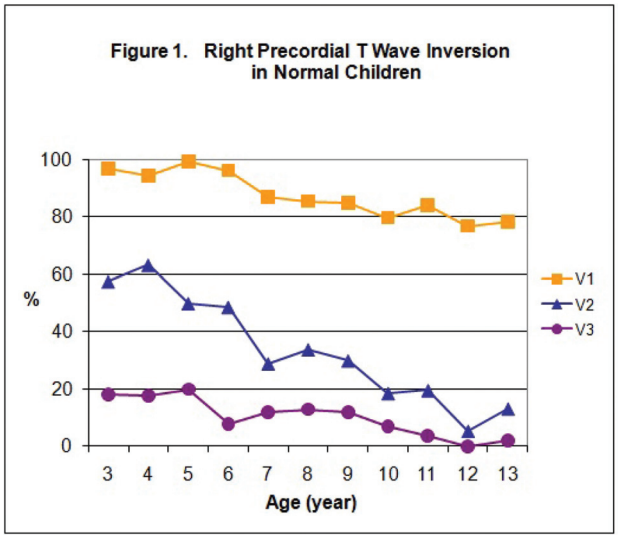
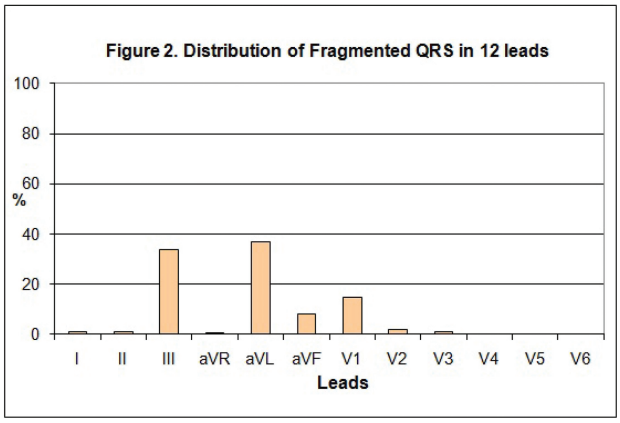
**Introduction:** Myocardial scarring and right ventricular dilatation cause QRS fragmentation and right precordial T wave inversion in patients with arrhythmogenic right ventricular dysplasia/cardiomyopathy (ARVD/C). The prevalence of fragmented QRS and normal T wave evolution in children, however, has not been well-studied. **Objectives:** To improve the diagnostic accuracy, we investigated the prevalence of QRS fragmentation and right precordial T wave inversion in children. **Methods:** ECGs of 818 normal Chinese children age 3–13 yrs from a community based health screening program were analyzed. QRS duration (QRSD), presence of fragmented QRS, and right precordial T wave inversion were evaluated. **Results:** 1) the mean QRSD was 82±10 ms. 2) fragmented QRS was present in 21% (170/818) ECGs, occurring in 1 (73%), 2 (18%) and 3 (9%) leads respectively most commonly in aVL (37%), followed by III (34%), V1 (15%) and aVF (8%). 3) the frequency of inverted T waves in V1–3 by age is shown in Figs. 1–2.

**Image/graph I:**




**Image/graph II:**




**Conclusion:** In normal children, fragmented QRS occurs mainly in a single lead. Knowledge of the prevalence of right precordial T wave inversion in normal children should be useful in ECG assessment of young patients with suspected ARVD/C.

## P439

### The QTc interval in HIV-positive nigerian children

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**Introduction:** QTc interval prolongation has been reported to be more common in HIV-positive children, worsening with progression to AIDS, and has been attributed to autonomic neuropathy or drugs administered including antiretroviral drugs. Children with long QTc interval have a propensity to develop polymorphic ventricular tachycardia with resultant sudden cardiac death. Regular recording of standard surface ECG and monitoring QTc interval is not currently part of the routine care of HIV-positive children in many parts of sub-Saharan Africa which bears almost 90% of the HIV/AIDS disease burden in children, possibly due to paucity of validating data. **Objectives:** To determine the prevalence of QTc interval prolongation in HIV-positive Nigerian children compared with normal controls and its relationship with use of antiretroviral therapy (ART), clinical and immunological stage of disease. **Methods:** This comparative cross-sectional study was carried out at a tertiary health care facility in Nigeria. Corrected QT (QTc) intervals were determined from standard surface ECGs of 100 HIV-positive children and 100 age and sex-matched controls. Their mean QTc intervals and prevalence of QTc prolongation were compared. QTc intervals of HIV-positive subjects were correlated with use of ART and stage of disease. **Results:** The mean QTc interval was significantly longer in subjects (34.83 ±0.04 seconds) compared with controls (33.10±0.47 seconds), $p = 0.006$. Prolonged QTc was significantly more frequent in subjects (18.0%) than controls (1.0%), $p = 0.0001$. Prolonged QTc interval was significantly more common in subjects on antiretroviral therapy (24.2% vs 2.9%), $p = 0.04$. There was no significant relationship between the

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presence of prolonged QTc interval and subjects clinical and immunological staging. **Conclusion:** QTc prolongation is significantly more common in HIV-positive Nigerian children on ART. Incorporating regular surface ECG recording and QTc interval monitoring may be helpful in preventing sudden death.

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**P441**

## Thrombo-embolic risk assessment and use of anticoagulant in patients of atrial fibrillation in real clinical practice: a British district general hospital experience

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**Introduction:** Atrial fibrillation (AF) is a major risk factor for stroke. Currently, platelet inhibitor and vitamin K antagonists (oral anticoagulants), including warfarin, are the only approved antithrombotic therapies for stroke prevention in patients with AF. Oral anticoagulants however are still being underused. **Objectives:** To study as to how well the patients of atrial fibrillation were being assessed for thrombo-embolic risk and if they were adequately and appropriately being initiated on anticoagulant therapy. **Methods:** We randomly and retrospectively selected case notes of 232 patients who were admitted with atrial fibrillation as the primary diagnosis for a period of one year .We studied as to how effectively their thrombo-embolic risk was assessed using CHADS2 score and whether they were initiated on anticoagulants or not. We also studied their follow up care i.e. achieving therapeutic INR prior to discharge and referral to the anticoagulant clinic. **Results:** Out of the 168 patients without mitral valve disease 102 (60.7%) had their CHADS2 score assessed and recorded. Based on their thrombo-embolic risk as per CHADS2 score there were 76 (74.2%) patients in whom anticoagulant was indicated. Out of these there were 69 patients in whom anticoagulant was indicated with no bleeding risk while there were 7 patients in whom risk of bleeding outweighed the risk of thrombo-embolism. Out of the 133 patients including those with significant mitral valve disease and in whom anticoagulant was indicated without bleeding risk, there were only 88 (66%) patients who were already established on anticoagulant or this was initiated during their hospital admission. Therapeutic INR prior to discharge was achieved only in 51 (57.9%) patients. Referral to anticoagulant clinic was arranged for 78 (88.6%) patients. **Conclusion:** Although there are well established guidelines and validated tools available to assess thrombo-embolic risk in atrial fibrillation and commencement of anticoagulant, they are still under utilised in real clinical practice. The adequate monitoring of anticoagulant therapy and the effort to achieve therapeutic INR are often lacking.

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**P442**

## Postoperative P-wave is a strong predictor of the occurrence of atrial fibrillation after coronary artery bypass grafting

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**Introduction:** About 30% of patients develop AF after coronary artery bypass grafting (CABG). Although the underlying mechanism is still unclear, surgery-induced atrial inflammation resulted in an increased inhomogeneity of atrial conduction may play a role. Therefore, post-op P-wave might have better predictive value. **Objectives:** To evaluate the role and accuracy of post-op P-wave duration (P-dur) and P-wave dispersion (PD) in predicting post-op AF (POAF). **Methods:** We prospectively studied 162 consecutive patients with sinus rhythm (SR) undergoing first-time elective isolated CABG. Standard 12-lead ECGs were obtained the day before surgery then daily until day 5 post-op or until AF occurred. P-dur and PD were analyzed with commercial software by an independent, blinded physician. Logistic regression was used to assess the independent role of post-op maximum P-dur ($P\text{-dur}_{max}$) and PD ($PD_{max}$) in predicting POAF. The accuracy in predicting POAF by $P\text{-dur}_{max}$ and $PD_{max}$ was determined by ROC curves. **Results:** Fifty-four (33.3%) patients developed AF ($m = 2.36 \pm 1.57$ days). P-dur tended to be shorter, and PD reduced from the baseline to the day of surgery, with a gradual increase on days 1 and 2 post-op in both AF and SR groups, however, the P-dur did not reach its preoperative level in the SR group. The AF group had greater changes than SR group from baseline to $P\text{-dur}_{max}$ and $PD_{max}$ (mean P-dur and PD changes: $8.41 \pm 19.59$ versus $-0.65 \pm 9.74$ ms, $P < 0.001$; $5.17 \pm 7.77$ versus $4.36 \pm 4.35$ ms, $P < 0.05$, respectively). In the AF group $P\text{-dur}_{max}$ and $PD_{max}$ occurred at a mean of $20.19 \pm 13.64$ hrs and $19.92 \pm 14.83$ hrs respectively before AF occurred. The unadjusted $P\text{-dur}_{max} \geq 111$ ms and $PD_{max} \geq 36.5$ ms were significantly associated with POAF (OR 5.09, 95% CI 2.4 - 10.75, $P < 0.001$; OR 11.20, 95% CI 4.42 - 28.41, $P < 0.001$, respectively). Logistic regression showed that age $\geq 62$ years, preoperative PD $\geq 34.5$ ms, post-op $P\text{-dur}_{max} \geq 111$ ms and $PD_{max} \geq 36.5$ ms independently predicted POAF. After adjusting for age and preoperative PD, post-op $P\text{-dur}_{max} \geq 111$ ms (OR 3.86, 95% CI 1.48 - 10.08, $P < 0.001$) and $PD_{max} \geq 36.5$ ms (OR 7.13, 95% CI 2.38 - 21.42, $P < 0.001$) were still stronger predictors of POAF. The combination of post-op $P\text{-dur}_{max} \geq 111$ ms and $PD_{max} \geq 36.5$ ms had a sensitivity, specificity, positive and negative predictive accuracy of 64.8%, 86.1%, 70.0%, and 83.0%, respectively. **Conclusion:** This study confirmed that post-op $P\text{-dur}_{max} \geq 111$ ms and $PD_{max} \geq 36.5$ ms are quite sensitive and accurate in predicting POAF.

**P443**

## Prediction of early malignant ventricular arrhythmias in patients with acute anterior myocardial infarction: role of infarction size to serum potassium rate

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**Introduction:** Malignant ventricular arrhythmia□MVA□is one of the most serious complications after acute myocardial infarction (AMI). **Objectives:** To analyze risk factors of MVA within 24 hours of acute anterior myocardial infarction, and to assess the predictive role of the infarction size to serum potassium rate (IS/[K]) at admission in the occurrence of early MVA in patients with anterior myocardial infarction. **Methods:** Consecutive patients who were suffered from acute anterior myocardial infarction within 12 hours of symptom onset were retrospectively enrolled. According to the occurrence of MVA at the early stage of myocardial infarction, all the cases were divided into malignant ventricular arrhythmia group (MVA group) and non-malignant ventricular arrhythmia group (non-MVA group). Primary outcome was MVA occurred within 24h of symptom onset. The factors associated with MVA were analyzed. Stepwise multivariate regression modeling was used to identify predictors based on the likelihood ratio test. **Results:** A total of 140 cases were enrolled in this study, while 127 cases in non-MVA group and 13 cases in MVA group. Blood glucose at admission, infarction size calculated according to ECG, peak CK-MB value and IS/[K] were much higher in MVA group than those in non-MVA group (all $P<0.05$). The serum potassium concentration at admission in MVA group was significantly lower than that in non-MVA group ($P<0.0001$). IS/[K] at admission was independently associated with MVA at the early stage of acute anterior myocardial infarction by stepwise multivariate analyses ($P<0.0001$). The area under the ROC curve for ratio was 0.887(95% confidence interval 0.80–0.97, $P<0.0001$). At a cut-off point of 5.7, IS/[K] exhibited 92.3% sensitivity and 68.5% specificity for detecting early MVA. **Conclusion:** Infarction size, serum potassium and blood glucose at admission are associated with early MVA in patients with acute anterior myocardial infarction, and IS/[K] at admission can predict MVA with high sensitivity and specificity.

**P444**

## The changes of ECG in the patients with cancer before and after the chemotherapy

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**Introduction:** Chemotherapy is one of the important effective treatments for cancer. There is considerable variability in the side effects experienced by different patients to chemotherapeutic drugs. especially the cardiotoxicity. **Objectives:** To analyze the changes of electrocardiography in the patients with malignant tumor before and after the chemotherapy. **Methods:** The abnormality of ECG data in 1200 patients before and after anthracycline and non-anthracycline chemotherapy in our hospital was analyzed, including 652 male and 548 female,to investigate the heart rhythm, the voltage of R wave, and the change of ST-T by standard 12-lead ECGs. **Results:** The abnormality of ECG occurred in 31 patients(31/1200,2.6%□before chemotherapy and in 320 patients(320/1200,26.7%)after chemotherapy.After chemotherapy ,the changes of ST-T was found in 176 cases□176/320,55.0%□, arrhythmia in 98 cases(98/320,30.6%□, low R in 45 cases □45/320,14.1%□, cardiac infarction in 1 cases □1/320,0.3%□.The incidence of abnormal ECGs after chemotherapy was higher than that before chemotherapy (*P*□0.05□. The incidence of low voltage R wave, low T wave, ST segment depression in the group treated with anthracyclines was higher than that in the group treated without anthracyclines □*P*□0.05□. **Conclusion:** Most of the chemotherapy programs induce cardiotoxicity, especially in the chemotherapy including anthracyclines.

**P445**

## A new algorithm of 12-lead ECG P wave detection based on wavelet transform

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**Introduction:** For automatic ECG analyzing system, the detection of P wave is still a problem need to be solved. Due to the weak amplitude, low frequency, multi-morphology of P wave and baseline drift, auto detection of P wave especially for 12-lead P wave remains a difficult problem. **Objectives:** Based on present methods, this paper applies quadratic spline wavelet to 12-lead ECG P wave for synchronous extraction of feature and good results are obtained in experiments. **Methods:** Appling quadratic spline wavelet transform to the ECG signal, it is found that there always exists at least one pair of modulus extremes with opposite sign (which exists zero-crossing point between them) at a scale $2^4$ or $2^5$ of the P wave. These extremes can correspond to the P wave in the original ECG signal .According to energy analysis of ECG signal, most energy of P wave is at scales of $2^4$ and $2^5$, while the baseline drift and other noise is mainly at scale of $2^5$. Taking the interference into account, this research will detect P wave at the scale of $2^4$.Implementation steps are shown as following: 1) Determine P wave of each lead detection range. 2) Determine the P wave peak of each lead. The quadratic spline wavelet is

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used to decompose the original signal at 4-time. There is a P wave peak in low-frequency components, corresponding to the position between the maximum pairs of high frequency component. With the information of these extremes and some filter delay, we can locate the searching range for the original signal vertex position. 3) Determine the onset and offset of each lead P wave. **Results:** In order to verify this 12-lead P wave identification accuracy, we use 12-lead electrocardiograph machine collected 200 12-lead ECG clinical data. Three heart experts identify P wave and manual measuring time limit of P wave.Compare this 12-lead P wave auto-detection results with the manually measured results of heart disease experts: the correct detection rate of P wave is 98.5%, **Conclusion:** The algorithm can reduce the interference from the baseline drift and the high frequency signals. The algorithm can improve accuracy of the 12-lead P wave detection and localization. Experiments show that the algorithm is accurate and valid.

**P446**

## Inflammation Is related with decreased cardiac autonomic functions in hypertension

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**Introduction:** Inflammation both plays a role in the mechanisms leading to hypertension alone and the mechanisms leading to atherosclerosis with hypertension. Previous studies showed the relation between the autonomic functions and inflammatory system activation. However, the exact mechanism between hypertension, inflammation, and autonomic functions remains unknown. **Objectives:** The aim of the study is to evaluate the relationship between inflammation and cardiac autonomic functions in hypertensive patients. **Methods:** One hundred twenty one hypertensive patients (mean age 59±11, 60 male) and 34 healthy volunteers (58±11, 18 male) were included to the study. Twenty-four hour ambulatory electrocardiogram recordings were taken using Pathfinder Software. The time domain parameters of heart rate variability (HRV) analysis were performed using the Heart Rate Variability Software. Heart rate turbulence (HRT) parameters, turbulence onset and turbulence slope were calculated withHRT! View software. **Results:** High sensitivity C-reactive protein (hs-CRP) was higher, HRV was slightly reduced while HRT was markedly blunted in hypertensive patients in comparison with control group. (Table 1). All of the HRV and HRT parameters were more deteriorated in the highest tertile hs-CRP group (Table 2). There were strong correlations between hs-CRP and HVR and HRT parameters.

**Table 1:** hs-CRP values, heart rate variability and turbulence parameters between the patient and the control groups

| | Control group n=34 | Patient group n=121 | *P* value |
|---|---|---|---|
| **hs-CRP (mg/L)** | 1.19 [0.74-2.10] | 1.33 [1.20-4.68] | **0.003** |
| **RR (msec)** | 807±105 | 848±126 | 0.086 |
| **SDNN (msec)** | 132±28 | 112±34 | **0.002** |
| **SDANN (msec)** | 111±34 | 99±33 | 0.058 |
| **RMSSD (msec)** | 27 [23-35] | 22 [16-28] | **<0.001** |
| **TO (%)** | -2.80±2.15 | -0.96±2.36 | **<0.001** |
| **TS (msec/RR)** | 7.56 [5.24-10.60] | 4.65 [2.44-7.26] | **<0.001** |

**Table 2:** Heart rate variability and turbulence parameters between the groups according to hs-CRP tertiles

| | Lowest tertile n=38 | Mid tertile n=43 | Highest tertile n=40 | *P* value |
|---|---|---|---|---|
| **RR (msec)** | 855±109 | 909±112 | 774±118 | **<0.001** |
| **SDNN (msec)** | 125±35 | 118±28 | 93±34 | **<0.001** |
| **SDANN (msec)** | 112±35 | 102±25 | 82±33 | **<0.001** |
| **RMSSD (msec)** | 25 [19-32] | 24 [20-32] | 17 [13-22] | **0.001** |
| **TO (%)** | -1.76±2.47 | -1.19±2.09 | 0.03±2.22 | **0.002** |
| **TS (msec/RR)** | 6.15 [4.13-11.69] | 5.30 [4.30-7.92] | 2.43 [1.84-3.89] | **<0.001** |

**Conclusion:** There is an inflammatory process in hypertensive patients and inflammation is related with decreased cardiac autonomic functions in this population.

**P447**

## Heart rate variability and heart rate turbulence in hypothyroidism before and after treatment

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**Introduction:** Cardiac autonomic dysfunction may develop in patients with clinical or subclinical thyroid hormone deficiency. Heart rate variability (HRV) and heart rate turbulence (HRT) are used for evaluating changes in cardiac autonomic functions and also used to provide risk stratification in cardiac and non-cardiac diseases. **Objectives:** The aim of this study is to evaluate cardiac autonomic functions before and 6 months after thyroid replacement therapy in patients with thyroid hormone deficiency. **Methods:** Forty hypothyroid patients (mean age 48±13, 4 male) and 31 healthy controls (mean age 51±12, 3 male) were included in the study. Twenty-four hour ambulatory electrocardiogram recordings were taken using Pathfinder Software Version V8.255 (Reynolds Medical). The time domain parameters of HRV analysis were performed using the Heart Rate Variability Software (version 4.2.0, Norav Medical Ltd, Israel). HRT parameters, Turbulence Onset (TO) and Turbulence Slope (TS) were calculated withHRT! View Version 0.60–0.1 software. **Results:** HRV and HRT parameters were decreased in the patient group (Table 1). After 6 months of thyroid replacement therapy, there were no significant changes observed in either HRV or HRT (Table 2).

**Table 1:** HRV and HRT parameters of patient and control groups

| | Control (n=31) | Patient (n=40) | *P* value |
|---|---|---|---|
| **RR (msec)** | 808±109 | 782±77 | 0.240 |
| **SDNN (msec)** | 130±27 | 73±32 | **<0.001** |
| **SDANN (msec)** | 113±26 | 95±30 | **0.009** |
| **RMSSD (msec)** | 31±12 | 25±13 | **0.049** |
| **TO (%)** | -2.980±2.368 | -1.717±2.649 | **0.035** |
| **TS (msec/RR)** | 9.244±5.577 | 5.356±3.080 | **<0.001** |

**Table 2:** HRV and HRT parameters of patients before and after $_L$-$T_4$ therapy

| | Before (n=28) | After (n=28) | *P* value |
|---|---|---|---|
| **RR (msec)** | 790±81 | 788±91 | 0.925 |
| **SDNN (msec)** | 65±23 | 67±42 | 0.840 |
| **SDANN (msec)** | 98±29 | 100±28 | 0.657 |
| **RMSSD (msec)** | 28±14 | 28±17 | 0.890 |
| **TO (%)** | -1.511±2.519 | -1.770±2.402 | 0.703 |
| **TS (msec/RR)** | 5.094±3.064 | 6.941±3.967 | 0.075 |

**Conclusion:** Hypothyroidism may cause cardiac autonomic dysfunction. Treating hypothyroidism with $_L$-$T_4$ therapy does not effectively restore cardiac autonomic function. HRV and HRT can be used as to help monitor cardiovascular-related risk in this population.

**P448**

## P-wave signal-averaged ECG in normal population and in patients with converted atrial fibrillation

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**Introduction:** Atrial fibrillation (AF) remains the most frequent arrhythmia (5% of the population over 69 years), thus any method that could assess the risk for AF may have important implications. Signal averaged electrocardiography of the P wave (P-wave SAECG) is a noninvasive method for evaluating the risk of AF onset or of the passing from paroxysmal (PxAF) to persistent atrial fibrillation (PsAF). Although there have been made some correlations between P-wave SAECG parameters and the risk for paroxysmal AF, or for evolution of PxAF to PsAF, normal values of these parameters or their variation with age, sex or other clinical factors are not well established. **Objectives:** We aimed to study P-wave SAECG parameters in a large number of apparently healthy subjects and to compare them with patients with converted atrial fibrillation. **Methods:** We examined 591 individuals; P-wave SAECG were recorded in 330 normal subjects, 31 patients with converted persistent AF and 57 patients with converted paroxysmal AF immediately after conversion, at 12 and 24 hours after conversion, then after 3 and 6 months. P-wave SAECG were recorded using a commercially available machine aiming to obtain a noise level $<1\mu$V. **Results:** In the normal population the duration of the filtered P wave (PWD) was higher in men. P wave duration, $RMS_{40}$ and $RMS_{30}$ were significantly correlated with age. By comparing the normal population with patients with persistent AF converted to sinus rhythm we demonstrated significant differences in PWD and P wave integral. Patients with recurrent persistent AF had significantly higher PWD. The study of patients with paroxysmal AF, compared to the control group, showed significant increase of the same parameters: PWD and integral of the P wave. Patients with recurrent paroxysmal AF had higher PWD and lower $RMS_{40}$, $RMS_{30}$, $RMS_{20}$. **Conclusion:** Filtered P wave duration was higher in men; PWD was weakly but significantly correlated with age. Patients with paroxysmal or persistent atrial fibrillation converted to sinus rhythm had significantly higher P wave duration and P wave integral.

**P449**

## Is it an old fashion? Mechanocardiography vs. echocardiography for optimization of atrioventricular pacing

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**Introduction:** The determination of the optimal atrioventricular (AV) delay in atrioventricular pacing (DDD) is mostly succeeded by the use of echocardiographic (ECHO) indexes. **Objectives:** The mechanocardiography (MCG) has provided a number of significant indexes, which can

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determine the left ventricular function (LVF) in a very effective way but it has never been used for optimal AV delay identification. **Methods:** 20 patients (M=15, F=5, m.a. 62.5±11 years) with DDD pacing and 20 healthy volunteers (Group A) were studied. Six months after the implantation of the pacemaker, all pts underwent MCG evaluation (combination of phonocardiogram, carotidogram, electrocardiogram and first derivatative of apexcardiogram-fdA) and ECHO evaluation (M-mode, 2-D and Doppler) of systolic and diastolic LVF during DDD pacing (rate 750msec) with three different, gradually increased, AV delays (B=100, C=150 and D=200msec). The LVF of Group A was also studied with the same indexes (mean heart rate 823.2±78.01msec). **Results:** While the AV delay was increased gradually from 100 to 200msec: **a)** the diastolic LVF appeared to deteriorate as it comes from the recordings of mitral valve (MV) E velocity, MV A velocity, E/A ratio, MV filling time and MV deceleration time, **b)** the systolic LVF appeared to deteriorate as it comes from the recordings of M-mode ejection fraction, aortic max. velocity, LV ejection time, LV acceleration time, LV velocity-time integral, MCG preejection period, MCG left ventricular ejection time LVET and hemodynamic ratio PEP/LVET, **c)** the diastolic and systolic LV function appeared to deteriorate simultaneously as it comes from fdA-index a/b and fdA-index ef/ZN. **Conclusion:** The present study: a) supports present knowledge that short AV delays around 100 msec affect more favorable the LV function, b) proves the great value of mechanographic indexes and c) demonstrates the effectiveness of the combination of MCG and ECHO indexes in the determination of the optimal AV delay and the estimation of cardiac function. The reevaluation and reintroduction of these classical non-invasive methods in determining the LV functional status under different conditions, such as DDD pacing, could be an extensive and interesting research field.

**P450**

## Incidence of atrial fibrillation in patients with VVI pacemaker

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**Introduction:** In the majority of patients with pacemakers, when AF develops it is "clinically silent" both because traditional symptoms are absent and because atrial rhythm diagnosis on a single-lead ECG may be difficult.(1) **Objectives:** To determine the incidence of atrial fibrillation in patients with high degree heart block after implantation of VVI(R) mode pacemakers in relation to time of pacing. **Methods:** This study included 122 patients attending Benha University Hospitals and Nasr City Insurance Hospital's' pacemaker clinics for follow up to assess the incidence of AF.(all patients were not in AF at time of pacemaker implantation), Patients were divided according to their atrial rhythm at the time of follow up into two groups : Group I included patients(89) with sinus rhythm at the time of follow up, Group II included(33) patients with AF at the time of follow up.All patients were suspected to full clinical data, resting twelve electrocardiogram and Transthoracic echocardiographic study to detect LA dimension, LV end diastolic dimension, LV end systolic dimension, LV EF and presence of MR. **Results:** We found that 33 (27.5%) of 122 Consecutive patients attending for routine follow up have AF ,the longer duration of pacing the more the incidence of atrial fibrillation(in the pacing period above 5 years p=0.025 and for the mean duration of pacing p=0.001).The mean value of left atrial dimensions in group I was 36.81 ± 4.52 versus 43.73±3.63 in group II and there was highly significant P value=0.001.The presence of mitral regurge is highly statistically increased in group. The only 3 (9%) patients who had AF were anticoagulated, and 25(75.7%) out of 33 patients met the high risk criteria for throboembolism. **Conclusion:** The prevalence of AF were 27.5%, there is a significant relationship between occurrence of AF after VVI(R) pacemaker and MR, LA dimension and duration of pacing.

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**P451**

## Atrial electromechanical coupling interval as a possible predictive factor for arrhythmias and thrombo-embolic events

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**Introduction:** Age related changes in the atria could be the cause of atrial remodeling, resulting in structural atrial changes, atrial fibrosis and atrial dilatation. **Objectives:** Atrial fibrosis could affect and prolong the atrial electromechanical coupling interval(AECI), responsible for a triggering factor in the occurrence of arrhythmias, thrombo-embolic events and heart failure. **Methods:** The study group consisted of 278 male ambulant patients, consulting because of chest pain, but with a normal electrocardiographic examination and with a normal systolic left ventricular function. All subjects were divided in three age groups: I:21–40; II:41–60; III:61–80years. The recordings of atrial motion were obtained when scanning from an apical position and data were obtained for radial motion from roof of left and right atrium and for longitudinal motion from atrial septum and lateral walls of left and right atrium. The AECI in milliseconds was determined by measuring time interval between onset of p-wave on the electrocardiogram and onset of atrial mechanical systole or atrial contraction on tissue doppler imaging. Intra-atrial asynchrony was calculated by measuring the difference between two parameters: the time of onset of p-wave to onset of atrial mechanical systole at septum minus the time of onset of p-wave to onset of atrial mechanical systole at roof of both right and left atrium. Inter-atrial asynchrony was measured between the roof of both atria. **Results:** In all age groups left AECI is the shortest at septum(66ms), longer at lateral wall(72ms) and longest at roof(78ms). Right AECI is the longest at septum(66ms), less longer at lateral wall(56ms) and shortest at roof(24ms). Left and right AECI both increase with age. At roof of left atrium AECI increases with age: I:66ms; II:70ms and III:77ms. At roof of right atrium AECI increases with age: 24ms in I, 26ms in II and 27ms in III. At septal wall AECI measures 57ms in I; 59ms in II and 66ms in III. Intra-atrial asynchrony increases with age: at left atrium in I:12ms; in II:13ms and in III 14ms; at right atrium in I:32ms; in II:33ms and in III 38ms. Inter-atrial asynchrony increases with age: the onset of atrial contraction is 42ms more delayed at roof of left atrium in I, 44ms in II and 50ms in III. **Conclusion:** Ageing involves atrial myocardial fibrosis, a progressive prolongation of AECI and an increased intra-atrial and inter-atrial asynchrony, resulting in atrial dysfunction, which creates a substrate for atrial arrhythmias and thrombo-embolic events.

**P452**

## Ambulatory ECG-based T-wave alternans and heart rate turbulence in patients with acute myocardial infarction with or without diabetes mellitus

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**Introduction:** Patients with a positive T wave alternans (TWA) and heart rate turbulence (HRT) are characterized by an increased risk of ventricular tachyarrhythmias and sudden cardiac death risk. TWA, which reflect temporal and spatial repolarization abnormalities, respectively,have been proposed as useful indices to identify patients at risk of ventricular arrhythmias based on coronary artery disease. Previous studies have described the clinical utility of heart rate turbulence (HRT) as an autonomic predictor in risk-stratifying patients after myocardial infarction (MI). **Objectives:** Few studies have explored the characteristic and clinical manifestation in patients with ischemic heart diseases according to T-wave alternans (TWA) using modified moving average (MMA) method and heart rate turbulence (HRT). We assessed the utility of TWA and HRT as a risk marker in post-MI patients with Diabetes Mellitus or without Diabetes Mellitus. **Methods:** A analysis of 206 patients who underwent MMA-based TWA and HRT divided the patients into 3 groups: group-C of 63 controls;81 patients with myocardial infarction (group post-MI without diabetes);62 myocardial infarction with diabetes (group post-MI with diabetes).The TWA was calculated automatically using time-domain modified moving average method. **Results:** TWA values differed significantly between controls (38±16$\mu$V) and group post-MI with (64±18$\mu$V,p<0.05) or without (56±15$\mu$V,p<0.05) diabetes. Among myocardial infarction, the accidence of ventricular tachyarrhythmia in positive TWA (>47$\mu$v) is higher than in the negative TWA.Impaired HRT were observed most frequently in group post-MI with diabetes (P<0.05),especially the decrease of the HRT onset slope (TS) (p<0.001). In group post-MI with or without diabetes, the accidence of cardiac eventswereno significant difference.TWA was not correlation with TO or TS. **Conclusion:** The TWA value was differ between myocardial infarction and controls. Weaken HRT, increased To and decreased TS were observed in AMI patients. TWA and HRT may be strong and independent predictors of cardiac and arrhythmic death in myocardial infarction patients .

**P453**

## Value and safety of oral administration of flecainide stress test to unmask type 1 Brugada

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**Introduction:** Brugada Syndrome (BrS) includes a group of patients with a typical pattern of S-T segment elevation in right precordial leads, without structural heart disease who are at risk for ventricular fibrillation. This electrocardiogram (EKG) pattern may be intermittent in up to 40% of the cases and can be unmasked by sodium channel blockers. **Objectives:** To assess the value and safety of oral administration of flecainide to unmask BrS type I electrocardiographic pattern. **Methods:** We prospectively studied 12 symptomatic (palpitations/syncope) patients referred to our laboratory for having a suggestive but not diagnostic BrS EKG or family history of BrS. Single oral dose of flecainide 400 mg. was administered in-hospital. Resting 12-lead EKG with upper and standard right precordial leads were performed at 15, 30, 60 and 90 minutes after flecainide administration. Continuous EKG and vital signs were monitored for 24 hours. Wilcoxon test was used to compare EKG measures before and after the flecainide test. **Results:** Twelve patients were included: 9 men, median age 37.5 years (range= 22–50). None of them had structural heart disease by Doppler echocardiogram. In 7 patients (58.3%) the typical coved-type ECG pattern of BrS was unmasked, 3 of whom had family history of sudden cardiac death and 2 previous syncope. Median PR interval was 170 mseg (range= 120–200, IQR=154–190.3) before and 193 mseg (range=153–207, IQR=162–200) after flecainide administration (p=0.037). Median QRS duration increased from 90.5 mseg (range= 60–110, IQR 80–101.8) to110 (range 95–159, IQR 109.3–122) (p= 0.008). The median QTc interval, determined using the Bazett method, remained unchanged (from 420 mseg to 422 mseg. p=0.092). PR interval, QRS duration and QTc median difference after-before test was 20 mseg (range=-17- +57), 22.5 mseg (range= 0 to +59) and 20 mseg (range= -11- +77) respectively. There were no episodes of AV block, atrial or ventricular tachyarrhythmias. **Conclusion:** Oral administration of flecainide in a single dose of 400 mg. is a safety method and an alternative option to intravenous drugs to unmask type 1 Brugada electrocardiographic pattern.

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## Effects of long term right ventricular apical pacing on the right atrium

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**Introduction:** Permanent single chamber pacing can cause ventricular dyssynchrony and heart failure. However, its effect on right atrial (RA) dimension and function remains unknown. **Objectives:** To investigate anatomical and functional changes in the right atrium and its relationship if any to left ventricular function. **Methods:** 96 patients with VVI pacemakers implanted between 2002 and 2004 were included. Pacing was at the RV apex in all cases. Transthoracic echocardiogarphic measurements were obtained at baseline and annually. RA Ejection Fraction (RAEF) was calculated using Modified Simpson's method: (RA End Diastolic Volume–RA End Systolic Volume) x 100% RA End Diastolic Volume Mean and standard deviations were analyzed using independent T tests. Relationships between RA function and new onset TR as well as changes in LV parameters were investigated using Pearson's and Spearman's correlations. **Results:** 96 patients were enrolled. Only 75 patients were follow-up for a mean of 5.5 years. 25 patients' data were available for analysis till 7 years. Their mean age was 68.78 +/- 12.17 years old. 67.89% had complete heart block, 15.78% had sick sinus syndrome and 7.98% had AV nodal disease Mean RAEF declined from 43.90% at baseline to 31.45% at 5 years (p=0.008). Mean RA area, RA end-diastolic volume and RA end-systolic volume increased from 16.79 to 20.58 cm2 (p = 0.047), 50.78 to 69.30 ml (p = 0.043) and 31.28 to 50.20 ml (p = 0.036) respectively at baseline and 5 years. 22 patients developed new tricuspid regurgitation by 3rd year. Trans-tricuspid pressure gradient increased from 28.65 mmHg at baseline to 56.60 mmHg at 5 years (p= 0.01). LVEF declined from 63.60% at baseline to 52.09% at 5 years (p =0.02). 46 patients developed new atrial fibrillation at 3rd year and had persistent atrial arrhythmias thereafter. E/A reversal occurred after a mean of 2.5 years. E/A ratio and deceleration time at baseline and at 5 years were 0.86 and 1.58 (p = 0.392), and 251 and 199 ms (p = 0.092) respectively. RA function showed an inverse relationship to new onset tricuspid regurgitation and trans-tricuspid pressure gradient with Spearman's correlation(rs)= -0.954, a linear relationship to declining LVEF with Pearson's correlation(r)=0.958 and an inverse relationship to LV dimensions for both LVED volume(rs)= - 0.955 and LVES volume(rs)= - 0.878 **Conclusion:** Single chamber pacing at RV apex led to significant RA dilatation and dysfunction which may explain the worsening TR, new atrial arrhythmias and deterioration of LV function.

P455

## Effects of heparin and type of cannulation on the rate of symptomatic and asympomatic PTE in patients undergoing EPS and RFA

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**Introduction:** Radiofrequency catheter ablation(RFCA)has become established as an effective therapy for the treatment of many cardiac tachyarrhythmias.The risk of developing pulmonary embolic from electrophysiologic procedures has been reported to be 0 to 1.7 percent.However ,the incidence and clinical importance of asymptomatic PTE are not well known. **Objectives:** The purpose of the study was to evaluate the effect of heparin and types of cannulation on the rate of symptomatic and Asymptomatic PTE in patient undergoing EPS. **Methods:** Our prospective study evaluated the early onset PTE, in the first 24 hours after EPS.400 consecutive patients enrolled the study who underwent EPS in our center.Patients were allocated randomly in 4 groups due to 4 combination of determinants(cannulation,heparin ).PTE was evaluated by tomographic lung perfusion scintigraphy with$^{99}$TC albumin,plantar perfusion/aerosol ventilation and CTangiography. The presence of dyspnea,cough and chest pain was noted during 1 week of observation,then we started anticoagulation therapy.follow-up perfusion scan were obtained at 1 week after anticoagulation to assess response to therapy.Categorical data analyzed using Fisher's exact test and chi squer, p value less than 0.05 was considered significant. **Results:** A total of 388(213 F, 175 M)patients were included the study,with the mean age of 47(range15–80 years),12 of them met the exclusion criteria.PTE was detected in 46 of 388 (11.8%) patients evaluated.Table1 displays comparisons between 4 goups of 97.Of 46 patients with PTE,3 patients(1.2%) developed into symptomatic PTE ,amongst who had no heparinizaton,also two of them had one line type of cannulation.There was a significant increase in the rate of PTE in via one line type of canuulation versus separate(8% vs 18.5%,p<0.05).Type of cannulation changed the PTE rate independently from heparinization and even by heparinization the rate of PTE were more in one line type(6% vs 14.4%,p<0.05).There was a slight decrease in rate of early onset PTE due to use of heparin,but it is statically insignificant.(14.5% vs 18.5%,p>0.05).
**Image/graph I:**

| heparin | cannulation | frequency | Percent |
|---|---|---|---|
| Yes | one | 14 | 14.4% |
| Yes | separate | 6 | 6.1% |
| No | one | 18 | 18.5% |
| No | separate | 8 | 8.1% |
| Total | | 46 | 11.8% |

**Conclusion:** However,heparinization showed an insignificant decrease in early onset PTE,it did have effect on preventing the develop of asymptomatic PTE in to symptomatic one.Therefore, we suggest heparinization,moreover ,RFCA via separate type of cannulation is strongly recommended.

P457

## Single beat determination of intraventricular systolic dyssynchrony in patients with atrial fibrillation and systolic dysfunction

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**Introduction:** Evaluation of intraventricular dyssynchrony in patients with atrial fibrillation( AF) is difficult due to beat to beat variation. Additionally evaluation of mechanical dyssynchrony in traditional method is based on average of 5 to 10 beats which is exhausting and time consuming. Single beat evaluation of a beat with equal subsequent cardiac cycles has been proposed as an accurate method in patients with AF. **Objectives:** We aimed to evaluate intraventricular mechanical dyssynchrony by measuring time to peak systolic velocity between basolateral and basoseptal segments (septum to lateral wall delay) using Tissue Doppler Study (TDI) by 2 different methods. **Methods:** 31 patient (68±10.3 years) with heart failure (EF<35%) and AF rhythm, R-R cycle length more than 500 msec were evaluated. We found a target beat in which preceding R-R (R-R1) to pre-preceding R-R (R-R2) ratio was 1(RR1/RR2 = 1) then we measured intraventricular dyssynchrony in that cycle. Intraventricular dyssynchrony was also determined and averaged for 8 consecutive cardiac cycles. The values at RR1/RR2 = 1 were compared with average of intraventricular dyssynchrony in 8 cycles and the relationship between dyssynchrony were evaluated by paired T-test, linear pearson correlation ($r^2$), linear regression analysis. **Results:** The average of dyssynchrony in 8 cycles showed a positive correlation with dyssynchrony in target beat RR1/RR2 = 1. Average of dyssynchrony in target beat was 46.77 msec, and average of 8 cycle was =47.701, (P value=0.776, pearson linear correlation 0.769). **Conclusion:** Measurement of intraventricular dyssynchromy in basoseptal and basolateral segments in AF and heart failure patients in a single beat with RR1/RR2 = 1, was quite similar to the average value of 8 cardiac cycle.

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## Increased plasma level of copeptin in patients with atrial fibrillation

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**Introduction:** Copeptin, a stable 39-amino-acid glycopeptide derived from provasopressin, was reported to be high in patients with heart failure. It was closely related to prognosis of them. Atrial fibrillation (AF) affects cardiac function seriously. Therefore, it is reasonable plasma copeptin level may be an important marker for patients with AF. However, it has not been reported before. **Objectives:** We aimed to measure the plasma level of copeptin to prove that copeptin may be an important clinical marker for atrial fibrillation. Also, we tried to find the effect of RFCA on plasma copeptin, which may suggest the cardiac function status. **Methods:** We measured peripheral plasma level of copeptin in 51patients with AF before, immediately after and 2 days after RFCA by radioimmunoassay. Also, we measured coronary sinus plasma level of copeptin before and immediately after RFCA in these 51 patients. What's more, hat's plasma level of copeptin plasma level of copeptin before and immediately after RFCA in these 51 patients. peripheral plasma levels of copeptin in 15 age matched healthy subjects were also measured. Student's *t*-test and one-way analysis of variance were used for statistical analyses. Correlations between variables were tested by simple linear regression analysis. **Results:** The peripheral plasma level of copeptin in patients with AF (57.73 ± 15.10 pmol/l) was significantly higher than that (13.15 ± 4.63 pmol/l) in controls($P<0.01$). After RFCA, the peripheral plasma level of copeptin (42.26±13.11pmol/l) in patients with AFand was significantly decreased by 26.7% ($P<0.01$), and was futher decreased by 39.5% (to 25.56±6.42pmol/l, $P<0.01$) 2 days after RFCA. Coronary sinus plasma Copeptin level in patients with AF was 73.49±16.2pmol/l, which is 27.3% higher than that in peripheral plasma level. However, different from the variation feature of peripheral plasma copeptin level, the copeptin level in coronary sinus plasma (85.51±14.62) in patients immediately after RFCA was significantly increased by 16.4% after RFCA ($P<0.01$). Simple linear regression results showed that both peripheral (r=0.48, p<0.05) and coronary sinus (r=0.62, p<0.01) plasma levels of copeptin were positively related with left atrial area. **Conclusion:** Plasma copeptin level may be an indicator for AF and the prognosis of AF, which indicate that the vasopressin system is activated in patients with AF. RFCA not only terminates AF, but also improves cardiac function.

P459

## A nurse led ambulatory atrial fibrillation service reduces the rate of hospital admissions and also reduces in-hospital length of stay for patients with acute symptomatic atrial fibrillation

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**Introduction:** Atrial Fibrillation (AF) is the commonest cause of hospital admissions due to a cardiac arrhythmia.AF is the primary cause of admission in 46% of patients.AF can be symptomatic or asymptomatic.Symptoms vary with the ventricular rate, underlying functional status, duration of AF.There has been an increase rate of admission rate for acute AF.The LOS depends on the time required to achieve an optimal heart rate control and anticoagulation ± bridging with low molecular weight heparin(LMWH). **Objectives:** The aim of the service is to facilitate early safe discharges and also to provide a safe and continuous care in out-patient setting for stable patients.It reduces the need for hospital admission in minimally symptomatic patients and also reduces the LOS for those who required a period of in-patient treatment. The patients can be seen frequently in clinic in order to optimise their treatment. **Methods:** The service is run by two nurses. We present the data for two months(24th May-26th July 2011).

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All the patients suitable for the service were assesed by a Cardiologist prior to referrals. There were total of 45 patients.Of those, 38 patients were referred after being admitted and 7 patients who would have otherwise been admitted, were sent home on the same day. **Results:** There was 15% reduction in admission rate for acute AF during this period. There was significant reduction in LOS of the patients particularly in acute admission areas (table 1).The rate of readmission was 2.2%(1 patient re-admitted with heart failure).

Table 1:

| Patients referred from | Number of patients | LOS after referral to AF service |
|---|---|---|
| Acute admission area | 23 | 1-5 days (average 2.5 days) |
| Coronary Care Unit | 11 | 1-3 days (average 1.7 days) |
| Cardiac Ward | 4 | 6-9 days (average 5.7 days) |

**Conclusion:** Ambulatory AF service is a very safe, cost effective way of treating patients with acute AF. It reduces the admission rate in stable patients. It is also effective in reducing the in-patient LOS in symptomatic, unstable patients who required a period of treatment.

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**P460**

## Assessing of myocardial atrial deformations in CABG patients as predictor of perioperative cardiac arrhythmia

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**Introduction:** Atrial fibrillation (AF is the most common serious arrhythmia, encountered in clinical practice by patients undergoing coronary artery bypass graft surgery(CABG). **Objectives:** The aim of the study was to describe the atrial deformations in patients, undergoing operative revascularization and to correlate and make prognosis about risk for AF during perioperative phase. **Methods:** We evaluated 35 patients(mean age57±14) without previous history of AF, undergoing elective CABG. Echocardiography was performed in all patients before revascularization (baseline),5th day-early phase and one month after CABG (1mFU) and images were acquired (frame rate74±6frames/s) and analyzed offline in order to extract the strain (rate)curves using vector velocity imaging (VVI) software.Conventional measures of atrial function included peak transmitral and transtricuspidal A-wave velocity, A-wave velocity time integral, atrial volume index for the left and right atria. Doppler tissue imaging was used to estimate atrial contraction velocity(A′velocity). **Results:** The prevalence of perioperative AF was relatively low in early phase-6 patients (20%). New events of AF did not register in all patients group until end of 1.month.We found significant differences for the LA volume index in the 1. month follow up (32,99ml/$m^2$±6,1vs.29,85ml/$m^2$±6,8,p<0,05)vs baseline in patients group with AF.In addition, there are not differences in the group with AF as in early phase, so 1mFU. Atrial myocardial properties assessed by VVI - strain rate, and strain were significantly reduced ($P<0.0001$) in patients with AF as in early phase -(velocity3,2±1,4cm/s,strain9,3±4,2%;strainrate 2±0,9$s^{-1}$) and 1m FU too(velocity4,2±1,4cm/s,strain12,3±2%;strain rate 4,2±1,8$s^{-1}$) compared with baseline. In the group without AF we found greater values for myocardial velocity, strain (rate) after 1 m FU(velocity 4,8±1,3 cm/s, strain 14.6±2%; strain rate 4,9±1,2$s^{-1}$,p=0,64). Atrial strain ($P<0.0001$; coefficient, 0.015; SE, 0.003) and strain rate ($P<0.0001$; coefficient, 0.372; SE, 0.075) parameters alone were confirmed as independent predictors of sinus rhythm maintenance by multivariable analysis. **Conclusion:** The assessment of CABG patients is possible nowadays to reduce the risk of occurrence AF. Patients with higher atrial strain and strain rate appear to have a greater likelihood of staying in sinus rhythm. Lower atrial strain and strain rate measurements may predict the perioperative risk of AF in CABG patients

**P461**

## Atrial volumetry in atrial fibrillation as assessed by cardiac magnetic resonance imaging: a marker for the stage of the disease?

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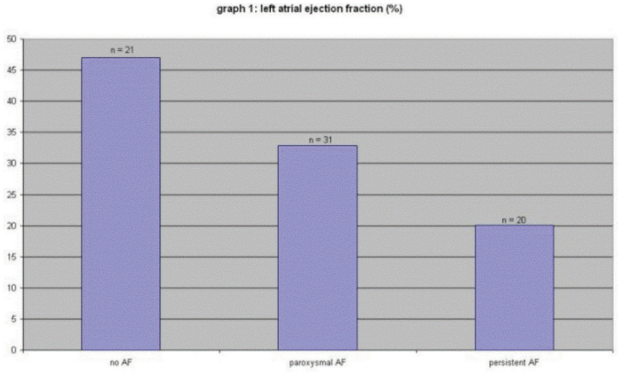
**Introduction:** Over time, atrial fibrillation (AF) is characterized by both progressive electrophysiological and morphologic changes of the atrial myocardium; the extent of these changes has considerable implications for the choice of the optimal treatment strategy. **Objectives:** Information about the mechanic atrial function may provide insights into the functional stage of the disease and might improve clinical decision making. **Methods:** A total of 72 patients (pts) (21 pts without AF, 31 pts with paroxysmal AF and 20 pts with persistent AF) underwent magnetic resonance imaging (MRI)-based volumetry of the left and right atrium (LA and RA, respectively) using a 1.5 Tesla scanner. Endsystolic and enddastolic atrial volumes and computed atrial ejection fraction (AEF) were compared between the groups. **Results:** Left atrial ejection fraction decreases with chronification of AF (graph 1) (no AF vs paroxysmal p = 0.02, paroxysmal vs persistent p = 0.03). Left atrial enddiastolic volumes increase during the process of chronification. (no AF vs. paroxysmal p=0.04, paroxysmal vs. persistent p=0.05). Similar data was obtained for the right atrium (graph 2).

**Image/graph I:**




**Image/graph II:**

| | no AF | paroxysmal AF | persitent AF |
|---|---|---|---|
| n (pts) | 21 | 31 | 20 |
| left atrial enddiastolic volume | 56.4 | 81.3 | 97.0 |
| left atrial endsystolic volume | 30.4 | 55.0 | 79.7 |
| left atrial ejection fraction | 47.0 | 32.9 | 20.0 |
| right atrial enddiastolic volume | 43.7 | 58.7 | 66.8 |
| right atrial endsystolic volume | 23.8 | 42.0 | 52.7 |
| riht atrial ejection fraction | 46.4 | 29.3 | 21.4 |

**Conclusion:** Atrial volumes were well correlated with the different stages of AF progression. The pts in the later stages of the disease displayed increased atrial volumes and reduced AEF. It seems conceivable that atrial volumes and AEF could be useful in the selection of the treatment strategy deemed appropiate for individual pts, possibly as well serving as a tool to estimate AF burden. Further studies correlating atrial volumes with treatment outcomes, especially with the success of rhythm control, are needed.

**P462**

## Myocardial apoptosis and lipid peroxidation after sinus rhythm restoration in patients with persistent atrial fibrillation

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**Introduction:** Atrial fibrillation leads to remodeling of atria which may modulate the process of apoptosis an lipid oxygenation in cardiomyocytes. **Objectives:** Evaluation of the influence of atrial fibrillation (AF) and sinus rhythm restoration on induction of apoptosis and oxidative stress in patients treated by elective cardioversion (pharmacological or electric). **Methods:** We observe 121 pts (84 men) at age 50–69 year (mean age 56,8 yrs) with symptomatic persistent AF, referred to cardioversion (CV), in whom sinus rhythm restoration longer than 1 month was achieved. Electrical CV with use of biphasic rectangular impulse was performed in 91 pts and pharmacological CV, using iv administration of amiodarone, was done in 30 pts. Serum concentrations of C-reactive protein (CRP), NTproBNO and total, HDL and LDL cholesterol as well as triglycerides were also evaluated before and 1 month after sinus rhythm restoration. Biochemical marker of apoptosis: TRIAL/Apo2L as well as peroxidasis products PerOx and ImAnOx were evaluated before and 1 month after CV. **Results:** Significant reduction of CRP (3,0 vs 6,1 mg/ml; p=0,02) and NTproBNP (164,0 vs. 642,6 pg/ml; p=0,001) were observed in all pts during 1 month follow up after rhythm restoration. There were no changes of serum lipids concentration during follow-up. TRIAL/Apo2L concentration before CV was in normal limit and increased significantly during follow-up (1275,66 vs 946.26 pg/ml; p=0.002). The lowest differences of TRIAL/Apo2L during follow-up were observed in pts with pharmacological CV. Mean concentration of PerOx decreased 1 month after (326,0 vs 450.3 umol/l; p=0.002). Similarly ImAnOx concentrations also reduces during follow-up after CV (134.63 vs 161.10 umol/l; p=0.02). **Conclusion:** 1. Reduction CRP concentration after sinus rhythm restoration may indicate the involvement of inflammatory process in the pathogenesis of atrial fibrillation. 2. Reduction of NTproBNP serum level after CV show a positive influence of sinus rhythm restoration on haemodynamic function of ventricles. 3. Significant increase of TRIAL/Apo2L serum level1 month after sinus rhythm restoration, particularly in pts after electrical CV, suggest an influence of both electrical CV and sinus rhythm restoration on induction of apoptosis. 4. Atrial fibrillation may lead to collection of harmful lipids peroxidation products. Sinus rhythm restoration diminish this process and prevent the development of myocardial injury due to peroxidation products accumulation in cardiac cells.

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## Utilizing a robotic system in atrial fibrillation ablation: early experience and practice evolution

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**Introduction:** Robotic catheter navigation (RCN) and ablation has emerged in the recent years for the management of atrial fibrillation. **Objectives:** We describe a single center's experience adopting a robotic catheter navigation system (Hansen Medical). **Methods:** The initial cases performed over 18 months were reviewed including patients with paroxysmal (PAX) and persistent (PER) atrial fibrillation. Intracardiac echocardiography guided circumferential pulmonary vein antral isolation (PVAI) was performed using RCN integrated with an electroanatomic mapping system. In addition, PER received isolation lines as needed to restore sinus or organized atrial rhythm. **Results:** Of 44 patients, 24 had PAX and 20 PER atrial fibrillation (98% male, 63 ± 6 years, Caucasians 93%, EF 0.54 ± 0.06 and left atrium diameter 45 ± 10 mm). PER cases were mainly later in the experience. Median follow up time was 17 ± 7 months. There were no significant baseline differences between the two groups except for EF and left atrial diameter (PAX 0.55± 0.06 and 45± 10 mm, PER 0.48± 0.08 and 52 ± 5 mm, p=0.005 and p=0.003 respectively). Median follow up was 16 ± 7 months. Acute complete PVAI was achieved in all patients. Procedure, fluoroscopy and ablation times were not significantly different between groups: 455 ± 119 vs. 452 ± 132 min, p=0.839; 20.6 ± 9.5 min vs. 19.1 ± 8.1 min, p=0.642 and, 4625 ± 508 sec vs. 4272 ± 464 sec p=0.112 for PER and PAX respectively. Procedure time for both groups diminished progressively. Three complications included esophageo-pericardial fistula, femoral and right phrenic nerve palsy all of whom recovered. **Conclusion:** RCN adoption is associated with a learning curve. Procedure time decrease with increasing operator and facility experience encouraged RCN utilization such that PER case times approximated those for early PAX cases.

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## Group education as an effective intervention to improve anticoagulation control in patients taking warfarin

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**Introduction:** Treatment with vitamin K antagonists is effective in various clinical conditions associated with thromboembolic events. A narrow therapeutic range is necessary for antithrombotic efficacy and low risk of bleeding. Patient education is an essential component in quality management of the anticoagulated patient. However, doubts remain about the effectiveness of different patient education strategies, and there is lack of evidence regarding group education for patients on anticoagulation therapy. **Objectives:** To assess whether group education strategy is an effective intervention to improve anticoagulation control of patients on anticoagulation therapy with warfarin. **Methods:** This prospective observational study enrolled all consecutive adult patients on oral anticoagulation attending the anticoagulation clinic of Hospital Municipal Odilon Behrens, Brazil. Anticoagulation control quality was assessed by calculating the time in therapeutic range (TTR) of the anticoagulation clinic, measured as the fraction of INR in range. Group education comprised weekly sections, which involved basic concepts about indications for anticoagulation therapy, risk-benefit, lab monitoring, food and drug interactions, and when to seek emergency care. Baseline was the first day this intervention was performed, and follow-up time was 3 months. **Results:** This study included 250 patients (mean age 64 ± 10 years, 55% women), 60% of whom participated in the educational group. The total number of INR tests was 1,115. The TTR of the anticoagulation clinic increased significantly after the begging of group education sessions: 47.8% on baseline vs. 61.8% in the end of follow-up (p = 0.032). A significant linear association between TTR and time after the beginning of the educational group was observed. The beta coefficient of the linear regression equation was 3.50/month (p <0.001), which means that the mean increase in TTR of the anticoagulation clinic after the beginning of the educational group was3.5% per month. The percentage of variance explained by the model ($R^2$) was 57.6% (p <0.001). **Conclusion:** The establishment of a group education strategy for patients taking warfarin was associated with a clinically relevant increase in TTR. This study suggests that group education is an effective intervention in improving anticoagulation control.

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## Quality of oral anticoagulation with warfarin in everyday practice

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**Introduction:** Oral anticoagulation (OAC) is indicated in moderate and high risk patients with non-valvular atrial fibrillation (NVAF). The currently widely used OAC agent, warfarin, is effective but has a narrow safe therapeutic window. **Objectives:** We aimed to examine the frequency of maintaining this therapeutic window in daily practice. **Methods:** We enrolled consecutive NVAF patients presenting to 5 busy general hospitals in Kuwait for their regular international normalized ratio (INR) testing. Patients had to have been on warfarin for more than 3 months and had done at least 5 INR tests. We recorded up to 20 previous INRs. Time in therapeutic range (TTR) was assessed by the Rosendaal method and the percentage of INRs in range. **Results:** 369 NVAF patients underwent 4392 INR measurements (mean age 62 years, 56% females, 78% had hypertension and 58% had diabetes). Average duration of OAC use was 13 months. 47% of all INRs were in the therapeutic range of 2–3. Rosendaal TTR was 52.6%.

| | OAC >1 year n=301 n (%) | OAC 6–12 months n=30 n (%) | OAC 3–6 months n=38 n (%) |
|---|---|---|---|
| INRs in range | | | |
| INR<2 | 1429 (38) | 120 (39) | 130 (47) |
| INR 2–3 | 1808 (48) | 125 (41) | 108 (39) |
| INR>3 | 533 (14) | 59 (19) | 36 (13) |
| Rosendaal method | | | |
| Overall TTR (%) | 53% | 52% | 48% |
| TTR>58% | 135 (45) | 15 (50) | 14 (37) |

INR, international normalized ratio; TTR, Time in therapeutic range.

**Conclusion:** The quality of OAC with Coumadin in non-selected daily practice in Kuwait is poor. This can have detrimental effects on patient outcomes. Educational program directed to patients and physicians is urgently needed to improve this. The role that new OACs can play in this matter needs to be explored.

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## Emergency room management of atrial fibrillation in the Middle East: findings from Gulf SAFE

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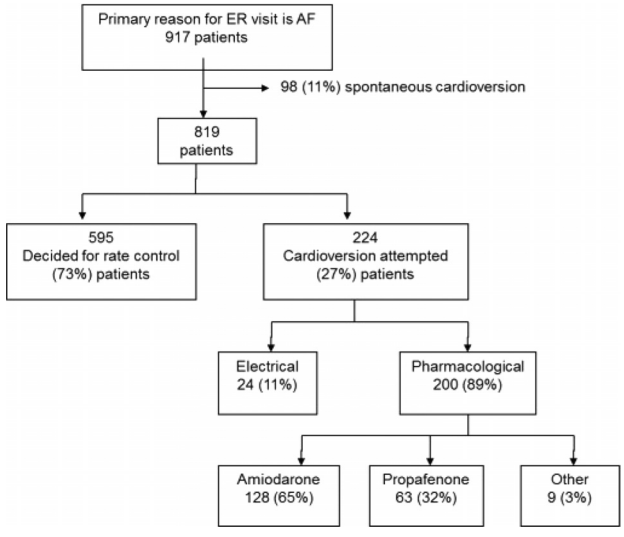
**Introduction:** Atrial fibrillation (AF) is the most common serious cardiac arrhythmia and its prevalence is expected to increase. There is lack of data about practice patterns of AF in the Arab Middle East. **Objectives:** To study emergency room (ER) management of patients presenting with AF in the Middle East. **Methods:** We used data from the Gulf Survey of Atrial Fibrillation Events (Gulf SAFE), a prospective multinational registry of consecutive AF patients presenting to ERs of 23 hospitals in the Gulf region of the Middle East between October 2009 and June 2010. **Results:** Of 2043 patients enrolled, we analyzed data from 917 patients whose primary reason for ER visit was AF (age 52±16, age≥75 (9%),56% male, 26% with diabetes, 48% with hypertension, 12% with history of heart failure, 6% with prior stroke/transient ischemic attack, 17% with history of significant valvular disease). Types of AF were: first attack 46%, paroxysmal 26%,persistent 11%, permanent 16% and unknown 1%. Most patients (75%) presented within 48 hours of symptom onset, and were admitted to the hospital (76%). Rate control was the strategy used in most patients (73%, Figure) and 1.5% of them left ER in sinus rhythm (SR). When cardioversion was attempted (27%), 47.8% of patients left ER in SR. Cardioversion was most often pharmacological (89%) with amiodarone or propafenone.
**Image/graph I:**

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**Conclusion:** Despite being relatively young with short symptom duration, most Middle Eastern patients presenting to ERs because of AF get admitted, and cardioversion is not attempted in the majority of them.

**References:**
Zubaid M, Rashed WA, Alsheikh-Ali AA, Almahmeed W, Shehab A, Sulaiman K, Al-Zakwani I, Alqudaimi A, Asaad N, Amin H; on behalf of the Gulf Survey of Atrial Fibrillation Events (Gulf SAFE) Investigators. Gulf Survey of Atrial Fibrillation Events (Gulf SAFE): Design and Baseline Characteristics of Patients With Atrial Fibrillation in the Arab Middle East. Circ Cardiovasc Qual Outcomes. 2011; 4:477–482.

**P467**

## Six-month patient outcomes in a contemporary Middle Eastern registry of atrial fibrillation (Gulf SAFE)

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**Introduction:** Atrial fibrillation (AF) is the most common serious cardiac arrhythmia and its prevalence is expected to increase. There is lack of data about outcomes of AF in the Arab Middle East. **Objectives:** To study the clinical characteristics and six-month outcomes of patients with atrial fibrillation (AF) in the Middle East. **Methods:** We used data from the Gulf Survey of Atrial Fibrillation Events (Gulf SAFE), a prospective multinational registry of consecutive AF patients presenting to emergency rooms (ERs) of 23 hospitals in the Gulf region of the Middle East between October 2009 and June 2010. **Results:** We enrolled 2043 patients (age 57±16, age≥75 (14%),48% female, 30% with diabetes, 53% with hypertension, 28% with history of heart failure, 13% with prior stroke/transient ischemic attack, 24% with history of significant valvular disease). Types of AF were: first attack 37%, paroxysmal 17%, persistent 10%, permanent 33% and unknown 3%. In non-valvular AF patients,CHADS2 score was 0 in 25%, 1 in 27% and ≥2 in 48%. AF was the primary reason for ER visit in 45% of patients, of whom 75% presented within 48 hours of symptom onset. Six-month mortality was 12.5% (3.5% for those whose primary reason for ER visit was AF and 22.3% for those whose presentation was due to other conditions). Table shows six-month outcomes.

Table shows six-month outcomes.

| Outcome | N=1826* n (%) |
|---|---|
| TIA/Stroke | 48 (3) |
| Peripheral Embolization | 3 (0.2) |
| Major bleed | 23 (1.3) |
| Admission for AF | 112 (6) |
| Admission for heart failure | 152 (8) |

* Patients analyzed excluded those who died prior to 6-month follow up and 81 patients lost to follow up.
TIA= transient ischemic attack; AF= atrial fibrillation

**Conclusion:** Middle Eastern patients presenting to ER with AF are relatively young with high risk profile. Their mortality differs based on the reason for ER presentation. Their outcome at six-month outcomes is not favorable.

**References:**
Zubaid M, Rashed WA, Alsheikh-Ali AA, Almahmeed W, Shehab A, Sulaiman K, Al-Zakwani I, Alqudaimi A, Asaad N, Amin H; on behalf of the Gulf Survey of Atrial Fibrillation Events (Gulf SAFE) Investigators. Gulf Survey of Atrial Fibrillation Events (Gulf SAFE): Design and Baseline Characteristics of Patients With Atrial Fibrillation in the Arab Middle East. Circ Cardiovasc Qual Outcomes. 2011; 4:477–482.

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## C-reactive protein levels in adult nigerians with non valvular atrial fibrillation

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**Introduction:** Atrial fibrillation is the most common sustained cardiac arrhythmia. Inflammation has been implicated in atrial remodeling, and the pathogenesis of atrial fibrillation. Elevated C -reactive protein, as a marker of inflammation, has remained a significant predictor of early atrial fibrillation relapse after successful cardioversion. Angiotensin Converting Enzyme Inhibitors and HMG-CoA Reductase Inhibitors appear to be effective in the prevention of atrial fibrillation, probably due to their anti inflammatory effects. **Objectives:** The main objective of this study was to determine the relationship between C-reactive protein and Non-valvular (non rheumatic) atrial fibrillation in adult Nigerians. **Methods:** Using a case–controlled design, C–reactive protein levels and echocardiography findings in 63 adult patients with non-rheumatic atrial fibrillation was compared with that of 63 age, gender and cardiovascular disease matched controls. To have an estimate of C-reactive protein levels in normal Nigerians, C-reactive protein levels in 22 apparently normal individuals were also assessed. **Results:** Hypertension was the most common past medical history in the atrial fibrillation group (50.8%) and most of them presented with symptoms suggestive of heart failure (82.8%). C–reactive protein levels were higher in the atrial fibrillation group, when compared with controls ($p<0.00001$). Gender was found to be the strongest predictor of left atrial volume, with males having larger left atrial volumes than females ($p=0.01$) There was a positive correlation between both left and right atrial size and C-reactive protein levels, and left atrial volume was the strongest predictor of C-reactive protein levels ($p=0.007$). **Conclusion:** Based on the above results, it was thus concluded that; Patients with atrial fibrillation have significantly higher C-reactive protein levels than patients in sinus rhythm, who have comparable cardiovascular diseases.

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## Impact of chronic kidney disease in echocardiographic stroke risk predictors

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**Introduction:** Recent studies have shown a relation between chronic kidney disease (CKD) and thromboembolism in atrial fibrillation (AF) using clinical endpoints. The presence of left atrial appendage (LAA) thrombi (T), LAA low flow velocities (LFV) and dense spontaneous echo contrast (SEC) are well known echocardiographic signs of increased stroke risk in patients with AF. There are no studies regarding the relation between CKD and markers of thrombotic risk identified by transesophageal echocardiogram (TEE). **Objectives:** To evaluate the impact of estimated glomerular filtration rate (eGFR) in echocardiographic predictors of stroke. **Methods:** Prospective study of a population of 359 consecutive patients (68.6+-10 years; 63.5% men) in AF underwent TEE and assessment of emptying and filling LAA flow velocities, degree of SEC and presence of LAA T was performed. eGFR was computed using the Cockroft-Gault (CG) equation and the Modification of Diet in Renal Disease (MDRD) formula. Patients were divided according eGFR in three groups for each formula estimating eGFR: A <30ml/min; B ≥30 to 60ml/min; C ≥60ml/min. Comparisons were performed between groups, namely for the prevalence of echocardiographic changes. **Results:** Average eGFR was 60.5±21.9ml/min using the CG equation and 71.0±29.7ml/min when using the MDRD formula. Patients with decreased eGFR were older (A 77.8±8.1 vs B 72.3±7.9 vs C 65.3±9.7 $p<0.001$). A moderate negative association was found between the CHADS2Vasc classification and eGFR assessed through the CG equation (r -0.371). LAA T were found in 9.5%, LAA LFV (maximum velocity <20/cm) in 14.2% and dense SEC (≥III/IV) in 27.5%. No differences were found regarding the prevalence of LAA T, LAA LFV and dense SEC according to the previously defined eGFR groups, using both the MDRD formula (LAA T A 0% vs B 10.4% vs C 10.2% p n.s.; LAA LFV A 6.7% vs B 13.5% vs C 15.7% p n.s.; LAA dense SEC A 28.0% vs B 26.9% vs C 27.7% p n.s.) and the CG equation (LAA T A 0% vs B 7.7% vs C 10.5% p n.s.; LAA LFV A 15.3% vs B 20.4% vs 12.9% p n.s.; LAA dense SEC A 33.3% vs B 27.9% vs C 25.5% p n.s.). **Conclusion:** An association between a risk classification scheme based on clinical data (CHADSVasc) and eGFR was found. Despite this, we did not find an increased prevalence of echocardiographic risk factors in patients with CKD. We propose that the role of left atrial dysfunction may not be as important as age, and other clinical variables, in the increased risk of stroke in patients with CKD and AF.

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## Left atrial speckle tracking: a safe surrogate for transesophageal echocardiogram in patients undergoing atrial fibrillation cardioversion?

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**Introduction:** Patients presenting to the emergency department with atrial fibrillation (AF) are a challenge. Transesophageal echocardiography (TEE) is recommended before cardioversion for minimizing the risk of stroke. Despite this, TEE is an invasive and uncomfortable examination for the patient and surrogate alternative tests are needed. Compromised left atrial deformation is a marker of dysfunction and may be related to an increased risk of stroke. **Objectives:** To evaluate a possible relation between left atrial deformation compromise and TEE changes suggestive of an increased risk of stroke. To define a cutoff point that can select patients with low risk of stroke and no need of pre-procedure TEE. **Methods:** 52 consecutive patients (aged 66.6±12.9; 36.5%♀) in AF were evaluated through conventional transthoracic and transesophageal echocardiogram (TTE and TEE). LA function (divided in 6 segments in apical 4C) was studied using Speckle Tracking with a GE Vivid 7 echocardiograph with quantification longitudinal S and SR, segmental velocities, transversal and longitudinal displacement. The presence of thrombus (T), spontaneous echo contrast (SEC) and left atrial appendage (LAA) maximum filling and emptying velocities (MFV and MEV) were measured by TEE. Comparisons were performed between the different LA segments and different measured parameters according to the presence of T, dense SEC and correlated with the values of LAA ME and MF velocities. Optimal cutoff were used for speckle tracking derived parameters in order to define high and low risk groups for TEE changes. **Results:** After analysis of the different studied segments of the left atrium and different parameters derived from speckle tracking, peak diastolic strain rate of the inferior septal portion of the left atrium in TTE displayed the higher acuity for the diagnosis of LAA T in TEE (AUC 0.841 $CI_{95\%}$ 0.713–0.927 $p<0.0001$). No LAA thrombi were found in the 24 patients with peak diastolic strain rate ≥ 1.27. These patients also had higher LAA flow velocities and less SEC. **Conclusion:** Further studies are needed to confirm these preliminary findings and confirm if patients with atrial fibrillation and preserved left atrial deformation may safely undergo cardioversion without previous transesophageal echocardiogram.

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## Angiographic findings and clinical profile among patients with atrial fibrillation presenting for coronary angiography

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**Introduction:** In clinical practice coronary artery disease (CAD) is frequently associated with atrial fibrillation (AF). However, the precise etiopathogenetic role of myocardial ischemia in patients (pts) with AF is poorly understood. **Objectives:** Aim of this retrospective study was to assess the prevalence of significant CAD in relation to the presence or absence of AF in an unselected consecutively collected patient population referred for selective coronary angiography (SCAG). **Methods:** Records of pts admitted to a single institution in 2 randomly selected months (April and November 2010) were evaluated. We compared pts with AF at admission or documented within the last 12 months to those without AF. Clinical characteristics, indication for SCAG, blood count, serum biochemistry, findings at SCAG, mode of treatment offered and medications at discharge were collected and analyzed. Univariate analysis was performed to assess factors significantly associated with a negative and a positive outcome of SCAG. Then significant factors where entered in multivariate analysis. **Results:** 494 pts were included in the study population, 122 patients had AF (24.5%). These pts were older (mean 65.5 years vs. 60 years; p=0.041), more often women (41% vs. 29%; p=0.013), had a history of congestive heart failure (39% vs. 17%; p=0.001). Indication for SCAG among AF pts was more frequently atypical chest pain together with shortness of breath and palpitations (57% vs.19%; P=0.001). Non-AF pts presented more with ACS and typical angina (61% vs.20.5%; p=0.001). AF pts showed more non-significant epicardial CAD (75% vs. 33%); while non-AF pts had more 3 vessel CAD (18% vs. 6%; p=0.001). More AF pts where treated conservatively (66% vs. 43%;p=0.001), while more non-AF pts had PCI. AF pts were less likely to use aspirin (67% vs. 87%;p=0.001) and clopidogrel(13% vs.47%;p=0.001), and more likely to use warfarin(88.5% vs. 4.8%;p=0.001), digoxin (17% vs. 3%;P=0.001) and amiodarone(14% vs. 1%; p=0.001). In multivariate analysis, atrial fibrillation was independently associated with a negative SCAG. **Conclusion: Pts with AF presenting for SCAG showed a significantly lower prevalence of clinically relevant CAD.** SCAG frequently did not contribute to identify ischemia substrate, AF *per se* might be responsible for the leading symptoms. Furthermore, etiological factors different from CAD should be focused as the uderlying heart disease in AF pts.

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## Does localization of the focus of atrial tachycardia influence clinical course?

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**Introduction:** The source of the focal atrial tachycardia (FAT) is often located in anatomically localized structures. The veins entering the atria are electrophysiologically and histologically distinct from the atrial muscle. Arrhythmias originating from the veins may therefore differ from atrial originating ones. **Objectives:** The aim of this study was to evaluate the clinical and electrophysiological properties of FAT originating from different anatomical structures. **Methods:** Seventy patients (37 F), mean age 31.7+/-16 years with FAT and structurally normal heart were included in this study. The clinical course, the data from ECGs (standard, 24-hour), echocardiographic and electrophysiological studies (EPS) were studied. The localization of the FAT origin was based on EPS and RF ablation results. The procedure and clinical outcome were assessed on 60.9+/-50 months follow up. **Results:** Twenty of the patients (28.6%) had the focus of the arrhythmia in vessels (coronary sinus–7, vena cava superior–2, left upper pulmonary vein–10, right upper pulmonary vein–1). These patients did not significantly differ from those with the atrial muscle focus in respect to sex, age, BMI, clinical signs and symptoms, disease duration, coexisting cardiovascular diseases and pharmacotherapy used. There were no significant differences between both analyzed subgroups in echocardiographic measurements and in the average cycle length of AT in EPS (402.3+/-91 ms from vessels vs 400.7+/-89 ms from atria, p=ns). Incessant tachycardia was caused more often by foci located in atrial muscle (23/50) while paroxysmal or recurrent tachycardia originated in veins (4/20), p=0.043. In 20 patients with decreased (<50%) left ventricle ejection fraction there was a significant improvement of EF after RF ablation, regardless of the localization of arrhythmia focus. **Conclusion:** Incessant atrial tachycardia is mainly caused by an atrial muscle originating focus, the veins localization mostly contribute to paroxysmal type of arrhythmia.

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## Clinical and electrophysiological characteristics of slow atrioventricular nodal reentrant tachycardias

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**Introduction:** Atrioventricular nodal re-entrant tachycardia (AVNRT) is a common form of paroxysmal supraventricular tachycardia (PSVT) that is readily amenable to radiofrequency catheter ablation (RFA). At times, AVNRT can be mistaken for other, less amenable arrhythmias, especially when the tachycardia cycle length (TCL) is prolonged. **Objectives:** We sought to compare the clinical and electrophysiologic characteristics of slow AVNRT to non AVNRT PSVTs. **Methods:** This was a retrospective cohort analysis of all adults undergoing electrophysiology study for slow PSVT (TCL500msec), excluding atrial fibrillation/flutter. Diagnosis was confirmed with standard electrophysiologic techniques. Slow AVNRT patients were compared with non-AVNRT PSVT patients using Student's t-test and the chi-square as appropriate. A $p<0.05$ was considered statistically significant. **Results:** Among 1826 consecutive patients undergoing PSVT ablations, 86 patients exhibited slow PSVT. Slow AVNRT occurred in 42 patients; the remaining 44 non-AVNRT patients had atrial tachycardia, inappropriate sinus tachycardia, and junctional tachycardia. Patients with slow AVNRT had longer baseline QT intervals (424 v. 397ms, $p<0.02$), greater ejection fraction (EF) (52 v. 42%, $p<0.03$), slower baseline heart rate (65 v. 79bpm; $p<0.001$), and more often presented in sinus rhythm ($p<0.002$), were more likely to take thiazides ($p<0.03$) and less likely to have a cardiomyopathy ($p=0.002$). Electrophysiologically, slow AVNRT patients had longer AV block cycle length (448 v. 406ms, $p<0.05$), longer AVNERP cycle length (591 v. 529ms; $p<0.02$), shorter SVT VA time (71 vs 272ms; $p<0.001$), and had a higher incidence of dual AV nodal anterograde pathways ($p<0.001$). Age, BMI, gender, race, cardiac symptoms, frequency and duration of palpitations, diabetes, hypertension, PR interval, QRS duration, AH interval, HV interval, and left atrial diameter were comparable between the two groups. **Conclusion:** Patients with slow AVNRT have higher EF, slower heart rates at baseline, more often present in sinus rhythm and have structurally normal hearts when compared to slow non-AVNRT PSVTs. These features may help in assessment of the likelihood that a slow narrow complex tachycardia is AVNRT and hence more amenable to RFA.

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## Study on the correlation between ventricular remodeling, impairment of connexin 43 and ventricular fibrillation in rats with myocardial infarction

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**Introduction:** Various malignant arrhythmia (particularly ventricular fibrillation) after myocardial infarction (MI) is the main cause of sudden death in patients. And some recent research suggests that ventricular remodeling and myocardial connexin 43 (Cx43), a essential structure of myocardial electrical coupling, are closely related to the damage of heart's electrical stability after MI. **Objectives:** To explore the correlation between myocardial Cx43, heart structure and ventricular fibrillation threshold in rats with MI. **Methods:** Male SD rats were randomly divided into sham operation group and model group. MI model of rats was established by ligating left anterior descending coronary artery, and rats in sham operation group were only punctured without ligating. One month after modeling ventricular fibrillation threshold was detected by electricity stimulation, and heart weight index was calculated after weighing, while left ventricular internal diameter was measured by image analysis after hematoxylin-eosin staining, and expression of Cx43 were observed by immunohistochemical methods. **Results:** Compared with sham operation group, ventricular fibrillation threshold decreased (4.80±1.30) vs (10.33±3.06) V, heart weight index increased (4.19±0.62) vs (3.37±0.35) mg/g, left ventricular internal diameter increased (6.07±0.93) vs (3.37±0.44) mm, while positive express area of Cx43 protein decreased (1602.29±258.28) vs (3325.72± 328.63) $\mu m^2$ and average optical density of Cx43 protein expressions decreased (0.23±0.02) vs (0.27± 0.03). These results were statistically significant(P□ƒ0.05 or P□ƒ0.01), after one month of operation.Correlation analysis showed: ventricular fibrillation threshold and heart weight index and left ventricular diameter was negatively correlated (Correlation coefficients were -0.744 and -0.763, P <0.05).Ventricular fibrillation threshold and myocardial positive express area of Cx43 protein was positively correlated (correlation coefficient 0.834, P <0.01).Multiple regression analysis showed that: The regression equation between ventricular fibrillation threshold and myocardial positive express area of Cx43 protein was Y =- 0.068 +0.003 X (coefficient of determination 0.7, P <0.01). **Conclusion:** The lower ventricular fibrillation threshold in rats with MI is closely related to ventricular remodeling and myocardial Cx43 damage after MI. And the positive express area of Cx43 protein play a key role for predicting the occurrence of ventricular fibrillation.

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## Incidence and clinical significance of ventricular arrhythmias occurring during exercise stress testing

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**Introduction:** Ventricular arrhythmias (VA), particularly ectopic ventricular beats (EVB), can occur during exercise stress testing (ET). **Objectives:** The aims of this study were to assess the incidence and clinical significance of VA occurring during ET in subjects with and without evidence of heart diseases (HD). **Methods:** This study concerns 3826 males who performed an ET from January 2007 to December 2010. Based on evidence of HD the subjects were divided in two groups: 3000 (78.4%), mean age 61.9±11.5 years, with HD (group A) and 826 (21.6%), mean age 45.6±14.9 years, without evidence of HD (group B). The subjects with VA occurrence were followed for 30±13 months and the end points were the occurrence of acute coronary syndrome (ACS), heart failure (HF), stroke and sudden cardiac death (SCD).

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**Results:**

| VA | Group A | Event FU | Group B | Event F.U. |
|---|---|---|---|---|
| EVB | 822 | uneventful | 188 | uneventful |
| NSVTex | 20 | 1 Stroke | 6 | uneventful |
| NSVTrec | 18 | 6 HF | | |
| NSVTex&rec | 10 | 3 ACS<br>2 SCD | | |
| SVT | 1 | 1 SCD | | |

As shown in table 1, during follow-up (FU) : 1) ectopic ventricular beats (EVB) occurred in 822/3000 (27,4%) in group A and 188/826 (22,76%) in group B, 2) non sustained ventricular tachycardia (NSVT) occurred in 6/826 (0,73%) in group B, only during the exercise, and in 48/3000 (1,6%) in group A, respectively in 20/48 (41,6%) during exercise, in 18/48 (37,5%) during recovery and in 10/48 (20,8%) during exercise and recovery from exercise, 3) sustained ventricular tachycardia (SVT) occurred during exercise only in one patient in group A that underwent ICD implantation, because a resuscitated cardiac arrest. The follow-up was uneventful in all cases of EVB occurrence, but 1/20 (5%) of NSVT occurrence during exercise in group A developed stroke, 6/18 (33,3%) of NSVT occurrence during recovery developed clinical evidence of heart failure during the follow-up, and 3/10 (30%) of NSVT occurrence during exercise and recovery developed clinical evidence of ACS, whereas 2/10 (20%) underwent ICD implantation, because a resuscitated cardiac arrest. **Conclusion:** The follow-up was uneventful in all cases of EVB occurrence, but one case of NSVT occurrence during exercise in group A developed stroke, one with SVT and twenty percent of NSVT occurrence during exercise and recovery underwent ICD implantation because of a resuscitated cardiac arrest, about thirty three percent of patients with NSVT occurrence during recovery developed clinical evidence of heart failure, and thirty percent of patients with NSVT occurrence during exercise and recovery developed clinical evidence of ACS.

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## Circadian arrhythmias in patients with ischaemic cardiomyopathy of ejection fraction <35%

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**Introduction:** Patients with poor left ventricular ejection fraction (PLVEF, defined LVEF<35%) is known to be associated with a diurnal surge of plasma catecholamine level. Elevated levels of plasma catecholamines are associated with supra-ventricular (SVA) and ventricular arrhythmias (VA). The relationship between PLVEF with SVA and VA has not yet been established. **Objectives:** To compare the quarterly frequency of cardiac arrhythmias, characterized by SVA and VA, in patients with PLVEF with patients with preserved LVEF (LVEF>55%). **Methods:** Records of 1288 patients underwent both transthoracic echocardiography (TTE) and 24-hour Holter ECG recording (24HER) were obtained. Patients were divided into two groups, age and gender matched. Group A were patients with PLVEF (n=80) and Group B with preserved LVEF (n=68). 24HER were assessed for SVA and VA, and circadian patterns were assessed by dividing a 24-hour period into quarterly intervals. Results from the 24HER were compared between both groups. **Results:** 80 patients were analyzed (Mean age 68.19 +/- 12.06, n (female) = 18, n (male) = 62). Patients with heart failure LVEF <35% had significantly more daytime and nocturnal episodes of supra-ventricular and ventricular arrhythmias than the control groups ($p<0.001$). However, patients with LVEF <35% had significantly more supra-ventricular and ventricular arrhythmias between 0600–1200 interval periods as compared to other quarterly interval of the day. Premature atrial ectopics, atrial fibrillation and VPE were significantly more as compared to other arrhythmic events (742.30 +/- 255.23, 10786.11 +/- 3848.23 and 892.11 +/- 257.00, $p<0.05$). However, there was no statistical significance increase in the total number of supra-ventricular as compared to the ventricular events ($p = 0.134$) and neither of these two events had circadian correlation (Spearman's correlation, Rs = 0.546). **Conclusion:** Compared with patients with preserved LVEF, patients with PLVEF demonstrated significantly more SVA and CA, in particular, during the morning quarterly interval. This could be due to an imbalance in the circadian neurohormonal cycle. Further studies need to be conducted to ascertain the significance of this finding, and could result in a treatment strategy that could reduce clinical events associated with this phenomena.

**P477**

## To explore healthcare providers beliefs and attitudes towards parental presence during paediatric resuscitation

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**Introduction:** Family Witnessed Resuscitation (FWR) was first adopted in the United States in the 80's. There has been widespread research on the practice since that time and while the majority of studies originate in the US, FWR is now an accepted practice internationally. In Ireland however, the research on FWR is limited, particularly in the paediatric population. This study intends to address this deficit and explore the views of both doctors and nurses providing emergency care to sick children. **Objectives:** The aim is to explore healthcare providers beliefs and attitudes towards parental presence during paediatric resuscitation. The topic of FWR is a life altering event, particularly in the paediatric population, and presently there are no guidelines in place at national or indeed local level dealing with this situation. It is of the utmost importance that FWR in paediatrics is addressed to close the gap in the literature and to inform policy development. The research aims and objectives of this study are to develop policies and guidelines at local level initially and to use this study as a pilot for a national study on this topic in the future. **Methods:** A quantitative cross sectional descriptive study using a survey method was employed. Questionnaires were posted to a convenience sample of 140 nurses and doctors working in Emergency Departments in 3 Midlands Hospitals, with a response rate of 62% (86). **Results:** Indicated those with greater number of years experience were more favourable to the practice of FWR. 68% of respondents were more favourable to providing parents with an option to be present, rather than it actually being a parents right to be present. 84% of participants supported a policy which would enable a facilitator to be present. In general, this study has shown the majority of staff are in favour of parental presence, but guidelines are necessary to enable the practice. **Conclusion:** The study has indicated the support of FWR but only with appropriate and sufficient policies, protocols, education and staffing. These guidelines will ensure improved care to children and their families in the ED, thereby improving both parental and staff satisfaction levels and enhancing current practices within the Emergency Department.

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**P478**

## Major cardiovascular complications and mortality in patients with Takotsubo cardiomyopathy

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**Introduction:** Takotsubo cardiomyopathy (TC) invariably presents as medical emergency requiring CCU and ICU level care, and often need urgent invasive cardiac catheterizations. However, the worst outcome has not been well studied for the TC population. **Objectives:** This study aimed to investigate the major cardiovascular complications and mortality in TC patients. **Methods:** TC case reports were retrieved from pubmed.org. Of 1042 TC related articles published between 2001–2011, 463 single cases (age 62±17 yrs, 88% F) with sufficient clinical information available were analyzed. The occurrence of TC-related major cardiovascular consequences including heart failure (HF), cardiogenic shock, ventricular wall rupture, apical thrombosis, syncope, cardiac arrest (CA), arrhythmias/conduction abnormality, sudden death (SD) and all cause death (ACD) were elucidated. **Results:** SD and ACD were seen in 1% and 4% of TC patients (pts), respectively. Table 1 shows the prevalence of major cardiovascular complications, their relative risks to SD and ACD. CA occurred in 6/28 of pts who had torsade de pointes (TdP). None of 29 pts with syncope, 1/28 TdP and 3/18 pts with ventricular fibrillation had SD. TC patients experienced with no complications were seen in 55%.

**Table 1.**

| *Clinical presentations* | *Prevalence* | *Odds Ratio for SD* | *Odds Ratio for ACD* |
|---|---|---|---|
| EF < 35% | 57.8% | 0 [0, 3.65] | 1.21 [0.34, 3.63] |
| Cardiogenic shock | 20.1% | 0.6 [0.01, 4.8] | 4.17 [1.08, 15.95] |
| Ventricular wall rupture | 1.9% | 12.44 [0.23, 141.46] | 20.09 [2.82, 107.62]* |
| Apical thrombosis | 3.5% | 0 [0, 21.16] | 5.01 [1.11, 17.39]* |
| Cardiac arrest | 6.5% | 8.04 [0.65, 71.92] | 34 [8.25, 161.29]* |
| Sinus arrest/AV block | 3.9% | 0 [0, 21.16] | 1.81 [0.04, 13.28] |
| TdP | 6.1% | 0 [0, 17.88] | 1.11 [0.03, 7.85] |
| VF | 3.9% | 19.64 [1.5, 180.91]* | 7.87 [1.27, 34.04]* |

* $p < 0.05$ for the odds ratio [lower and upper limits of 95% CI]

**Conclusion:** TC is often associated with major cardiovascular complications. In latter severe HF and cardiogenic shock are the most common. After CCU/ICU level of care most patients have a benign prognosis nevertheless. In TC TdP does not appear to contribute significantly to SD whereas VF, cardiogenic shock, wall rupture and apical thrombosis are the major contributors to the mortality.

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Zhang L, Bradley J, Burke J, Abramson S, Kowey PR. Takotsubo Syndrome: Does a Markedly Prolonged QT Interval Presage Life-threatening Arrhythmias? Circulation 2010:122:e1605.

**P479**

## Occluded infarct-related artery, worse Killip class, and higher QRS score are positive predictors, while predischarge revascularization of IRA Is a strong negative predictor of sudden cardiac death in patients with AMI treated with thrombolytic therapy

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**Introduction:** Sudden cardiac death (SCD) is an unexpected death within 1 h of symptom onset. Most cases of SCD are related to cardiac arrhythmias. The risk of SCD in patients with acute myocardial infarction (AMI) is high and approximately half of all patients (pts) die suddenly. **Objectives:** The aim of our study is to determine predictors of SCD in patients with AMI treated with thrombolytic therapy during long-term follow-up. **Methods:** Study group consisted of 933 pts (79.2% male, mean age 55.7 ± 9.8 years) with AMI treated with thrombolytic therapy who survived to hospital discharge. They were followed-up for 10 years (median 6.8 years). SCD was registered in 112/933 pts (12.0%). SCD was associated with older age, previous infarct, non-inferior infarct location, higher QRS score (>8 points),

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Killip class >1, worse echocardiographic parameters (EDV, ESV, LVEF), more occluded infarct-related artery (IRA), and more frequent use of digitalis, antiarrhythmics, and nitrates at discharge. Patients with SCD were less likely to undergo predischargerevascularization of IRA (PCI/CABG), and they were prescribed beta-blockersless often at discharge. **Results:** Cox regression analysis after multivariable adjustment for baseline and clinical characteristics showed that patients with SCD were more likely to have occluded infarct-related artery, OR 2.16, 95% confidence interval (CI) 1.19 to 3.92; p=0.011; Killip class >1, OR 1.91, 95% CI 1.21 to 3.02; p=0.004; QRS score >8, OR 2.30, 95% CI 1.25 to 4.26, p=0.008; After further adjustment for discharge medications and predischargerevascularization of IRA, the lower risk for SCD was statistically significant for patients who underwent predischargerevascularization of IRA, OR 0.31, 95% CI 0.13 to 0.76, p=0.009. **Conclusion:** During long-term follow-up of patients with AMI treated with thrombolytic therapy occluded infarct-related artery, Killip class >1, and QRS score >8 points are positive predictors, while predischarge revascularization of IRA is a strong negative predictor of sudden cardiac death.

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## Outcomes after in-hospital ventricular fibrillation

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**Introduction:** Numerous reports document the survival of in-hospital ventricular fibrillation (VF), but there are none that report the long survival. **Objectives:** Determine survival to hospital discharge of patients with in-hospital VF and 5 years after the event. **Methods:** All cardiac arrest treated with CPR in adult patients, between April 2004 and June 2006, in an University Hospital of Cardiology, were registered and followed during 5 years. Data were collected according to the Utstein format and recorded immediately after each resuscitation attempt. Medical records of these patients were reviewed five years after the arrest. **Results:** A total of 800 attempted CPRs were performed. From all cardiac arrests 190 (25.7%) had VF or tachycardia without pulse (VT) as initial rhythmic of arrest. From all patients in VF/VT, 68 (35.8%) survived to hospital discharge. Stepwise logistic regression showed pre arrest normal systolic ventricular function (OR 4.4, 95%CI 1.68–11.26) as independent predictor of increased survival. Predictors of low survival were: age > 60 years (OR 0.42, 95%CI 0.19–0.9), hypotension as cause of arrest (OR 0.13, 95%CI 0.27–0.63), the presence of infections (OR 0.082, 95%CI 0.31–0.217), the use of more than 3 doses of epinephrine (OR 0.23, 95% CI 0.076–0.67) and bicarbonate (OR 0.18, 95%CI 0.032–1.037) during resuscitation efforts. Five years after the event, 62 patients had medical records available. Forty eight patients (77%) were alive. The most important cardiovascular interventions during this period were coronary bypass surgery/angioplasty in 52%, implantation of cardioversor defibrillator in 26%, valvar surgery in 8% and cardiac transplantation in 5% of patients. **Conclusion:** Survival to hospital discharge of patients with VF/VT, in a cardiology specialty hospital, was similar of those in general hospital. In addition of traditional predictors, normal systolic ventricular function was an indicator of survival. Five years later, survival was very high, which could be related with the large cardiologic interventions.

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## Risk of sudden death after successful elimination of accessory atrioventricular pathway in resuscitated patients with Wolff-Parkinson-White syndrome in long-term follow-up

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**Introduction:** Patients (pts) with Wolff-Parkinson-White'a syndrome (WPW) that survived VF, without treatment are at high risk of a recurrent VF episode. In those pts with WPW VF who have normal left ventricular function and no ECG abnormalities suggesting additional electrical disease, successful elimination of accessory pathways prevent cardiac arrest recurrences in midterm follow-up. **Objectives:** We performed a long-term follow-up study of 53 resuscitated patients with WPW syndrome who underwent successful accessory pathway ablation/surgical dissection as their sole primary treatment (yrs 1984–2008). **Methods:** Inclusion criteria: pre-excitation in ECG, VF electrocardiographically documented or observed by a physician on the ECG monitor, normal left ventricular function in echocardiography, after ablation/surgery the surface ECG showed no ECG abnormalities that suggested additional electrical disease, VF was not associated with an acute myocardial infarction or other concomitant factors. **Results:** Out of 56 pts with AP and documented VF, 53 pts had WPW syndrome (40 M, mean age 33.0 ± 14 yrs). 49 pts had overt pre-excitation, 4 intermittent and 3 concealed AP. Four patients had more than one VF episode. The follow-up was completed in 95% of patients. Three patients who underwent surgical treatment of accessory pathways in the mid-eighties were lost in the follow-up. Out of 50 patients, 46 survived a mean follow-up of 12.0 ± 5.0 years. Four pts died during the follow-up, 14.0 ± 1.6 years after the procedure, 16.75 ± 3.6 years after the first VF episode. Two patients died 14 and 12 years after non-pharmacological treatment, at the age of 72 and 78 yrs, respectively. One patient had fallen from high scaffolding at work and died at the age of 44 yrs, 16 yrs after the procedure. It is impossible to refute a theory that he had fallen due to VF, but during 12 yrs follow-up he had not had pre-excitation on ECG, did not report any arrhythmia and had not received AA drugs. Therefore it is unlikely that there is a connection between previously treated WPW and his death. The 27 years old young woman died 14 yrs after a successful RF ablation of two overt APs. We have failed to determine the cause of her death. **Conclusion:** In our opinion these results still supports the statement that elimination of accessory pathway conduction reduces the risk of dying suddenly.

**P483**

## Where are automated external defibrillators located in the community areas in bahrain? And are there any barriers to purchasing AEDs?

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**Introduction:** Antedotal evidence indicate that deaths in the pre hospital setting is high in Bahrain. Heart disease & diabetes is increasing rapidly in the child & adult population in the Gulf regions.Currently to date no study has explored whether Automated External Defibrillators (AED) are readily available in the community setting in Bahrain, and if there are any potential barriers to the purchase and implementation of AEDs in community areas. **Objectives:** The overall aim of the study was to find out where are AEDs located in the community areas of Bahrain. To assess the knowledge in these community areas on AEDs and what they are used for. The outcome of the study is to increase awareness of what is an AED ? why they should have an AED in these community areas ? and what is the international best practice recommendations on AED placement. **Methods:** A phone survey was conducted of 84 locations in Bahrain. A predesigned questionnaire assessed primarily if the community location had an AED and secondly assessed knowledge and awareness of AED. The study also assessed if there was any barriers from these community areas to purchasing an AED. Areas included in the research were schools, shopping malls, sports centres, mosques and areas where large crowds of people congregate and the potential for cardiac arrest is high. **Results:** Indicated that only 22% (n=19) of areas surveyed currently had an AED. 57% (n=48) of areas were not aware that an AED was a live saving piece of equipment that can be used by lay people. 70% (n=60) of areas did not know where the nearest AED was in an emergency. Also 68% of locations reported that people had collapsed at these locations & 32% (n=27) of the areas reported deaths at these locations. Only 21 % of schools have an AED, 1 of 8 shopping malls had an AED. Of the 22% (n=19) locations with an AED in place, 4 of these locations have used the AED in an emergency. **Conclusion:** In conclusion the study indicated that there is an inadequate number of AEDs available in the community in Bahrain. Also there is a lack of knowledge & awareness in the community in Bahrain of what an AED is and who can be trained to use it in an emergency. No barriers to purchase AEDs were indicated. Public education and awareness of AEDs is fundamental to increase the number of AEDS in the community in Bahrain.

**P484**

## Does it matter whether first responders trained in the use of automated external defibrillators in the community setting in a Muslim country are male or female?

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**Introduction:** To date no study has explored the role of any potential cultural barriers to the use of an Automated External Defibrillators (AED) in Arab Gulf countries. No previous study has explored the knowledge and attitudes of people in the community areas on the use of AEDs, whether they would agree to post mortems being carried out on a young person who dies suddenly. **Objectives:** The objective of this large quantitative study (n=345) was to explore if sex or ethnicity was a barrier to resuscitation in a predominantly Muslim country. The study also tried to assess what is the knowledge and attitude of people in the community on AEDs ? resuscitation and sudden cardiac death in young people in an Arab Gulf country. **Methods:** Both male and female (n=345) at an exhibition completed a quantitative questionnaire assessing attitudes and knowledge towards use of an AED in Sudden cardiac arrest in community areas. Respondents were given a vignette, which was one of 12 different vignette photographed scenarios, and then questioned on knowledge of AED, and themes around resuscitation in the community setting. **Results:** Results of this study have demonstrated significant differences were found on acceptability ratings of questions in relation to CPR & AEDs when the victim was a female. Specifically participants were more likely to express low acceptability ratings for a male rescuer intervention when the male was from the Indian sub continent. No differences were highlighted in relation to a European male rescuer and an Arab male rescuer. **Conclusion:** The research study did highlight a lack of knowledge and awareness in the community areas in Bahrain as to what is an AED ? and when it is used? The findings also indicate that Indian male rescuers appear to be a barrier to both AED & CPR when the victim is an Arab female. This does have serious implications for the delivery and training in AEd useage and the selection of who should be trained in providing CPR in the community setting in an Arab country.

**P485**

## Cross recurrence plots analysis for predicting sudden cardiac death in postinfarction patients

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**Introduction:** Predicting SCD and/or the role of the types of arrhythmia causing lethal arrhythmia are a remaining challenge. **Objectives:** To forecast sudden cardiac death (SCD) based on the complex analysis of frequent telemedicine long-term ECG registrations. **Methods:** The non-linear relation of the sinus rhythm and the beat-to-beat ventricular premature beat "rhythm" were analyzed. We use the extension of the method of recurrence plots to cross recurrence plots (CRP) which enables a nonlinear analysis of bivariate data (beat-to-beat intervals of sinus rate and beat-to-beat intervals of ventricular premature beats). To quantify CRPs, we used three measures of complexity (recurrence rate (RR), determinism rate (DET), and linemax (L). The test for closeness of each point of the first trajectory with each point of the second trajectory results in a N ×M array Cri, the cross recurrence plot (CRP) is determined. We apply our analysis with m = 3, tau = 4 and eps = 1.3 (fixed radius, Euclidean distance). 121 postinfarction patients (age 64.8+-2.4, m/f 55/66 with ejection fraction greater 0.5) were enrolled in a 3-year telemedicine project, where a 24-hour telemedicine ECG registration was performed in every 10 days. Patients were divided into two groups: the

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Group_A contains patients without SCD:103 patients, and Group_B with SCD (18 patient). **Results:** In Group_A there was not significant changes ($p<0.01$) neither around zero, nor about 12 months. In Group_B the analysis reveals maximum for the complexity measures RR+, DET+ and L+ for correlated behavior around a delay of zero months, whereas the measures for anti-correlated behavior RR−, DET− and L− increase after about 12 months. **Conclusion:** This results show a positive relation between the instantaneous sinus rate and the rate of ventricular premature beats and would be a powerful tool to forecast malignant ventricular arrhythmias via frequent telemedicine ECG monitoring in patients after myocardial infarction.

**P486**

## Analysis of factors influencing on the incidence of depression syndrome in patients with vaso-vagal syncope

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**Introduction:** Depression syndrome (DS) is relatively common in patients with syncope. **Objectives:** Analysis of factors influencing on the prevalence of DSin patients with vaso-vagal syncope (VVS). **Methods:** Syncope history was achieved and standardised according Calgary Symptom Syncope Scale (CSSS) proposed by Sheldon. All pts underwent standard tilt test (HUTT). During HUTT regional saturation (rSO2) of frontal lobes of brain was measured using INVOS cerebral oximeter. Before HUTT the Depression Beck Score questionnaire (DBSq) was applied to all pts for evaluation of presence of DS. Mild DS was diagnosed if DBSq ranged between 10 and 19, mild 20–25 and severe SD–with DBSq 26 and higher. Univariate and multivariate analysis were performed for evaluation of the influence of age and gender, number of syncope and presyncope episodes, duration of disorder, CSSS results, type of vaso-vagal response during HUTT and duration of total, passive and active phases of HUTT on the occurrence of depression syndrome in patients with VVS. **Results:** DS was diagnosed in 123 pts(42,4%). Mild DS was observed in 31,4% of cases, moderate DS–in 4,8% of pts and severe DS was noticed in 6,2% of pts. Significant influence of older age (F-5,8; $p<0,02$), higher number of syncope (F-4,1; $p<0,04$), longer time from first syncope (F-16,9; $p<0,0001$) and type of vaso-vagal response during HUTT (F-3,8; $p<0,04$) on prevalence of depression syndrome in patients with VVS was proofed. Pts with DS more frequently presented positive HUTT result and vaso-depressive response to orthostatic stress than pts without DS. Patient with severe DS presented higher rate of cardioinhibitory response during HUTT. **Conclusion:** 1. Depression syndrome is relatively frequent in patients with vaso-vagal syncope. 2. Prevalence of depression syndrome in patients with vaso-vagal syncope correlate with age. 3. Occurrence of depression syndrome, in spite of age correlation, is also related to intensity of syncope and duration of the disorder and may be related to the type of vaso-vagal response to orthostatic stress during HUTT. 4. Cardioinhibitory response to the orthostatic stress during head-up tilt test occurred significantly more frequent in patients with diagnosed severe depression syndrome.

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## The evaluation of natriuretic peptide NT-proBNP in the differential diagnosis in episodes of loss of consciousness

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**Introduction:** To evaluate the reliability of natriuretic peptide NT-proBNP in the differential diagnosis of episodes of loss of consciousness in patients with or without previous cardiovascular diseases' (CVD) medical history. **Objectives:** There is not an extended number of studies that indicate the usefulness and ability of NT-proBNP to determine the existence of heart rhythm dysfunction in episodes of loss of consciousness. **Methods:** In 31 patients (pts) who were admitted in the CVD department due to episodes of loss of consciousness the NT-proBNP levels were determined. All pts were physically examined, their complete medical history was taken and an ECG and chest X-ray was made. They were also evaluated by 24-hour continuous ambulatory ECG (Holter) and transthorasic echocardiography. Patients with myocardial and brain damage were excluded from the study. **Results:** In 8 pts were present different kinds of pure tachyarrythmias and the levels of NT-proBNP were over 500pg/ml. 3 pts had different kinds of tachyarrythmias but the levels of NT-proBNP were between 200–500pg/ml. In 6 patients mixed tachy-bradyarrythmias were present and the levels of NT-proBNP were 200–500pg/ml. In 5 patients bradyarrytmias were present with NT-proBNP levels of 200–500pg/ml. 6 patients had no rhythm changes and the levels of NT-proBNP were between 200–500pg/ml. 3 patients without rhythm changes were observed and the levels of NT-proBNP were below 200g/ml. The time of arrival and admittance in the department as it was evaluated from the medical history was critical, and it seems that influences the estimated levels of NT-proBNP importantly, especially in tachyarrhythmia's cases. It is probably due to the biochemical characteristics of brain natriuretic peptides (e.g. lifetime) *as*markers of the hemodynamic stress on the heart, denoting the neurohumoral activation of the myocardium. **Conclusion:** It is evident that the determination of NT-proBNP levels is a fast, reliable and effective low cost examination that can assist in the differential diagnosis of episodes of loss of consciousness. It seems that the earliest from the episode's onset the peptide's determination is done the more reliable the test is.

**P488**

## Natural history of vasovagal syncope: data of initial evaluation and 3-years follow-up

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**Introduction:** Patients with vasovagal syncope (VVS) might have more than one reason to faint and this situation represent a great challenge to all specialists. **Objectives:** To define the prevalence of different causes of transient loss of consciousness (TLOC) in patients with VVS. **Methods:** The trial was planned as open-label, single-center, prospective study. Patients with episodes of TLOC had been recruited into the study since year 2006 till 2009. 212 patients were enrolled altogether (mean age 39,1 (14,3) yrs, males 93 (44%)). All of them were evaluated according to ESC guidelines. **Results:** After baseline investigation 27 (12,7%) patients were excluded from further analysis due to cardiac&arrhythmic reasons (n=19), drug-related hypotension (n=3), situational syncope (n=4), carotid TIA (n=1). Remaining 185 patients were divided into two groups. Group 1 consisted of 144 patients with certain classical VVS. Group 2 comprised 41 (19,3%) patients with unexplained syncope. Patients with VVS were followed up for 12 to 50 (29±13) months. Patients with VVS were much younger - 35,1 (13,6) yrs vs. 44,4 (13,9) yrs in group 2 ($p<0,01$), age of first episode was 16 (12; 20) yrs vs. 39 (20; 52) yrs in group 2 ($p<0,01$). In the vast majority of patients with VVS their first syncopal attack occurred before 35 yrs of age, only 17 (12%) of them were older. In 94 (65%) of patients with VVS faints were mediated by orthostatic stress or emotional distress only. Remaining 50 (35%) patients from VVS group had also situational syncope, namely post-exercise (60%), micturition (32%), cough (4%), swallow (4%). Clinical features of VVS had changed in 10 (6,9%) patients (mean age 51,7 (6,5) yrs, M1/F9) within five years before enrollment. Frequency of typical falls had increased in 11 more patients (mean age 29,4 (13,1) yrs, M2/F9) during the same period. Therefore, it should be stressed that in 21 (15%) of VVS patients it can be considered as vasovagal disease. Recurrent VVS had occurred in 37% of patients during follow-up. However, frequent episodes (≥2/yr) had been observed in 7% only. Six (4,2%) patients with VVS had more than one reason to faint. Despite confirmed VVS three of them had confirmed epilepsy, and another three supraventricular tachyarrhythmias. **Conclusion:** Almost 40% of patients with VVS had more than one reason to faint, which may lead to misdiagnosis. Vasovagal disease can be considered in 15% of patients with VVS.

**P489**

## Head-up tilt testing in pediatric age: a retrospective observational study

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**Introduction:** Syncope is a common clinical problem in children and adolescents. Head-up tilt testing (HUTT) is a valuable diagnostic tool to investigate unexplained syncope, but limited data is available in pediatric population. The aim of this study was to assess the usefulness of HUTT in pediatric unexplained syncope patients. **Objectives:** The aim of this study was to assess the usefulness of HUTT in pediatric unexplained syncope patients. **Methods:** We retrospectively analyzed clinical records of 100 patients aged less than 18 years, undergoing HUTT from January 1997 through June 2011. Information about their episodes, prodromes, triggers, as well as the HUTT outcomes was evaluated. **Results:** From the 100 patients enrolled, 66 were female, average age 15 years. In 76 patients, prolonged standing up was the major reported trigger. Dizziness (82%) and blurred vision (63%) were the most experienced prodromal symptoms. Asthenia (63%) and skin pallor (68%) were the major manifestations in the recovering phase. Eighty-two of 100 had a positive test (vasodepressor response in 46, cardioinhibitory in 8, mixed in 28). There was no significant difference between the two outcome groups (positive versus negative HUTT) regarding prodromes, frequency of recent syncope episodes (in the 12 months preceding HUTT), triggers and recovery manifestations ($p>0,05$ for all the variables). All positive HUTT patients were reassured, counseled about recognizing their prodromes, and to perform counterpulsation and postural maneuvers to abort syncope. **Conclusion:** The clinical manifestations associated with syncopal episodes reported in pediatric patients are nonspecific and none of them predict neurocardiogenic syncope. HUTT gives potentially useful information about syncope, enabling the etiological diagnosis of the vast majority of pediatric patients (82 % in this population).

**P490**

## Marked reduction of cardiac events by omega-3 fatty acids in long QT syndrome children carrying KCNQ1 mutations: a 3-case follow-up report

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**Introduction:** The benefit of omega-3 fatty acids (fish oils) on overall cardiovascular health has been well-appreciated by general public. However, there are very limited data on the effects of fish oils in inherited arrhythmias. **Objectives:** To follow-up with LQTS individuals for the long-term effects of fish oil supplementation on the frequency of cardiac events (CEs). **Methods:** Fish oils (1000 mgs EPA + DHA/150 lbs/day in 2 cases and 500 mgs Tuna oil/day in 1 case) were started and continued for 5–10 years in 3 LQTS children carrying *KCNQ1* mutations. CEs before and after fish oils were evaluated. **Results:** A 17-year-old girl and her twin brother, both with Jervell and Lange-Nielsen syndrome (genotype: *KCNQ1*-Q530 & R518), had early onset (ages 3–4) of recurrent syncope/seizures. The girl received with metoprolol, mexiletine and $K^+/Mg^{++}$supplements. The boy received metoprolol and dilantin. Both had ICDs placed but continued having frequent CEs. Subsequently, 1000 mgs EPA + DHA/150 lbs/day was added and each was followed for 10 years. For the girl, the frequency of CEs reduced from 79 to 1 and QTc interval shortened from 560 ms to 498 ms. For the boy, CEs decreased from 30 to 4 after the fish oils, though his QTc remained unchanged (492 ms before & 496 ms after). The 3rd case was a 9-year-old boy with LQT1, who started having recurrent

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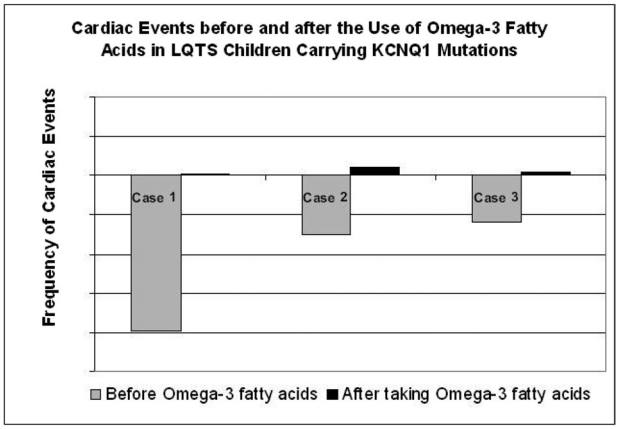
syncope at age 3. Nadolol (later changed to atenolol) and mexiletine were taken without improvement. Subsequently, 500 mgs Tuna oil/day was added and CEs decreased from 24 to 2 and QTc shortened from 580 ms to 520 ms during 5-year follow-up.

**Image/graph I:**




**Conclusion:** Long-term fish oil supplement in addition to standard LQTS therapies decreased CEs remarkably in 3 children carrying *KCNQ1* mutations. This observation is in line with a recent experimental study which demonstrated that DHA/EPA shortened the QT interval and eliminated early after depolarizations in the whole heart animal LQTS models. Large sample patient studies are warranted to determine whether the long term omega-3 fatty acid supplements can help prevent life-threatening arrhythmia in LQTS.

**References:**

Milberg P, Frommeyer G, Kleideiter A, et al. Antiarrhythmic effects of free polyunsaturated fatty acids in an experimental model of LQT2 and LQT3 due to suppression of early afterdepolarizations and reduction of spatial and temporal dispersion of repolarization. Heart Rhythm. 2011 Sep;8(9):1492–500.

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**P491**

## Positive impact of antiarrhythmic therapy on left ventricle diastolic function in patients with atrial fibrillation

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**Introduction:** Diastolic dysfunction (DD) resulting in hemodynamic overload and dilatation of the left atrium promotes atrial fibrillation (AF) development. This defines close correlation and common pathogenesis of DD and tachyarrhythmia. **Objectives:** We aimed to evaluate LV diastolic function parameters during antiarrhythmic therapy (propafenone and amiodarone) in patients with diastolic heart failure (DHF) complicated with AF. **Methods:** 218 Pts (mean age 54.2±3.2) with DHF (EF>50%), complicated with persistent AF were included in the multicentric, prospective, comparative, randomized study. In addition to main therapy for chronic HF 132 Pts received propafenone, 450 mg/day (Group 1) and 86 Pts were indicated amiodarone, 200–400 mg/day (Group 2) for AF prevention. During follow up of 12 months all Pts underwent ECG, Holter monitoring ECG, Doppler echocardiography. **Results:** After 12 months of therapy propafenone effectiveness in complete prevention of AF episodes was 61.4% and for amiodarone-63.2%, EF didn't change (p>0.05). Pts of each group were subdivided according to type of DD. Significant improvements of echocardiografic parameters that characterize LV diastolic function were registered in both groups (Table 1, Table 2). Due to development of side effects 2 Pts (1.5%) were excluded from the Group 1 and 29 Pts (33.7%) from the Group 2.

**Table 1: LV diastolic function parameters in dynamics (Group 1).**

| Group 1 | E/A initially | E/A 12 month | IRP(ms), initially | IRP (ms), 12 months |
|---|---|---|---|---|
| DD with impaired relaxation, (N=58) | 0.69±0.02 | 0.87±0.07** | 91.5±4.21 | 87.5±5.06** |
| Pseudonormal DD, (N=20) | 1.23±0.14 | 1.25±0.12 | 68.2±3.12 | 71.1±4.10* |
| Restrictive DD, (N=8) | 2.32±0.16 | 2.12±0.13* | 62.3±6.21 | 66.7±5.31 |

**Table 2: LV diastolic function parameters in dynamics (Group 2).**

| Group 2 | E/A initially | E/A 12 month | IRP(ms), initially | IRP (ms), 12 months |
|---|---|---|---|---|
| DD with impaired relaxation, (N=58) | 0.96±0.01 | 1.02±0.05** | 94.8±4.13 | 90.3±4.23** |
| Pseudonormal DD, (N=20) | 1.34±0.16 | 1.31±0.12 | 67.3±3.16 | 70.2±4.23* |
| Restrictive DD, (N=8) | 2.33±0.09 | 2.15±0.11* | 63.4±6.17 | 68.3±4.27 |

E/A – the ratio of mitral peak velocity of early filling (E) to mitral peak velocity of late filling (A); IRP-isovolumic relaxation period.
*p<0.05,**p<0.001 for E/A and IRP after 12 months of therapy relative to the initial parameters.

**Conclusion:** Our findings suggest that treatment with propafenone and amiodarone in patients with DHF complicated with AF characterizes with high antiarrhythmic effectiveness and safety. Main therapy for DHF in combination with these antiarrhythmic drugs improves LV diastolic filling.

**P492**

## The impact of discontinuation of antiarrhythmic drugs in patients treated with temporary pacemaker due to atrioventricular block

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**Introduction:** Patients treated with temporary pacemaker (TPM) due to atrioventricular (AV) block are monitored after discontinuation of antiarrhythmic drugs to evaluate the indication for permanent pacing. However, the impact of drug withdrawal and frequency of resolution of the AV conduction disturbance is sparsely documented. **Objectives:** This study investigates the course of patients who received a TPM due to AV block after drug discontinuation. **Methods:** All hospital records of patients who received a TPM at Aalborg Hospital, Denmark, between January 2000 and March 2011 (n=575) were retrospectively reviewed. Patients with ECG-documented AV block were included if they were receiving AV-blocking agents at the time of admission, and if these drugs were discontinued. **Results:** Fifty-five patients fulfilled our inclusion criteria. In total, 49 (89%) had an indication for permanent pacemaker (PPM). Forty-seven patients had an indication for PPM during the initial hospital stay. Of the remaining 8 patients, who were discharged without PPM, 3 subsequently had an event: 2 had recurrence of the block requiring PPM and 1 had a syncope. Follow-up time for patients not requiring PPM (n=6) was 830±1391 days. Three of these patients died of non-cardiac causes, and three are still alive. The QRS width was not significantly associated with an indication for PPM. Patients in monotherapy with beta-blockers had indications for PPM in 96% of cases. Of 15 patients treated with a combination of beta-blocker and digoxin, 13 subsequently required PPM, and 1 was treated with atrial flutter ablation. On the contrary, only 1 out of 4 patients who received the combination of verapamil and digoxin (with or without beta-blocker) had a PPM. The implantation of TPMs was complicated by infection or displacement in 11% of cases. **Conclusion:** The vast majority of patients who are treated with TPM due to AV block and who receive beta-blockers alone or in combination with digoxin, have indication of PPM despite cessation of antiarrhythmic drug treatment.

**P493**

## Efficacy, safety, and outcome of atrial fibrillation ablation in the elderly

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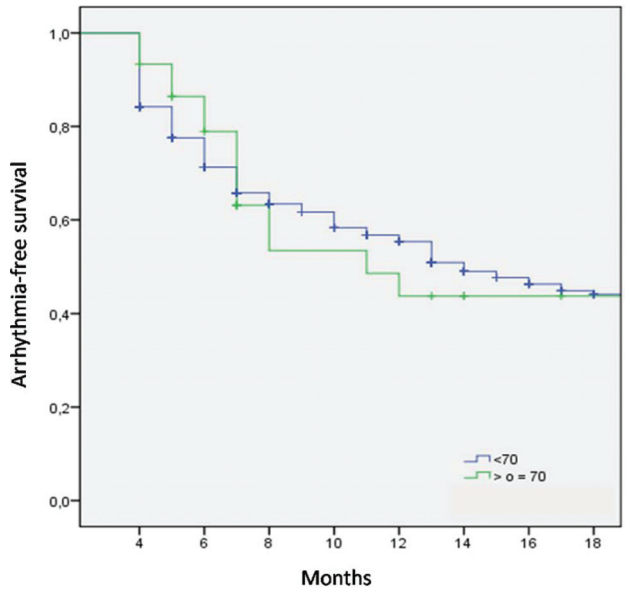
**Introduction:** The incidence and prevalence of atrial fibrillation (AF) increase with age. Catheter ablation (CA) of atrial fibrillation (AF) has become a treatment option for younger patients with drug refractory AF. With improved safety, the therapy has been offered to increasingly older populations. However, the outcome of AF ablation in the elderly is not clear. **Objectives:** To compare success rate, outcome, and complication rate of AF ablation in the elderly (>70 years old) versus the younger population. **Methods:** We retrospectively analyzed 785 consecutive patients (76% male, 41% hypertension, 58% paroxysmal, LA diametre 42 ± 6 mm, LVEF 59

±10%, 23% structural cardiomyopathy) that had undergone a catheter ablation for drug-refractory symptomatic AF from 2003 to 2011. Patients were divided into two groups: (1) ≥70 years (n = 41) and (2) <70 years (n = 744). AF ablation consisted of pulmonary vein antralisolation with or without additional linear lesions of complex fractionated electrogram ablation. Follow-up was performed at 1, 3, 6 months after the procedure and every 6 months thereafter. After a 3 month blanking period, recurrence was defined as the ocurrence of any arrhythmia of ≥30 seconds. **Results:** Baseline characteristics among the two groups only differed ingender (78% in group 1 versus 42% in group 2), presence of hypertension (40% in group 1 and 59% in group 2) and the duration of AF (57,50 ± 58,1 in group 1 and 59,13 ± 59,21 in group2). No significant differences were observed between the groups in terms of LA diametre, structural cardiomyopathy, ejection fraction, nor any other arrhythmia predictor. After a mean follow-up 14,49 ± 14,9 months, there was no significant difference in the arrhythmia-free survival curve after a first procedure of AF ablation between the two groups (60% in group 1 vs. 56% in group 2 at 12-months, log-rank p = 0,663). The incidence of complications was also similar (8,1% in group 1 versus 7,3% in group 2). However, there were 2 strokes and 2 other cardioembolic events in the group ≥70 years old, and this was significantly different to the younger patients (1,5% in group 1 versus 9,8% in group 2). There were no deaths in this series.

**Image/graph I:**




**Conclusion:** AF ablation is a safe and effective treatment for AF in the older patients. However, special care must be taken with the anticoagulation management, for there seems to be a higher risk of periprocedural thromboembolic events.

P494

## Inducibility of atrial fibrillation does not influence the outcome after pulmonary vein isolation

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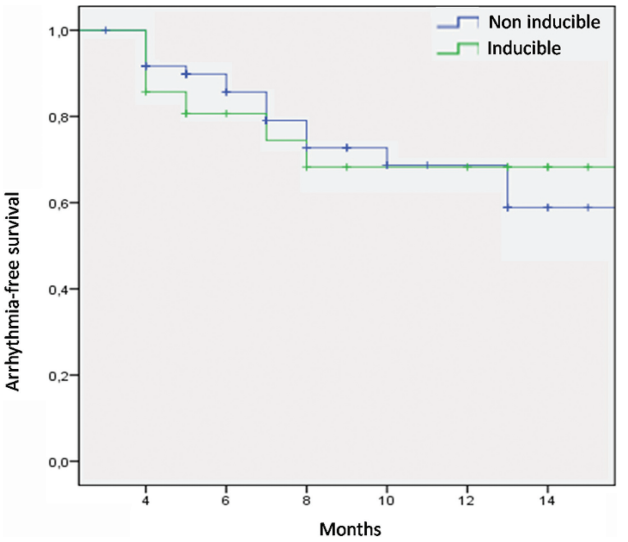
**Introduction:** Some conflicting results of the efficacy of the inducibility test used in the catheter ablation of atrial fibrillation (AF) have been reported. **Objectives:** To investigate the value of inducibility in the outcome of circumferential pulmonary vein isolation in patients with paroxysmal AF. **Methods:** In this prospective study, 114 consecutive patients (p) undergoing ablation of atrial fibrillation were included. The ablation set included antral encircling of the pulmonary veins (PV) in all p (checking for conduction block with a multipolar circular catheter placed within the veins), with additional lines at the LA roof in 55 p and the mitral isthmus line in 8 p. At the end of the procedure, inducibility was evaluated with trains of 10 impulses with an initial cycle length of 350 ms, reduced by 10 ms until 250 ms or until 1:1 atrial capture was lost. AF was considered inducible when sustained for at least 30 seconds. Patients were followed up at 1, 3 and 6 months after the procedure and every 6 months thereafter. **Results:** 130 patients (55 ± 11 years, 74% male, 40% hypertension, LA diametre 42 ± 5 mm, LVEF 60 ± 10%, 16% structural cardiomyopathy) undergoing AF ablation (99 p Paroxysmal AF, 31 p Persistent AF in sinus rhythm during the procedure) were evaluated. AF was inducible in 25 p (22%) after antral PV isolation. No significant differences were observed between the inducible vs. non-inducible groups in terms of LA diametre, presence of hypertension, structural cardiomyopathy nor any other arrhythmia predictor. After a first procedure of AF ablation, there was no significant difference in the arrhythmia-free survival curve between the two groups (68% vs 86% at 12-months, p= 0,584) (figure).

**Image/graph I:**




**Conclusion:** The absence of inducibility of arrhythmias after circumferential pulmonary vein isolation does not predict a better mid-term result after catheter ablation of atrial fibrillation.

P495

## The roof line does not influence the 12-month success of circumferential ablation of the pulmonary veins: results of a prospective randomized study

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**Introduction:** The isolation of the pulmonary veins (PV) for the treatment of atrial fibrillation (AF) is often associated to linear radiofrequency lesions within the left atrium (LA) in an effort to improve results. **Objectives:** To evaluate the contribution of the roof line in the mid-term success of AF ablation. **Methods:** We prospectively included patients (p) undergoing catheter ablation for AF. The PV isolation was performed by continuous circular lesions around ipsilateral PV, checking for conduction block with a circular multipolar catheter within the veins. Subsequently, p were randomized to no further ablation (CPVA-NoRL) versus an additional linear ablation at the roof of the LA (CPVA-RL) between the superior aspect of the circular lesions at the left and right PV). Follow-up was performed at 1, 3, 6 months after the procedure and every 6 months thereafter. After a 3 month blanking period, recurrence was defined as the ocurrence of any arrhythmia of ≥30 seconds. **Results:** 140 patients (55 ± 11 years, 69% male, 35% hypertension, LA diametre 42 ± 6 mm, LVEF 62 ± 8%, 20% structural cardiomyopathy) undergoing AF ablation, were randomized. No significant differences were observed between the CPVA-NoRL vs. CPVA-RL groups in terms of LA diametre, presence of hypertension, structural cardiomyopathy nor any other arrhythmia predictor. After a first procedure of AF ablation, there was no significant difference in the arrhythmia-free survival curve between the two groups (72% in CPVA-RL vs. 78% in CPVA-NoRL at 12-months, log-rank p = 0,29). The incidence of LA macroreentrant tachycardias after a first procedure was 4,8% in the CPVA-RL group versus a 5,5% in the CPVA-NoRL one.

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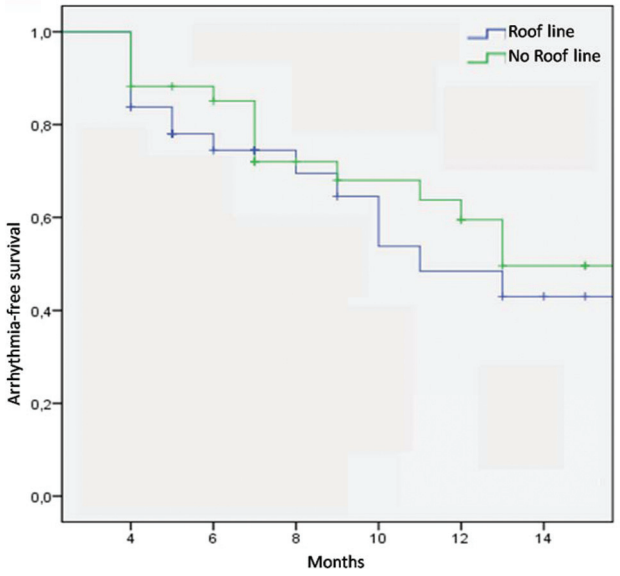


**Conclusion:** The left atrial roof line does not improve mid-term results of the isolation of the pulmonary veins for the ablation of atrial fibrillation.

**P496**

## What's the exact criteria for evaluation of complete mitral isthmus block?

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**Introduction:** Because complete mitral isthmus(MI) conduction block is associated with a high cure rate for atrial fibrillation (AF). **Objectives:** We investigated a reliable technique to assess MI linear block in patients with chronic AF. **Methods:** Thirty consecutive patients (6 women, 58±9 years) with persistent AF underwent circumferential pulmonary vein antrum ablation (CPVA) and linear ablation at left atrial roof and cavotricuspid isthmus(CTI) and MI. After sinus rhythm was restored, PV isolation and linear block of the 3 lines were confirmed(complete block of MI line was validated by previously described criteria), with additional ablation if necessary. Then isoproterenol infusion/atrial burst pacing was used to induce atrial tachycardias (ATs). After that, an additional maneuver for validate bidirectional MI block was used by demonstrating multi-sites activation detours along the whole linear leison while pacing from proximal coronary sinus, followed by attempts to close the residue gaps. The induce method was repeated at the end of the procedure. **Results:** All pulmonary veins (PV) were isolated and linear block was achieved in all ablated lines before the rigorous criterion was used to assess MI block. And ATs were induced in 16/30(69.5%) patients (16 AT). However, MI was found not completely blocked in 8(26%) patients through additional pacing and mapping. After ablation of persistent gaps, ATs were induced in only 2/30(9.5%, p=0.007) patients (2AT). **Conclusion:** A rigorous criteria for evaluation of complete conduction block at the MI is necessary for the catheter ablation of AF.

**P497**

## Early recurrence predicts long-term unsuccessfully atrial fibrillation ablation

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**Introduction:** Radiofrequency ablation has assumed increasing importance in the treatment of atrial fibrillation (AF). However, success is still limited and many patients have recurrence of the arrhythmia. Initial studies with relatively short follow-up suggested that early recurrences (first 120 days after ablation) did not predict long-term treatment failure. Therefore, the decision for reintervention is usually delayed until the 4th month after the procedure. **Objectives:** To determine the prognostic significance of early recurrence in long-term success of ablation of atrial fibrillation (per procedure analysis). **Methods:** Retrospective study of AF patients treated by radiofrequency ablation. Clinical outcome was assessed in all patients by clinical records and structured telephone survey. We defined (1) short-term success as survival free of recurrence during the first 120 days after ablation; and (2) long-term success as survival free of any recurrence of AF between the 4th month and the end of the follow-up. Patients that required re-ablation during follow-up were classified as treatment failures, regardless of the outcome of subsequent procedures. **Results:** We studied 51 patients (35 men, 55 ± 12 years), 90% of them with persistent AF. The time between the first episode and AF ablation was 9 ± 9 years. 27 patients (54%) were treated with point-by-point radiofrequency ablation guided by electro-anatomical mapping, and 23 (46%) with multipolar radiofrequency catheter. The mean follow-up duration was 23 ± 14 months. Short-term success was achieved in 27 (53%) and long-term success in 26 patients (51%). 75% of patients with early recurrence also had AF recurrence during long-term follow-up. The risk of long-term treatment failure was eight times higher in patients with early recurrence (OR: 8.6, 95% CI 2.4 to 30.3, p <0.001). **Conclusion:** The early recurrence of AF after ablation is a strong predictor of long-term treatment failure. Thus, postponing the decision on the need for reintervention in patients with early recurrence is unlikely to be justified.

**P498**

## Atrioventricular nodal reentry tachycardia in pediatric population: radiofrequency ablation results

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**Introduction:** Atrioventricular nodal reentry tachycardia (AVNRT) is the most frequent cause of paroxysmal tachycardia after adolescence, but is uncommon in pediatric population. In this group of patients antiarrhythmic drugs are usually considered the first line therapy due to risk of AV block related to radiofrequency ablation. **Objectives:** To describe the clinical and electrophysiological characteristics of AVNRT, and the acute and long-term results of radiofrequency ablation in a pediatric population. **Methods:** Between 2000 and 2011, 27 consecutive children up to 15 years (12.5 ± 2.3) were diagnosed with AVNRT during the electrophysiological study (EPS) in our Institution. Their clinical and EPS records were reviewed, and all patients or their cardiologists were contacted for follow-up. **Results:** All patients presented with palpitations and had documented supraventricular tachycardia. Twenty one (78%) had been treated with antiarrhythmics drugs (86% betablockers). At baseline EPS 67% had demonstrable dual AV nodal physiology. Typical AVNRT was induced in all patients, requiring isoproterenol for induction in 8 children (30%). Tachycardia cycle length was 325±64 msec. One patient had also orthodromic tachycardia due to concealed left sided accessory pathway. Successful ablation was achieved in all patiens. Sixteen of them (59%) had residual dual AV nodal physiology without reinducible tachycardia, despite isoproterenol infusion. Fluoroscopy time was 16±7.1 minutes and total procedure time was 3.7±1.1 hours. There were no acute complications. After a mean follow-up of 65.8±39 months no recurrences of tachycardia or AV node dysfunction have been reported. **Conclusion:** Our results show that radiofrequency ablation is an effective therapy for AVNRT in pediatric population with a low rate of complications.

**P499**

## Uric acid is associated with left atrial thrombus in patients with atrial fibrillation

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**Introduction:** Uric acid (UA) was a cardiovascular risk marker associated with oxidative stress, inflammation and prothrombosis. **Objectives:** We assessed the hypothesis that high level of UA was associated with high risk of left atrial (LA) thrombus in patients with atrial fibrillation (AF). **Methods:** From January 2007 to March 2008, 433 consecutive patients with non-valvular AF were enrolled in this study. Patients with valvular heart disease, deep vein thrombosis or pulmonary embolism were excluded. All patients underwent transesophageal echocardiography. **Results:** Twenty-six patients (6.0%) were found to have LA thrombus. The patients with LA thrombus had a significantly higher level of UA (420.8±106.8 umol/L VS. 345.8±98.9 umol/L, P<0.001). The area under the receiver operating characteristic curve of UA predicting LA thrombus was 0.704 (95% CI 0.601–0.807). The optimal cutoff point of UA for predicting the presence of thrombus was 353.7 umol/L (Fig1). With a cutoff point of 353.7 umol/L, the sensitivity and specificity of UA for the diagnosis of thrombus were 76.9% and 57.7%, respectively. The incidence of LA thrombus was 10.4% in patients with UA ≥353.7 umol/L versus only 2.5% for patients with UA <353.7 umol/L (P=0.001). After adjustment for LA diameter, left ventricular end diastolic diameter, left ventricular end systolic diameter, ejection fraction, body mass index,, UA (odds ratio 1.01, 95% CI 1.01–1.10, P=0.018), CHADS2 ≥ 2 (odds ratio 5.83, 95% CI 1.26–27.07, P=0.019), non-paroxysmal AF (odds ratio 3.41, 95% CI 1.09–10.64, P=0.035) and fibrinogen (odds ratio 2.49, 95% CI 1.14–5.45, P=0.022) were independent risk factors of LA thrombus.

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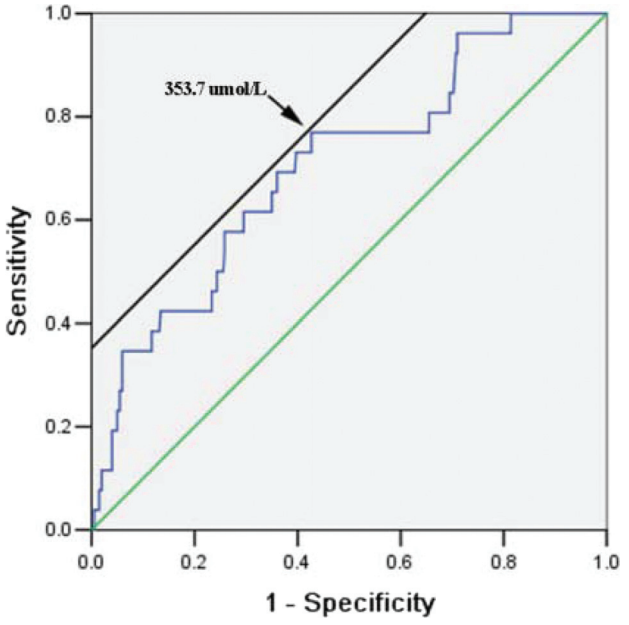
**Image/graph I:**




**Conclusion:** In conclusion, UA is an independent risk factor of LA thrombus in patients with AF.

**P501**

## The non coronary aortic sinus, an unrecognized focus of atrial tachycardia

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**Introduction:** Focal atrial tachycardia (AT) originating from the non-coronary aortic sinus (NCAS) is very rare and reports describing successful radiofrequency (RF) ablation are very limited. **Objectives:** The aim of this study is to describe characteristics of AT originating from the NCAS and RF ablation therapy. **Methods:** Seven patients (four male, age 40±9) with symptomatic, drug refractory AT, were referred for electrophysiologic study (EPS). Two patients had a past history of pulmonary vein isolation, one patient an ablation of atrioventricular node re-entrant tachycardia and one patient an ablation of a para-hisian concealed bypass. EPS and extensive right, and left atrial mapping revealed AT near His in all patients but either failed to identify a successful ablation site or RF applications only resulted in temporary termination of the tachycardia. Mapping of the NCAS, retrogradely via the right femoral artery, was performed to identify the origin of the AT. **Results:** Mapping of the NCAS demonstrated earliest atrial activation during AT preceded the reference coronary sinus electrogram by 34 ± 21 ms (14 to 59 ms) and the onset of the P wave by 38 ± 14 ms (17 to 56 ms). Earliest atrial activation in the NCAS was earlier than earliest activation in the right atrium and left atrium in all patients. AT was terminated by RF application in 10 ± 6 sec (2 to 6 sec). No complications occurred. All patients were free of symptoms during a follow up of 9 ± 9 months. **Conclusion:** Symptomatic focal AT near His may originate from the NCAS and can be treated effectively and safely with RF-ablation in the NCAS.

**P503**

## Recurrence of atrial flutter and fibrillation after electrical cardioversion: 4 years experience in a center

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**Introduction:** With the aging of population, we are witnessing an increased incidence of atrial fibrillation (AF) and atrial flutter (FL). Some studies have attempted to validate predictors of recurrence after electrical cardioversion (ECV), however these are limited and don't reflect the importance that this theme has in our daily practice. **Objectives:** Survey of elective ECV in a center, with follow-up of patients (pts) in order to evaluate the recurrence and its predictors. **Methods:** Observational retrospective study of patients undergoing elective ECV between 2006 and 2009 for clinical (type and duration of arrhythmia, presence of cardiopathy and antiarrhythmic drugs) and echocardiographic (left atrial dimension) characterization of the population, to determine the event recurrence and recurrence-free survival. **Results:** We studied 198 pts, mean age 68±11years, 56% male, 81% with AF and 19% with FL. The duration of arrhythmia was <6meses in 27%, >6 months in 33% and indeterminate in 40%. Of the pts with AF, 41% had persistent AF, 19% long-term persistent AF and 40% of indefinite duration. The dimension of the left atrium (LA) was normal/mild dilatation in 64.7%, moderate/severe in 31.8%, unknown in 3.5%. 14.6% of pts didn't have structural heart disease, 24.7% had valvular heart disease and 56.6% had non-valvular heart disease. 64% were previously (6.6±8.8 months) treated with antiarrhythmic drugs (AA). There was success in CVE in 85% pts, and the presence of AA as well as the duration of AA did not influence the success (NPS). During the follow up of 31±16 months (1–57) the recurrence of the arrhythmia was detected in 68% of pts who had previously experienced a successful ECV, with time to recurrence of 9±10 months (1–42). The statistical analysis showed that the patients who had recurrence of the arrhythmia presented duration of arrhythmia>6 months (p0.02), LA moderate/severe (p0.006) and structural heart disease (p0008). There were no statistically significant differences in recurrence rate among populations in AF and FL (60%vs50%, NSP), however when the survival free of recurrence was analyzed, it was significantly higher in pts with AF (log rank 0.014). **Conclusion:** In our population of pts with AF and FL undergoing elective CVE the recurrence rate at 31 months was 68%. The variables associated with higher recurrence were the longest duration of arrhythmia, greater dilatation of the LA and the presence of structural disease. The presence of FL was associated with a lower survival free of recurrence.

**P504**

## Cardiac failure following VVI pacemaker, a myth or reality: an echocardiographic study and an indian perspective

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**Introduction:** Permanent pacemakers has revolutionized the management of symptomatic bradyarrhythmias. In India, about 10000 pacemakers are implanted every year. There is a huge cost variation between modern day pacemakers and conventional pacemakers. The apparent advantages of newer generation pacemakers over conventional pacemakers are not clear.There has been some concern about development of cardiac failure with VVI pacemaker[1]. We have already reported the incidence of cardiac failure with VVI pacemaker from our registry which was surprisingly negligible. In this context, we studied bi-atrial and left ventricular function in patients following VVI pacing. **Objectives:** To Assess Biatrial And Left Ventricular Function In Vvi Pacemaker Implanted Patients. **Methods:** 31 patients were randomly selected from a group of 526 VVI pacemaker implanted patients of duration more than 6 months with mean 50± 40 months.The shortest duration was 6 months and longest was 185 months. Of the 31 patients,17 were males and 14 were females. The indications for VVI Pacemakers were complete heart block (22 patients) and sick sinus syndrome(9 patients). Patients who sustained MI, valvular heart diseases, cardiomyopathies and who had RWMA were excluded from the study. 31 persons of similar age and sex distribution without pacemaker were included in the study as controls. All selected patients including controls underwent ECHO, ECG. **Results:** In VVI group there was no significant reduction in EF and LA volume index,but mitral E/E'& RA volume index were reduced significantly. Paradoxical septal motion(PSM) did not influence any parameter.

| GROUPS | EF(%) | | mitral E/E' | | LA volume index ml/BSA | | RA volume index ml/BSA | |
|---|---|---|---|---|---|---|---|---|
| | <50 | >50 | >7 | <7 | >29 | <29 | >26 | <26 |
| VVI n=31 | 7 | 24 | 20 | 11 | 7 | 24 | 10 | 21 |
| Controls n=31 | 2 | 29 | 8 | 23 | 3 | 28 | 2 | 29 |
| p VALUE | 0.1466 | | 0.0046 | | 0.30 | | 0.02 | |
| VVI+PSM n=4 | 2 | 2 | 3 | 1 | 2 | 2 | 1 | 3 |
| VVI no PSM n=27 | 5 | 22 | 8 | 19 | 5 | 22 | 9 | 18 |
| p VALUE | 0.2120 | | 0.1154 | | 0.2120 | | 1.000 | |

**Conclusion:** Contrary to the popular belief, VVI pacemaker was not associated with worsening LV function and left atrial dimension in our study. But there was a marginal deterioration in LV diastolic functional parameter.There was no significant impact on the quality of life indices, and no adverse outcome observed.We believe VVI pacemaker would continue to be safe and effective for our population.The usage of dual chamber pacemaker may be selectively used and need not be recommended routinely.

**Reference:**

1. Nathan AW, Davies DW. Is VVI pacing outmoded? Br Heart J 1992; 67: 285–8.

**P505**

## Bradyarhythmia during cholinesterase inhibitor therapy in patients with Alzheimer's disease

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**Introduction:** The management of Alzheimer's disease (AD) is challenging and gratifying, despite the absence of a cure or a robust pharmacologic treatment.Herein we describe six cases of patients with AD presented with syncope, diziness and dyspnea soon after initiation of cholinesterase inhibitor therapy. All patients had bradyarhythmia on ECG. **Objectives:** To evaluate anticholynesterase-induced bradyarhythmia in patients with AD. **Methods:** A total of 668 patients presented with symptomatic bradyarhythmia to our institution between January 2008 and June 2009. Of 668 patients 22 patients had AD.20 patients with Alzheimer's disease had implanted a pacemaker. 6 of these were on cholinesterase inhibitor (ChE-Is) therapy (Table 1) started 2–8 weeks before the initial symptom. Thyroid function test, serum potassium level were obtained ,and echocardiography was performed for every patient (Table 2). **Results:** Average time from the initiation of ChE-Is therapy to the hospital admission was 18 weeks. The most common symptom was dizziness starting just after the prescription of ChE-Is, but the

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most common presentation was a syncope. All of the patients were treated with a permanent pacemaker implantation and ChE-Is were continued. Symptoms were dramatically improved in all of the patients. At thirteen month follow-up no syncope, diziness or dyspnea was reported.

**Table 1.** Characteristics of the Patients

| Case | Age | Sex | Presentation | ECG finding | ChEIs type | PM type | Comorbidities |
|---|---|---|---|---|---|---|---|
| 1 | 84 | Male | Dyspnea | CAVB | Donezepil | VVI | HT,CRF,DM |
| 2 | 75 | Female | Syncope | CAVB | Galantamine | DDD | HT |
| 3 | 83 | Female | Dizziness/Dyspnea | 2/1 AVB | Rivastigmine | DDD | HT |
| 4 | 73 | Female | Syncope/Dizziness | SBR,HCS | Galantamine | VVI | HT,HL |
| 5 | 88 | Female | Syncope | 2/1 AVB | Rivastigmine | VVI | HT,Immobility |
| 6 | 85 | Male | Syncope | SSS | Donezepil | VVI | HT,CRF,CAD |

**Table 2:** Additional examinations and initial time of symptom onset after ChE-Is therapy

| Case | TSH | Serum Potassium level | Echocardiography | Time of onset of symptom after the ChEIs therapy |
|---|---|---|---|---|
| 1 | N | 5,18 mEq/L | LVH,EF 64% | Two weeks |
| 2 | N | 4,2 mEq/L | EF 50%,EA,Severe TR | One month |
| 3 | N | 4,5 mEq/L | LVH, Mild MR | Two months |
| 4 | N | 4.1 mEq/L | N | Since the onset |
| 5 | N | 4,5 mEq/L | EF 55%,Moderate MR | Four months |
| 6 | N | 5,4 mEq/L | EF 40%, WMA | Four months |

**Conclusion:** Effective drugs for AD are only a few and mainly consist of ChE-Is. Patients starting treatment with ChE-Is should be screened for an increased risk of cardiac arrhythmias and routinely obtained an ECG. In case of bradyarhythmia a pacemaker implantation may be justified instead of drug cessation.

**P506**

## Do we still need temporary pacing wires after coronary artery bypass graft surgery

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**Introduction:** We routinely fix temporary epicardial pacemaker wires at the end of coronary artery bypass graft (CABG) procedures regardless the need for those. **Objectives:** was to assess the actual need for temporary pacing wires in isolated CABG surgery and its potential complications to weigh the benefit ratio of such practice. **Methods:** A total of 100 patients referred for isolated CABG surgery were observed prospectively during their hospital stay. A preoperative 12-lead electrocardiogram was used to identify conduction problems. All patients had only ventricular pacing wires that were placed on the anterior or diaphragmatic surfaces of the right ventricle. Our anesthesia protocol is to start epinephrine infusion for all patients towards the end of cardiopulmonary bypass (CPB) unless unneeded or another inotropic agents are required. Postoperatively, all patients are evaluated to determine if pacing is required. This may include significant bradycardia and associated hemodynamic instability. **Results:** The mean age of the studied population was 65.2±11.8 years, there was 88 male patients. 18% of patients had diabetes mellitus, 28% had hypertension, and 82% were receiving beta blockers. The mean left ventricular ejection fraction was 45.1±16.4%. The mean CPB time was 99.1± 25.4 minutes, and the mean aortic cross clamp time was 68.2±10.3 minutes. 18% of patients had cardioversion in operating room (OR) to resume sinus rhythm upon separation from CPB machine. Two patients had bleeding from the fixing site which necessitated suture repair to stop bleeding. None of our patients was in need for pacing to come off CPB machine. Fifteen patients received antiarrhythmic drugs on leaving OR for ventricular tachycardia. Mean postoperative stay was 6.7±4.2 days. Two patients developed right bundle branch block. Five percent of patients had postoperative acute myocardial infarction. Two patients died because of pump failure. Pacing in the post operative stay period was not needed for any patients. **Conclusion:** The routine use of temporary pacing wires in setting of isolated CABG surgery has negligible role and rather has additional cost and potential for complications.

**P508**

## Remote monitoring system in familial amyloid polyneuropathy patients

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**Introduction:** Familial amyloid polyneuropathy (FAP) patients (pts) may present early unpredictable conduction abnormalities that can cause hemodynamic instability during hepatic transplantation. This led some hospital to include pre-hepatic transplant cardiac pacemaker (PM) implantation in their protocols. **Objectives:** Evaluate the importance of remote surveillance monitoring in FAP pts. **Methods:** We collected a sample of pts who underwent pre-hepatic transplant PM implantation, according to our hospital protocol, with wireless transmissions for arrhythmia monitoring and event notification. Clinical follow up (FU) was made through scheduled clinical and electrocardiographic examination and pacemaker interrogation or derived from hospital re-admissions and confronted with the remote surveillance weekly alert. **Results:** We studied 22 pts (13 women; 37 ± 8.7 years). All were successfully submitted to hepatic transplant (mean age=34 ± 7.3 years; 34 ± 20.6 months from symptoms onset). Mean age at first symptoms was 31 ± 7.6 years. Mean FU was 32 ± 10.6 months (no deaths recorded). Mean age at PM implantation was 34 ± 8.5 years. Five pts had baseline cardiac arrhythmias and conduction disturbances. We report a progressive and significant increase in Vp (>70%) in only one pt; the majority of pts (86.4%) had less than 10% Vp (59.1% with 0% of Vp). Only three pts (13.6%) had no recorded supraventricular arrhythmias (SVT) in the FU. All pts had significant ventricular ectopy (VE). We notice an increase in the number of SVT and VE in the FU. The remote monitoring system (RMS) allowed anticipating the FU of one patient, because of significant change in right ventricular lead impedance, due to pacing lead fracture. There was no significant difference in the data acquired from personal FU and the one recorded with the RMS, so closer monitoring with reduction in staff time could be anticipated. **Conclusion:** The RMS is a useful, reliable and cost-effective surveillance tool for the early detection of arrhythmia, changes in ventricular pacing as well as technical problems. In addition, RMS can help to better track the early, unpredictable automacy and conduction disturbances in FAP and shed some light in the pacemaker protocols for liver transplantation.

**P509**

## Cardiac resynchronization therapy in octogenarian patients: is it a useful treatment?

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**Introduction:** Cardiac resynchronization therapy (CRT) has been used to treat patients with dilated cardiomyopathy, wide QRS and left ventricular dysfunction. CRT improves symptoms, improves NYHA functional class (FC) and decreases mortality. These benefits of CRT remain unclear in elderly patients. **Objectives:** To evaluate CRT results in patients older than 80 years old. **Methods:** A single institutional retrospective cohort study was conducted on 252 consecutive patients who underwent CRT between 2000 and 2010. The total cohort was divided in two groups: younger and older than 80. Statistical analysis was performed using student's test, chi-square test and survival curves. **Results:** The mean follow-up time was 35.6±24.73 months. Main results are shown on the table. Demographics were comparable with exception of the age and ejection fraction. In both groups a comparable number of CRT-defibrillator was implanted. There were no differences in atrial fibrillation, implantation success rate, survival and clinical benefits of CRT in both groups.
**Image/graph I:**

| | <80 (N=211) | >80 (N=41) | P value |
|---|---|---|---|
| Age (years) | 65.6 ± 10.3 | 82.8 ± 2.6 | <0.01 |
| Male | 151 (71.6%) | 35 (85.4%) | NS |
| Baseline functional class III (NYHA) | 173 (82%) | 36 (87.8%) | NS |
| Ejection Fraction (%) | 27.5 ± 9 | 34 ± 13.4 | <0.01 |
| Ischemic cardiomyopathy | 102 (48.3%) | 25 (61%) | NS |
| Upgrade from previous pacemaker | 38 (18%) | 10 (24.4%) | NS |
| Atrial fibrillation | 39 (18.5%) | 8 (19.5%) | NS |
| Successful CRT implantation | 197 (93.4%) | 39 (95.1%) | NS |
| CRT-defibrillator (CRT-D) | 71 (33.6%) | 9 (22%) | NS |
| Functional capacity improvement after CRT | 177 (83.9%) | 33 (80.5%) | NS |
| Survival at 3 year follow-up (%) | 69 | 65 | NS |

**Conclusion:** In our experience CRT in octogenarian patients is equally successful as in younger patients. Despite the age, the global survival was similar. These results suggest that advanced age should not be a contraindication at the time of considering this treatment.

**P510**

## Ensuring septal position as pacing site on right ventricular outflow tract, this is the real purpose

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**Introduction:** The deleterious consequences of right ventricular apical pacing is know from long time ago. To choose alternate pacing sites as right ventricular outflow tract (RVOT), especially septal (SP) location better than free wall (FW), to decrease incidence of left ventricular dysfunction should dictate a change of attitude. A characteristic septal electrocardiogram (ECG) pattern during implantation is being established and can help us to minimize radiation exposure. The use of oblique fluoroscopic projection is an excellent and useful tool to confirm true SP location. **Objectives:** To analyse 12-lead ECG performed during RVOT pacing and determinate characteristic ECG patterns depending on SP or FW placement by means of isolated frontal fluoroscopic projection to choose pacing site. We usedfluoroscopic on oblique projection to confirm this position. **Methods:** In 30 patients undergoing to permanent pacemaker implantation, we randomized to SP or FW position as pacing location. We used isolated frontal fluoroscopic projection during the process to determinate this exact RVOT pacing site.A 12-lead ECG was performed during forced ventricular pacing and recorded at a standard paper speed of 100 mm/s with gain of 10 mm/mV. Looking for septal site an ECG

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were analysed for QRS duration and axis, inferior leads classified as monophasic or notched, morphology and gain of QRS in lead I and aVL were described as positive, negative, or isoelectric. Precordial QRS transition as early or late if transition was before or after lead V3. After that, by means of oblique fluoroscopic projection we confirm the lead position. **Results:** 60% were men (10p FW vs. 8p SP); the mean age was 75±13 years. 15 (50%) were positioned on the SP site and 15 (50%) on the FW. SP sites were associated with shorter QRS duration (165±12 ms vs. 186±13 ms, p<0.0005). Notching of the inferior leads was more common in FW group (92,9% vs. 26,1%, p<0.001). Precordial transition was earlier (≤ V3) in the SP group (50% vs. 7,1%, p=0,026). We couldn't find higher frequency of a negative or isoelectric voltage in lead I pacing associated to SP site. **Conclusion:** SP sites display characteristic ECG patterns like a narrow QRS complex, absence of notching and early transition in precordial leads, which may ensure ventricular lead location success. The use of oblique fluoroscopic projection confirms the septal position.

**P511**

## Temporary transvenous pacing via upper limb veins in patients undergoing trans radial interventions

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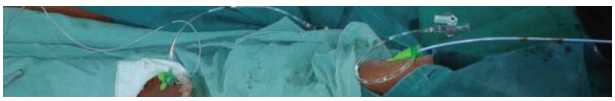
**Introduction:** Temporary transvenous pacing (TTVP)is done in patients undergoing percutaneous interventions(PCI) for underlying conduction system disease and severe bradycardia. In patients undergoing Trans Radial Intervention (TRI),transfemoral pacing obviates the advantages of trans-radial access-immediate ambulation and decreased bleeding risks. Subclavian,jugular and axilary veins are dangerous in the setting of high antiplatelet and anticoagulant use as they are non compressible. **Objectives:** To assess the feasibility and safety of temporary pacing via the upper-limb veins in patients undergoing transradial PCI and to compare it with transfemoral pacing. **Methods:** Between June 2010 to 2011 sixteen patients (10 male)undergoing elective TRI, needed TTVP. Cephalic or Basilic veins at or proximal to the cubital fossa cannulated with a 20 G venous cannula and 6F Radifocus II sheath introduced over a 43 cm terumo 0.021 straight hydrophilic guidewire. A 5F bipolar pacing lead( St Jude Medical) was used.The data was compared to the Femoral TTVP patients. **Results:** Upper-limb and Femoral TTVP was successful in 12( 75%), vs 28( 100%),( 9 vs 14 male), age was 62± 8 vs 58± 11years. In the UL group, vein access was in the same arm as TRI in 9, contralateral in 3 and failed in 4( 1 obese and 3 thrombosed). The first 3 patients, procedure took more than 15 minutes as the lead entered into vein tributaries, necessitating a venogram to guide the wire. Subsequently,, a re-sterilized 0.014 inch PTCA guidewire advanced till the RA stayed as a marker, straightened the veins, prevented the entry of lead into branches and decreased the procedural time to below 10 minutes. The mean duration was 16 ± 8 minutes vs 8±4 minutes.( P= 0.02). A stable position achieved in the RV at pacing thresholds of 1.8±0.4 Vs 1.6 ± 0.3mV in the fremoral group. In the ULTTVP, all received heparin, aspirin, clopidogrel and 8 tirofiban vs FTTVP group with 14 on aspirin, clopigogrel and 3 on tirofiban. None in the ULTTVP had any local or cardiac complications, in the FTTVP, one had tamponade and 4 femoral haematoma.

**Image/graph I:**



**Conclusion:** Pacing from the upper-limb veins is feasible and safe in a majority of patients undergoing TRI. Though it takes longer than femoral pacing, the use of a 0.014coronary guidewire aids in the procedure and may achieve comparable timings once the learning curve is overcome.

**P512**

## Incidence of mitral & tricuspid regurgitation in RVOT & RVA pacing in Naft hospital and arrhythmia Clinic, Tehran

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**Introduction:** Pacing from Right ventricular Apex had many adverse effects on left ventricular function like LV dyssynchrony,hemodynamic sideffects,heart failure etc. so it caused to finding alternative pacing sites,specially the septal aspect of Right Ventricular outflow Tract(RVOT),in order to achieve a more physiological pattern of ventricular activation. **Objectives:** This study was conducted to determine the incidence of mitral and tricuspid regurgitation in RVOT and RVA pacing in naft Hospital & Arrythmia cilnic of tehran. **Methods:** This single_blind randomised clinical trial was performed among 164 patients under pacing in Naft Hospital and Arrythmia clinic that 82 patients underwent RVA pacing & 82 underwent RVOT pacing. **Results:** Mitral regurgitation was mild in 17.1% and moderate in 4.9% in RVA group and 78% were normal;but it was mild in 6.1% and moderate in 1.2% and trivial in 3.7% in RVOT group and 89% were normal(p=0.022) severity of tricuspid regurgitation was not differed between two groups(p>0.05). **Conclusion:** Totally,according to our findings in current study,it may be concluded that RVOT pacing would have less complications.

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**P513**

## Influence of AV interval on interventricular dyssynchrony and stroke volume in patients with complete AV block and implanted DDD pacemaker

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**Introduction:** RV pacing results in significant haemodynamical and electrophysiologic changes in the heart. These changes lead to negative haemodynamic effects of RV stimulation: reduced stroke volume, asymmetric hypertrophy, RV dilatation, increased wall tension which can lead to ventricular failure in up to 25% of patients who are implanted with cardiac pacemaker. **Objectives:** To evaluate individual AV interval optimization as a programmable parameter that could reduce interventricular dyssynchrony and influence on diastolic and systolic function of the left ventricle in patients with structurally normal hearts and implanted DDD pacemaker. **Methods:** Patients who were implanted with DDD pacemaker underwent evaluation including ECHO, ECG stress test, ANP and BNP measurements after implantation and after 6 month. Using Ritter method optimal AV delay was found for all patients. They were divided in two groups: Group1 - nominal AV delay and group 2 - optimal AV delay. Parameters as BMP, stroke volume, EF, oxygen consumption, functional capacity were evaluated and compared. **Results:** Patients with optimal AV were thinner (p=0,008), had higher values of ejection fraction (p=0,001), higher stroke volumes (p<0,001), higher level of oxygen consumption, meaning better functional capacity (p=0,022), smaller enddiastolic diameter (p=0,122) and lower values of ANP (p=0,022) after 6 months of follow up. Patients with nominal AV interval were more obese (p<0,018), had lower values of ejection fraction (p<0,001), had larger enddiastolic diameter (p<0,001), larger end-systolic diameter (p<0,001), had reduced functional capacity (p<0,001), they had higher values of ANP (p=0,001) and BNP (p<0,001) after 6 months of follow up. After 6 months, patients who with optimal AV interval had significantly lower values of BMI (p<0,001), higher values of EF (p<0,001), smaller end systolic diameter (p=0,037), better functional capacity (p<0,001) and lower values of ANP (p=0,003). **Conclusion:** Using individual optimization of the AV interval we could increase the stroke volume and systolic function of the LV with positive haemodynamic effects. We did not prove that individual optimization of AV interval could lead to reduction of itnerventricular dyssynchrony. However, the difference in dyssynchrony between the two groups was present but it didn't reach statistical significance. Future studies are needed to evaluate our hypothesis.

**P514**

## Outcomes From Remote Monitoring Technology for Bradycardia-Pacemaker Follow-Ups

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**Introduction:** Patients with pacemakers require regular follow-ups after their implant. Currently in the UK, as well as most other countries, these patients routinely attend the hospital clinic for assessments, despite the availability of remote device interrogation technology for almost a decade. With increasing pressure from the volume of patients with pacemakers, changes in practice are required in order to provide a more efficient follow-up service. **Objectives:** We conducted a study to assess the safety, feasibility and benefits of virtual at-home follow-up (V-group) utilising Home Monitoring® technology vs. standard in-hospital follow-up (S-group) for routine pacemaker assessment. **Methods:** 43 patients undergoing dual chamber permanent pacemaker implant were randomised to the V-group (21) and the S-group (22), and followed-up accordingly after the initial post-implant 1-month in-hospital check. Further pacemaker follow-ups were done at 6 months and 12 months in both groups. The primary end-point was the total workload for patient pacemaker follow-up care, which also included the total time for data analysis & clinical examinations during the 1-, 6- and 12-month follow-ups. The secondary end-point was the number of serious adverse events related to device implant and programming. **Results:** Over the 12-month post-implant interval, the median total work load per patient was 40.5mins (IQR: 21.5) and 60mins (IQR: 10) for the V- and S-group, respectively, p<0.01. At the 12-month follow-up appointment, the median follow-up duration per patient was 9mins (IQR: 5.5) and 25mins (IQR: 5), for the V- and S-group, respectively, p<0.01. Three patients in the V-group experienced device-related adverse events (two lead displacements & one wound infection) which were not related to the Home Monitoring® systems. **Conclusion:** Remote pacemaker follow-up duration is significantly shorter when compared with standard in-hospital follow-up assessment. This reduces the hospital workload over the 12 months follow-up period and, at the 12-month stage, also provides a time & potential cost saving of sixty-four per cent per patient follow-up. A virtual at-home pacemaker follow-up clinic appears to be a safe & feasible alternative to the standard in-hospital follow-up clinic.

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## The implantable cardioverter-defibrillator in the united Arab Emirates: preliminary findings of a national survey

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**Introduction:** The Implantable Cardioverter-Defibrillator (ICD) is an effective, and often underutilized, therapy for the prevention of sudden cardiac death in high-risk patients. Data on ICD use in developing countries are very limited. **Objectives:** To describe ICD utilization in the United Arab Emirates (UAE), a developing high-income country with recently established electrophysiology services. **Methods:** We collected data on ICD implantation in the only two centers with dedicated electrophysiology services in the UAE, estimated to implant more than 90% of all high-voltage devices in the country. Information on patient characteristics and device types and indications was collected from 2007 and continues to the present (prospective data collected from 2010 onward). **Results:** A total of 266 unique ICD implantations were recorded between June/2007 and May/2011 (40% single chamber, 16% dual chamber, and 44% CRT-D). Between 2008 and 2010, the ICD annual implant rate had increased by 37%. The mean age of patients was 56 ± 16 [range 12 to 84 years], and 80% were male. The majority of patients were non-UAE citizens (67%) and most were covered by a health insurance plan (96%), with a minority (4%) of self-pay patients. Most patients were electively admitted for the implant procedure (61%) while the rest were in-patients predominantly for cardiac reasons. Common co-morbidities were congestive heart failure (77%), hypertension (58%), and diabetes mellitus (46%), while end-stage renal disease (3%), cerebrovascular disease (6%), and chronic lung disease (5%) were less common. History of syncope was reported by 35% of the patients, and 20% had prior CABG. The mean left ventricular ejection fraction was 29% ± 14 and mean QRS duration was 129 ± 33 msec. A pre-implant electrophysiologic study was done in only 14% of patients, and primary prevention of sudden cardiac death was the indication in most patients (71%). Based on the most recent full-year implant numbers, the estimated national ICD implant rate in 2010 was approximately 10 per million. **Conclusion:** This is the first description of ICD utilization in the UAE. Patients with ICDs in the UAE are relatively younger than their counterparts in developed countries. While implant rates are increasing, the ICD remains underutilized in the UAE with absolute implant/population rate far below what has been reported in many developed countries or other high-income nations.

P516

## Chagas' disease and implantable cardio-defibrillators: 10-year experience in a university hospital. LV ejection fraction is the most important prognostic factor

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**Introduction:** Implantable cardio-defibrillators (ICD) are empirically used to treat Chagas' disease life threatening arrhythmias even though their effectiveness in this population was not appropriately evaluated. Observational studies implicate that a potential collateral impact of ICD use in this population is the increasing amount of patients dying of advanced heart failure, since patients are not dying of arrhythmias anymore. **Objectives:** We sought to investigate if patients with depressed cardiac function would have higher death rate in this population, irrespectively of ICD appropriate therapy. **Methods:** Demographic and clinical data of ICD receivers with Chagas' disease from a university hospital were prospectively evaluated. Time to death was considered as outcome, depressed cardiac function (2D echocardiographic LV ejection fraction lower than 45%) as the exposure and age, gender and ICD therapy delivery were considered as potential confounders. We used time-to-event methods and Cox proportional models for analysis, censoring observations up to death or five-years follow up. **Results:** 101 patients (67.3% male; 62±12 years-old) were followed for 1195±877 days after implantation (62% due to ventricular tachycardia; 21% to aborted sudden cardiac death). Death occurred in 29 (28.7%) patients at a mean follow-up of 937±760 days, due in most cases (18) to cardiogenic and/or septic shock. Unadjusted death rate was 12.6(95%CI 5.0; 25.9) and 38.4(95%CI 23.0;59.3) by 100.000 patients/year for those with ejection fraction higher or lower than 45% respectively. Adjusting for potential confounders, low ejection fraction (Hazard ratio 5.36 - 95%CI 2.06;13.9), age(HzR 1.03–95%CI 1.00;1.07) and male gender (HzR 0.27–95%CI 0.11;0.64), but not ICD delivery therapy (HzR 0.80–95%CI 0.35;1.78), were associated with the outcome. **Conclusion:** Depressed LV ejection fraction is associated with an increase in death rate in patients with chronic Chagas disease irrespectively of appropriate ICD therapy.

P517

## ICD interventions as marker for adverse outcome of post myocardial infarction patients implanted for secondary prevention of sudden cardiac death

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**Introduction:** Post-hoc analyses of several large randomized trials with post myocardial infarction (MI) patients have demonstrated that occurrence of appropriate (AI) or inappropriate (InI) ICD interventions is a marker of adverse outcome of patients implanted for primary prevention of sudden cardiac death (SCD). However, less is known about their prognostic value in patients implanted for secondary preventative reasons in the era of modern reperfusion therapy of MI. **Objectives:** To analyze the impact of ICD interventions (AI or InI) on mortality in a secondary preventative cohort of post-MI patients. **Methods:** This retrospective analysis included all consecutive post-MI patients implanted with an ICD for secondary SCD prevention in a single centre between 2000 and 2007 (n=148; mean age 65±10 years; mean left ventricular ejection fraction 33±8%). We have compared the total mortality of patients with versus without AI. The impact of InI or ICD shocks for any reason was studied subsequently in the same way. **Results:** After a mean follow-up of 51±27 months we found at least one AI in 96(65%) and at least one InI in 37(25%) patients, 27(18%) patients had both AI and InI, 37(25%) patients died. Patients experiencing an AI had a significantly higher mortality comparing to the others (OR 2,92; 95% CI 1,18–7,23; P=0,02). There was a non-significant trend for a higher mortality in the group with InI (32% vs. 23%; P=0,23). However, when only ICD shocks irrespective of their appropriateness were considered, they were associated with a higher mortality (OR 2,32; 95% CI 1,05–5,15; P=0,04). **Conclusion:** In our cohort of consecutive patients with ICD implanted in the setting of secondary prevention of SCD after MI, AI and ICD shocks (delivered as AI or InI) were related to a higher mortality. These findings correspond to the data from primary preventative post-MI ICD populations and highlight the need for a careful follow-up and management of the underlying disease in patients experiencing an AI, as well as the use of conservative algorithms minimizing ICD shocks.

P518

## Indications for cardiac devices implantation in Oman

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**Introduction:** Indications for low voltage devices i.e. permanent pacemakers PPM and high voltage devices i.e. Implantable cardiovertor defibrillators ICD are updated every few years. For Oman there is no study looking at the indication for implantation of these devices. The Royal Hospital is the exclusive center for cardiac devices implantation in Oman. **Objectives:** This is a retrospective observational study looking at the indications for cardiac devices implantation in Oman from January 1st 2008 to December 31st 2010. **Methods:** All cardiac devices implantation at the Royal hospital are recorded in a book registry. We went through all implantation procedures done from January 1st 2008 to December 31st 2010. **Results:** A total of 305 implantation procedures done through the study period. 164 (53%) were male and average age of 55.8 (+/− 22.4) years. There were 248 (81%) procedures for PPM and 57(19%) for ICD implantations. For PPM 185 (75%) were new implantations and 63 (25%) were for pulse generator change PGC. Of the total PPM procedures ;198 (80%) were single chamber, 46 (19%) were dual chamber and 4 (1%) were triple chamber (cardiac resynchronization device CRT) PPM. Indications for new PPM implantation were; 152 (82%) high-grade heart block, 27 (15%) sinus node disease, 4 (2%) for cardiomyopathy and heart failure and two patients (1%) had other causes. For ICD 49 (86%) were new implants and 8 (14%) were PGC. Of the total ICD procedures; 23 (40%) were single chamber ICD, 10 (18%) were dual chamber ICD and 24 (42%) were CRT-ICD. Indications for new ICD implantations were; 31 (63%) for primary prevention and 18 (37%) for Secondary prevention. **Conclusion:** This is the first study of the indications of cardiac devices implantation in Oman. The indications are in keeping with the guidelines for PPM and ICD. A further detailed analysis of each device indications will be needed taking in considerations the demographics of the population in Oman.

P519

## Personalized remote monitoring of atrial fibrillation and ventricular arrhythmias in patients with electronic implant devices

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**Introduction:** Care management systems are used to support and manage the care of patients (pt) with chronic diseases. Although adopting evidence-based clinical guidelines provide numerous benefits, at the moment they are underutilized in clinical practice due to interoperability problems of different healthcare data sources. The iCARDEA architecture is an intelligent platform for personalized remote monitoring of pts with cardiovascular implantable electronic devices (CIED). **Objectives:** To introduce the iCARDEA care management system for Atrial Fibrillation (AF) and Ventricular Arrhythmias (VT/VF) in CIED pts, with emphasis on prevention of adverse events and and rhythm management. **Methods:** The care plan engine executes the clinical guideline for management of patients with AF or VT/VF by accessing the Electronic Health Record (EHR) systems, the patient maintained personal health records (PHR) and the CIED data through standard interfaces. **Results:** The care plan is initiated whenever an AF or VT/VF event is detected and the physician is notified automatically by the iCARDEA system. Information about care plan execution steps are provided, and a link is given to a graphical monitoring tool which shows the care plan workflow graphically, allowing seeing the results of each decision step, such as the retrieved EHRs (prior diagnosis, lab results, medical treatment, etc.). For every decision, the care plan engine accesses the EHR and PHR. After a recommendation is presented to the physician, different options are provided, such as guidance on possible doses and major side effects, updating the hospital information system for storing this prescription, or continuing with the rest of the care plan.

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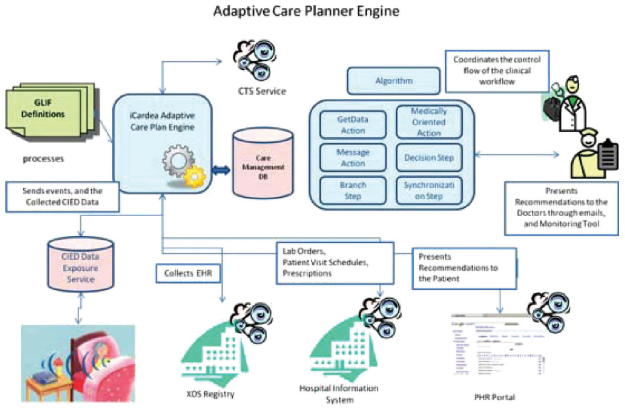
**Image/graph I:**




**Conclusion:** Remote monitoring in conjunction with iCARDEA with alert notification is expected to reduce the time from a clinical event to a clinical decision in response to arrhythmias, and to enable a more systematic implementation of the clinical guidelines compared to patients receiving in office care only. After completing all the system components including the security and privacy measures, a clinical trial is planned.

**P520**

## Electrocardiographic abnormalities as predictors of mortality in community-dwelling elderly chagas disease patients: 10-year follow-up of the Bambui health and aging study

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**Introduction:** Chagas disease (ChD) is still endemic in Latin American countries. Despite the effectiveness of the control measures, there is no undisputable effective treatment for chronic infection, and the disease might remain a public health problem for some decades among older patients. The effect of *T. cruzi* infection on the elderly has hardly been studied. **Objectives:** To investigate the prevalence of electrocardiographic abnormalities and their prognostic significance for all cause mortality among persons with ChD. **Methods:** Participants were enrolled in Bambuí City, Brazil, which is an area known to be endemic for ChD. The study sample of this study consists of subjects ≥60 years of age with confirmed *T. cruzi* infection, which was assessed by three different assays performed concurrently. At baseline, a twelve-lead electrocardiogram (ECG) was performed and analyzed at the ECG Reading Center EPICARE according to the Minnesota code criteria, and blood was collected for BNP measurement. The primary outcome was all-cause mortality during a follow-up period of 10 years. **Results:** This study included 557 ChD patients, median age 68 (interquartile range 64–74) years, 32.5% males. During a mean follow-up time of 8.9 years, 233 participants died, leading to 4,483 person-years of observation. The mortality rate was 52.0 per 1,000 person-years of observation. Table 1 illustrates the prevalence and prognostic significance of the main electrocardiographic abnormalities at baseline. Only 69 subjects (12.4%) had no ECG abnormalities. On multivariate analysis, after adjusting for clinical variables and BNP plasma level, it was observed that atrial fibrillation, left ventricular hypetrophy, possible old myocardial infarction, frequent supraventricular or ventricular premature beats, major isolated ST-T abnormalities and right bundle branch block were independent predictors of mortality.

**Image/graph I:**

**Table 1. Prevalence and prognostic significance of the main ECG abnormalities in elderly infected with ChD in Bambuí Study (n=557)**

| ECG abnormality | N (%) | Unadjusted HR (95% CI) | Adjusted model* HR (95% CI) |
|---|---|---|---|
| Frequent VPB | 60 (10.8) | **2.24** (1.60-3.13) | **1.59** (1.11-2.27) |
| Frequent SPB | 46 (8.3) | **1.62** (1.10-2.38) | **1.90** (1.28-2.82) |
| Atrial fribrillation or flutter | 37 (6.6) | **2.84** (1.91-4.21) | **2.35** (1.53-3.62) |
| LBBB | 18 (3.2) | 1.60 (0.88-2.93) | 1.13 (0.61-2.02) |
| RBBB | 129 (23.2) | **1.55** (1.18-2.03) | **1.46** (1.11-1.93) |
| LAH+RBBB | 51 (9.2) | 1.40 (0.95-2.06) | 1.32 (0.89-1.96) |
| Third degree or pacemaker | 9 (1.6) | 1.66 (0.74-3.74) | 1.01 (0.43-2.34) |
| Possible old MI | 33 (5.9) | **2.21** (1.44-3.40) | **1.84** (1.19-2.83) |
| Major isolated ST-T abnormalities | 69 (12.4) | 1.41 (1.00-2.00) | **1.52** (1.06-2.18) |
| LVH | 11 (2.0) | **2.80** (1.44-5.46) | **2.08** (1.05-4.12) |
| Major QT prolongation | 33 (5.9) | **2.06** (1.34-3.16) | 1.43 (0.91-2.24) |
| Low QRS amplitude | 14 (2.5) | **2.14** (1.01-4.16) | 1.78 (0.87-3.65) |

* Adjusted for age, sex, hypertension, diabetes mellitus, current smoking, systolic blood pressure, diabetes mellitus, ratio of total cholesterol to high density lipoprotein cholesterol, serum creatinine and BNP levels.
VBP: ventricular premature beats; SPB: supraventricular premature beats; LBBB: left bundle branch block; RBBB: right bundle branch block; LAFB: left anterior hemiblock; LVH: left ventricular hypertrophy; major QT prolongation: QTi >115%.

**Conclusion:** Most elderly ChD patients developed ECG abnormalities and are in chronic cardiac form. The indeterminate form, which predominates in samples of young ChD patients, is rare in the elderly. ECG abnormalities are powerful predictors of the risk of death in elderly subjects with ChD.

**P521**

## Influence of different proton pump inhibitors on the antiplatelet action of clopidogrel associated with aspirin

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**Introduction:** Recent studies show that treatment with clopidogrel plus proton pump inhibitors(PPI) can increase the incidence of adverse cardiovascular events in patients of ACS. Some data indicated that the concomitant use of clopidogrel and PPI may attenuate the benefits of antiplatelet effects□. **Objectives:** This trial sought to assess the influence of PPI on platelet aggregation in ACS patients who received dual antiplatelet therapy. **Methods:** 90 patients (60 male and 30 female, mean age were 60.20±10.10 years old) including 74 with UAP, 12 with STEMI and 4 with Non-STEMI were divided into 3 groups equally, placebo group, omeprazole group (20 mg/day) or esomeprale group (20 mg/day). All the patients received clopidogrel (loading dose 150 mg, followed by 75 mg/day) and aspirin (100 mg/day). 5 days later. Platelet aggregation was measured with whole blood impedance method induced by adenosine diphosphate (ADP) at 10$\mu$mol/L with a mobile four-channel impedance aggregometer (Chronolog-Log Corporation). **Results:** The platelet aggregation had no significant difference before administration ($P > 0.05$), which was obviously decreased at 5 days after administration ($P < 0.05$). However, the Platelet aggregation difference among groups had no significant ($P > 0.05$). **Conclusion:** In ACS patients who received dual antiplatelet therapy, the intake of standard dose of omeprazole or esomeprazoleor notis not associated with impaired platelet aggregation in a short time.

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**P522**

## Anti-platelet effect of pre-infarction angina in patients with ST segment elevation acute myocardial infarction

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**Introduction:** Patients with acute myocardial infarction (AMI) who refer pre-infarction angina (PIA) have decreased infarct size and better clinical outcome compared to patients without PIA. This protective effect is usually attributed to ischemic preconditioning (IPC). **Objectives:** In this study we assessed whether, among patients with AMI, PIA is associated with a reduced platelet reactivity which might also contribute to its favourable effects. **Methods:** We studied 85 consecutive patients (63±10.5 years, 60 male) with a first ST-segment elevation AMI treated by primary angioplasty. Platelet reactivity was evaluated at admission by measuring monocyte-platelet aggregates (MPAs) and glycoprotein IIb/IIIa (CD41) and fibrinogen receptor (PAC-1) platelet expression by flow cytomtery (mfi=mean fluorescence intensity), at baseline and after ADP stimulation. **Results:** A history of PIA was present in 31 patients (Group 1) whereas 54 patients had unheralded AMI (Group 2). There were no differences between the two groups in clinical characteristics. At baseline, cytometry variables were significantly lower in Group 1 compared to Group 2 (table). Furthermore, compared to basal values, ADP caused a significant lower increase in Group 1, compared to Group 2, of CD41 and PAC-1 platelet expression (+25%±13% vs. +34%±24% and +38%±25% vs. +55%± 30%, respectively; p<0.001 for both) (table).

| | Group 1(n=31) | Group 2(n=54) | p |
|---|---|---|---|
| MPAs(%) | | | |
| Baseline | 21.8±1.5 | 25.9±3.9 | <0.001 |
| ADP | 27.0±3.0 | 30.3±4.6 | 0.001 |
| CD41 in platelet gate(mfi) | | | |
| Baseline | 157.1±25.3 | 176.0±29.5 | 0.003 |
| ADP | 196.7±33.8 | 235.4±71.7 | 0.006 |
| PAC-1 in platelet gate(mfi) | | | |
| Baseline | 7.1±2.3 | 9.5±2.9 | <0.001 |
| ADP | 9.8±2.5 | 14.0±3.5 | <0.001 |

**Conclusion:** Our data show that patients with ST-segment elevation AMI who experienced PIA show a lower platelet reactivity compared with those without history of PIA. This difference might contribute to the better clinical outcome associated with PIA.

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## Differences in platelet reactivity between patients with ST segment elevation and with no ST Segment Elevation

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**Introduction:** Acute coronary syndromes (ACS) share common pathophysiologic mechanisms, mainly involving coronary thrombosis. Why different patients develop different thrombotic patterns at the level of unstable plaques, and therefore develop a different clinical syndrome, remains unknown. **Objectives:** In this study we assessed whether platelet reactivity is different in patients with acute myocardial infarction with ST-segment elevation (STEMI) compared to patients with no STEMI (NSTEMI). **Methods:** We studied 50 consecutive patients (61±10 years, 35 male) with a first episode of STEMI and 25 patients with a first episode of NSTEMI (60±9.5 years,15 male). Platelet reactivity was evaluated at admission, before angioplasty, by measuring monocyte-platelet aggregates (MPAs) and glycoprotein IIb/IIIa (CD41) and fibrinogen receptor (PAC-1) platelet expression by flow-cytometry (mfi=mean fluorescence intensity), at baseline and after ADP stimulation. **Results:** There were no differences in the main clinical characteristics and pharmacological treatment between the two groups. MPAs and CD41 and PAC-1 platelet expression were not different in the two groups at baseline. However, ADP stimulation caused a significantly higher increase of MPAs, CD41 and PAC-1 platelet expression in STEMI patients compared to NSTEMI patients (+29%±17% vs. +23%±16% for MPAs, p<0.005; +19%±11% vs. +10%± 9% for CD41, p<0.022; +45%±23% vs. +16%±12% for PAC-1, p<0.001) (table).

| | STEMI (n=25) | NSTEMI (n=50) | p |
|---|---|---|---|
| *MPAs(%)* | | | |
| Baseline | 21.6±2.1 | 21.6±2.4 | 0.97 |
| ADP | 27.8±2.0 | 26.5±2.5 | 0.02 |
| *CD41 in platelet gate (mfi)* | | | |
| Baseline | 60.7±19.4 | 52.5±10 | 0.08 |
| ADP | 72.3±27.0 | 58.1±9.3 | 0.03 |
| *PAC1 in platelet gate (mfi)* | | | |
| Baseline | 6.9±0.9 | 6.9±0.9 | 0.97 |
| ADP | 10.0±3.1 | 8.0±1.1 | 0.01 |

**Conclusion:** Our data show an increased platelet reactivity in STEMI patients compared to NSTEMI patients. This finding may contribute to explain the different thrombotic pattern and clinical presentation of the two ACS.

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## Limited efficacy of on-table administration of Gp IIb/IIIa inhibitors in STEMI patients pre-treated with 600 mg of clopidogrel

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**Introduction:** Primary coronary angioplasty is the preferred method of reperfusion in STEMI patients. Pharmacologic treatment that facilitates the procedure is still the subject of debate. **Objectives:** To examine the efficacy of on-table infusion of GP IIb/IIIa inhibitors in STEMI patients pre-treated with a 600mg of clopidogrel. **Methods:** We studied 295 consecutive STEMI patients referred for primary coronary intervention (PCI). Inclusion criteria were: (1) chest pain persisting for >30min, (2) ST-segment elevation >1mm in ≥ 2 contiguous leads, (3) admission within 12 hours from symptoms onset, (4) pre-treatment with a loading dose of 600mg clopidogrel, aspirin and unfractionated heparin (5000 IU intravenous bolus). Relationships between TIMI flow prior to PCI, total ischemic time, post-PCI rate of ST-segment total resolution and myocardial blush grade (MBG), peak troponin T and CK-MB level were analyzed in patients who were treated with on-table infusion of GP IIb/IIIa inhibitors and those who were not. **Results:** Angiographic examination revealed TIMI flow ≥2 prior to PCI in 101 patients (34.3%; group I) and TIMI flow ≤1 in 194 patients (65,7%; group II). Of these in 190 (97,9%) TIMI ≥2 was restored after PCI. Despite successful restoration of TIMI flow differences in microvascular perfusion and extent of myocardial necrosis were observed–table. Bail-out infusion of GP IIb/IIIa inhibitors in group II did not alter rate of MBG 3 (53.6% vs. 57.7%;NS), TnT level (7.3±4.9 vs. 6.4±4.8 ng/ml; NS) and peak CK-MB (317.3±198.2 vs. 293.8±188,8;NS) when compared to remaining patients.

| | Group I (TIMI flow ≥2) | Group II (TIMI flow ≤1) | *p* |
|---|---|---|---|
| Age (years) | 59.7±11.0 | 61.0±10.9 | NS |
| Total ischemic time (min) | 232.4±129.1 | 243.1±133.4min | NS |
| GP IIb/IIIa (%) | 26.7 | 50.0 | 0.0001 |
| ST segment resolution (%) | 63.4 | 11.4 | <0.0001 |
| MBG 3 (%) | 76.0 | 55.6 | 0.0011 |
| TnT (ng/ml) | 2.4±2.6 | 6.8±4.9 | <0.00001 |
| CK-MB (IU) | 137.8±133.8 | 303.8±192.8 | <0.00001 |

**Conclusion:** 1. Pre-treatment with 600mg of clopidogrel is associated with preprocedural TIMI flow ≥ 2 in 34% of patients and results in greater degree of microvascular perfusion and smaller myocardial necrosis. 2. Effect of on-table infusion of GP IIb/IIIa inhibitors is limited in patients pre-treated with a combination of antiplatelet and antithrombin agents.

**Reference:**

Mehili J, Kastrati A, Schulz S et al. Abciximab in patients with acute ST-segment-elevation myocardial infarction undergoing primary percutaneous coronary intervention after clopidogrel loading. A randomized double-blind trial. Circulation 2009;119;1933–1940

P525

## IPF, a new prognostic marker in acute coronary syndrome

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**Introduction:** Activated platelets play a crucial role in the pathogenesis of acute coronary syndromes (ACS). They participate in the process of forming an extending atherosclerotic plaques. Young platelets are typically larger, more dense and contain RNA which gives them a reticulated look. Large platelets are metabolically more active than small platelets and have higher pro-thrombotic potential. Measurement of reticulated platelets, expressed as the immature platelet fraction (IPF) reflects thrombopoiesis and platelet turnover. **Objectives:** Evaluate the impact of a new analytical parameter, the immature platelet fraction (IPF), on short-term prognosis in patients with ACS. **Methods:** IPF was determined on the first morning blood count in patients admitted with ACS using a fully automated haematology analysis system, Sysmex XE-2100. We analyzed the relationship between IPF and intrahospital mortality (IM). **Results:** the study included 251 patients admitted with ACS: age 68±11 years, 66(26%) women, 82(33%) diabetics, 110(44%) patients with ST segment elevation myocardial infarction. IPF was not associated with other prognostic markers of ACS, such as C-reactive protein (CPR) (Pearson=0.032; p=0.628), pro-BNP (Pearson=0.138; p=0.152) or with markers of myorcardial injury such as Troponin I (Pearson=0.039; p=0.54). IPF value was higher in patients who died during hospitalitation (8.6% vs 5.7%; p=0.002). IM rates increased together with IPF tertiles: first tertile (<3.9%): 6%; second tertile (3.9–6.2%): 10.8%; and third tertile (>6.2%): 22%. The third tertile of IPF remained an independent predictor of hospital mortality in multivariate analysis (OR=2.50, CI95%, 1.18–5.63; p=0.018).

**Image/graph I:**

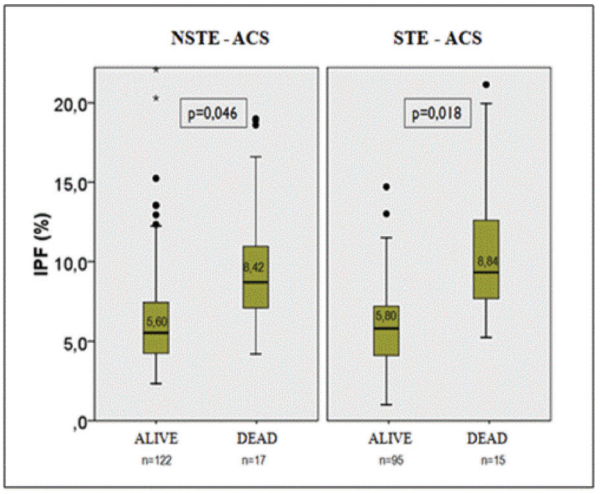


**Image 1: IPF levels in patients admitted in the hospital with ASC. There is an increase in IPF values in dead patients compared with those who survived, both in NSTE-ACS (left panel) and in STE-ACS (right panel). IPF: Immature platelet fraction; STE-ACS: persistent ST segment elevation acute coronary syndrome; NSTE-ACS: Non-persistent ST segment elevation acute coronary syndrome.**

**Image/graph II:**

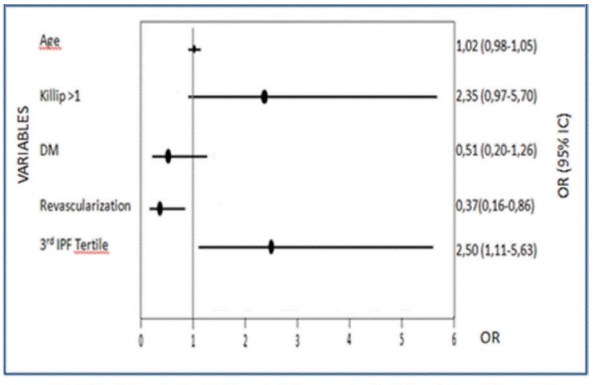


**Image 2: Multivariate analysis with binary logistic regression for in-hospital mortality. Results are adjusted for age, heart failure at arrival, diabetes mellitus and revascularization during hospitalization. DM: Diabetes mellitus; CI: Confidence interval; IPF: Immature platelet fraction; OR: Odds ratio.**

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**Conclusion:** We can conclude: 1) Increased IPF values, measured within the first 24 hours after arrival, are associated with a worse in-hospital prognosis and an increase of mortality rates. 2) IPF determination paves the way for a new research field in the area of SCA (evolution, antiaggregant therapy).

**References:**


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**P526**

## Icariin reduces the risk of thrombosis in atherosclerotic rabbits independent of its lipid-lowering effects


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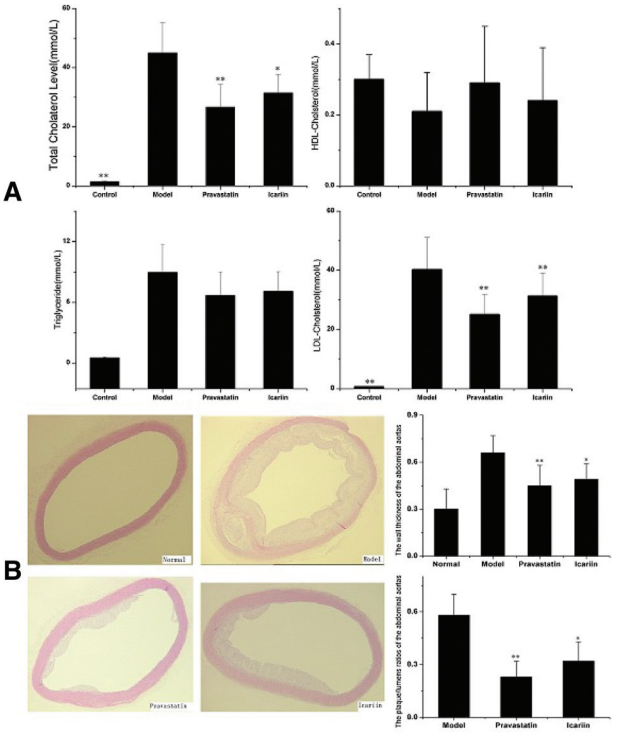
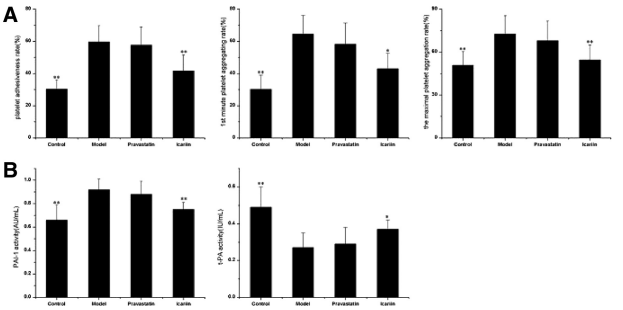
**Introduction:** Thrombosis accounts for myocardial ischemia and progression of atherosclerosis. Both the abnormal coagulation and damaged lining of the arteries can promote thrombosis. Icariin possesses a wide range of pharmacological activities including testosterone mimetic properties, which can convert estrogen and attenuate early atherogenesis. Whether icariin could also improve lipid metabolism and further reduce the formation of thrombosis in atherosclerosis need to be known. **Objectives:** We investigated the effects of icariin on hyperlipidemia and atherosclerosis. We further evaluated whether its effects could improve unfavorable hemorheologic parameters, attenuate platelet activation, and facilitate the balance of plasmic t-PA and PAI activities of high-cholesterol-diet fed rabbits. **Methods:** Rabbits were fed a high-fat diet (1.0% cholesterol, 5% fat and 10% yolk powder) for 4 weeks and the diet was switched to reduced-cholesterol (reduce 0.5% cholesterol) for the remainder of the study (4 weeks). At the beginning of the high-fat diet, the rabbits were divided into 3 equal groups: the model group(physiological saline), icariin-treated group(icariin 5mg/kg body weight), and pravastatin-treated group(5mg/kg body weight). Physiological saline, icariin and pravastatin were given daily via intragastric administration during the 8-week period. In addition, rabbits fed normal rabbit chow were considered as normal controls. The different aspects of lipid metabolism in serum, platelet adhesiveness and aggregation, plasmic t-PA and PAI-1 activities, hemorheologic parameters were examined during the entire experimental period. **Results:** Icariin and pravastatin reduced serum TC and LDL-C levels, and subsequently atherosclerosis(Figure1A and B, *P<0.05 and **P<0.01 versus the model group). In addition, icariin improved the imbalances of plasmic PAI-1 and t-PA activities, and reduced platelet adhesiveness and aggregation(Figure2A and B, *P<0.05 and **P<0.01 versus the model group). Icariin also modulated unfavorable hemorheologic variables in hypercholesterolemia. Whole blood viscosity at low shear rates (4.95±0.67 vs 6.71±0.72), whole blood reduced and plasma viscosities (4.22±0.65 vs 5.87±1.11, and 1.86±0.18 vs 2.33±0.21), and ESR (3.11±1.31 vs 5.23±1.52) was significantly lower in the icariin-treated group compared to the model group.

**Image/graph I:**




**Image/graph II:**




**Conclusion:** Icariin has lipid-lowering effects and could reduce the risk of thrombosis during atherosclerosis. The effects of icariin on thrombosis are independent of its lipid-lowering effect.

**P527**

## Effects of different statins combined with clopidogrel on the platelet functions in patients with acute coronary syndrome: a meta analysis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**Introduction:** Antiplatelet therapy is one of the most treatments for patients for acute coronary syndrome (ACS). However, there are many factors which may impact the antiplatelet effects of clopidogrel. **Objectives:** To evaluate the effects of different statins (CYP 3A4 metabolized statins and CYP 2C9 metabolized statins) combined with clopidogrel on the platelet functions in patients with ACS by Meta analysis. **Methods:** Both foreign and Chinese databases including PubMed, EMbase, Cochrane library, and CNKI were searched to identify randomized controlled trials (RCTs) that reported the effects of different statins combined with clopidogrel on the platelet functions and major adverse cardiac events (MACE). Two reviews assessed the quality of each trial and extracted data independently. The Cochrane Collaboration's RevMan 4.2.8 software was used for statistical analysis. **Results:** A total of 11 RCTs were included, and the methodological quality of each trial was good. There was no significant difference in platelet aggregation rate when different types of statins were used [WMD=0.39, 95%CI 1.04, 2.62), *P*=0.73], as well as the incidence of MACE [OR=1.07, 95%CI (0.77, 1.49), *P*=0.69]. However, the level of P-selectin was lower in patients received CYP 3A4 metabolized statins [WMD=-1.16, 95%CI (-1.77, -0.54), *P*=0.0002]. **Conclusion:** Both statins metabolized with and without CYP 3A4 were safe for ACS patients.

**P528**

## Prediction of platelet distribution width on no-reflow phenomenon in patients with acute myocardial infarction undergoing primary percutaneous coronary intervention


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**Introduction:** No-reflow phenomenon is one of the serious complications of percutaneous coronary intervention which leads to inceasing mortality. Up to now, no effective factors was found to predict no-reflow. **Objectives:** To analyze the predict effect of platelet distribution width (PDW) on no-reflow phenomenon in patients with ST-segment myocardial infarction (STEMI) undergoing primary percutaneous coronary intervention (PCI). **Methods:** Consecutive patients who were suffered from STEMI within 12 hours of symptom onset and underwent primary PCI were retrospectively enrolled. According to the occurrence of no-reflow during primary PCI, all the cases were divided into no-reflow group and normal flow group. The factors associated with no-reflow were analyzed. ROC curve was used to identify predict effect of PDW on no-reflow phenomenon. **Results:** A total of 118 cases were enrolled in this study, while 33 cases in no-reflow group and 85 cases in normal flow group. The value of PDW at admission was much higher in no-reflow group than that in normal flow group (16.7±2.3 vs. 15.1±2.2, *P*<0.01). The area under the ROC curve for ratio was 0.726 (95% CI 0.608–0.844□*P*<0.01). At a cut-off point of 16.45, the value of PDW exhibited 80.0% sensitivity and 72.4% specificity for detecting no-reflow phenomenon during primary PCI. **Conclusion:** The value of PDW at admission can predict no-reflow phenomenon in STEMI patients undergoing primary PCI□with high sensitivity and specificity.

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P529

## Impact of in-hospital recurrent ischemic event: findings from GULF RACE-2

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**Introduction:** Little in the literature is known about the long term outcome of patients with acute coronary syndrome (ACS) and in-hospital recurrent ischemic event. **Objectives:** To determine the baseline characteristics of patients, the predictors, and the long term outcome of patients with recurrent ischemia. **Methods:** The population compromised 7930 enrolled in the second Gulf Registry of Acute Coronary Events (Gulf RACE-2). **Results:** Out of the 7930 ACS patients, 172 (2.2%) had Re-MI during their hospital stay. Patients with Re-MI were more likely to be older( mean age 59.12±13.5 vs. 56.8±12.4, P=0.016), had significantly higher rate of prior history of angina( 48% vs. 38.2%, P=0.006 ), and hyperlipidemia (45.2% vs. 37.3%, P=0.027) than patients without Re-MI. On admission patients with Re-MI had significantly higher HR, lower systolic BP, Killip class 4 and high GRACE risk score than those without Re-MI (27.3% vs. 17.6%), (11% vs. 4.8%), (8.1% vs. 3.2%), and (31.8% vs. 21.5%, P<0.05 for all comparisons) respectively. Patients with Re-MI had a higher rate of STEMI on admission than patients without Re-MI (72.1% vs. 43.9%; P<0.001). Re-MI patients were less likely to receive Aspirin(94.8% vs. 98.5%, P=0.002), beta blockers( 95.3% vs. 74.7%, P<0.001), and Statin(87.2% vs. 94.9%, P<0.001) than patients without Re-MI. Coronary angiogram was less frequently performed on patients with Re-MI than patients without Re-MI (30.8% vs. 32.5%, P=0.036). In hospital adverse events including HF, cardiogenic shock, VT/VF were more frequent in the Re-MI group than patients without Re-MI (44.2% vs. 12.4%), (25.6% vs. 5.3%), (7.6% vs. 2.7%; P<0.001 for all comparisons) respectively.. In ACS patients with Re-MI in-hospital, 30 days and 1 year were significantly higher that patients without Re-MI( 23.8% vs. 4.1%), (28.1% vs. 7.7%), and (31.6% vs. 12.1%; P<0.001 for all comparisons), respectively. **Conclusion:** Recognizing patients at high risk of Re-MI is important as modifying the risk factors, and managing the patient aggressively may reduce the incidence of such events and the associated morbidity and mortality.

P530

## Relationship between HDL mean size and MPO/PON1 ratio in unstable CAD patients

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**Introduction:** Inflammation and oxidative stress have been implicated as key events in coronary artery disease (CAD). Myeloperoxidase (MPO) as an inflammatory and oxidative stress enzyme has been involved in initiation, progression and complication of CAD. On the other hands, Paraoxonase-1 (PON-1) is an antioxidant and antiatherogenic enzyme that predominately associated with High density lipoprotein (HDL) particles. **Objectives:** In this study we sought to evaluate the relations of MPO and PON-1 with HDL mean size in unstable CAD patients. **Methods:** 50 control subjects and 50 unstable CAD patients were participate in this study. FBS, HDL-C, and LDL-C were determined by direct enzymatic, TC and TG by enzymatic and hsCRP by immunoturbidometric methods. Plasma MPO levels were determined using an immunoassay methods and serum PON1 activity was assayed by a colorimetric method. HDL mean size was determined by dynamic light scattering methodology. **Results:** As the results show the biomarkers, hsCRP and MPO, were profoundly higher in unstable CAD patients than in control subjects. Results indicate a significant negative correlation between plasma MPO levels and serum PON1 activity. The MPO/PON1 ratio amount was significantly higher in unstable CAD patients (0.21 ± 0.14) than in control subjects (1.49 ± 1.10) (p<0.001). There is a significant correlation between MPO/PON1 ratio and HDL mean size and hsCRP in unstable CAD patients. **Conclusion:** This study explicitly demonstrated that there is a complicate relationship between MPO/PON1 ratio and HDL mean size in unstable CAD patients. Recently, MPO/PON1 has been suggested as a novel biomarker in secondary prevention of CAD. According to our results concentration of the enzymes and their relations to HDL particle sizes in unstable CAD patients in comparison with normal subjects, may better revealed their roles in CAD pathogenesis and clinical application.

P531

## Activation of aldehyde dehydrogenase-2 increases the cardioprotection effect during cardioplegic arrest

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**Introduction:** Aldehyde dehydrogenase-2 (ALDH2) activation confers profound cardioprotection during ischemia and reperfusion (I/R) damage, and I/R damage is inevitable during open-heart surgery. The effect of ALDH2 activation under clinical circumstances when hypothermia and cardioplegia solution is used has not been studied yet. **Objectives:** To evaluate whether ALDH2 activation can further increase the cardioprotection effect of cardioplegia solution. **Methods:** Alda-1 was used to activate ALDH2. The cardioprotection effects of Histidine-Tryptophan-Ketoglutarate (HTK) solution with and without Alda-1 were compared by using an ex vivo perfused rat heart model of I/R. Hearts were divided into 3 groups: sham (n= 6), no I/R; HTK and HTK plus Alda-1 groups (n=6 at each time point), underwent variant ischemia or I/R time course. ALDH2 activities, oxidative parameters (including 4-hydroxy-2-nonenal (4-HNE) His adducts, malondialdehyde (MDA) levels, and glutathione (GSH) levels), myocardial protein carbonyl levels, coronary effluents creatine kinase isoenzyme MB (CK-MB) levels and heart function parameters (including maximal velocity of pressure development and decline (dP/dt), left ventricular developed pressure (LVDP), and heart rate) were measured and compared between groups with and without Alda-1. **Results:** Alda-1 increased ALDH2 activity during the whole process of I/R even when hypothermia was used. Increased ALDH2 activity in turn decreased I/R-induced elevation in myocardial aldehydes, CK-MB leakage and protein carbonyl formation, and less GSH was consumed in hearts protected by Alda-1 supplemented HTK cardioplegia solution. ALDH2 activation alleviated I/R–induced heart contractile function impairment evidenced by improvement of dP/dt, LVDP, and heart rate. **Conclusion:** Our results indicate that Alda-1 supplementation can significantly increase myocardial ALDH2 activity. ALDH2 activation consequently improved the cardioprotection effect of cardioplegia solution, possibly through removal of toxic aldehydes to protect the heart from I/R injury.

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P532

## Value of quantitative real-time myocardial contrast echocardiography for detection of angiographically significant coronary artery disease

Dongye Li[1,*] on behalf of Yes, Li Liang[1] And Xu Tong-Da, Zhang Hui, Pan De-Feng, Zhu Hong, Chen Jing, Wang Xiao-Ping
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**Introduction:** There are two ways to evaluate coronary artery stenosis: one is the determination of coronary artery stenosis lumen diameter directly (such as angiography technology), the other is to evaluate coronary arteries function condition. Myocardial acoustic imaging (MCE) already gradually began to be used for clinical evaluation myocardial perfusion for a high space and time resolution, cheap fee,repeatability and no radiation pollution. **Objectives:** The aims of this study wasto evaluate the feasibility and diagnostic accuracy of quantitative Real-time (RT) myocardial contrast echocardiography (MCE) in predicting significant coronary stenosis, with reference to quantitative coronary angiography. **Methods:** Thirty-five patients scheduled for coronary angiography underwent RT-MCE at rest. Coronary angiography was performed within one week after RT-MCE. The observing indexes included: (1)The sensitivity and specificity of RT-MCE for detection of coronary artery disease (CAD) were performance. (2)The area of ROC was used to assess with A, $\beta$ and A$\times\beta$ respectively. (3) Gensini score were calculated. **Results:** (1)The cutoff of A, $\beta$ and A$\times\beta$ was 4.58, 0.64 and 2.73, then the sensitivity and specificity of RT-MCE for detection of CAD were 86.0%, 80.2%, 88.9% and 84.1%, 64.6%, 79.9%. The sensitivity and specificity of the semi-quantitive analysis for assessment of CAD were 66.7% and 61.8%. (2)The ROC curve area of A and A$\times\beta$ was 0.91 and 0.90 in middle segments. The ROC area of A was 0.52 in base segments. (3) The correlation coefficient was -0.79□"-0.51 and -0.76 comparing the results of A, $\beta$ and A$\times\beta$ with Gensini score. **Conclusion:** RT-MCE is an effective method for the detection of coronary artery stenosis and ischemic myocardium.

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P533

## Body surface mapping with nitroglycerine administration in the localization of the coronary artery lesion

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*[1]Cardiometabolic Center, Flor Ferenc Hospital Of County Pest, Kistarcsa, [2]Cardiology, State Health Center, [3]Research Institute for Technical Physics and Materials Science, Hungarian Academy of Sciences, Budapest, Hungary*

**Introduction:** The body surface potential mapping (BSPM) method is suitable to detect minor electrical potential changes in various myocardial settings and can predict coronary artery lesion. **Objectives:** Investigate whether nitroglycerine administration during BSPM can give further information about the coronary artery state in patients (pts) without necrosis sign or acute ischemic repolarization changes on the ECG or troponin riseat the time of the BSPM record. **Methods:** Pts (130), after non-ST elevation myocardial infarction (74 pts, 47 m, mean

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age: 61/31–79/y), and after unstable angina (56 pts, 38 m, mean age: 62/30–76/y) in their stable clinical state were investigated by BSPM (63 leads) before and after administration of 0.8 mg nitroglycerine (Nitromint retard EGIS). The same patients also underwent coronary arteriography. Controls: 59 healthy subjects (32 m, 53/23–72/y) with normal ECG, cardiac ultrasound, chest X-ray and laboratory findings. The control subjects had a 12 months follow-up to verify their health status. **Results:** BSPM detected potential losses in 120 pts. The coronary arteriography proved causative coronary artery lesion in 113 pts (multiple vessel disease in 77 pts) The positive predictivity (+Pred) was 94%. The reversibility of the potential loss after nitroglycerine administration correlated with the localization of the coronary lesion. Reversibility in the middle anteroseptal and anterosuperior regions indicated distal left anterior descendent coronary artery (LAD) stenosis (Spec: 91%, +Pred: 80%) while electrical damage in the same area but without regression indicated proximal LAD stenosis (+Pred: 88%, Sens: 78%. Circumflex artery occlusion was observed only in cases of the posterolateral electrical potential loss without regression (4/19). The reversibility of the inferior potential loss excluded the right coronary occlusion (Spec and +Pred: 100%). Regression of the potential loss of the apical anterior and/or inferior) regions indicated also distal LAD or circumflex artery stenosis (Spec: 93%, +Pred: 89%). **Conclusion:** Our non-invasive method provides valuable information on both the presence and localization of the coronary lesion.

**P534**

## Survival benefits of anti-ischemic metabolic therapy in coronary artery disease

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**Introduction:** Current guidelines highlight two objectives in the management of stable angina: improvement of prognosis and reduction in symptoms.[1] Preventive treatments from the BASIC protocol significantly improve prognosis of coronary artery disease (CAD) patients. Among currently available therapies, metabolic anti-anginal agents offer a valuable alternative approach for improvement of symptoms. However, the influence of these drugs on prognosis is still discussed. **Objectives:** Determine whether any of the available metabolic anti-anginal agents may also contribute to patient survival. **Methods:** Two commonly used antianginal agents were selected. Trimetazidine (TMZ) partially inhibits free fatty acid oxidation in ischemic myocardium. Ranolazine (RAZ) a late sodium current inhibitor is also described as presenting similar metabolic effects. Medline and Embase databases were searched for trials assessing either all-cause or cardiovascular mortality in CAD adult patients. At least one treatment arm had to include one of the two treatments of interest at any dosage. **Results:** Five clinical trials (24 343 patients) indicate potential survival benefits, mainly via post-hoc analysis, secondary end points, or retrospective investigations (**Table**).[2–6] Although no significant survival benefit was found with RAZ, three out of the four TMZ trials in various clinical settings indicated significant survival benefits. One TMZ trial (EMIP-FR) reached significance only in per protocol analysis of one patient stratum. These results may be linked to reduction of ischemia and angina symptoms as well as TMZ-associated preservation of cardiac function, which are three major determinants of long-term prognosis.

**Image/graph I:**

**Table.** Survival data with metabolic agents in ischemic cardiomyopathy (ICM), stable and unstable angina pectoris (SAP and UAP), and acute myocardial infarction (AMI). RCT, randomized, placebo-controlled trial.

| | Trimetazidine | | | | | Ranolazine |
|---|---|---|---|---|---|---|
| | El Kady et al 2005 | Di Napoli et al 2007 | Iyengar et al 2009 | EMIP-FR 2000 | | MERLIN TIMI-36 2007 |
| Patients (n) | ICM + SAP (n=200) | ICM (n=61) | SAP (n=353) | AMI (n=171 69) | | UAP/NSTEMI (n=6560) |
| Methods (duration) | RCT (24 mo) | Randomized, open-label (18 mo) | Retrospective | Double-blind RCT (12 mo) | | Double-blind RCT (12 mo) |
| End point | All-cause mortality | All-cause mortality | 6-mo post-MI mortality risk | Cardiovascular death | | Cardiovascular death |
| HR (95% CI), *P* value | 0.14 *P*<0.0001 | 0.26 (0.10–0.69) *P*<0.002 | 0.36 (0.15–0.86) *P*=0.022 | Thrombolized 1.07 *P*=0.36 | Nonthrombolized 0.85 *P*=0.015 | 1.00 (0.79–1.25) *P*=0.98 |

**Conclusion:** The metabolic approach to ischemia with TMZ may have a beneficial effect on survival in CAD. These results call for confirmation in large-scale double-blind, randomized trials.

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**P535**

## Effect of DC magnetic fields on LDL oxidation

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**Introduction:** Application of electromagnetic fields has been dramatically increased in modern life. Recent studies indicate that exposure to electromagnetic field may affect the course of cardiovascular disease especially in relation with lipid metabolism. It is provided that oxidized LDL (Ox-LDL) plays an important role in the pathogenesis of atherosclerosis. So it would be of interest to determine whether oxidation of LDL is affected by exposure to electromagnetic fields. **Objectives:** In this research we investigated the possible effects of DC magnetic fields on susceptibility of LDL to oxidation in vitro. **Methods:** LDL was isolated from fresh pool serum by sequential density gradient ultracentrifugation. LDL cooper induced oxidation was measured by continues monitoring of formation of conjugated dienes at wavelength of 234 nm under expose of different DC magnetic flux densities (produced by a solenoid cylinder with 1200 turns) compared with control. The zeta potential of LDL particles was measured by Zetasizer Nano ZS-90 instrument. **Results:** Results indicate that the magnetic flux density of 0.25, 0.5 and 1 mT increase the lag time from 86.3 ± 2.5 in controls to 108 ± 3, 94 ± 1.73 and 92.3 ± 1.53 respectively and reduce the Vmax proportionally. The zeta potential of LDL particles was significantly reduced under expose of these magnetic fields in a time-dependent manner. Increasing of magnetic flux densities over than 1 mT conversely cause to reduce the lag time to 81.3 ± 2.52, 52.3 ± 4.04 and 42.3 ± 1.53 in 2, 3 and 4 mT in compared with control. **Conclusion:** It is concluded that DC magnetic fields can alternate the susceptibility of LDL to oxidation *in vitro* via modification of its lag time and Vmax. It seems that LDL surface charge modification caused by magnetic field has an important role in this process. However more comprehensive studies should be done to determine the effects of magnetic fields on LDL and pathogenesis of atherogenesis.

**P536**

## Plasma microRNAs levels associate with coronary atherosclerosis and cardiac event in patients

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**Introduction:** Previous study demonstrated that plasma levels of endothelial-enriched miR-126 and smooth muscle–enriched miR-145 are significantly downregulated in patients with stable coronary artery disease (CAD). **Objectives:** The purpose of this study was to observe miR-126 and miR-143 expression in Chinese Han patients. **Methods:** We collected the fasting venous blood samples of n=22 acute myocardial infarction (AMI), n=31 unstable angina pectoris (UAP), n=23stable angina pectoris(SAP) and n=20 non-coronary heart disease (NCHD) from our hospital. Importantly, these patients had not been treated withstate-of-the-art medication, including aspirin, clopidogrel, $\beta$-receptor blockers, statins or ACEI before blood sample collected. The relative expresssion of plasma microRNA were measured by real-time polymerase chain reaction, and the correlation between microRNA and clinic parameters were also analysed. **Results:** Plasma miR-126 expression are markedly higher in SAP, UAP and AMI patients than NCHD patients (p=0.009, 0.003, 0.001, respectively), with no significant difference among AMI, UAP, and SAP groups. miR-143 expression in AMI group was significantly higher than other 3 groups ($p<0.05$), with no significant difference among UAP, SAP and NCHD groups. Plasma miR-143 level was positively correlated with CK, CK-MB, myohemoglobin levels (r=0.220, 0.336 and 0.300, p=0.048, 0.003 and 0.010, respectively). Moreover, Plasma miR-126 level positively correlate with atherosclerosis burden score (r=0.691, p=0.003)and SYNTAX score (r=0.769, $p<0.001$) calculated from the coronary angiograms. **Conclusion:** Plasma miR-126 and miR-143 may be novel biomarkers for atherosclerosis and acute cardiac event, which may provide insights into the mechanisms underlying atherosclerotic plaque in coronary artery disease.

**P537**

## Effects of rehmannia glutinosa oligosaccharides on allogenic adipose tissue-derived stem cells transplantation in miniswine with acute myocardial infarction

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**Introduction:** It is not clear that whether Rehmannia Glutinosa Oligosaccharides (RGOs) treatment can increase the efficacy of adipose tissue-derived stem cells (ASCs) transplantation in Chinese miniswine with acute myocardial infarction. **Objectives:** The study was conducted to evaluate whether RGOs treatment can increase the efficacy of ASCs transplantation in Chinese miniswine with acute myocardial infarction and to explore the potential mechanisms. **Methods:** The ASCs of miniswine were isolated and cultured from adipose tissue harvested from inguinal regions by enzyme digestion and adherent. the molecular phenotypes of ASCs at passages 4 were examined by flow cytometry,and results showed that ASCs were positive for CD29,CD44,CD90 and CD105,but negative for CD31,CD34,CD45 and HLA-DR.Seventeen Chinese miniswine were divided into four groups: control(group C,n=5);RGOs alone (group R.n=4),administration crude extract alone from the 3rd day prior to acute myocardial infarction to one month post acute myocardial infarction(4g,tow time per day) ASCs transplantation alone(group A,n=4) and RGOs+ASCs(group RA,N=4). Acute myocardial infarction models

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were created by occlusion of the left anterior descending artery for 90 mintes.One weeks later (the 7th to 10th day post AMI), allogenic ASCs (0.8X106/kg) were injected into left anterior descending artery. **Results:** At 8 weeks post transplantation, magnetic resonance imaging(MRI)showed that the left ventricular ejection fraction and wall thickness of infarcted regions were increased while the left ventricular mass index, the infarct size were decreased only in group RA compared with group C($p<0.05$).ASCs survival was significantly better in group RA than in group A($p<0.01$).Microvascular densities both in the infracted zone and the peri-infarct zone also increased significantly in group RA but not in other three groups($p<0.01$).Masson trichrome stain showed that there was less fibrosis with more surviving myocardium in group A and group RA than that in group C($p<0.05$ and $p<0.01$).Western blot analysis indicated that the expression levels of Bax in group R,group A and group RA were significantly decreased□$p<0.01$□versus group C□However, the expression levels of Bcl-2 in group R and group RA were significantly increased ($p<0.01$, versus group C). **Conclusion:** RGOs treatment improves the therapeutic efficacy of ASCs transplantation by improving the local milieu of the ischemic myocardium, promoting ASCs proliferation and survival, enhancing paracrine function and by anti-apoptosis.

**P538**

## Late ventricular potentials instability in patients with acute myocardial infarction one year after

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**Introduction:** Late ventricular potentials (LP) represent an arythmogenic substrate in patients with acute myocardial infarction (AMI). It is a simple and noninvasive method for prediction of sudden cardiac death in those patients. Detection of LP is managed by recording of signal averaged ECG (SAECG). **Objectives:** The aim of our study was to evaluate stability of SAECG parameters in AMI patients one year after its occurrence. **Methods:** We analyzed 77 patients with AMI. Patients with bundle branch block and reinfarction were eliminated. Late potentials were detected through signal averaged ECG recording and its three parameters: QRS duration (QRSd), low amplitude high frequency duration (LAHFd) and root mean square in last 40ms (RMS(40ms)). Criteria for their presence were QRSd longer than 114ms, LAHFd longer than 38ms and RMS (40ms) less than 20 microV. At least two of those three parameters with abnormal values indicated LP presence. SAECG was recorded between 7 and 14th day of AMI. 40 patients had abnormal findings which suggested presence of LP. 37 patients didn't have LP in acute phase of AMI and were considered as a control group. There were no significant differences between groups towards sex and age. One year after AMI we repeated SAECG analysis. We divided patients into four groups: permanently positive, permanently negative, those who became negative and those who became positive considering LP presence. Then we analyzed factors which, with statistical significance, could contribute to their variability. **Results:** In 57.5% patients positive findings of SAECG converted to negative during first year after AMI and only 13.5% patients who didn't have LP in acute phase of AMI became positive. Diabetes mellitus was an independent predictor of variability of LP ($p<0.05$) since 13.0% patients became positive comparing to 3.8% of non-diabetic patients. Thrombolytic therapy in our patients favored the variability of LP in the mean of their changing from positive to negative. 10.2% patients who didn't receive thrombolytic therapy became positive comparing to 0.0% patients who received thrombolysis. The most stable SAECG parameter was QRSd since 81.0% of patients with normal values of this SAECG parameter in acute phase of AMI kept these values after one year. **Conclusion:** Late potentials are unstable parameter in patients with AMI, especially in patients with Diabetes mellitus which contributes to SAECG abnormality one year after AMI. Application of thrombolythic therapy favorizes their loss during first year after AMI.

**P539**

## Predictive value of late ventricular potentials for the ventricular arrhythmias development in patients with acute myocardial infarction

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**Introduction:** Signal averaged ECG (SAECG) is a simple and non invasive method for detecting presence of late ventricular potentials (LP). Patients with acute myocardial infarction (AMI) have arythmogenic substrate presented by occurrence of LP. **Objectives:** The aim of this study was to evaluate correlation between occurence of ventricular arrhythmias and SAECG parameters as well as their predictive value during first year period after AMI. **Methods:** We analyzed occurrence of ventricular arrhythmias (classified by Lown classification) detected by the 24 hour ECG ambulatory monitoring in acute phase and one year after AMI in 43 patients with AMI and present LP and 51 patient without LP as a control group. Late potentials were detected through signal averaged ECG recording and its three parameters: QRS duration (QRSd), low amplitude high frequency duration (LAHFd) and root mean square in last 40ms (RMS (40ms)). Criteria for their presence were QRSd longer than 114ms, LAHFd longer than 38ms and RMS (40ms) less than 20 microV. At least two of those three parameters with abnormal values indicated LP presence. SAECG recordings were made in between 7th and 14th day of AMI. Patients with bundle branch block and those with reinfarction were eliminated. There were no significant differences between groups towards sex and age as well as therapy modality (all patients were on beta blocker therapy). **Results:** There were 16.3% patients with AMI and LP presented who had ventricular tachycardia (Lown IVb) in acute phase and none of the patients with AMI but without LP ($p<0.01$). Prolonged QRSd parameter of SAECG was significantly related to severity of ventricular arrhythmias in acute phase ($p<0.01$). During one year period, presence of LP did not indicate ventricular arrhythmias development but multivariate analyze recognized QRSd parameter as significant predictor of occurrence of ventricular arrhythmias together with left ventricle dilatation and aneurysm presence ($p<0.05$). **Conclusion:** Presence of late ventricular potentials detected through SAECG was related to ventricular arrhythmia occurrence in acute phase of AMI in our study group. Their predictive strength was lost during follow up period except for QRSd parameter.

**P540**

## The association of intensive statin therapy on long-term risks of cardiovascular events and diabetes following acute myocardial infarction

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**Introduction:** Higher dose statin therapy has been endorsed by practice guidelines for treatment of patients with acute myocardial infarction (AMI) because of its impact on reducing recurrent cardiovascular events in the short term. However, the association of higher dose statin therapy on longer-term cardiovascular events is unclear. Furthermore, recent studies have raised concern regarding an increased risk of developing diabetes with higher dose statins. **Objectives:** Accordingly, our main objective was to evaluate the association of higher statin dose on longer-term risks of cardiovascular events and development of diabetes mellitus following AMI. **Methods:** A propensity analysis was performed using data from the Enhanced Feedback for Effective Cardiac Treatment (EFFECT) study, which included 7,746 patients hospitalized with an AMI in Ontario, Canada from 2004 to 2005. Intensity of statin therapy was based on the magnitude of LDL reduction achieved by the type and dose of statins. The primary end point was a composite of death or recurrent hospitalization with acute coronary syndrome. The secondary endpoint was the development of diabetes mellitus. **Results:** In our cohort, 5,622 patients survived hospitalization and were discharged on statin therapy. There were 2,529 patients (45%) who were discharged on higher dose statin and 3,093 (55%) patients who were discharged on low dose satin. In the propensity matched cohort that included 4,146 patients (2,073 matched pairs), death or acute coronary syndrome occurred in 35.4% of patients in the higher dose statin group versus 36.3% of patients in the low dose group at 5 years ($p = 0.54$). Among the 3,024 AMI patients who did not have diabetes mellitus, the incidence of developing diabetes mellitus was 15.3% in the higher dose statin group versus 14.6% in the low dose statin group ($p = 0.61$). **Conclusion:** In this population-based study of patients with AMI, we found that higher doses of statin therapy were not associated with a reduction in mortality or acute coronary syndrome at 5 years after hospitalization. In addition, higher statin doses were not found to be associated with an increased risk of developing diabetes mellitus.

**P541**

## Hypoalbuminemia as a predictor of poor prognosis in acute coronary syndrome

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**Introduction:** Hypoalbuminemia is a negative acute phase protein found to be associated with poor prognosis in certain chronic diseases. However, its impact on acute coronary syndromes (ACS) outcome has not been established. **Objectives:** The aim of this study was to evaluate the relevance of admission serum albumin on in-hospital and post-discharge prognosis in the setting of ACS. **Methods:** We enrolled 245 consecutive patients admitted to a tertiary hospital for ACS. Sociodemographyc, clinical and laboratory data (including admission serum albumin levels) were collected. In-hospital complications and mortality were evaluated. Post-discharge follow-up (clinical visit or telephonic contact) was performed to determine the occurrence of a composite outcome (all-cause mortality and new hospital admission for ACS, stroke and congestive heart failure). **Results:** In our population, 69.4% patients were male, mean age 64.2±13 years. Mean serum albumin was 37.40±3.80 and 17.7% of patients had hypoalbuminemia (≤34mg/dL). Patients with and without low albumin were found to be similar in age, sex, cardiovascular risk factors prevalence (except diabetes which was more prevalent in the hypoalbuminemia group, $p<0.001$), admission diagnosis, maximum troponin I value and left ventricular systolic function. Hypoalbuminemia was associated with higher Killip class, higher admission BNP and serum creatinin and lower hemoglobin ($p<0.001$ for all the analysis). The incidence of complications and in-hospital mortality was similiar between the low versus normal albumin level patients. Follow-up was possible in 220 (90%) patients for a mean time of 25±10.5 months. Composite outcome occurred in 24.9% of the patients (27 ACS, 16 congestive heart failure and 5 strokes admissions, and 13 deaths), at a mean time of 10.7±9 months. Hypoalbuminemia was a strong predictor of the composite adverse outcome on univariate analysis (HR 3, CI 1.7–5.1). After Cox-Regression multivariate analysis adjusted for other relevant covariates (age, left ventricular systolic function and maximum troponin I value), low serum albumin was associated with a 3.3 fold higher risk of developing the composite adverse outcome (HR 3.3, CI 1.7–6.3). **Conclusion:** In our population, hypoalbuminemia was a common finding and it was an independent predictor of post-discharge adverse outcome. This might suggest a potential role for admission serum albumin as an important biomarker of high risk ACS patients.

**P542**

## Delayed revascularization with immediate restoration of sinus rhythm in a patient with inferior STEMI and persistent complete heart block

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**Introduction:** Transient atrioventricular block is a known common complication following acute inferior right ventricular ST elevation myocardial infarction (STEMI). Immediate revascularization of infarct related artery (commonly RCA) would lead to early restoration of sinus rhythm. Persistent AV nodal disturbance beyond 48–72 hours raises suspicion of permanent AV nodal damage and would warrant a permanent pacemaker implantation. **Objectives:** We demonstrate a patient with persistent complete heart block requiring transcutaneous temporary pacing wire at day 10 of acute inferior RV STEMI. Following delayed PCI to the infarct related artery, there was immediate restoration of sinus rhythm. **Methods:** 63 year old gentleman who was an active smoker and hypertension presented

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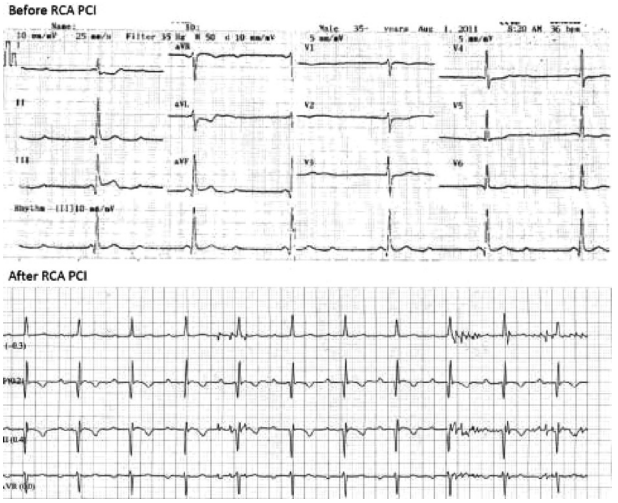
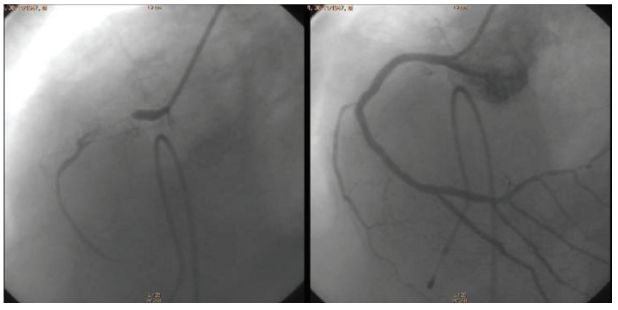
to a local hospital for acute inferior RV STEMI. He was thrombolysed successfully with resolution of ST segment. He developed complete AV block (Image/graph I) at presentation with hypotension and was stabilised with intravenous fluid therapy and temporary pacing. Despite optimal antiplatlet and antiangina medication, he was pacing dependent at day 10 of STEMI. He was thus referred to Penang Cardiac Center for permanent pacemaker implantation. On arrival, we decided to proceed with coronary angiogram, which showed minor disease over left coronary system, with visible collaterals to right PDA branches, Rentrop grade 2. There was 99% subtotal occlusion of RCA (Image II), with organised thrombus at proximal RCA. There was TIMI 2 flow antegradely in the RCA. We proceed with PCI to proximal RCA. The RCA was engaged with 7Fr JR4 guiding catheter. RCA was wired with Fielder XT and finecross microcatheter, subsequently exchanged to BMW II guide wire. Proximal RCA was predilated with Everest 2.0 x15 compliant balloon, followed by NC Sprinter 2.5 x15 non compliant balloon. Xience Prime drug eluting stent 3.0 x38 was deployed, and postdilated with Hiryu 3.5x14 balloon up to 28 atm. We achieved TIMI 3 flow of RCA with no dissection(Image II). It was a dominant RCA. There was immediate restoration of sinus rhythm from initial complete AV block(Image I). **Results:** The patient was observed for 3 days without recurrence of AV disturbance. He was discharged well. Initial plan for a permanent pacemaker implantation was abandoned.

**Image/graph I:**




**Image/graph II:**



**Conclusion:** This case showed that persistent complete AV block may be due to persistent AV node ischemia. We recommend early coronary angiogram and revascularization in those group of patient prior to decision for permanent pacemaker implantation.

**P543**

## Gastrointestinal related bleeding sequale in patients with acute coronary syndromes receiving dual antiplatelet therapy with aspirin and clopidogrel

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**Introduction:** Dual antiplatelet therapy (DAT) with aspirin and clopidogrel is recommended up to one year following acute coronary syndrome (ACS) and gastrointestinal bleeding is the main hazard of this treatment. **Objectives:** To assess gastrointestinal (GI) bleeding event rate in patients on 12 months dual anti-platelet therapy (DAT)-Aspirin and Clopidogrel, following acute coronary syndrome (ACS). **Methods:** The patient case records of 180 consecutive admissions with ACS on DAT were reviewed to assess the re-admission rate with GI related complaints, specifically GI bleeding. **Results:** 65% of the patients were male and 35% female, 73% Caucasian and 27% Asians. Patients were also divided in two groups : Group 1 (Age $>$ 65, n$=$ 96) and Group 2 (Age $<$65, n$=$84) Out of 180, there was no GI related mortality, 15 patients (8%) were re-admitted with GI-related problems (Abdominal pain/Dyspepsia 8, Haematemesis and melaena 4, fresh PR bleeding 2, new onset anaemia 1). Median onset of presentation was 5 months. An obvious GI bleeding source (following OGD and Colonoscopy) identified in 10 patients (5.5%) (2-bleeding peptic ulcer disease, 1-Mallory-Weiss tear, 6-gastritis, 1-proctitis). With 2 patients, DAT was discontinued. In group 1, (Age $>$ 65), 7 patients were found with GI-related bleeding events (7.2%) and in group 2 (Age $<$65) 3 patient (3.6%) were found with GI-related bleeding (Odds ratio-2.12, z-statistic -1.06, p$=$0.28). **Conclusion:** GI related bleeding is a complication of dual anti-platelet therapy following ACS with increased age ($>$65) possibly being a significant pre-disposing risk factor. Studies with larger population numbers are required to confirm the observations.

**P544**

## Baseline hypercalcaemia predicts the outcome of patients with acute coronary syndrome

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**Introduction:** Serum calcium level has been associated with ischaemic myocardial damage, but its role as a predictor of outcome in patients with acute coronary syndromes (ACS) was not determined. **Objectives:** The aim of this study was to assess the role of admission calcaemia in predicting adverse outcomes, among ACS patients. **Methods:** We enrolled a total of 195 consecutive patients admitted to a tertiary hospital for ACS. Data on sociodemographic and clinical characteristics were evaluated. The occurrence of a composite outcome (all-cause mortality and hospitalization for heart failure, acute coronary syndrome or stroke) was assessed, at 27 month follow-up. **Results:** Among all, 68.7% patients were male and the mean age was 64.0$\pm$13 years. Mean serum calcium was 2.41$\pm$0.26 and 28.7% of patients had hypercalcaemia ($>$2.60 mmol/L). Patients with hypercalcaemia were more frequently women (48.6% vs 27.5%; p$=$0.015), diabetic (42.9% vs 23.1%; p$=$0.017) and renal insufficient (34.9% vs 14.3%; p$=$0.001). Follow-up was achieved in 180 (92.3%) patients. Of these, composite outcome occurred in 45 (23.1%) patients: 18 (9.2%) acute coronary syndromes, 14 (7.2%) hospitalizations for heart failure, 3 (1.5%) strokes and 10 (5.1%) deaths. The composite end point occurred more frequently in patients with hypercalcaemia (50.0% vs 19.6%; p$<$0.001) and left ventricular dysfunction (33.3% vs 16.7%; p$=$0.01). Univariate analysis showed that hypercalcaemia was a strong predictor of the composite adverse outcome (OR 4.1; CI 1.8–9.2). Multivariate regression analysis including hypercalcaemia and left ventricular systolic function confirmed the independent association (OR 3.8; CI 1.6–8.7) of hipercalcaemia with adverse outcome. **Conclusion:** Hypercalcaemia is an independent predictor of post-discharge adverse events occurrence. Thus, serum calcium concentration may constitute a cost-effective and important prognostic indicator for ACS patients.

**P545**

## Impact of CRUSADE score in patients with acute coronary syndromes without ST-segment elevation: follow-up at 6 months

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**Introduction:** The treatment of acute coronary syndromes without ST-segment elevation (NSTEMI) reduces ischemic events but increases the risk of bleeding, leading to increased mortality at 30 days. **Objectives:** The purpose of this study was to evaluate the impact of major bleeding (MB) and the risk classes CRUSADE, with respect to ischemic complications and mortality at 6 months (M). **Methods:** We conducted a retrospective, descriptive and correlational study involving 512 patients (P) admitted to a Cardiology Department from January 2008 to December 2009. We evaluated the baseline characteristics of P, treatment strategies, CRUSADE risk classes, rate of ischemic events (myocardial re-infarction (re-MI), post-infarction angina, cardiac re-catheterization, strokeand cardiovascular (CM) and overall (OM) mortality rates at 6 M. For statistical analysis we used SPPS 13.0. **Results:** According to the CRUSADE score, 31,4% of P belonged to high bleeding risk classes (41–50 points: 84 P (16,4%) and $\geq$ 50 points: 77 P (15%)). In these P, there was a higher number of re-MI (5% vs 1,8%, p $=$ 0,043). There was no statistically significant difference at OM, CM, as well as in other ischemic events. In P who showed MB during hospitalization, there was a greater OM (16% vs 4,6%, p $=$ 0,012) and a trend toward higher occurrence of stroke (25% vs 5%, p $=$ 0,072). There was no significant difference in CM and other ischemic events. We found as independent predictors of mortality at 6M: non-realization of coronary angiography (p $=$ 0,002), presence of previous stroke (p $=$ 0,018), poor left ventricular function (p $=$ 0,018) and the occurrence of MB (p $=$ 0,018). **Conclusion:** 1–The MB is associated with an increased OM and a higher incidence of stroke at 6 months. 2–The P belonging to the higher risk bleeding classes, showed a greater number of re-MI. 3–In order to reduce the mortality at 6M, P admitted for NSTEMI should be subject to a stratification of their bleeding risk, in order to take effective measures to prevent bleeding.

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## First septal branch and regional wall motion in patients with first acute anterior myocardial infarction

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**Introduction:** Echocardiography is one of the simplest investigations to assess the myocardial regional wall motion abnormalities in coronary artery disease. **Objectives:** The aim of the study is to analyze the influence of patency of first septal branch (FSB) of left anterior descending (LAD) coronary artery on left ventricular regional wall motion in patients (pts) with first acute anterior myocardial infarction (AAMI) and one vessel (LAD) coronary artery disease. **Methods:** The total of 540 pts were divided into the two groups: in Group A (246 pts, 45.6%), LAD was ocluded after the FSB, and in Group B (294 pts, 54.4%) before FSB. Echocardiography and coronary angiography were performed during the second week of AAMI. Left ventricular shape was analyzed by use of central point method, and dividing left ventricle with 48 radiants starting from the mitral valve. The average regional ejection fraction (AREF) was calculated for 6 segments: posterior (P), inferior (I), apical (Ap), anterior (Aa) and anterobasal (Ab) enclosed with radiants 1–8, 9–21, 22–29, 30–38 and 39–48 respectively. **Results:** In Group A the AREF was significantly worse for segment I (46.7% vs 69.4%, p=0.019) and the average radial shortening (ARS) for radiants 8–20 (Fig1). There were no significant differences in ARS for other radiants, AREF for segments P (31.6% vs 27.4%), Aa (14.2% vs 14.5%), Ap (23.7% vs 7.6%), and Ab (34.8% vs 38.1%) and for global ejection fraction (36.4% vs 30.5%). **Conclusion:** The average radial shortening in patients with first acute anterior myocardial infarction and proximal LAD occlusion was significantly worse for radiants 8–20 compared to the group of patients with LAD occlusion after the first septal branch and the average regional ejection fraction was significantly worse for inferior segment.

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## Can CHADS2 and CHA2DS2-VASc be used for the prediction of an adverse prognosis after an acute myocardial infarction?

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**Introduction:** $CHADS_2$ and $CHA_2DS_2$-VASc are two classifications that are widely used in daily practice for risk stratification of atrial fibrillation and are based on risk factors that are highly prevalent among patients with coronary heart disease. Despite this, their role in prognosis assessment of patients admitted with acute myocardial infarction (AMI) has not been tested. **Objectives:** Evaluate the performance of these classifications when compared to Grace risk score (GRS), the gold standard for prognosis assessment in AMI. **Methods:** Retrospective study of 693 consecutive pts (age 68.9±13.5 ♀ 36.9%) admitted with AMI (45.9% STEMI) in a single center and followed for 24 months. $CHADS_2$, $CHA_2DS_2$-VASc and GRS were compared using ROC curves for the prediction of the following endpoints: Primary endpoint - Total death; Secondary endpoints: heart failure readmission, reinfarction, stroke and major adverse cardiovascular events (MACE), comprising primary plus all secondary endpoints. Cumulative hazard plots were traced, according to $CHADS_2$ or $CHA_2DS_2$-VASc and stratified by the presence or absence of atrial fibrillation. **Results:** GRS (AUC 0.829) was superior in the prediction of primary endpoint (vs $CHADS_2$ AUC 0.759 p 0.009, $CHA_2DS_2$-VASc AUC 0.727 p 0.001). No differences between $CHADS_2$ (AUC 0.715), $CHA_2DS_2$-VASc (AUC 0.705) and GRS (AUC 0.749) were found regarding MACE and all the remaining secondary endpoints (all p=n.s.). Death in the first 24 months increased alongside with $CHADS_2$ score, even in patients in sinus rhythm. **Conclusion:** $CHADS_2$ score is easy to calculate and provides reasonably accurate information on prognosis and risk of future events. Despite being inferior to Grace Risk Score in prognosis assessment, it may be a reasonable option for risk stratification of patients with acute myocardial infarction.

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## Impact of persistent hyperglycemia on contrast-induced nephropathy in diabetic patients undergoing primary coronary intervention

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**Introduction:** Acute hyperglycemia and contrast-induced nephropathy (CIN) are frequently observed in ST-elevation acute myocardial infarction (AMI) patients with diabetes undergoing primary percutaneous coronary intervention (PCI), and acute hyperglycemia is associated with an increased risk for CIN and with increased in-hospital mortality. The relation of change in blood glucose levels after admission and CIN remains unclear. **Objectives:** We investigated whether persistent hyperglycemia was associated with CIN in AMI patients with diabetes undergoing primary PCI. **Methods:** We measured blood glucose on admission and 24 hr after symptom onset in 82 diabetic patients after primary PCI for AMI. CIN was defined as an increase in serum creatinine of >=0.5 mg/dl or a >=25% increase from the baseline value within 48hours after the procedure. **Results:** There were 59 patients with admission hyperglycemia, defined as a blood glucose level of >198mg/dl. Patients with acute hyperglycemia had a 2-fold higher incidence of CIN than those without acute hyperglycemia (21% vs 11%, P<0.05). Patients with admission hyperglycemia were subdivided according to the presence (n=28) or absence (n=31) persistent hyperglycemia defined as blood glucose level of >198 mg/dl 24 hr after symptom onset. The incidence of CIN were higher in patients with persistent hyperglycemia than in those without it (32% vs 10%, p<0.05), whereas there were no significant differences regarding CIN between patients without persistent hyperglycemia and those without admission hyperglycemia. Multivariate analysis showed that persistent hyperglycemia was independently associated with the incidence of CIN. **Conclusion:** Our findings suggest that persistent hyperglycemia after AMI, but not transient hyperglycemia on admission, is associated with CIN in diabetic patients undergoing primary PCI.

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## Incidence and predictors of arrhythmia during cardiovascular rehabilitation in patiens after myocardial infarction treated with primary coronary intervention

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**Introduction:** Primary coronary intervention/PCI/reduce mortality after myocardial infarction/MI/but it remains unclear if PCI reduces the incidence of late arrhythmias. We analize the incidence of arrhythmias after PCI and which predictors for they outcome could be relevant. **Objectives:** To evaluate the relation between incidence of arrhythmias and number, type of stents/bare metal stent (BMS), drug eluted stent (DES)/, localization of infarct and age of patients with previous MI undergoing PCI primaria during cardiovascular rehabilitation. **Methods:** Study population consisted of 1028 patients who had MI and PCI primaria and were rehabilitated in our Institute in last three years. Rehabilitation started 20+/-15 days after PCI primaria. Arrhythmias were detected with Holter EKG who was performed 7–15 days after starting cardiovascular rehabilitation. **Results:** There were 160 patients/6,83%/with arrhythmias/VES, VT non sustained, SVES, AF/. There were 127/79,4%/men and 33/20,6%/women (mean age 60,8+/-10,6 years). Control group of 160 patient/MI, PCI prim,no arrhythmias/with same sex distribution and mean age of 58,25+/-11,25 years. There were significant differences in age among two groups (t=2,071; p=0,039). The anterior localization of infarct were present in 65/40,6%/and inferior localization in 95/59,4%/patients in arrhythmia group. In control group anterior localization of infact had 84/52,5%/and inferior localization of infarct had 76/47,5%/ patients. There were significant differences among groups in localization of infarct (X2=4,534;p=0,033). Multiple linear regression analysis show that the most important predictor for arrhythmias were localization of infarct-more frequent in inferior localisation/p 0,034,RR 1,613,95% CI 1,038–2,515/. There were no significant differences in patients in both groups in number of stents/in arrhythmia group mean 1,61+/-0,89; in control group mean 1,55+/-0,88/and type of stents/BMS 147 (91,9%) in arrhythmia group and 150 (93,8%) in control group; DES 15 (9,4%) in arrhythmia group and 14 (8,8%) in control group. **Conclusion:** We did not found that incidence of arrhythmias correlate with number and type of stents/BMS, DES/. Localization of infarct and age were important predictor of arrhythmias and among them more important predictor is inferior localisation of myocardial infarction.

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## Stress hyperglycemia as an indicator of in-hospital and 6 month prognosis in acute myocardial infarction and its correlation with endothelial dysfunction

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**Introduction:** High blood glucose levels in acute myocardial infarction (AMI) are common and they are associated with an increased risk of death. Hyperglycemia induces endothelial dysfunction which can contribute to it's damaging effect during AMI. **Objectives:** The aim of our study was to determine the influence of stress hyperglycemia (SH) on intrahospital and 6-month prognosis after AMI and it's correlation with microalbuminuria (MA) which is a marker of endothelial dysfunction. **Methods:** There is no universal definition of SH and we determined it as a glucose level >8.5 mmol/L at admission since this glucose level showed the highest specificity (60.3) and sensitivity (75.0) in ROC analysis for intrahospital mortality rate (AUC=0.563, 95% CI 0.47–0.65, p=0.67). Microalbuminuria was measured as a urinary albumin creatinin ratio (UACR): 2.5–25 mg/mmol in men and 3.5–35 mg/mmol in women, on the 3rd day after hospital admission. Patients (pts) were clinically followed for 6 months. **Results:** We included 130 pts with AMI (63% men, age 62.48±12.0), 34.6% pts had diabetes. 35.8% of pts without diabetes and 64.2% of diabetics had SH (p<0.0001). Pulmonary oedema was significantly more frequent in pts with SH (8% vs. 0%, $\chi 2$=6.28, p<0.05). There were no significant differences in prevalence of other intrahospital complications: mechanical complications, arrhythmias, conduction disturbances and increase in infarct size between pts with and without SH. Stress hyperglycemia had no influence on intrahospital mortality rate in logistic regression analyses. Only troponin I level had influence on intrahospital mortality rate (B=0.005, t=2.481, p<0.01). During follow up period there was no significant difference in number of re-hospitalizations for cardiovascular diseases (0.9 vs. 0.5) and mortality rate (8% vs. 5.3%) between pts with and without SH. Mean UACR was 8.16±21 mg/mmol and 27.7% of pts had MA. Correlation was found between UACR and glucose level (r=0.179, p<0.05), however there was no significant difference in prevalence of MA in pts with and without SH (45.3% vs.31.2%, $\chi 2$= 2.68, p=0.139). **Conclusion:** Patients with stress hyperglycemia more often had pulmonary oedema during hospitalization in AMI. Stres hyperglycemia did not have influence on 6 month prognosis after AMI. There was no correlation between SH and microalbuminuria which is a marker of endothelial dysfunction. We need more studies to elucidate the prognostic role of hyperglycemia in AMI.

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## Dynamic changes of Q-T dispersion in 210 cases with acute myocardial infarction

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**Introduction:** Q-T dispersion (maximum QT interval minus minimum QT interval) was originally proposed as an index of the spatial dispersion of ventricular recovery times, now it has been widely used to evaluate all kinds of pathological status of the heart. **Objectives:** To observe the dynamic changes of the QT dispersion in patients with acute myocardial infarction(AMI). **Methods:** Analyze with detail the electrocardiogram data of 210 AMI patients(all the patients hospitalized in 24 hours) in CCU ward during January 2005 and January 2011. The changes of their QT dispersion were measured with 17 lead electrocardiogram (‡,‡,‡, aVR, aVL, aVF, V1-V9, V3R, V4R).Process the data with SPSS13.0. **Results:** QT dispersion in 210 AMI patients varied dynamically. It peaked in day2 and day3, respectively (65.18 + 34.08) and (63.18 + 28.51), and begin to decrease from day5, which is in accord with the clinical situation□**Graph 1**□. **Conclusion:** The QT dispersion of patients in early stage of AMI increases obviously and peaked in the day2–3, in line with the clinical manifestation.It is helpful to understand acute myocardial infarction.Q-T dispersion can be as a non-invasive prediction index of the ventricular arrhythmia after AMI□.

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## Percutaneous retrieval, repositioning, unknotting, and stripping of intracardiac catheters and foreign bodies

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**Introduction:** Percutaneous retrieval, repositioning, unknotting, and stripping of intracardiac catheters and foreign bodies. **Objectives:** Intracardiac embolization of catheter fragments and iatrogenic and other foreign bodies (stents, bullets, IVC filters); intracardiac knot formation in catheters; malpositioning of intracardiac catheters; and thrombi and fibrin deposition in intracardiac catheters are serious complications of percutaneous catheterization techniques, and penetrating trauma associated with high morbidity and mortality. **Methods:** We performed percutaneous retrieval of intracardiac catheters and iatrogenic foreign bodies (n=70), unknotting of catheter knots (n=4), repositioning of malpositioned catheters (n=36), and stripping of catheters (n=20), in 130 adults and children. Interventional radiologic equipment included: Dotter retrieval baskets, Amplatz and Curry retrieval loops, and other types of loops, deflecting wires, retrieval forceps, and different types of angiographic catheters, alone or in combination. **Results:** Retrieval of catheter fragments and iatrogenic foreign bodies was successful in 66 patients. There were four failures: an IVC filter, a catheter fragment, a stent both lodged in the right atrium, and a bullet lodged in the right ventricle. Unknotting of catheters knots, repositioning of misplaced catheters, and stripping of catheters was successful in all patients. There were no major complications related to the IR procedures. **Conclusion:** These interventional radiologic procedures are quick, safe, and effective to manage potentially serious and lethal complications of percutaneous catheterization techniques. Dialysis and central catheters and ports can be made functional for much longer periods. In many instances major operations to manage these problems, which may include open-heart surgery, are avoided. IR is the discipline of choice to solve these situations. Experienced personnel are needed everywhere.

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## Myocardial infarction complicated by cardiogenic shock, outcome of its treatment by percutaneous coronary intervention and increased survival factors

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**Introduction:** Treatment of myocardial infarction complicated by cardiogenic shock is presently well advanced. Aggressive treatments such as revascularisation, reperfusion and intra-aortic balloon pump have contributed to the decline in mortality, which still remains significant. Study of outcome after percutaneous coronary intervention by differing centres may produce significant and new insights leading to a more effective treatment of myocardial infarction complicated by cardiogenic shock and better prognosis assessment. **Objectives:** To determine the outcome of post percutaneous coronary intervention and the contributing factors to increased survival in patients with myocardial infarction complicated by cardiogenic shock. **Methods:** A one year retrospective analysis of 47 patients admitted to Penang Hospital for myocardial infarction complicated by cardiogenic shock. **Results:** Of the 47 patients, 30 (63.8%) underwent intervention. In-hospital mortality among the intervened was 60% (p=0.193). Mortality post discharge but within 30 days was 3 patients (10%). Thirty days survival was 9 patients (30%). Six months survival was 9 patients (30%). Percutaneous coronary intervention with stent alone was done on 14 of the 30 patients, of this 40.7% were discharged home. Pre and post TIMI score and TMPG in mortality prediction for <24 hours was significant (p<0.05). Patients with multi-vessel disease had higher risk of mortality (p<0.05). **Conclusion:** The small sample size of this study limits the confidence level of the findings. Nevertheless the following were concluded. Percutaneous coronary intervention with stents lowers mortality. Advantages of intervention with stent should be clearly explained to patients or next of kin as a better option in patients gravely diseased with poor prognosis. Increased post TIMI score and TMPG values should be targeted for better survival rate.

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## Non-invasive study of coronary microvascular function in patients with systemic sclerosis

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**Introduction:** Systemic sclerosis (SSc) is a connective tissue disease characterized by vascular dysfunction and excessive fibrosis. Coronary microvascular dysfunction (CMD) is associated with markedly adverse prognosis in SSc patients. However, it is often subclinical during the early stages of the disease, and therefore underestimated, hindering the timely implementation of potentially useful preventive measures. **Objectives:** Aim of this study was to evaluate the prevalence and severity of CMD in asymptomatic SSc patients, by dipyridamole stress echocardiography. **Methods:** We enrolled 14 consecutive patients (12 females and 2 males), with the diffuse (dSSc n=6) and limited form of SSc (lSSc n=8). None had history of atherosclerotic coronary disease. All underwent coronary flow reserve (CFR) examination following dipyridamole administration (0.84 mg/kg/6min). Four healthy subjects (2 females and 2 males) were enrolled as controls. **Results:** Mean age of the SSc patients was 50.36±13.25 years and mean time from the onset of Raynaud's phenomenon was 10.57±9.57 years. Compared to healthy controls, CFR was reduced in the 14 SSc patients (2.04±0.48 vs. 2.62±0.56, p=0.06). Among SSc patients, 7 (50%) had a reduced CFR value (<2.0, lowest value 1.4 ; n=2 with lSSc and 5 with dSSc); the remaining 7 (6 with lSSc and 1 with dSSc) all had normal values (>2.0, highest value 2.94). Of note, CFR was particularly impaired in the dSSc subgroup (1.80±0.27; p=0.05 vs. controls). The dSSc subgroup was characterized by a higher prevalence of reduced CFR (<2.0) than the lSSc subgroup (5/6 vs. 2/8, p=0,031). Among patients with lSSc, an inverse relationship between the time since the onset of Raynaud's phenomenon and CFR values was observed (correlation coefficient -0.623; p=0.05). **Conclusion:** Asymptomatic SSc patients showed a 50% prevalence of CMD, which was more prevalent and severe in those patients with the diffuse, as compared to the limited form of the disease. These data highlight the importance of an exhaustive cardiac evaluation in all SSc patients, even at an early stage, including non-invasive evaluation of the CFR.

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## New coronary findings in HIV-infected patients receiving highly active antiretroviral therapy: dissociation between anatomy and function

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**Introduction:** Acute coronary syndromes and coronary artery disease (CAD) represent an emerging complication in HIV-infected patients under highly active antiretroviral therapy (HAART). **Objectives:** Present study sought to invasively assess coronary flow reserve (CFR) in an asymptomatic HIV-positive population receiving HAART whit evidence of significative stenosis to multidetector computed tomography (MDCT). **Methods:** From an initial database of approximately 500 subjects, 52 HIV+ patients receiving HAART (age range 25–73yrs; mean 50.3 yrs) were enrolled in the study; all subjects were asymptomatic and stratified as low cardiovascular risk subjects according to the CUORE-project risk score. A standard MDCT acquisition protocol was acquired in all cases. A stenosis >50% was considered significant. All patients with significant CAD were addressed to coronary angiography (CA). In all patients CFR after adenosine(AD) and acetylcholine(AC) infusion was measured in all coronary vessels. **Results:** CA was performed in 12 patients (preliminary results). 36 coronary vessels (CV) were investigated. 7(19.4%) CV presented a significant stenosis (SS). CFR after AD was 2.40±0.4 and AC 2.45±0.3. No significant differences were observed in term of CFR value between vessels with SS and without SS (AD: (SS) 2.1±0.4 vs 2.5±0.3(non-SS) p=ns; AC: (SS) 2.26±0.3 vs 2.5±0.25(non-SS) p=ns;). **Conclusion:** Coronary endothelial and non-endothelial function seems to be preserved in this setting of patients as shown by normal CFR values, despite angiographic significant coronary stenosis.

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## Slow coronary flow: clinical analysis of the risk factors

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**Introduction:** Slow coronary flow (SCF) phenomenon is a coronary microvascular disorder characterized by the delayed passage of contrast in the absence of obstructive epicardial coronary disease. Although clinical and pathological features of SCF have been previously described, its etiopathology remains unclear. Understanding of risk factors would provide the foundation for further exploration of potential mechanisms of SCF. **Objectives:** We sought to investigate the risk factors of slow coronary flow. **Methods:** A retrospective review of 50 consecutive patients with documented slow coronary flow as defined by TIMI frame count (TFC) was performed. Clinical information was collected. The analysis was performed on 96 coronary arteries with SCF. **Results:** The risk factors analysis of 96 coronary arteries with SCF showed the presence of active smoking in 21 (20%), hyperlipidemia in 34 (32%), diabetes in 21 (20%), hypertension in 42 (41%), and positive stress test in 41 (39%). 24 (48%) patients had chest pain. The mean TFC for this population was 32 ± 20 (p value <0.001) compared to standard TFC count of 18 ± 2. The mean TFC following administration of adenosine was 16 ± 10. **Conclusion:** In the absence of epicardial coronary artery disease, the chest pain described by patients and the corresponding abnormalities on non-invasive stress tests can be associated with the presence of slow-flow phenomenon as determined by TFC. This slow-flow has been

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associated with the smoking, hyperlipidemia, diabetes and hypertension. It has been shown that the TFC improves with the administration of adenosine suggesting a microvascular component.

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## Left ventricular contractile reserve is a reliable non-invasive marker of coronary microvascular function

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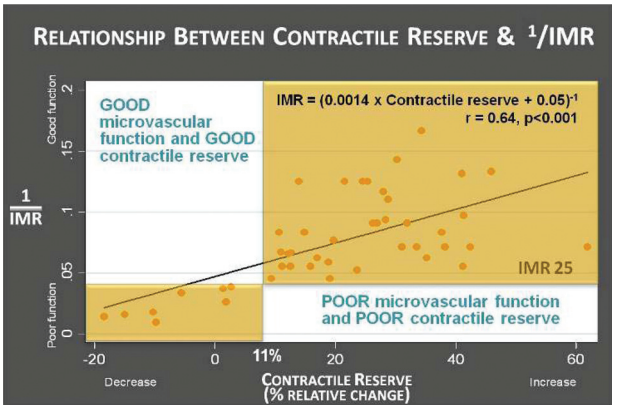
**Introduction:** Coronary endothelial function has important diagnostic and prognostic implications, however its routine assessment is difficult. The index of microcirculatory resistance (IMR) is considered a reliable but invasive measure. A reduced contactile reserve to inotropic stimuli is a reliable sign of subclinical left ventricular (LV) dysfunction in valvular heart disease, but has not been previously examined in the detection of other subclinical heart diseases. **Objectives:** We sought to determine whether LV contractile reserve measured with strain imaging at low dose dobutamine echocardiography (echo) is a reliable non-invasive surrogate of IMR in patients without significant epicardial disease. **Methods:** 45 patients (aged 59±10years, 21 DM, mean ejection fraction 66%, range 31–81%, none had significant epicardial coronary disease by fractional flow reserve) underwent low dose dobutamine echo and invasive coronary angiography with IMR measurement. Global mean peak systolic longitudinal strain was measured in the 3 apical views at rest and low dose dobutamine echo. Contractile reserve was defined as the difference between the resting and low dose strain values. IMR was measured in the left anterior descending artery during coronary angiography. **Results:** The mean IMR was 19.8 (range 6–104); mean peak global systolic strain at rest was -17.90% and at low dose dobutamine was -21.46%, corresponding to a mean contractile reserve of +3.6% (20% relative increase). There was a significant relationship between IMR and contractile reserve, described by: IMR=(0.0014 x Contractile Reserve $+0.05)^{-1}$ r=0.64, p<0.001. A ≥11% relative increase in contractile reserve identified an IMR of <25 with 100% sensitivity and 100% specificity (AUC=1.0). This is shown in the following graph:

**Image/graph I:**




**Conclusion:** LV contractile reserve measured with strain imaging at low dose dobutamine echo may be used to estimate IMR as a measure of coronary microvascular function in patients without significant coronary artery disease.

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## New view of the relationship between coronary artery and ventricular myocardium

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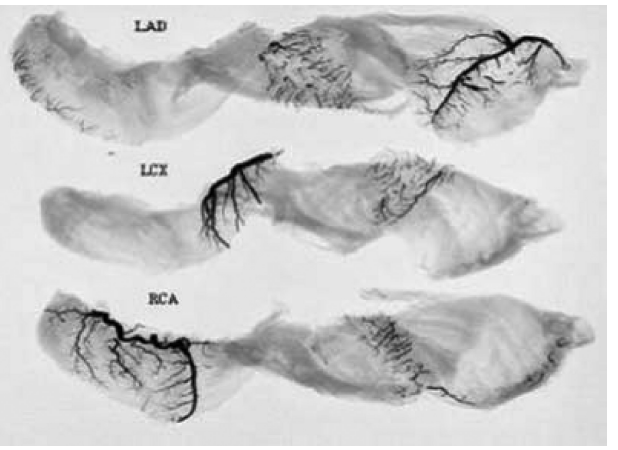
**Introduction:** The relationship of coronary artery and ventricular myocardial is crucial for understanding the cardiac performance, helical ventricular myocardial band (HVMB) of Torrent-Guasp is thought to be a new concept in understanding the architecture of the ventricular myocardium. **Objectives:** To study the relationship of coronary artery systems and blood supply of left ventricular papillary muscle based on the HVMB. **Methods:** 160% barium sulfate suspension was injected into coronary arteries of fresh swine hearts, after boiling and subsequent cooling, HVMBs of all swine hearts retained the integrity coronary artery systems were unwrapped. Then, X-ray and coronary artery angiography were obtained and evaluated. Also the blood supply of left ventricular papillary muscle was studied. **Results:** The relationship of coronary artery systems and the HVMBs were clearly distinguished on Image 1.

**Image/graph I:**




**Conclusion:** The relationship of the coronary artery and blood supply of left ventricular papillary muscle based on the HVMB brings a new explanation of ischemic heart disease, even supply evidence support some surgical treatment for some ischemic heart diseases.

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## Vasodilation effect of contrast media during coronary angiography and coronary flow reserve measurement

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**Introduction:** Coronary flow reserve (CFR) represents the regulatory ability of coronary microcirculation to increase its blood flow during hyperemic stimuli. Most of current methods of CFR measurement are expensive. The thrombolysis in myocardial infarction (TIMI) frame count is an index of coronary flow and has recently been validated. Many studies showed that contrast media have vasodilator effects. **Objectives:** The aim of the present study is to investigate the CFR calculated based on the contrast-induced vasodilation effect on coronary vessels, as well as its association with angiographic and clinical findings. **Methods:** This study included 667 patients underwent diagnostic coronary angiography in 2006 in the University Hospital for Heart of Aleppo, Syria. The TFC was calculated as the number of frames required by the contrast medium to opacify standard predetermined distal coronary landmarks. For each left and right coronary angiography, baseline TFC was obtained from the first recorded angiogram while hyperemic TFC was obtained from the following angiogram which recorded only 5–10 seconds after the contrast effect during the first one. CFR was calculated as the ratio of baseline to hyperemic TFC. Significant stenosis lesions were defined as >=50% luminal narrowing. Classical cardiovascular (CVD) risk factors were identified including obesity, hypertension, diabetes, dyslipidemia, and smoking. **Results:** Mean of baseline TFC was 21.5±10.6 and hyperemic TFC was 18.4±10.4 (P <0.001). Mean of CFR was 1.27±0.47 in the study sample, lower in vessels with significant and vessels with non-significant stenosis lesions than in normal vessels (1.16±0.40 and 1.23±0.40 vs. 1.36±0.54; respectively, P<0.001 for both comparisons). Patients with more than one classical CVD risk factors had a decreased CRF mean of 1.32±0.49 compared with 1.42±0.61 in the other patients, p<0.05). **Conclusion:** Although contrast media used in coronary angiography did not result in complete hyperemia, their effect on coronary flow measured with TFC could provide information about the coronary flow reserve with no additional cost.

P560

## Low testosterone level in middle-aged male patients with coronary artery disease

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**Introduction:** Endogenous testosterone has been shown to provide a protective role in the development of cardiovascular diseases in men. **Objectives:** This study investigated the

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changes of testosterone level and its relationship to the severity of coronary artery stenosis in middle-aged men with coronary artery disease (CAD). **Methods:** Serum testosterone concentration was measured in 87 middle-aged men patients with CAD including stable angina pectoris (SAP), unstable angina pectoris (USAP) and acute myocardial infarction (AMI). All patients underwent coronary angiography and the severity of coronary stenosis was estimated by the Gensini coronary score. The patients with the severity of coronary artery stenosis of less than 50% were served as control group (except USAP and AMI patients). **Results:** The levels of testosterone in SAP group (488.2±96.8 ng/dl), USAP group (411.6±128.6 ng/dl) and AMI group (365.3±116.6ng/dl) were significantly lower than that in control group (562.8±110.2ng/dl) (all $p<0.05$). When compared with one another group among SAP, USAP and AMI groups, the level of testosterone in AMI group was the lowest, the USAP group was the median while the SAP group was the highest (all $p<0.05$). There was significant correlation between angiographic Gensini score and testosterone level (n=87, r=-0.513, $p<0.05$). Multiple regression analysis found that testosterone and BMI were independent predictors for CAD (testosterone: odds ratio 0.311, 95% confidence interval 0.174–0.512; BMI: odds ratio 1.905, 95% confidence interval 1.116–2.973). **Conclusion:** The present study showed that middle-aged male patients with CAD present a lower level of serum testosterone and the testosterone level was negatively correlated with the severity of coronary artery stenosis.

**P561**

## Optical coherence tomography-derived anatomical criteria for functionally significant coronary stenosis assessed by fractional flow reserve

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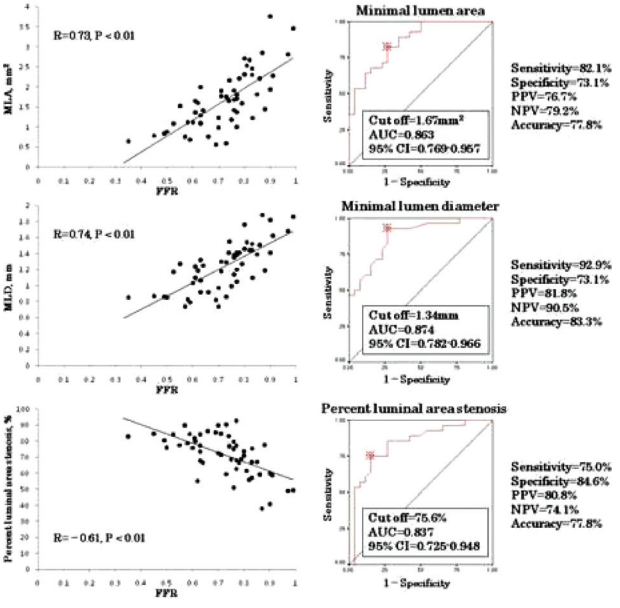
**Introduction:** In patients with coronary artery disease, minimal lumen area (MLA) measured by intravascular ultrasound (IVUS) correlates with the pressure-derived fractional flow reserve (FFR), and IVUS-derived MLA 3.0mm$^2$ or 4.0mm$^2$ has been suggested as cutoff value to predict functionally significant coronary stenosis. Dedicated optical coherence tomography (OCT) studies concerning this issue have not been reported previously, although OCT can clearly detect coronary vessel lumen with higher resolution than IVUS. **Objectives:** The aim of this study was to investigate the relationship between the coronary lumen dimensions measured by OCT and FFR, and to determine the□"cutoff values of OCT parameters to predict physiologically significant stenosis. **Methods:** Fifty-four coronary lesions in 51 patients were assessed by OCT and FFR. FFR was calculated as the ratio of the mean distal coronary pressure divided by the proximal coronary pressure during maximal hyperemia. An FFR value of <0.75 was used as the threshold for diagnosing functionally significant stenosis in this study. MLA, minimal lumen diameter (MLD), percent lumen area stenosis were measured by OCT. **Results:** The FFR values were significantly correlated with OCT-derived MLA (r=0.73, $p<0.01$), MLD (r=0.74, $p<0.01$), and percent lumen area stenosis (r=□0.61, $p<0.01$), respectively. A receiver operating characteristic curve suggested the OCT-derived MLA <1.67mm$^2$ (sensitivity 82.1%, specificity 79.2%), MLD <1.34mm (sensitivity 92.9%, specificity 73.1%), and a percent area stenosis >75.6% (sensitivity 75.0%, specificity 84.6%) as the best cutoff values for an FFR <0.75.

**Image/graph I:**




**Conclusion:** Anatomical measurements of coronary stenosis obtained by OCT showed a significant correlation to the FFR values. OCT also has the potential to predict functionally significant coronary stenosis, although OCT-derived parameters were smaller than those reported by previous IVUS studies.

**P562**

## Radiation dosage from routine cardiac catheter laboratory procedures

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**Introduction:** Physicians and patients are becoming increasingly aware of the potential harmful effects of ionizing radiation. It is well established that investigations to exclude coronary disease involve exposure to ionizing radiation. The United Nations Scientific Committee (UNSC) on the Effects of Atomic Radiation cites a typical value of 7 mSv as an appropriate average effective dose for a routine coronary angiogram. **Objectives:** This study sought to investigate the dose of radiation received by patients from routine coronary angiography, coronary angioplasty and stenting and to assess whether a high volume cardiac catheterization laboratory was achieving UNSC targets for radiation exposure. **Methods:** Consecutive patients undergoing routine coronary angiography, coronary angiography plus percutaneous coronary intervention (PCI) or PCI only at Royal Prince Alfred Hospital, Sydney, over a four month period in 2011 were identified. The two angiography suites employ Siemens Axiom Artis dFC (flat panel) and FC (image intensifier) equipment. Radiation doses were automatically recorded as dose area products at the time of the procedure and converted into an effective dose in mSv using a conversion factor of 0.18 mSv/(Gy·cm$^2$), as validated by the National Radiological Protection Board (NRPB). **Results:** A total of 333 patients were included. Of these 210 patients underwent diagnostic coronary angiography, 108 underwent coronary angiography and PCI at the same procedure, and 24 underwent PCI only. The average dose area product (DAP) for coronary angiography was 38.66 +/- 31.28 Gy.cm$^2$ which converts to an effective dose *(E)* of 6.96 +/- 5.63 mSv. The average DAP for coronary angiography plus PCI was 76.38 +/- 54.27 Gy.cm$^2$, which converts to an *E* of 13.75 +/- 9.77 mSv. For PCI only the average DAP was 77.66 +/- 53.80 Gy.cm$^2$ giving an *E* of 13.98 +/- 9.68 mSv. **Conclusion:** At a high volume cardiac catheterization laboratory, UNSC targets for radiation exposure from coronary angiography are being achieved. The radiation dose from PCI, either with or without concomitant coronary angiography is significantly higher than from coronary angiography alone, as expected.

**P563**

## Effect of kidney function on near-infrared spectroscopy derived lipid-core burden index score of a non-intervened coronary artery segment

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**Introduction:** A quarter of the patients with coronary artery disease (CAD) have an impaired kidney function, which has been associated with an increased risk of (cardiac) events post-percutaneous coronary intervention (PCI). Near-infrared spectroscopy (NIRS) is a recently developed technique to determine tissue composition. **Objectives:** Our aim was to assess the relation between the kidney function and the NIRS derived Lipid-Core Burden Index (LCBI) score of a non-intervened coronary artery segment. **Methods:** Between April 2009 and January 2011, LCBI scores were obtained in a total of 208 patients undergoing coronary angiography in our institution. Among these patients, 194 patients (93%) had a routine baseline serum creatinine measured and comprised the study population. Baseline creatinine values were used to calculate the creatinine clearance by the Cockroft-Gault formula (normal kidney function≥ 90ml/min; mild renal insufficiency (RI)= 60–89ml/min; moderate RI<60 ml/min). **Results:** There was no significant difference in the square-root of LCBI score between patients with normal kidney function (6.6±3.7), mild RI (6.7±3.6) and moderate RI (7.0±2.9) (overall p-value=0.9). The number of patients with moderate RI was higher in the highest LCBI tertile group (n=65) compared to the remaining patients (n=129), however it did not reach statistical significance (9.2% vs. 4.7%, p=0.2). Correlation and linear regression analysis showed no relationship between creatinine clearance and square-root of LCBI score (r=0.06; $r^2$=0.004; p-value=0.4).

**Image/graph I:**

| NIRS-patients (n=194) | | GFR≥90 (n=123) | GFR=60-89 (n=59) | GFR<60 (n=12) | p |
|---|---|---|---|---|---|
| √LCBI, mean score (±SD) | 6.7 (±3.6) | 6.6 (±3.7) | 6.7 (±3.6) | 7.0 (±2.9) | 0.9 |

| | Low √LCBI score (n=65/194) | High √LCBI score (n=129/194) | p |
|---|---|---|---|
| GFR≥90 (%) | 61.2 | 67.7 | 0.4 |
| GFR=60-89 (%) | 34.1 | 23.1 | 0.1 |
| GFR<60 (%) | 4.7 | 9.2 | 0.2 |

**Table 2: NIRS-analysis. NIRS, Near-Infrared Spectroscopy; GFR, Glomerulal Filtration Rate; LCBI, Lipid-Core Burden Index; SD,**

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**Conclusion:** The kidney function of patients undergoing diagnostic coronary angiography or PCI seems to be unrelated to the LCBI score of a non-intervened coronary artery segment as assessed with NIRS.

**P564**

## Functional angiographic evaluation of arterial composite grafts with skeletonized bilateral mammary arteries

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**Introduction:** Several previous investigations reported the advantages of using left internal mammary artery (LIMA) grafts compared to the saphenous vein grafts (SVGs) in coronary artery bypass grafting (CABG) including improved graft patency (1), fewer subsequent adverse cardiac events (2,3) and enhanced survival (4–6). The efficacy of application of bilateral-IMA (BIMA) in CABG has been demonstrated in a large body of previous researches (7–9). Patency rates and long-term clinical results after CABG are superior when BIMA, rather than unilateral IMA, are used. **Objectives:** Recent studies suggest the efficacy of application of arterial grafts, especially bilateral internal mammary arteries (BIMA), in coronary artery bypass grafting (CABG). To further characterize the composite arterial grafts using skeletonised-BIMA (SKT-BIMA) we decided to evaluate the short-term angiography results of the patients who underwent CABG with this method. **Methods:** From April 2006 to May 2007, 23 patients who were younger than 55 years old with ejection fraction (EF) $\geq$40% underwent CABG using SKT-BIMA. Both mammary arteries were harvested with Skeletonization technique. Right-IMA (RIMA) was harvested in its full length, cut in different length's, and anastomosed to left-IMA (LIMA) which was connected to its pedicle via left side. We used Radial artery to form more branches if necessary. Graft patency and flow abnormalities were examined with angiography in all of the patients after 8–12 weeks. **Results:** Short term clinical outcomes were excellent with no mortality. Echocardiography evaluations of the patients showed 3.4% increases in EF. Among 94 distal anastomoses in all patients, 66 of which (70.2%) were with mammary arteries. The most common performed patterns were (kappa) (11 patients), $\lambda$ (lambda) (3 patients) and double mini-composite (3 patients). Post operative functional angiography showed angiography-defined string sign in 1 mammary graft(1.5%), total graft occlusion in 1 mammary graft (1.5%) and competitive blood flow in 4 mammary grafts (6%) were observed. **Conclusion:** Short term graft patency of arterial grafts using SKT-BIMA in CABG, proved to be acceptable with little flow disturbances and excellent clinical results.

**P565**

## Safety and feasibility of mobile cardiac catheterization laboratories in a small district general hospital

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**Introduction:** Coronary artery disease is on the rise[1] and so is the demand for diagnostic procedures. The increasing demand has encouraged significant changes in service provision. One such development is the use of mobile catheter laboratories.[2] Safety of such a service is of paramount importance and is always under scrutiny.[3]**Objectives:** To audit mobile cardiac catheterization diagnostic service in order to assess safety and cost effectiveness. **Methods:** Patients undergoing angiogram in mobile cardiac catheterization service of our hospital were auditedover a five month period. Waiting time monitored for documentation of potential impact on decrease in referral time for definitive treatment.

**Results:**

- All patients n=150, 91 (40%) female, 59 (60%) male.
- Age of patients ranged from 34 to 88 (median 68 years).
- Majority of the patients were referred from outpatients 142 (95%), and 06 (5%) in patient.
- 67% of diagnostic angiograms showed abnormal coronaries.
- 33% showed normal coronaries with breakup of diagnoses shown in table 1.

**Table1. Outcome of patients with normal coronaries**

| Diagnoses | Percentage |
|---|---|
| Poor LV | 5% |
| Valve disease | 5% |
| Atypical chest pain | 13% |
| False +ve MIBI | 2% |
| False +ve ETT | 5% |
| NSTEMI with plaque rupture | 1% |
| Primary VT | 1% |
| Failed | 1% |

- No major complications or death were reported in the group studied, 14 minor complications reported are shown in table 2.

**Table 2. Break up of complications during angiogram n=14**

| Complications | Number of Patients |
|---|---|
| HAEMATOMA | 5 |
| VASOVAGAL | 2 |
| ANGINA (TRANSIENT ST ELEVATION) | 3 |
| TRANSIENT NUMBNESS (FEMORAL NERVE) | 1 |
| PROCEDURE RELATED VT | 1 |
| BRADYCARDIA | 1 |
| FAILED ACCESS | 1 |

**Conclusion:** Mobile cardiac catheterization service is safe with no major complications.[4] The service has helped to cut down average waiting times leading to decrease in time to diagnoses and definitive treatment thus improving long term outcome of cardiac patients.

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**P566**

## Difference of ruptured plaque morphologies between non ST elevation acute coronary syndrome and asymptomatic patients: an optical coherence tomography study

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**Introduction:** Pathological andautopsy studies have reported that rupture of a thin-cap fibroatheroma (TCFA) and subsequent thrombus formation is the most important mechanism leading to acute coronary syndrome (ACS). However, it is not clear why some plaque ruptures lead to ACS with some clots being partially or totally occlusive, whereas others dose not cause ACS. Optical coherence tomography (OCT) is a high-resolution (approximately10–20 $\mu$m) imaging modality that offers microscopic visualization of coronary plaques. Recent studies have shown that OCT is a feasible and safe imaging modality in patients with coronary artery disease and allows us to identify vulnerable plaque features including plaque ruptures, TCFAs, and intracoronary thrombus in vivo. **Objectives:** The aim of this study was to investigate the difference of ruptured plaque morphologies assessed by OCT betweennon-ST elevation ACS (NSTEACS) and asymptomatic patients. **Methods:** We examined the ruptured plaque morphologies by OCT in 53 patients with coronary artery disease (NSTEACS patient= 33; Asymptomatic patient= 20). **Results:** The incidence of intraluminal thrombus was significantly higher in NSTEACS patient compared with asymptomatic patient (85% vs. 40%, p=0.002). Although the cross sectional area of ruptured cavity was similar in the either groups (1.22$\pm$ 1.10 mm$^2$ vs. 1.69$\pm$ 1.15 mm$^2$, p=0.271), the cross sectional lumen area at the rupture site was significantly smaller in NSTEACS patient compared with asymptomatic patient (2.34$\pm$ 1.61 mm$^2$ vs. 3.60$\pm$ 2.01 mm$^2$, p=0.002).Furthermore,minimum lumen area was significantly smaller in NSTEACS patientcompared with asymptomatic patient (1.27$\pm$0.77mm$^2$ vs. 2.37$\pm$1.65 mm$^2$, p=0.018). **Conclusion:** The present OCT study demonstrated the differences of the ruptured plaque morphologies of coronary artery between NSTEACS and asymptomatic patients. The morphological feature of plaque rupture and the intracoronary thrombus could relate with the clinical presentation in patients with coronary artery disease.

**P567**

## Spontaneous coronary artery dissection: hypothetical pathogenetic role of lipoprotein(a)

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**Introduction:** Spontaneous coronary artery dissection (SCAD) is a rare and unexplained cause of acute coronary syndrome (ACS). **Objectives:** To investigate the existence of a pathogenetic link between SCAD and high serum Lipoprotein(a) [Lp(a)] levels. Secondly, to present the middle-term follow-up in patients affected by SCAD. **Methods:** From November 2003 through August 2011, 16970 white patients were hospitalized for ACS in six hospitals of the Marche Region (Italy). Coronary angiography was performed in the same Hub center catheterization laboratory. **Results:** Ten patients (two men), mean age 45$\pm$8 years, showed SCAD involving the right coronary artery (RCA) in four cases, the left anterior descending artery in three cases, multivessel dissection in three cases. Lp(a) concentration was higher than 30 mg/dL in six patients; among them, one female patient suffered from aortic dissection six years before, one patient was in her peripartum period; three patients (two men) presented underlying coronary atherosclerotic lesions, the remaining patient didn't show other known risk factors for SCAD. Nine patients were treated by percutaneous coronary intervention (PCI), one patient received coronary artery bypass surgery. Owing to recurrent dissection, within seven days after the initial event, one male patient received a second PCI. At the follow-up evaluation, after 48$\pm$31

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months, all patients were alive**. Conclusion:** Results from our case series confirms that SCAD is a rare cause of ACS, with a younger age at presentation and a striking predilection for women (80%); RCA involvement and the association with coronary atherosclerotic lesions are most frequent in men; PCI is the reperfusion strategy of choice; prognosis is favorable if patients survive the acute phase. High serum Lipoprotein(a) levels in six patients over ten is an intriguing finding. We suggest that Lp(a) may play a pathogenetic role in SCAD entering into an arterial wall presenting an altered architecture, owing to atherosclerosis or other undetermined lesions; in these sites Lp(a) may promote coronary artery dissection through proinflammatory mechanisms and matrix metalloproteinases activation.

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**P568**

## Assessment of relationship between helicobacter pylori infection and acute coronary syndrome

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**Introduction:** Helicobacter pylori(HP)is a curved,flagellated,gram-negative rod found only in gastric epithelium.HP is the most common world wide microbial infection,with an estimated half of the worlds population being infected.Coronary heart disease is the leading cause of death in most nations.This disease results in significant morbidity,disability and loss of productivity and is the leading cause of health care expenditure.Recently HP is suspected to be a risk factor for coronary heart disease. **Objectives:** This study is planned to assess the relationship of helicobacter pylori and Coronary artery disease. **Methods:** Eighty acute coronary syndrome patients and 80 control individuals were examined for HP IgG serology and were compared with each other about HP serology.The data was analyzed with spss1o software. **Results:** Of 80 studied patients in Case group mean age was 55.7 and 62.7 in controls.In 51.25% of patients HP serology was positive and 27.5%in controls was positive($p=0.006$)there was no significant relationship for diabetes,hyperlipidemia,hypertension and family history of Coronary artery disease with CAD in two group($p>0.05$). **Conclusion:** There is significant relation between HP and acute coronary syndrome. Eradication of HP can be effective in prevention of coronary artery disease.

**P569**

## Monocyte toll-like receptor 4 response following PCI (percutaneous coronary intervention)

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**Introduction:** Toll like receptors (TLRs) are key players in arterial occlusive disease. Tumor necrosis factor-$\alpha$ (TNF-$\alpha$) and Interleukin 1-$\beta$ (IL1-$\beta$) as major products of TLR4 activation are multifunctional inflammatory cytokines that are upregulated in myocardial ischemia. **Objectives:** Here we decided to find the possible effects of PCI on TLR4 response at specific intervals. Both cytokines are important in inflammation. **Methods:** The subjects included 46 patients with stable angina who underwent PCI according to the hospital protocols. We measured serial serum TNF-$\alpha$ and IL1-$\beta$ levels. We collected blood samples 0 hr before, 2 hr and 4 hr after PCI procedure was completed. The concentration of TNF-$\alpha$ and IL1-$\beta$ were evaluated using enzyme-linked immunosorbent assay (ELISA). **Results:** A significant relation was observed between TLR response and PCI ($p<0.05$). TNF-$\alpha$ mean concentration was $30.32 \pm 4.11$ (pg/ml) before PCI, but it decreases after PCI to $23.4 \pm 3.6$ and $21.3 \pm 2.9$ (2hr and 4 hr after PCI respectively). IL1-$\beta$ serum level was $22.3 \pm 3.2$ (before PCI) and $19.3 \pm 2.7$ and $17.8 \pm 2.2$ (2hr and 4 hr after PCI respectively). **Conclusion:** We conclude that regardless of which time points, serum concentration of TNF-$\alpha$ and IL1-$\beta$ are attenuated after PCI. It may be due to diminished TLR4 expression on monocytes after PCI, but the exact mechanism is not fully understood.

**P570**

## Effect of intervention on the control of risk factors in coronary artery disease (CAD) patients

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**Introduction:** During the past 30 years, the use of percutaneous coronary intervention (PCI) has become common in the initial management strategy for patients with stable coronary artery disease in North America, even though treatment guidelines advocate an initial approach with intensive medical therapy, a reduction of risk factors,and lifestyle intervention (known as optimal medical therapy).[4,5] **Objectives:** To asses the effect of optimal medical therapy on the control of risk factors in coronary artery disease (CAD) patients with or with-out intervention. **Methods:** It was a cross sectional comparative study carried out at Lady Reading Hospital, Peshawar January to December 2010. Subjects were divided into two groups based on percutaneous coronary intervention and optimal medical therapy. Study variables were smoking, physical activity, dyslipidemia, diabetes, hypertension and obesity. Informed written consent was taken from all the study participants. Data was recorded on a preformed Questionnaire and analyzed with SPSS version 16. P-value of 0.05 was taken as significant. **Results:** A total of 315 patients were studied. Baseline characteristic were similar between groups.Smoking was decreased significantly in(PCI group) as compared to (OMT group) ($p=0.027$). Physical activity goal $\geq$ 150 min/week were achieved more in (PCI group) compared to (OMT group)($p=0.019$). Goals set for Serum cholesterol, HbA1c%, serum LDL, Systolic blood pressure and Diastolic blood pressure have significantly achieved in (PCI group) as compared to (OMT group) with p-valves of (0.018, 0.027, 0.023, 0.033 and 0.017) respectively. While goals set for Triglycerides, serum HDL and BMI have no significant difference between the two groups with p-valves of (0.223, 0.089 and 0.164 respectively). **Conclusion:** Intervention confers clear benefit inpatients with coronary artery disease on optimal medical therapy in terms of long-term control of risk factors compared with only conservative medical treatment.

**P571**

## Changing angiographic CAD profile in young STEMI population

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**Introduction:** Previous data on young patients with acute myocardial infarction have indicated higher rates of normal CAG. Incidence of normal CAG in young STEMI is reported to be between 40–50%. There was a suggestion of decline in normal CAG in young STEMI .In this context, this study was planned. **Objectives:** The present study was conducted at madras medical college, Department of Cardiology, Chennai to assess the incidence of CAD in young diabetic post myocardial infarction patients in the urban and suburban populations of Chennai. **Methods:** Angiographic data of 80 consecutive young patients with MI were studied.Patients who were nondiabetic,more than 40 years old and not thrombolysed were excluded. **Results:** :out of 80 patients 74 were males and 6were females.25% of patients had normal LV function and75% had mild LV dysfunction. All are having DM and 30% are having HT and 40% are smokers In our study 20%of patients with inferior wall MI and 80%had anterior wall MI. CAG was performed on a mean average of 4 weeks after the index myocardial infarction and optimal medical treatment. Of the 80 patients 75%(60) had coronary artery disease and the remaining 25 %( 20) had normal coronaries .Of the 60 patients with CAD, 52(65%) patients had single vessel disease, 4(5%) had double vessel disease and 4(5%) had triple vessel disease.LAD lesion was present in 46patients and RCA lesions found in 16 patients. This made us to think why there is a higher incidence of CAD in these group of patient's .Physical inactivity has become rampant due to high degree of automation. Diabetes added to this physical inactivity accelerates atherosclerotic process. So these patients might have had CAD already and myocardial infarction might have occurred as an acute insult .More lesions were found in atherosclerotic prone LAD than RCA. **Conclusion:** According to our observation, it seems, CAD in young is taking a different avatar compared to what we have witnessed few decades ago. The incidence of normal coronary arteries following a STEMI is distinctly reduced. While most have critical SVD, significant subset do have extensive mutivessel disease. We suggest this changing angiographic profile need to recognized and looked for in different geographical locations of our country. It would have major management implication.

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**P574**

## Everolimus-eluting stents reduce target revascularization compared with zotarolimus-eluting stents in patients with coronary artery disease: a meta-analysis

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**Introduction:** Both everolimus-eluting stent (EES) and zotarolimus-eluting stent (ZES) are second generation drug-eluting stents. The efficacy and safety of both drug-eluting stents compared with each other remain controversial. **Objectives:** The aim of this study was to evaluate the efficacy and safety of EES as compared to ZES according to several clinical studies. **Methods:** A meta-analysis was performed on clinical studies comparing EES with ZES in patients with coronary artery disease undergoing percutaneous coronary intervention. The databases searched included PubMed, Embase, the Cochrane Central Register of Controlled Trials, and Web of Science. The same terms or relevant studies were also searched on the website including the U.S. National Institute of Health, escardio.org, and TCTMD.com. Search terms included "everolimus," "zotarolimus," "eluting," and "stent." The pooled odds ratios (OR) were calculated based on a fixed-effects model. However, if homogeneity across individual studies was rejected by the Cochran's Q test and the $I^2$ statistics ($P<0.10$), a random-effects model was selected. **Results:** A total of 12 non-randomized studies and 1 randomized controlled trial (RCT) were included in this meta-analysis, involving 12595 patients (6117 patients with EES and 6478 patients with ZES). At 6 months to 2 years, EES showed a significant reduction in target lesion revascularization (Figure) as well as target vessel revascularization (OR: 0.45, 95% confidence interval (CI): 0.22–0.91, $P=0.03$) compared with ZES. On the other hand, the incidence of clinical outcomes regarding safety issues, such as cardiac death (OR: 0.79, 95% CI: 0.54–1.15, $P=0.21$), myocardial infarction (OR: 0.95, 95% CI: 0.69–1.31, $P=0.77$), or definite or probable stent thrombosis defined by the Academic Research Consortium (OR: 0.81, 95% CI: 0.56–1.17, $P=0.26$), was comparable between the 2 groups.

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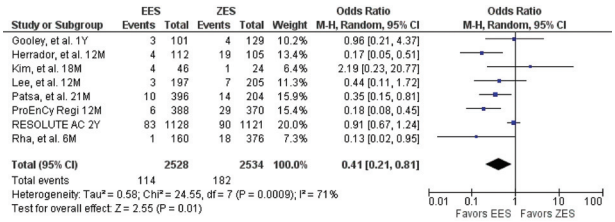
**Image/graph I:**




**Conclusion:** In this meta-analysis, EES demonstrated more favorable outcomes compared with ZES up to 2 years. However, since most of the studies reported so far were conducted in a non-randomized fashion, further RCT are warranted to validate these findings.

**P575**

## Practice and outcomes of cardiac catheterization in Egypt before the 2011 revolution: a report from the Ain Shams University and the National Heart Institute cardiac cath lab registry

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**Introduction:** The absence of reliable database is one of the major problems facing policy makers in Egyptian public health sector. A cardiac cath registry has been started in Ain Shams university Hospital (ASUH) in 2007. The National heart institute (NHI) joined the same registry in 2009. Both ASUH and the NHI are the two largest cardiac hospitals in Egypt. **Objectives:** The aim of this report is to describe the practice and outcomes of cardiac catheterization in both centers. This report also is meant to document the type of service provided to Egyptian cardiac patients before the January 2011 revolution in Egypt. **Methods:** This registry included all patients admitted to the cath lab in both ASUH (from 3/2007 till 1/2011) and the NHI (from 6/2009 till 1/2011). The total number of patients in this report is 33288 patients (11692 in ASUH and 21596 in NHI). **Results:** The patients' mean age was 54.1 years (only 14% were > 65 years old) and 73.6% were males. The majority of patients (72.5% in ASUH and 78% in NHI) had just diagnostic coronary angiography while the remaining had percutaneous coronary intervention (PCI). Among the PCI patients, the mean BMI was 29.1, 15% had history of myocardial infarction, 3.9% had history of PCI, 0.9% had history of CABG and 0.5%, 0.9% and 0.2% had history of stroke, congestive heart failure and chronic renal failure, respectively. The prevalence of smoking, diabetes, and hypertension was 32.2%, 16.4%, and 20.1%, respectively. Only 7.2% of PCI procedures were for urgent non-elective patients, 69% was a one vessel intervention, 0.2% was PCI to a graft, and 5.9% was PCI to left main. The arterial access was femoral in 99.9% of cases and there was no usage of IVUS, pressure wires, rotablators, atherectomy, distal protective devices or brachytherapy. The total number of implanted stents was 7128 stents; a single stent was implanted in 69% and 2 stents were implanted in 26 % of patients. The penetration rate of drug eluting stents was only 3.9%. The success rate (freedom from death or life threatening complications was 99.8% among the PCI procedures, while in hospital mortality was 0.1%. **Conclusion:** The lack of modern cardiac cath lab procedures and equipments in the largest two public hospitals in Egypt, characterize the type of service provided to the Egyptian patients prior to the January 2011 revolution.

**P576**

## The change of NT-proBNP coronary heart disease patients in plasma after PCI

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**Introduction:** To investigate the clinical significance of NT-proBNPin Plasma of patients with acute coronary syndrome, and Research Relationship between the Plasma concentration of NT-proBNP and left ventricular ejection function. In order to assess the role of NT-proBNP plasma concentration in patients with acute coronary syndrome□ACS□ in the early diagnosis, treatment and prognosis. **Objectives:** This study was to investigate the clinical significance of NT-proBNPin Plasma of patients with acute coronary syndrome, and Research Relationship between the Plasma concentration of NT-proBNP and left ventricular ejection function. In order to assess the role of NT-proBNP plasma concentration in patients with acute coronary syndrome□ACS□ in the early diagnosis, treatment and prognosis. **Methods:** 133 patients with acute coronary syndrome patients were select in Department of Cardiology in our hospital Between February 2008-February 2009. Group 1: 54 cases ST-elevation myoeardial infarction□STEMI□, Group 2: 39 cases non-ST-elevation myocardial infarction□NSTEMI□, Group 3: 40 cases Unstable angina pectoris□UA□, the NT-proBNP concentration in plasma of patients after Immediate admission, Immediately, Six months and 1 year after PCI. During the hospitalization and follow-up the end point of cardiovascular events. Including death, malignant arrhythmia and severe heart failure. **Results:** The concentration of NT-proBNP in STMI group, NSTMI group and the UA group were elevated, 800.93pg/ml, 413.75pg/ml, 210.07 pg/ml respectively, the control group: 60.91 pg/ml, P <0.05. STMI, NSTMI, UA group patients LogNT-proBNP in plasma before PCI were: 2.79±0.31□"2.60±0.18□"2.26±0.25□The LogNT-proBNP in plasma of 3 groups 6 month after PCI were: 2.35±0.38□"2.17±0.27□"2.05±0.30, the differences that compared with that before PCI were statistically significant (P<0.05□"P<0.05□"P<0.05). **Conclusion:** 1.The NT-proBNP in Plasma with Coronary heart disease was significantly increased□and elevated increase indicates the severity of the disease;2.The concentration of NT-proBNP was an effectively tool to evaluate the patients with coronary heart function after PCI

**P577**

## Association between admission fasting plasma glucose and contrast-induced nephropathy in elderly acute myocardial infarction patients undergoing percutaneous coronary intervention

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**Introduction:** Despite numerous prior studies have established the association between admission randomized glucose levels and poor outcomes in patients with acute myocardial infarction (AMI), less is known regarding the correlation between the initial fasting plasma glucose (FPG) and contrast-induced nephropathy (CIN), especially in elderly AMI patients undergoing percutaneous coronary intervention (PCI). **Objectives:** The aim of this study was to assess the association between the initial FPG levels on admission and CIN in elderly patients with AMI. **Methods:** From April 2004 to October 2006, 881 elderly patients (age ≥65 years) diagnosed with AMI undergoing PCI were enrolled in the Beijing Elderly Acute Myocardial Infarction Study (BEAMIS) consecutively. According to admission FPG levels, patients were categorized into 4 groups: hypoglycemia group (N=187, 21.2%), FPG≤5 mmol/L; euglycemia group (N=412, 46.8%), FPG>5 to 7 mmol/L; mild hyperglycemia group (N=128, 14.5%), FPG>7 to 9 mmol/L; and severe hyperglycemia group (N=154, 17.5%), FPG>9 mmol/L. The primary end point was CIN, which was defined as an increase in serum creatinine >25% from baseline in the first 72 hours. **Results:** A total of 125 (14.2%) patients developed CIN. Patients with severe hyperglycemia had a 1-fold higher incidence of CIN than those with mild hyperglycemia (29.9% vs 14.1%, P=0.02), 2-fold higher incidence of CIN than those with euglycemia (29.9% vs 10.7%, P<0.001) and hypoglycemia (29.9% vs 9.1%, P<0.001). Hyperglycemia was an independent predictor of CIN. **Conclusion:** In AMI patients undergoing PCI, hyperglycemia is associated with an increased risk for CIN.

**P579**

## Comparison of transradial and transfemoral approaches for PCI in acute myocardial infarction

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**Introduction:** As compared to the femoral approach, the use of radial arterial access has been demonstrated to reduce the incidence of access site bleeding complications. **Objectives:** To evaluate clinical outcomes comparing radial and femoral approaches in the treatment of acute myocardial infarction (AMI) with emergency percutaneous coronary intervention (PCI). **Methods:** From January 2004 to May 2011, we consecutively enrolled 158 AMI patients undergoing primary PCI (N=119) or rescue PCI after thrombolysis failure (N=39) comparing radial (N=85) and femoral (N=73) access. **Results:** Cannulation time (from skin anesthesia to arterial cannulation) and procedural time (from patient arrival at the catheterization room to the completion of the procedure) was not significantly different in radial and femoral groups (respectively 1.8 +/- 0.6 vs 1.8 +/- 0.9 minutes, p=0.81, and 45.4 +/- 28.2 vs 44.8 +/- 27.1 min, *P*=0.74). Nevertheless, X-ray fluoroscopy time (30.1 +/- 7.5 min vs 23.5 +/- 10.9 min; *P*=0.01) was significantly higher in the radial group. Angiographic success rate is comparable in both groups. Freedom from ischemic recurrent events at 1-month follow-up occurred in 83 (97.6%) and 69 (94.5%) patients in the radial and femoral groups, respectively (*P*=0.42). There were no major access site bleeding complications in the radial group, as opposed to 3 (4.0%) in the femoral group (*P*<0.001) and surgical repair necessary in 1. Uncomplicated clinical course occurred in 83 (97.6%) of patients in the radial group and 61 (83.6%) in the femoral group (*P*=0.01). Total hospital length of stay was significantly higher in the femoral group (8 +/- 2 vs 5 +/- 1 days; *P*<0.001). **Conclusion:** We report here our initial experience in transradial approaches for PCI in AMI. In patients with AMI treated with PCI, the transradial access is efficacious with fewer major access site complications than transfemoral access. Transradial approach produces a shorter length of stay, as compared to the transfemoral approach although with a little longer times of radiation.

**P580**

## Serial troponin-I measurement after elective percutaneous coronary intervention: is it worth?

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**Introduction:** Elective percutaneous coronary interventions (PCI) have been performed with high success rates and are now a routine procedure. The occurrence of peri-procedural acute myocardial infarction (MI), a controversial diagnosis in this particular situation, requires a longer hospitalization for, with associated costs. Patient evolution is usually favorable and the usefulness of such surveillance is not clear. **Objectives:** To characterize the occurrence of MI, according to the Universal Definition of Myocardial Infarction (UDMI), and associated complications, after elective PCI. **Methods:** We retrospectively analyzed patients (pts) who underwent elective PCI,without acute coronary syndrome, from July 2008 to December 2009, in the Cardiology Department of a tertiary care center. We compared 2 groups, Group A [pts discharged after troponin-I (Tp-I) measurement in the morning after the intervention - M1] and Group B (pts with prolonged hospitalization after M1, because significant increase of Tp-I, in order to repeat its measurement) for in-hospital events. **Results:** 174 pts underwent elective

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PCI. Thirteen pts were excluded from analysis because of peri-procedural complications or non-cardiac complications, which alone could justify a longer hospitalization. The 161 studied pts had mean age of 62.2±10.6 years and 80.7% were male. At M1, 32 (19.9%) pts had Tp-I≤0.012 ng/mL [99% of the upper reference limit (URL)], 25 (15.5%) pts had Tp-I from 0.013 to 0.036 ng/mL (3xURL) and Tp-I>0.036 ng/mL (type 4a MI) was found in 104 (64.6%) pts. In group A (104 pts) the median (25th-75th percentile) value of Tp-I in M1 was 0.034 ng/mL (0.010–0.086) and in group B (57 pts) was 0.363 ng/mL (0.185–1.079) (p<0.001). Prevalence of type 4a MI was significantly higher in pts of group B (96.5% vs 47.1%, p<0,001). In group B, two, three, four, five and six Tn-I measurements were performed in 32, 19, 4, 1 and 1 pts, respectively. In group B, multivessel procedure was significantly more frequent (> 1 vessel intervened in 29.3% pts vs 8.7%, p=0.001), and the number of implanted stents was higher (1.79±0.99 vs 1.27±0.70, p=0.001). There was a complication in one patient (1.0%) of group A (non-sustained ventricular tachycardia) and another one in one patient (1.8%) of group B (symptomatic hypotension), p = 0.66. **Conclusion:** Occurrence of type 4a was frequent and comparable to similar studies. In-hospital complications in pts with post-PCI MI were rare, suggesting that the extension of stay/surveillance of these pts may be questionable.

**P581**

## Prolonged bivalirudin infusion post percutaneous coronary intervention and risk of bleeding

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**Introduction:** Treatment with the direct thrombin inhibitor bivalirudin is common in patients who are undergoing percutaneous coronary intervention (PCI). It has a half-life of 25 minutes, plasma levels of bivaluridin fall from therapeutic levels to below 2 μg/mL within approximately 1 hour. The safety and efficacy of bivalirudin prolonged infusion after PCI is not well known. **Objectives:** Determine risk of bleeding in patients undergoing PCI who received treatment with prolonged infusion of bivalirudin after PCI. **Methods:** Retrospective, Case Control Study. Control defined as bivaluridin infusion immediately discontinued after PCI and case defined as prolonged Infusion of bivaluridin > 120 minutes after PCI. Data obtained from same institution from 2007–2010, demographics, risk factors, rates of bleeding complications and clinical outcomes described. **Results:** 130 patients, 65 controls 72% male, 28% female, age: 64.3 ± 11.3years and 65 cases 75% male, 25% female, age: 66.2 ± 10.3years, Average total infusion time of bivalirudin in control group 49.8 ± 23.1 minutes and 254.2 ± 33.4 minutes in prolonged infusion group (p =0.00). Any reported bleeding complications 3% in control group and 3% in bivalirudin group OR 1.0 (95% CI 0.137–7.322), according to TIMI Bleeding classification, 0% of major bleeding in either group, 1.5% of minor bleeding in control group vs 0% in prolonged bivalirudin group OR 0.32 (95% CI 0.013–8.2), 1.5% of minimal bleeding vs 3.% in bivalirudin group OR 0.49 (95% CI 0.044–5.5), Groin Complication 1,5 % in control group vs 1.5% prolonged bivalirudin group OR 1.0 (95% CI 0.061 16.33). Transfusion 4.6% in Control group vs 7.6% in prolonged bivalirudin group (p=0.66). No cases of stent thrombosis in the first 30 days in either group. **Conclusion:** Treatment with the direct thrombin inhibitor bivalirudin in prolonged infusion >120 minutes in patients undergoing PCI does not increase risk of bleeding complications.

**P582**

## Post chronic total occlusion (CTO) intervention: the stents are floating in the artery!

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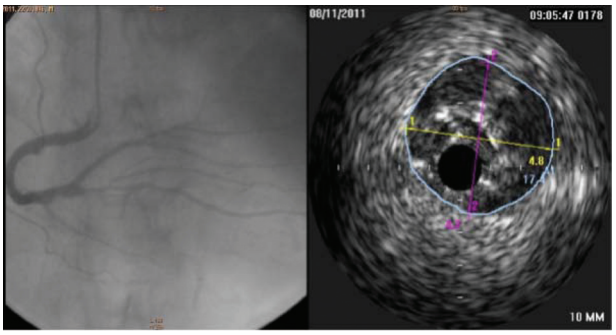
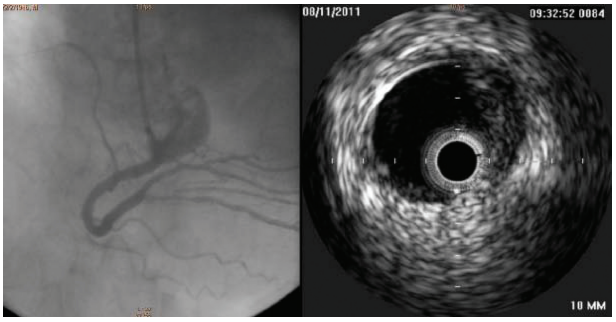
**Introduction:** We report a case of right coronary artery CTO intervention. On follow up coronary angiogram, we found an interesting phenomenon. Intravascular ultrasound(IVUS) was the key to explain the phenomenon and guide for a solution. **Objectives:** To emphasize the importance of IVUS in managing complex coronary anatomy. **Methods:** 63 year old lady was admitted for proximal RCA CTO intervention. Via femoral approach, the RCA was wired with Fielder XT and Miracle 3, using finecross microcatheter and parallel technique. We attempt to wire into PDA but caused a localized dissection at distal RCA and PDA. Therefore, we wire into PLV, and manage to stent the distal RCA with Biomatrix 2.25x28, midRCA with Biomatrix 3.0x36 and proxRCA with Biomatrix 3.5x18. It was postdilated with Voyager 3.75x12. We achieved TIMI 3 flow. 1 month later, she was admitted for staged PCI to LCx, done successfully. Repeat RCA angiogram showed healed dissection, but there seems to be aneurysmal segment or possible branch segment beneath the distalRCA stent. The distal RCA seems to be bigger than its last post PCI picture.There are reported case that DES may cause negative remodelling and aneurysm to the stented artery, and we are not sure the exact mechanism. We decide to repeat angiogram in another month. A repeated angiogram 1 month later showed a growing RCA, larger than 2.25 size distally. In fact, the whole RCA seems to have grown bigger compared to last 2 previous RCA angiogram. We performed RCA IVUS and found that the distal RCA stent was floating in within a bigger vessel size(imagel), rather than an aneurysm. The distal stent was obviously unopposed. This could be a source of stent thrombosis. We decide to post dilate the distal RCA stent with Falcon Forte 3.0x14 at 28atm, knowing the fact that the distal RCA may fracture from high pressure postdilatation. **Results:** A final RCA angiogram showed that the distal RCA was well covered.Final IVUS showed a well opposed stent in distal RCA(image II).The stent strut was disintegrated due to high pressure balloon inflation. We accepted the result and would want to repeat another angiogram in 3 months time. We may subject to deploy an overlapping stent to distal RCA depend on our future finding.

**Image/graph I:**




**Image/graph II:**




**Conclusion:** Using IVUS, we detected that the distal RCA has grown bigger due to improved proximal RCA flow after CTO intervention. The unopposed stent was quickly postdilated to reduce risk of stent thrombosis. We suggest more liberal use of IVUS in future CTO intervention to aid in better vessel sizing.

**P583**

## Low-dose furosemide administered with adequate hydration prevents contrast-induced nephropathy in patients undergoing coronary angiography

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**Introduction:** In theory, the diuretic furosemide should be able to help reduce the incidence of CIN. However, many previous studies have shown that instead of reducing incidence, furosemide actually aggravates contrast agent-induced kidney damage. We thought inadequate hydration and furosemide overdose may lead to renal hypoperfusion and symptom aggravation. **Objectives:** The purpose of the present study was to study the effects of low-dose furosemide, administered with adequate hydration, on contrast-induced nephropathy (CIN). **Methods:** A total of 759 patients who were to undergo coronary angiography, percutaneous coronary intervention, or both were enrolled between September 2009 and February 2011. These were randomly divided into a control and a furosemide group. All patients received adequate hydration before and after surgery. The furosemide group received intravenous furosemide injection (20 mg) immediately after surgery, and the control group received no treatment. Serum creatinine concentration was measured before and 48 h after the operation. Pre- and post-surgical changes in serum creatinine levels, glomerular filtration rate, and serum creatinine clearance rate were compared within each group. The changes in these markers and the incidence of CIN were also compared between the two groups. Logistic regression analysis was used to study risk factors for CIN among these variables. **Results:** General baseline conditions were similar between the two groups. Compared with the furosemide group, the control group experienced a significantly higher increase in serum creatinine (89.21 ± 17.57 vs 93.13 ± 16.75umol/L $P<0.05$)and a more marked decrease in glomerular filtration□75.87 (22.57) vs 72.38 (18.85)mL/min/1.73 $m^2$ P <0.05□ and serum creatinine clearance rates□79.70 (28.92) vs 74.68 (25.48)mL/min $P<0.05$□. The incidence of CIN was also significantly higher in the control group(14.24% vs 8.06% $P=0.006$) and one patient had postoperative acute left heart failure. Logistic regression analysis revealed that female gender, acute myocardial infarction, and angiotensin-converting enzyme inhibitors were risk factors for CIN, whereas furosemide acted as a protective agent. **Conclusion:** With full hydration, small doses of furosemide can better prevent CIN than hydration alone.

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P584

## The impact of coronary chronic total occlusion intervention on the renal function outcome: single center experience

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**Introduction:** Patients who have percutaneous coronary intervention (PCI) are at risk for contrast–induced nephropathy (CIN), longer hospitalizations, and renal failure requiring dialysis. Limited data are available on predictors of contrast induced nephrology (CIN) in PCI for chronic total occlusion lesions (CTO). **Objectives:** The aim of our study is to determine the impact of CTO lesion characteristics, intervention techniques and devices on the renal function outcome. **Methods:** This retrospective analysis included all consecutive patients referred for CTO PCI between January 2002 and December 2009. CIN was defined as 24 hours post procedural increase of estimated baseline creatinine levels $\geq$ 25%.We compared patient's characteristics, Mehran score, lesion characteristics, intervention procedure and devices used for CIN and Non-CIN groups. Patients who had ESRD, undergone CTO intervention for grafts, those presenting with acute myocardial infarction and or had hemodynamic unstability were excluded. **Results:** A total of 516 patients underwent PCI for CTO, were eligible for analysis. The incidence of CIN was 5.4% (28/516), 2 cases needed transient hemodialysis. Analysis in different Mehran score stage: 0.5% developed CIN in stage 1($<$5); 3.4% in stage 2; 15.9% in stage 3; 37.5% in stage4 ($p<0.001$).LAD CTO vessel in comparison to other lesion locations ($p=0.024$), tortuosity of target vessel ($p=0.03$) and are significant predictors of the worse renal outcome. Multiple logistic regression analysis showed no significant impact of the intervention procedure and devices used. **Conclusion:** Our results support that the coronary CTO vessel location, vessel tortuosity and Mehran score have a significant impact on the renal function outcome during CTO PCI.

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P585

## Transcatheter foam embolism: a serious but poorly recognized complication of coronary angiography

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**Introduction:** Mixtures of contrast medium with blood components and air can produce significant volumes of foam within control syringes and manifolds used for coronary angiography (CA). Foams are complex fluids that can behave as viscoelastic solids under low shear stress. They are hydrodynamically more obstructive than larger air bubbles. A retrospective analysis done by Zavala-Alarcon et-al of 5700 patients who underwent CA at University of Arizona school of Medicine revealed that 10 cases or (0.17%) were identified to have no flow phenomenon or Thrombolysis in Myocardial Infarction (TIMI 0-1) Clinical reports of intracoronary bubble emboli are common, but reports related to foam embolism are lacking. We present a case of Transcatheter Foam Embolism (TFE) occurring during CA. **Objectives:** -To elucidate the origin of the LAD occlusion. -To study the radiographic appearance of foam. **Methods:** Foam was produced in the lab by shaking 5 ml of contrast medium with 1 ml of 5 gm% albumin and 1 ml of air. To elucidate the origin of the LAD occlusion, we studied the radiographic appearance of foam produced in 2 to 4 mm coronary phantoms with contrast medium and small amounts of albumin. **Results:** Foam was found to produce low density radiographic contrast compared to undiluted contrast medium, with no radiographically visible bubbles. TFE can be differentiated from air embolism, dissection, thrombus, and STEMI no-reflow by

Low radiographic contrast.
Post –injection persistence of low contrast "Ghost" vessel.
Presence of one or more stationary bubbles.

**Conclusion:** Both Air and Foam embolism can be prevented if caution is maintained in the preparation of the manifold balloons and guiding catheters. Coronary Air Embolism treatment is mainly supportive using 100% oxygen and pain control, unlike the treatment of Foam Embolism which requires use of suction catheters.

**Reference:**

Zavala- Alarcon et-al, Cardiovasc Revasc Med.2005 Jul-Sep;6(3):126–32

P586

## Protective effect of pre-procedure administration of trimetazidine on markers of myocardial damage in patients undergoing PCI and diagnostic coronary angiography

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**Introduction:** There are reports that application of trimetazidine in patiens prior to percutaneous coronary intervention reduces myocardial repefusion injury. **Objectives:** We sought to explore the hypothesis that pre-procedure application of trimetazidine in a loading dose in trimetazidine naïve patients can be protective against myocardial damage related to diagnostic cardiac catheterization and PCI. **Methods:** 30 patients scheduled for diagnostic coronary angiography (10 patients) or PCI (20 patients) for stable and unstable coronary heart disease were included. The patients' baseline clinical characteristics were analyzed and were typical of the patient population with ICD. Patients with normal baseline CPK, CPK-MB and troponin I values were included. Trimetazidine oral loading dose of 105mg was administered 5 hours ahead of invasive procedure and followed by 35mg twice daily. Serum samples for CPK, CPK-MB and TnI levels were collected 24 hours after the procedure and analyzed using standard validated laboratory assays. Information about tolerability of trimetazidine was actively collected during the hospitalization period. **Results:** In 90% of the patients with diagnostic CAG no rise of TnI above ULN (0.03ug/l) was detected. The TnI elevation registered in the patient in the diagnostic CAG group was 0.1ug/l. No rise in CPK and CPK-MB values was registered in the CAG group. Of the patients with inteventional revascularization serum TnI values above upper normal limit of the local laboratory were registered in 4 patients (20%). The maximum rise in TnI post-PCI was 0.25ug/l. Post procedural rise of CPK, CPK MB values above ULN was noted in 5 patients (25%). These were patients with unstable coronary syndromes, prior CABG, unresolved residual coronary lesions and complex interventional procedures. At the same time the peak MB values were up to two times ULN. Administration of trimetazidine was well toleated. No adverse reactions attributable to trimetazidine were noted during the in-hospital follow up period. **Conclusion:** Periprocedural application of trimetazidine loading dose 105mg in trimetazidine naïve patients prior to diagnostic CAG and PCI is safe and effective in reducing procedure induced myocardial damage as reflected by rise in serum troponin I, CPK and CPK MB levels.

**Reference:**

Polonski et al. Curr Med Res Op 2002; 18: 389–96. Labrou et al. Eur Heart J 2005; 26 (abstr. Suppl.): 40 Steg et al. Int J Cardiol 2001; 77: 263–273.

P587

## Atorvastatin reduces plasma C-reactive protein and cardiac complications in percutaneous coronary intervention patients

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**Introduction:** C-reactive protein(CRP) is an independent predictor of risk and percutaneous coronary intervention (**PCI**) is associated with an early rise in CRP. PCI is an integral part of the management of acute coronary syndromes and is associated with long-term clinical benefits. **Objectives:** To evaluate the beneficiary effect of atorvastatin on plasma high sensitivity C-reactive protein (hs-CRP) levels and major adverse cardiac events in patients. **Methods:** Eighty PCI patients with stable coronary heart disease or non-ST-segment elevation ACS was selected without a history of taking atorvastatin medicine. These patients were randomly divided into the intensive therapy group (n=40), which received loading capacity of atorvastatin (80 mg, oral) 12 hours before PCI, and control group (n=40), which received placebo treatment. Patients with liver and renal dysfunction as indicated by high levels of LDL-C, TG, hs-CRP, AST, or ALT were excluded from the study. All patients received conventional anti-platelet, lipid-lowering therapy after PCI operation. The levels of LDL-C, TG, hs-CRP, and the incidence of adverse events (death, myocardial infarction, target vessel revascularization) were compared before and after PCI. **Results:** The reduction of LDL-C levels was significantly greater in patients received atorvastatin treatment (from 4.02 $\pm$ 0.26 to 2.85 $\pm$ 0.51 mmol/l, 29.5 $\pm$ 4.5% decrease) than in placebo group of patients (from 4.08 $\pm$ 0.32 to 3.12 $\pm$ 0.48 mmol/l, 23.8 $\pm$ 3.5 % decrease, $p<0.05$). However, the reduction of TG in the two groups of patients was not significantly different. Furthermore, the decreases in hs-CRP levels (from 21 $\pm$ 7 to 7 $\pm$ 4 mg/l, 64.8 $\pm$ 6.6 % reduction) in patients received atorvastatin treatment were significantly greater than in placebo group of patients (from 21 $\pm$ 8 to 11 $\pm$ 5 mg/l, 45.2 $\pm$ 8.4 % reduction, $p<0.05$). In addition, the incidence rate of adverse events in 30 days after PCI was significantly lower in atorvastatin treatment group (2 of 40, 5%) than in control group (5 of 40, 12.5%, $p<0.01$). **Conclusion:** Intensive lipid lowering with load capacity dose of atorvastatin significantly reduces the levels of LDL-C, hs-CRP, and 30-day incidence rate of adverse events in PCI patients. Intensive lipid-lowering treatment produces greater beneficial effect than normal lipid-lowering treatment in patients subjected to PCI operation.

**Reference:**

1. Chan AW et al (2003) Relation of inflammation and benefit of statins after percutaneous coronary interventions. Circulation 107:1750–1756.

P588

## Use of neutrophil gelatinase-associated lipocalin (NGAL) urinary as an early marker of contrast induced acute-kidney injury (CI-AKI) in patients undergoing coronary catheterization

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**Introduction:** Contrast induced acute kidney injury (CI-AKI) is a serious complication of coronary catheterization and increases morbidity and mortality. The identification of reliable biomarker that allows earlier diagnosis of CI-AKI may optimize clinical management of patients. **Objectives:** To evaluate the neutrophil gelatinase-associated lipocali (NGAL) urinary as an early marker in determining the contrast induced acute-kidney injury (CI-AKI) after coronary catheterization. **Methods:** From March 2010 to June 2011, 119 patients who were undergoing coronary cathetrerization were enrolled. The serum creatinine was measured at baseline and 24 and 48 hours after the use of contrast medium. Urinary creatinine and urinary NGAL were measured at baseline and 3, 6, 24, 48 hours later. CI-AKI was defined as serum creatinine increase $>$ of 0.3 mg/dL 48 hours after theuse ofcontrast medium. **Results:** In the study population 12 patients (9.3%) developed the CI-AKI. In aunivariatelogistic regression model, predictors ofCI-AKIwere detected: clinical instability ($p=0.02$), heart failure ($p=0.05$), chronic renal failure ($p=0.002$), dialysis ($p=0.002$), baseline serumcreatinine ($p<0.001$), NGAL/urinary creatinine at baseline ($p<0.001$), urinary NGAL at 3 h ($p=0.005$), NGAL/urinary creatinine at 6h ($p<0.002$). If we consider a multivariate analysis of the data available after the procedure, it is revealed that the independent predictors of CI-AKI is the ratio NGAL/creatinine urinary at 3 and 6 hours after the use of the contrast medium. At the ROC analysis we found that the cut-off predictive of NGAL/creatinine urinary at 3 h is 0,48 (66,7–79; SE 0,08; AUC 0,73

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CI:0,6–0,75, p=0,005) and at 6 h is 0,45 (77,8–73,6; SE 0,09; AUC 0,77, 95% CI: 0.6–0,8, p=0,003). **Conclusion:** The use of NGAL in the daily clinical practice is promising and may be helpful in the early identification of patients at higher probability to develop CI-AKI.

**References:**
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Levy EM, Viscoli Cm, et al. "The effect of acute renal failure on mortality. A cohort analysis" JAMA 1996;275:1489–94
Michael Haase, Rinaldo Bellome et al. "Accurancy of Neutrophil Gelatinase-Associated Lipocalin (NGAL) in diagnosis and prognosis in acute kidney injury: A sistemic review and Meta-analysis"American journal of kidney diseases 2009;54:1012–1024

**P589**

## Managing no-reflow: tenecteplase a new medication?

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**Introduction:** No-reflow has been defined as "inadequate myocardial perfusion through a given segment of coronary circulation without angiographic evidence of a mechanical obstruction." No-reflow can complicate any percutaneous intervention (PCI), though it is more common following acute myocardial infarctions (MI), particularly with prolonged occlusion times. **Objectives:** Managing no-reflow can be approached in a number of different ways and needs to be tailored to the type of intervention being performed. In the setting of acute myocardial infarction the most effective preventative measure is the rapid opening of the vessel and as such the development of a robust and efficient primary PCI service is integral to the avoidance of this complication. **Methods:** A 59-year-old woman presented to the hospital after 2 hours of continuous chest pain. ECG on admition showed ST elevation in D2, D3, aVF and V5-V6 neg T. Echocardiography show that inferior and posterior walls are discinetic and lateral wall in basal and medial segment is hypocontractile. She underwent direct stenting to an occlusion in the right coronary artery. **Results:** Despite succesful implantation of stents revascularization failed. During intervention she developed a transitory complete AV block. Temporary pacemaker is positioned but suboptimal coronary flow was achieved, and she subsequently developed no reflow. In absence of aspiration devices and other pharmacological agents we decide to apply 5 mg (1000 IU) tenecteplase intracoronary, 1/6 of dosage for systemic administration. 3 min after administration TIMI flow grade improved from TIMI 0 to TIMI 3. The patient was transfered to coronary care unit for further monitoring and medical treatment. **Conclusion:** Managing no-reflow will become increasingly important with the wider development of primary PCI. Interventional cardiologists are increasingly performing these procedures and this will also necessitate robust strategies to avoid no-reflow. It is clear that pharmacological agents and distal protection devices are important in the treatment of high risk cases, and further studies may establish the adjuvant use of tenecteplase. Within the setting of acute myocardial infarctions with no reflow as primary percutaneous intervention complication, there are potential important future pharmacological regimens that may become established and one of them can be tenecteplase. Further clinical trials will be required to study the routine application of tenecteplase as pharmacological solution in acute MI.

**P590**

## Pre-cardiac procedures fasting: is it time to change practice?

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**Introduction:** Patients are usually kept starved (Nil-By-Mouth) pre-cardiac interventions including coronary interventions and and devices therapy. Fasting reduce the risk of aspiration if patients has to undergo emergency surgery or develop cardiac arrest. Currently there is no clear evidence available for pre-procedure fasting in patients undergoing coronary interventions.Fasting increases the risk for dehydration, hypoglycaemia and omission of medications. **Objectives:** To assess that low to medium risk procedures doesnot need Fasting pre-cardiac procedures. **Methods:** The data source was a retrospective data registry of consecutive patients who underwent percutaneous coronary interventions (PCI) for acute Coronary syndrome (ACS) and stable angina at our institution where no on-site cardio-thoracic services are available. Patients who underwent PCI between Jan 2010 and June 2011 were included. Additional information was collected through follow-up clinic letters, hospital and PCI database. **Results:** A total of 611 patients underwent PCI. Mean Follow-up of 6 ±2 months. Mean age was 68 ±16 years. 397(65%) male, Asians 85 (14%), 135 (22%) diabetic, 303 (49%) hypertensive, 311 (51%) smoker and 390 (64%) were with Hyperlipidemia. 269 (44%) patients had Non-ST elevation myocardial infarction (NSTEMI), 84(14%) had ST-elevation myocardial infarction (STEMI) and 240(39.27%) with stable angina. PCI was technically successful in all patients. More than 80% procedures were via radial access. In-Hospital complications included 1 death (related to cardiogenic shock), 6 had bleeding from the groin site requiring femstop (no blood transfusion) and 2 had re-infarction (requiring repeat angiography). None of the patients required emergency coronary artery bypass surgery, coronary perforation causing pericardial tamponade, complete heart blocks and stroke. The average in-hospital stay post-procedure for ACS was 4 ± 1 days while for stable angina was 1 day. A total of 17 (3%) patients were re-admitted post-discharge within 30 days. 9 had troponin negative chest pains, 1 each with heart failure and complete heart block requiring permanent pacemaker (PPM), while 7 had non-cardiac related problems. Only 3 patients had repeat coronary angiograms with 1 requiring further coronary intervention. **Conclusion:** This study indicates that patients undergoing medium risk PCI post ACS in a district general hospital with no on site cardio-thoracic facilities, does not need to be starved before the procedure and can safely undergo coronary interventions.

**P591**

## Femoral to radial access for coronary catheterization: a rapid conversion and the cost reduction

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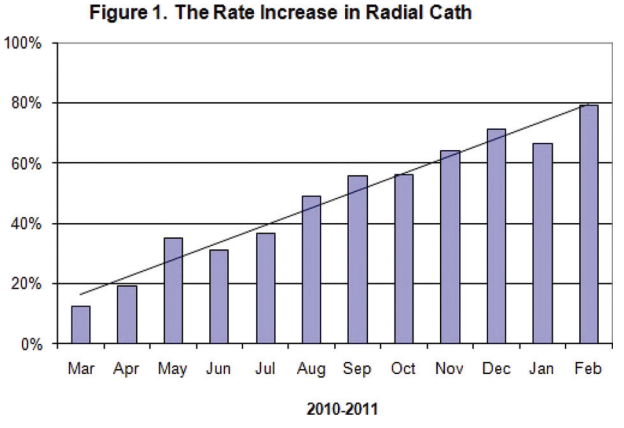
**Introduction:** Radial access for coronary catheterization (cath) has been shown to reduce access site complications but is technically more difficult and takes longer than the femoral access. Therefore, many centers in the US have been reluctant to adopt the technique. **Objectives:** This study aimed to determine 1) whether a rapid conversion from femoral to radial cath is feasible and 2) whether there are any differences between the two methods with regard to the access site-related complications, the length of hospital stay and cost. **Methods:** Departmental policies for change to a predominantly radial center were reviewed. The conversion rate from femoral to radial cath was evaluated for the period of change. The access site-related vascular complications were evaluated for all cases and the hospitalization cost was evaluated by a pilot study of both femoral and radial cath. **Results:** After the initial learning curve period, the adoption rate of radial cath increased steadily, from 12% in March 2010 to 79% in Feb 2011 (Fig. 1). The overall access site-related vascular complications was 0.6%, with 10/1168 pts in femoral access and 0/466 pts via radial access ($p<0.05$). In a pilot study, compared to femoral access radial cath reduced the length of stay by 44% and actual total cost by 47% (Table 1). Policies followed and the multidisciplinary approach allowed embracing both teaching and private cardiologists (8 operators) to achieve improved patient outcomes while reducing the healthcare cost.

Table 1: The length of stay and cost of hospitalization in femoral & radial cath

| | Femoral Cath | Radial Cath |
|---|---|---|
| No | 9 | 10 |
| Length of Stay (sum in days) | 50 | 28 |
| Total Charges (in 1000 USD) | 750 | 482 |
| Actual Variable Direct Cost | 80 | 48 |
| Actual Variable Fixed Direct Cost | 19 | 11 |
| Actual Total Cost | 172 | 109 |

**Image/graph I:**




**Conclusion:** Rapid adoption of radial artery as a dominant route for coronary catheterization is feasible and this experience can be replicated in similar centers. The marked reduction in complication rate, length of stay and hospitalization cost strongly support that radial access improves patient safety measures in coronary catheterization and is highly cost effective.

**Reference:**
Rao SV, Ou FS, Wang TY, et al. Trends in the prevalence and outcomes of radial and femoral approaches to percutaneous coronary intervention: a report from the National Cardiovascular Data Registry. JACC Cardiovasc Interv. 2008 Aug;1(4):379–86.

**P592**

## Invasive strategy in elderly patients with non st elevation acute coronary syndrome

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**Introduction:** The benefits of invasive strategy (IS) in elderly patients with non ST elevation acute coronary syndrome (NSTE ACS) are not totally clear. Most clinical trials don't include this population group so the

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treatment is individualized in each medical centre. **Objectives:** To analyze the effects of invasive strategy in comparision with non invasive strategy (NIS) in patients with NSTE ACS ≥75 years. **Methods:** We analyze retrospectively 249 with NST ACS admitted consecutively in our hospital between January 2005 and December 2007. 163(65%) underwent non-invasive strategy and 86 (35%) underwent invasive strategy. We analyze: in hospital mortality (HM) and in long term follow up (mean 18±14 months) mortality (LM) and combined event (mortality and/or non fatality myocardial infarction. **Results:** Patient's features are shown in this table.

| | NIS | IS | P | | NIS | IS | P |
|---|---|---|---|---|---|---|---|
| Age | 83±4 | 81±4 | <0,001 | ST desviation | 48% | 65% | 0,015 |
| Women | 41% | 42% | 0,908 | Tp I (+) | 83% | 89% | 0,181 |
| DM | 32% | 34% | 0,722 | GRACE | 176±36 | 165±27 | 0,010 |
| Killip>1 | 49% | 31% | 0,007 | PCI | 16% | 98% | <0,001 |
| Clcr≤30 | 28% | 16% | 0,044 | Major bleeding | 5% | 6% | 0,198 |

There were no differences in HM between NIS and IS: 9,2% vs 4,7% (p=0,198). However Kaplan Meier curver (Log-Rank test) for LM (p=0,008) and combined event (p<0,001)were favorable to IS. Cox multivariate analysis showed as predictors of the combined event: Cl cr <30 ml/min (HR 3.32, 95% CI 1.79 to 6.15, p <0.001) and major bleeding (HR 6.98, 95% 1 ,55–31, 44, p = 0.011), and the IS as a protective factor (HR 0.36, 95% CI 0.18 to 0.74, p = 0.005). **Conclusion:** Elderly patients with NSTE ACS may have benefits with invasive strategy. There are necessary clinical trials in this group of patients.

**P593**

## Primary percutaneous coronary intervention in octogenarians: single center real world experience

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**Introduction:** Scarce data is available regarding the acute management of ST elevation myocardial infarction in octogenarians. Even though mechanical reperfusion has proved to reduce mortality and morbidity, controversy remains in treating the very elderly due to the paucity of clinical trials of primary percutaneous coronary intervention (PCI) in this cohort and the observed increased risk of complications. **Objectives:** Evaluate clinical outcomes after primary PCI in octogenarians. **Methods:** Single center observational retrospective study of patients (pts) undergoing primary PCI between 2005 and 2010. Clinical and procedural data were collected. Primary outcomes were rates of 1) procedural success and 2) major adverse cardiovascular events (MACE) during in-hospital stay or at follow-up. MACE included death (considered cardiac unless otherwise documented); new Q-wave and non-Q-wave myocardial infarction; cerebrovascular accident defined as transient ischemic attack or stroke; and bleeding complications according to the GUSTO trial scale. **Results:** We studied 64 consecutive patients (pts), mean age 83.8 ± 3.2 years, 50% male. The majority of pts (70%) presented with more than two hours after symptoms onset, with 11% atypical presentations. Three pts presented with Killip IV class. Multivessel disease was present in 71% (left main disease in 19%). Mean Syntax score was 20.9 ± 10.2. Co-morbidities were common (cerebrovascular disease–14%, peripheral vascular disease–23%, >= stage III National Kidney Foundation renal failure–52 %). PCI success was attained in 81.5% (52 pts), in 95% with stenting (drug-elluting stents in 73%). 30 days and one year mortality rate were 14% and 23%, respectively. At 41 ± 6.8 months follow-up, the cumulative rate of MACE was 31.3% (15 deaths; one hemorrhagic stroke; two post-PCI major bleeding; 2 non-Q-wave myocardial infarctions). The rate for target-lesion revascularization (TLR) was 6.3%. Killip class, time to reperfusion and Syntax score were significantly correlated with in-hospital mortality in the univariate analysis. **Conclusion:** Even though late presentation, multivessel disease and comorbidities decrease the myocardial salvage with primary PCI, causing worst short and long term outcomes, high revascularization success (81.5%) with a low rate of peri-procedural complications (3.8%) can be attained in the majority of pts.

**P594**

## Electrocardiographic picture of acute anterior infarction due to stenosis of the right coronary artery: two cases report

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**Introduction:** Anterior left ventricular myocardial infarction (MI) is usually presented by anterior ST-segment elevation. However, anterior ST-segment elevation has also been described in patients with lesion of the right coronary artery (RCA). **Objectives:** Aim of this paper is to show two cases of RCA lesion with anterior ST-segment elevation. **Methods:** Methods. We present two patients with anterior ST-segment elevation caused by severe RCA stenosis. **Results:** The first patient, a 47-year old male, with a history of smoking and dyslipidemia, was admitted in our clinic because of chest pain, nausea and loss of consciousness. A 12-lead electrocardiogram (ECG) on arrival showed complete AV block and ST-segment elevation in leads V1-V3. The patient's levels of MB fraction of creatine kinase (CK-MB) and troponin I were elevated. Echocardiography demonstrated hypokinesis of interventricular septum (IVS) and cardiac apex. RCA catheterization was done and it showed an ostial stenosis of 99%. Angiography of the left coronary artery was normal. The patient underwent PCI with stenting infarct-related RCA with good angiographic results. His in-hospital course was uneventful and he was discharged from the hospital 5 days later. The second patient was female 42 years old, with smoking as a risk factor. A 12-lead ECG on admission showed ST-segment elevation in leads III, aVF, V1-V4. Echocardiography demonstrated hypokinesis of the posterior wall, IVS and basal segment of inferior wall of the LV. Angiography of the left coronary artery was normal, but angiography of RCA showed severe proximal stenosis. PCI with stenting infarct-related RCA was done with good final result. The rest of her hospital stay was without complications and she was discharged on the fifth day. **Conclusion:** Several mechanisms for anterior ST-segment elevation in patients with RCA lesion have been proposed. One of them is RCA occlusion proximal to the branch that perfuses the right ventricle. The other explanation is that inferior wall of the LV can be supplied by collaterals from left coronary artery. We described two patients with exceptional ECG showing ST-segment elevation in anterior leads secondary to severe RCA stenosis.

**P595**

## Primary PCI: time is life

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**Introduction:** The rapid treatment of Acute Myocardial Infarction (AMI) increases the survival of the patient. The time from hospital admission and the restoration of coronary flow in the infarct related artery (door-to-balloon) is strongly associated with loss of function post-myocardial infarction, major determinant of life prognosis. As such it is extremely important is to minimize this time. **Objectives:** To evaluate the time between symptoms, hospital admission and the restoration of coronary flow by Percutaneous Coronary Intervention (PCI) and assess the mortality indexed by this time in order to determine the increase of intra-hospitalar mortality per three time periods : symptoms-hospital admission (symptoms-to-door), symptoms-restoration of coronary flow (symptoms-to-balloon) and hospital admission-restoration of coronary flow (door-to-balloon). **Methods:** A descriptive typology with a quantitative approach, with the target population consists of 333 patients who underwent primary PCI between January 1 and December 31, 2009, in a single hemodynamic center. The mean±sd age was 63±10 years; 72.6% were male and the risk factors are: Hypertension-66.6%, Hypercholesterolaemia-57.6%, Smoking-36.4%, Obesity-33,5%, Diabetes-31.4%. Statistics: Time periods were divided in quartiles and the relationship with intrahospitlar death evaluated with Qui-Square test, Pearson correlation coefficient and multivariate linear regression analysis (Backward Stepwise assessement to determine the most important time. **Results:** (1)The mean±sd of symptoms-to-door was 190.71±179.595 minutes, the mean±sd of symptoms-to-balloon was 329.52±218.700 minutes and the mean±sd of door-to-balloon was 200.94±246.566 minutes. The in-hospital mortality rate was 31 patients (9.4%). (2)Greater the time quartile greater the intrahospitalar death (see table). (3) By multivariate linear regression analysis (Backward Stepwise) the door-to-balloon time was the most important time period to predict intra-hospitalar (p=0.015).

| Intra-hospitalar mortality | Quartile 1 | Quartile 2 | Quartile 3 | Quartile 4 | Sig. |
|---|---|---|---|---|---|
| symptoms-to-door | 2.8% | 8.2% | 10.7% | 15.3% | p=0.009 |
| symptoms-to-balloon | 3.8% | 6.2% | 10.8% | 15.0% | p=0.007 |
| door-to-balloon | 4,9% | 6.1% | 9.9% | 15% | p=0.017 |

**Conclusion:** For the target population under study there is close relationship for increased mortality with delay in treatment of AMI by ICP, therefore there should be an effort by the clinical teams to reduce the time door-to-balloon

**P596**

## Long-term outcomes after percutaneous coronary intervention of unprotected left main coronary disease with drug-eluting stents

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**Introduction:** Most available data indicates that stenting for unprotected left main coronary artery disease (ULMCA) with drug-eluting stents (DES) is safe and effective. At present, surgery is considered the gold standard for optimal revascularization. **Objectives:** The aim of this study was to evaluate the long term outcome of patients with ULMCA stenosis who underwent percutaneous coronary intervention (PCI) with DES implantation in a single center. **Methods:** Coronary stents were implanted into ULMCA in 59 patients. Long term main adverse cardiac events (MACE) were assessed: cardiac death, myocardial infarction and additional target lesion or non-target lesion revascularization (TLR). **Results:** Mean age was 68 ±13, (29% were females). Angiographic and clinical success of PCI was 100%. 30% required two stents bifurcation technique stenting .Complete revascularization was performed in all patients. Median follow-up duration was 26 months. Total mortality on follow up was 10.5%, cardiac death occurred in 5.2%. Angiographic follow-up was performed in (82%) patients and TLR occurred in 11% of treated lesions. One possible stent thrombosis was documented. **Conclusion:** ULM stenting is feasible and safe. Long term results seem to be encouraging, showing limited cardiac mortality and TLR.

**P597**

## Following PCI, elderly patients are more likely to die from cancer than from cardiovascular related deaths

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**Introduction:** With the expanding aging population, more elderly patients are undergoing high risk, invasive procedures. We wished to assess our practice and outcomes in terms of Percutaneous Coronary Intervention (PCI) in this particular population. **Objectives:** To determine the clinical risks and procedural outcomes for elderly (age > 80 years) patients undergoing PCI at a regional cardiology centre. **Methods:** A retrospective analysis on all patients greater than 80 years, undergoing elective and emergency PCI at a single tertiary referral centre, between 2007 and 2009. Patient demographics, procedural details and

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in-hospital complications were obtained from patient notes. 30-day, 6 month and 1 year mortality were obtained from analysis of the death registry. **Results:** A total of 118 procedures were carried out in 106 elderly patients over the two year study period, 2007–2009. Mean age was 82.5 years, with 35% female cases. 47% of cases were elective PCI, the remainder emergency cases-10% of which were deemed "critical." Mean TIMI risk score for Acute Coronary Syndromes was 5, overall mean logistic Euroscore was 16.75% (additive score 8.8) and BCPCI (British Colombia Percutaneous Coronary Intervention 30 day mortality) mean score was 7.44%. Actual 30-day, 6 month and 1 year mortality was 2.75%, 7.3% and 10.1% respectively. Cardiac related mortality (as per cause of death on death registry) was 2.75% at 30 days, 4.6% at 6 months and 4.6% at one year. All early (30 day) deaths were cardiovascular related. The primary cause of death at two years (as documented on the death certificate) was more likely due to cancer (n=8) as to a primary cardiac cause (n=7).

**Image/graph I:**

| | n= (%) |
|---|---|
| Radial Access | 26 (24) |
| **No. of Vessels Treated** | |
| 1 | 85 (81) |
| 2 | 18 (17) |
| 3 | 2 (2) |
| **Target Vessel:** | |
| LMS | 7 (6) |
| LAD | 50 (46) |
| LCx | 23 (21) |
| RCA | 36 (33) |
| SVG | 5 (5) |
| IMA | 0 |
| **Stent Use:** | |
| Mean Number per Case | 1.78 |
| Stent Length (mm) | 28.5 |
| Drug Eluting Stent | 38 (34) |
| Gp IIb/IIIa Use | 11 (10) |
| Rotablation | 12 (11) |
| IABP (Intra Aortic Balloon Pump) | 7 (6) |
| Angiographic Success | 105 (96) |
| Length of procedure (min) | 102 |

**Conclusion:** The number of elderly patients undergoing PCI is high risk as per TIMI, Euroscore and BCPCI risk calculators. Despite this, overall outcomes appear better than the calculated risk. Interestingly, in this population, cancer accounted for more deaths than cardiovascular related deaths.

**P598**

## Inhibition of IL-1-beta convertase and caspase-1 reduces intimal apoptosis paralleled with inhibition of inflammation and neointimal hyperplasia after balloon injury and stenting of the porcine coronary arteries

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**Introduction:** Short exposure of atherosclerotic plaque to antiproliferative substances (such as paxlitaxel-eluting balloon) decreases the restenosis after coronary intervention. **Objectives:** The aim of the present study was to evaluate the effect of the pre-inteventional intracoronary infusion of Ac-YVad.cmk, an apoptosis and IL-1-beta convertase inhibitor, on the development of neointimal hyperplasia in porcine coronary arteries. **Methods:** Eight pigs received 25mg Ac-YVAD-cmk selectively, randomly into the left anterior (LAD) or circumflex (LCx) coronary arteries before implantation of BMS (group Inhibitor-BMS) or balloon dilation with oversizing-injury (group Inhibitor-PTCA). Either other animals served as controls with implantation of either BMS (group Control-BMS) or PTCA (group Control-PTCA) randomly chosen of LAD or LCx. After 4 weeks, neointimal hyperplasia, intimal inflammation, fibrin deposition, haemorrhagia and injury have been assessed histopathologically. TUNEL was carried out to assess apoptosis. **Results:** Injury score was similar in PTCA and also in stent groups, with significantly higher injury score in stent groups as compared to PTCA groups. Intracoronary infusion of Ac-YVAD-cmk resulted in significantly less intimal apoptosis in Inhibitor-PTCA ($3.5\pm2.7\%$ vs $13,1\pm6.7\%$, $p<0.001$), as well as in Inhibitor-BMS groups ($3.5\pm3.8\%$ vs $14.8\pm7.7\%$, $p=0.001$) as compared to controls. Significantly smaller neointimal area was found in Inhibitor-PTCA ($0.5\pm0.35$ vs $1.2\pm0.44$ mm$^2$, $p=0.001$) and Inhibitor-BMS groups ($0.68\pm0.21$ vs $1.7\pm0.71$ mm$^2$, $p=0.001$) as compared to controls. Histopathology revealed a trend towards lower intimal inflammation in PTCA groups ($0.22\pm0.44$ vs $0.5\pm0.52$ in Inhibitor-PTCA and Control-PTCA, $p=0.214$) but significant difference between the stent groups ($0.33\pm0.5$ vs $1.22\pm0.67$, Inhibitor-BMS vs Control-BMS groups, $p=0.006$). Fibrin deposition and haemorrhagia were similar in the PTCA groups, as well as in BMS groups. Pooling the data of the 4 groups, higher apoptosis index was associated with higher neointimal area ($r=0.501$, $p=0.022$) and intimal inflammation ($r=0.675$, $p<0.001$). **Conclusion:** Short exposure of coronary arteries to IL-1-beta convertase and apoptosis inhibitor results in a significant decrease in intimal apoptosis paralleled with a significant inhibition of neointimal inflammation and neointimal hyperplasia, suggesting a direct role of apoptosis-induced releases of different mediators (such as IL-1$\beta$) which promote neointimal development after coronary interventions.

**P599**

## Intraoperative new generation c-arm imaging during cardiac interventional procedures: a bridging solution to a hybrid operating room?

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**Introduction:** Transcatheter valve interventions (TAVI), hybrid coronary and aortic disease procedures require angiographic intraoperative imaging supporting the heart team approach. Considering limited financial and logistic possibilities of many medical centers, alternative strategies should be investigated . **Objectives:** We sought to evaluate the use of different X ray mobile c arm systems in the operating room performing transcatheter valve procedures and intraoperative coronary angiography and PCI interventions. **Methods:** Between 2/2001 and 7/2011, 392 patients (pts) were evaluated and treated using 4 different types of mobile c-arms: GE OEC 9800 (325), Siemens Arcadis (5), Philips Veradius (17), Ziehm RFD (45). We observed a steady increase of this imaging procedure for major cardiac procedures from 23 to 43 cases per year during the last decade ($p=0.002$). Indications for the use of a mobile c arm system was TAVI (53), coronary bypass angiography after robotic bypass surgery (318) and bail out coronary angiography for signs of myocardial ischemia or aortic stenting in 21 pts. **Results:** There were 3 cases (0.8 %) of system crashes, one procedure was deviated from a TAVI to an open surgical procedure. All other 52 TAVI procedures were completed without valve malposition or coronary obstruction. After robotic bypass surgery anastomotic or graft revision was required in 11/375 anastomoses (3%). Nitroglycerin sensitive target vessel or graft spasm was detected in 122 (33 %) and 18 (5%) cases respectively. Emergency coronary intraoperative coronary angiography for signs of myocardial ischemia was performed in 14 cases (4 patients after CABG, 2 patients after AVR, 7 patients after MVR and 1 cardiac transplant recipient), in all but two patients at least one additional graft was needed. Bail out aortic stenting was needed in 7 patients and performed using conventional and digital substraction angiography and roadmapping. Median procedure duration for coronary evaluation was 22 (10–110) minutes, fluoroscopy time was 413 (89–2282) sec, cumulative radiation (dose area product) was 46,261 (9,381–429,787) mGy/cm$^2$.The amount of contrast agent used was 150 (20 to 600) ml. **Conclusion:** The use of new generation mobile c-arms in the cardiac operation room is very useful for transcatheter valve and aortic interventions as well as coronary artery graft evaluation. Furthermore bail-out procedures can be successfully performed.This imaging approach may represent a bridging solution to a fully equipped hybrid interventional room.

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P600

## Associations of microcirculatory endothelium-dependent vascular reactivity with cardiovascular risk factors in patients with essential hypertension

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**Introduction:** While cardiovascular risk factors are well known to enhance the development of atherosclerotic lesions in large arteries,there is also evidence that the structure and function of microscopic blood vessels can beprofoundly altered by these conditions. The microcirculatory disorders of the vascular reactivity to endothelium-dependent vasoactive substances such as acetylcholine and histamine fixed when the early stages of development of arterial hypertension were. It is regarded as the initial manifestation of systemic reduce of depressor vascular tone regulation. **Objectives:** The aim of this study was to estimate association of microcirculatory endothelium-dependent vascular reactivity with cardiovascular risk factors in patients with essential hypertension. **Methods:** 97 consecutive patients (52.3 +/- 12.9 years of age) with arterial hypertension (AH) and without coronary artery disease (CAD) were investigated. Laser Doppler flowmetry of the forearm skin vessels was used to study microcirculatory vascular reactivity (MVR) on intradermal injected acetylcholine and histamine. **Results:** The associations between MVR on acetylcholine and smoking ($r=-0.255$, $p<0.05$), abdominal obesity ($r=-0.208$, $p<0.05$), family history on early CAD ($r=-0.243$, $p<0.05$) were observed in patients with AH. The MVR on histamine was associated with Ketle index($r=-0.256$, $p<0.05$). Multivariate linear regression analysis demonstrated a significant associations MVR on acetylcholine with smoking (beta = -0.307, p = 0.004) and between MVR on acetylcholine and family history on early CAD (beta = -0.267, p = 0.013), even after adjustments for covariates, including the use of medication for hypertension. **Conclusion:** This study showed that major cardiovascular risk factors such as smoking and family history on early CAD have negative impact on microcirculatory endothelium-dependent vascular reactivity.

P601

## Longitudinal blood pressure trend in women after hypertensive pregnancy disorders

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**Introduction:** Women with hypertensive pregnancy disorders (HPD) are at increased risk to develop hypertension and cardiovascular disease later in life, it is not known however at what age hypertension appears in affected women. **Objectives:** In this study we evaluated the trend in blood pressure in women after HPD compared to women with normotensive pregnancies. **Methods:** Data of the Doetinchem study, a population based cohort study with 15 years of follow-up, were used. Women between 30–49 years of age at baseline were included, follow-up was performed by a questionnaire and physical examination each 5 years. History of HPD was assessed from the questionnaires. We analysed longitudinal trends in systolic blood pressure (SBP) and diastolic blood pressure (DBP) by using generalized estimating equation (GEE) analysis in SAS software for effects of HPD and age. **Results:** A total number of 1587 women with normotensive pregnancies (mean age of 39.5 years, SD 5.4 year) and 455 women with a history of HPD (mean 38.6 years and SD 5.3 year) were included. At each measurement SBP was 3.05 mmHg higher (95%CI 1.86–4.44) in affected women compared to unaffected women while DBP was 2.24 mmHg higher (95%CI 1.44–3.04). In both groups SBP increased 1.03 mmHg (95%CI 0.97–1.10) per year of age and DBP 0.54 mmHg (95%CI 0.50–0.57). There was no significant interaction between HPD and age in GEE analysis. **Conclusion:** Women with HPD have significantly higher SBP and DBP compared to unaffected women, with a comparable yearly increase in blood pressure with ageing.

P602

## Right ventricular dysfunction in a hypertensive population stratified by patterns of left ventricular geometry

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**Introduction:** Right ventricular (RV) dysfunction in hypertensive patients has been previously described. Four different LV geometric patterns in hypertensives have also been previously described. However, RV dysfunction in subjects with the various LV geometric patterns has not been previously well described. **Objectives:** To assess the prevalence, predictors and correlates of RV systolic and diastolic dysfunction (RVSD and RVDD respectively) in hypertensives, who were stratified according left ventricular (LV) geometric pattern. **Methods:** The study was carried out in the echocardiography laboratory of Aminu Kano Teaching Hospital (AKTH) in Kano, Nigeria. The study was cross-sectional in design. Hypertensive subjects referred for echocardiography to AKTH were serially recruited. RVSD was defined as the presence of either or both of Tricuspid Annular Plane Systolic Excursion (TAPSE) of ≤14mm, or peak velocity of the systolic wave ($S_m$) in Tissue Doppler Imaging (TDI) of RV lateral tricuspid annulus of $_m$) to late ($A_m$) diastolic waves of <1.0 in the TDI of RV lateral tricuspid annulus. Subjects with normal LV geometry (NG) were compared with those who had other patterns. **Results:** A total of 128 subjects were serially recruited. Subjects with eccentric hypertrophy (EH) had the highest prevalence of RVSD (55.3%), while those with NG had the lowest prevalence (20.4%). In contrast, prevalence of RVDD was high across the four groups, and the highest prevalence was recorded in subjects with NG (68.5%), while those with concentric remodelling (CR) had the lowest (42.9%). Predictors and correlates of RVSD and RVDD were determined. **Conclusion:** This study has described, perhaps for the first time, the prevalence of RVSD and RVDD in hypertensive subjects grouped by LV geometric patterns.

P603

## Effect of trans-[Ru(NH3)4(Py)(NO)]3+ in aortic rings of rats

Ana Gabriela Conceição-Vertamatti[1,*], Luiz A. Ramos[1], Ivy Calandreli[2], Aline N. Chiba[2], Douglas W. Franco[3], Miguel A. Areas[4], Elia Tfouni[2], Dora M. Grassi-Kassisse[4]
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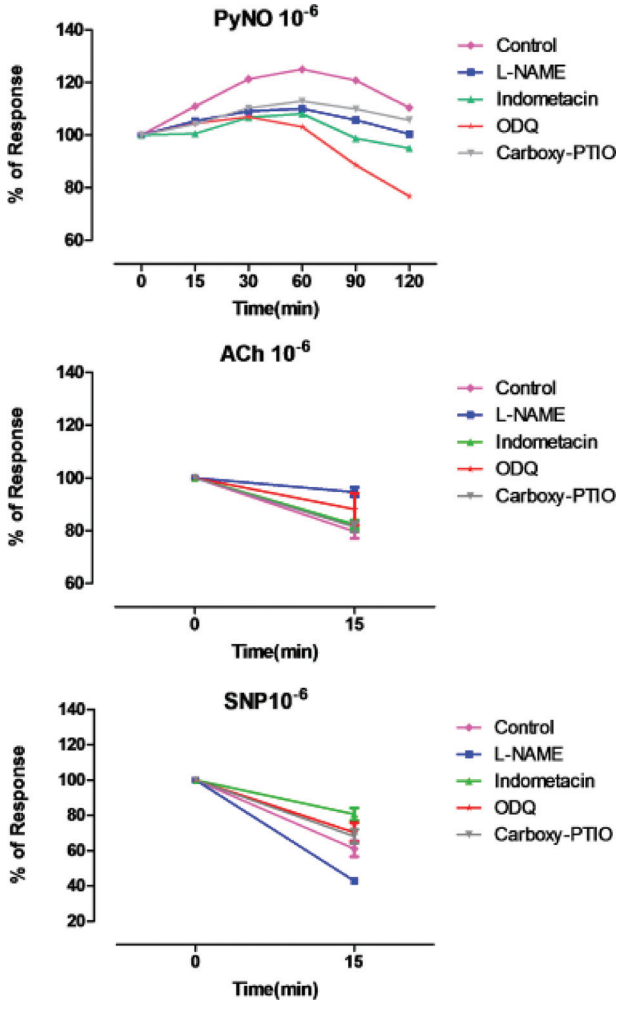
**Introduction:** We demonstrate the effectiveness of the vasorelaxant effect of ruthenium *trans*-$[Ru(NH_3)_4L(NO)]^{n+}$ [L=pyridine, nicotinamide, 4-picoline, Nimidazol, pyrazine, $NH_3$, $SO_3^{2-}$, or $P(OEt)_3$] compounds in aortic rings without endothelium, the response induced by the release of NO molecule by these compounds when activated by reduction. **Objectives:** This study aimed to assess the vascular response of the *trans*-$[Ru(NH_3)_4(Py)(NO)]^{3+}$ complex (PyNO) in aortic rings with endothelium, pre-contracted with norepinephrine (NE, $10^{-6}$ M), isolated from male rats (n=15). **Methods:** Assays were performed as described before by Zanichelli, et al., 2007 excepted that aortic rigs with endothelium were used and in the medium was added enzyme inhibitors as L-Name ($10x10^{-6}$ M), Indometacin (Indo, $5.6x10^{-6}$ M), ODQ ($10^{-6}$ M) or Carboxy-PTIO (C_PTIO$10x10^{-6}$ M). Inhibitors of nitric oxide sintase (NOS), cyclooxigenase (COX), and guanylate cyclase (GC) and NO scavenger, respectively. Data are expressed as wall tension (gF) and % of response, means ± SEM and analyzed by Student's *t* test and ANOVA followed by Tukey's test $p<0.05$. **Results:** Figures show PyNO effects in aortic rings with endothelium, under NE tension induced tonus alterations, there was a vasoconstriction effect in 15, 30, 60 and 90 min. NOS inhibition decreased PyNO response in 15, 30 and 60 min and abolished the response observed in 90 min. COX inhibition abolished the tonus response observed in 15 and 30 min, and reduced response in 60 min. Under GC inhibition, PyNO decreased tonus response in 15 and 30 min, and abolished tonus response in 60 and 90 min. NO scavenger decrease PyNO response in 30 min and abolished response in 15, 60, and 90 min. Endothelial integrity was confirmed by ACh effects and integrity of vascular smooth muscle was also preserved.

**Image/graph I:**

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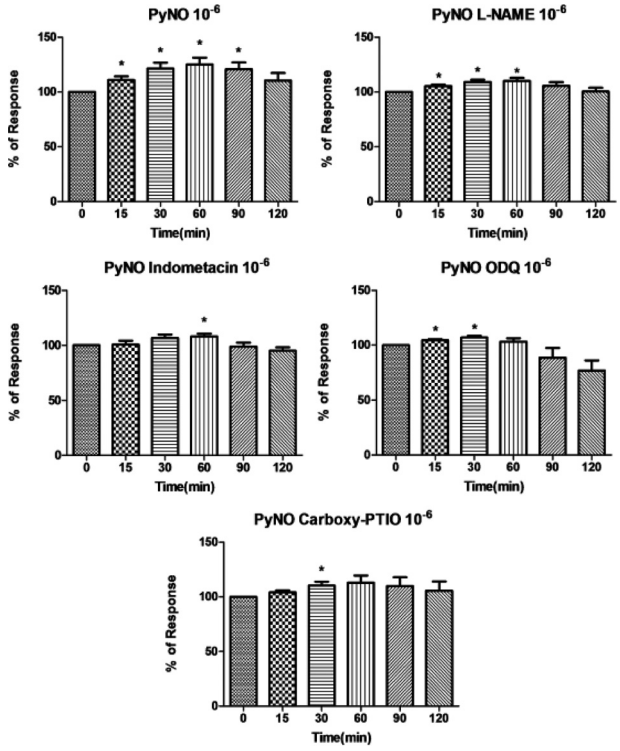
**Image/graph II:**




**Conclusion:** These assays allowed us suggest that contractions effect induced PyNO-complex in aortic rings with endothelium are mediated by thromboxane production because higher tone observed was inhibit buy indometacin and probably PyNO also acts as a NO scavenger. FAPESP, CAPES, CNPq.

**References:**

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**P605**

## Exercice controls blood pressure and improves quality of life

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**Introduction:** The correct treatment of hypertension, independent of the use of pharmacological agents, requires a change in lifestyle, with emphasis on physical exercise, something that has been neglected in Brazil. **Objectives:** Analyze the effect of treatment by means of physical exercise on blood pressure and quality of life in hypertensive patients. **Methods:** Clinical trial with 32 sedentary hypertensive individuals, 55 ± 9 years, who were under antihypertensive drug treatment and were randomly assigned to Group Exercise (GE) and Group Control (CC). GE, 18 subjects (50% women), 10 days after cessation of drug treatment began an exercise program (EP) of 10-week, three times a week, with sessions of 30 minutes of aerobic exercise, followed by resistive exercises, while GC, 14 individuals (57% women), remained in antihypertensive drug treatment. Blood pressure (SBP) and diastolic (DBP) was evaluated by auscultation and QOL were evaluated using the questionnaire MINICHAL. Data were expressed as mean ± SD and statistical analysis was performed using t test, Mann Whitney U and Wilcoxon test. **Results:** At the beginning and end of the study, there was no statistical difference ($p>0.05$ NS) in SBP and DBP in both groups: EG (SBP 132.2 ± 13.3 x 134.10 ± 4 mmHg, DBP 85, 0 ± 85.3 mmHg ± 9 x 10) and CG (SBP 127.19 ± 2.16 x 130 ± 2 mmHg and DBP 82.1 ± 85.3 x 16 ± 12 mmHg). In the inter-group assessment there was no difference in QoL scores at the beginning and end of the study, while the intra-group assessment showed a significant improvement in emotional state only in the GE (p 0.02). **Conclusion:** In relation to drug treatment, exercise was equivalent to control blood pressure and superior in improving the quality of life.

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**P606**

## Effect of trans-[Ru(NH3)4(Cy)(NO)]3+ in aortic rings of rats

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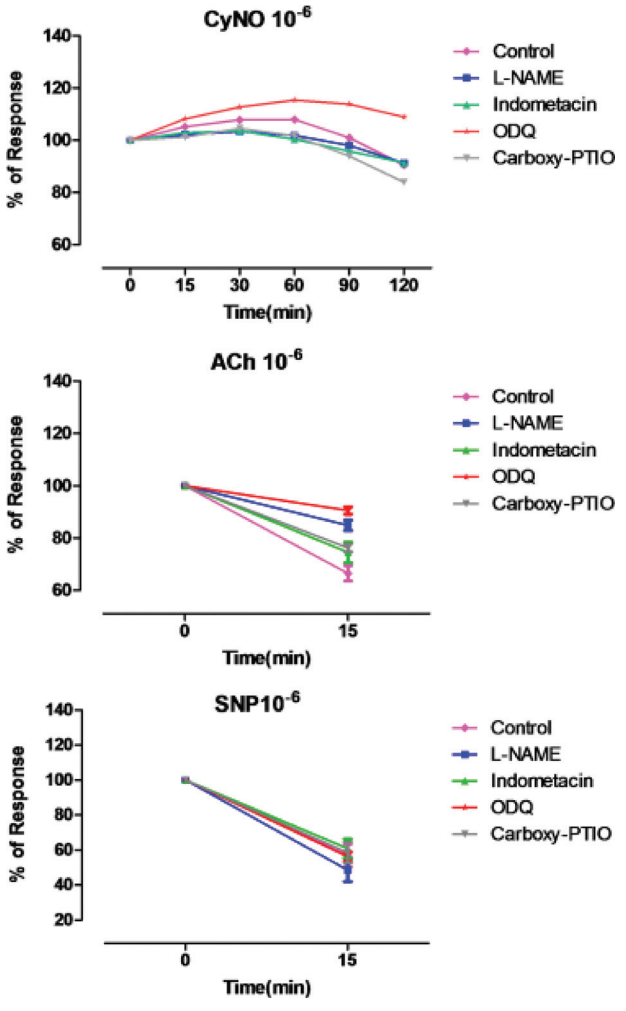
**Introduction:** We demonstrate the effectiveness of the vasorelaxant effect of ruthenium *trans*-$[Ru(NH_3)_4L(NO)]^{n+}$ [L=pyridine, nicotinamide, 4-picoline, Nimidazol, pyrazine, $NH_3$, $SO_3^{2-}$, or $P(OEt)_3$] compounds in aortic rings without endothelium, the response induced by the release of NO molecule by these compounds when activated by reduction. **Objectives:** This study aimed to assess the vascular response of the *trans*-$[Ru(NH_3)_4(Cy)(NO)]^{3+}$ complex (CyNO) in aortic rings with endothelium. **Methods:** Assays were performed as Zanichelli et al., 2007 (15 male rats) with addicional enzimatic inhibitors in the medium.The assays were performed in a presence or absence of L-Name ($10x10^{-6}$ M), Indometacin ($5,6x10^{-6}$M), ODQ ($10^{-6}$M)or Carboxy-PTIO($10x10^{-6}$M),inhibitors of nitric oxide sintase(NOS), Cyclooxigenase(COX), Guanylate Cyclase(GC) and NO scavenger, respectively.Data are expressed as the percentage of decrease in the wall tension(gF)and % of response,means±SEM, analysed by Student'*t* test and ANOVA followed by Tukey's test $p<0.05$. **Results:** Figure describes the CyNO in aortic rings with endothelium under NE tension. CyNO induced tonus increased in 15 and 30min, with no relaxing effects. NOS inhibition abolish increased in tonus 15 min and reduced that one observed in 30min, and in this conditions, CyNO induced significantly decreased tonus in 120min.COXinhibition reduced but not abolish increased in tonus observed in 15 and 30min. Under GC inhibition,CyNO induced a tonus increased even in 30 and 60 min with a reduction in tonus in 90 min. NO scavenger did not alter the CyNO response. Endothelial integrity was confirmed with the relaxation induced by ACh(-33.49±2.93%)and the integrity of vascular smooth muscle was also preserved (SNP,-43.07±6.49%).

**Image/graph I:**

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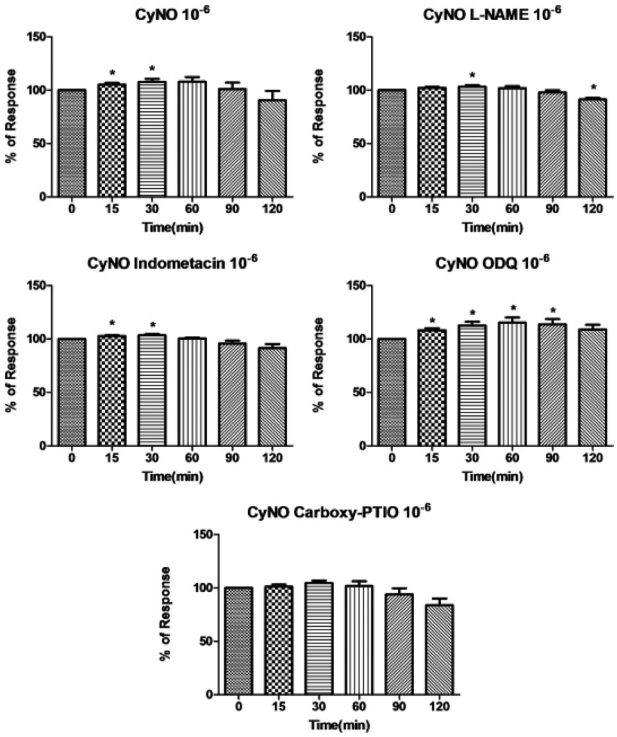
**Image/graph II:**




**Conclusion:** Under our experimental CyNO induced increased in vascular tonus without relaxing effect. This effect was modified only by No-scavenger in the medium. FAPESP, CAPES, CNPq.

**References:**

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**P607**

## Switching from immediate release thiazide diuretics to sustained-release indapamide in women with arterial hypertension reduces the rate of emergency room visits: a nested case-control study

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**Introduction:** Immediate-release thiazide diuretics are still widely used as a basis of treatment in patients with arterial hypertension. They represent a heterogeneous class of drugs with differing chemical structures, mechanisms of action, and pharmacokinetic and pharmacodynamic features, which results in differences in antihypertensive efficacy and impact on patient outcomes. **Objectives:** The aim of our nested case-control study in women with arterial hypertension was to evaluate the effect of switching from immediate release thiazide diuretics to sustained-release indapamide on BP reduction and the number of emergency room visits. **Methods:** We have analyzed data from AFINA, a prospective study of 2862 women with arterial hypertension carried out in primary care settings across 56 cities of the Russian Federation, with the participation of 293 doctors. We assessed the rates of emergency room visits during 12 weeks in two groups: 150 women who switched from immediate release thiazide diuretics to indapamide SR at baseline, and 144 women either treated with immediate release thiazide diuretics or with an arbitrary change in antihypertensive therapy at baseline (controls). **Results:** During the 12-week follow-up, 5.3% (8/150) of hypertensive women in the indapamide SR group visited emergency room compared with 12.5% (18/144) of those in the control group ($P=0.03$). Switching from immediate release thiazides to indapamide SR also resulted in greater reductions in systolic blood pressure (mean difference of -6 mm Hg, 95% CI, 3–9, $P=0.001$), diastolic blood pressure (-3 mm Hg, 95% CI, 1–5, $P=0.005$), and pulse pressure (-3 mm Hg, 95% CI, 0–6, $P=0.02$). **Conclusion:** Switching from immediate release thiazides to sustained-release indapamide in hypertensive patients may reduce rates of emergency room visits. This may be due to an indapamide SR-associated improvement in heart disease and a further reduction in blood pressure.

**P608**

## Cardiovascular outcomes in hypertensives treated exclusively with nifedipine GITS or Co-amilozide: evidence from the "INSIGHT" trial database

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**Introduction:** The International Nifedipine GITS Study: Intervention as a Goal in Hypertension Treatment (INSIGHT) study was designed to compare the cardiovascular (CV) outcomes in hypertensives at high CV risk treated with the long-acting calcium-channel blocker nifedipine GITS) or the fixed dose combination of the diuretics hydrochlorthiazide and amiloride (co-amilozide). **Objectives:** INSIGHT included a relatively large cohort whose blood pressure (BP) was controlled without the need for further add-on therapy, thus this analysis compares CV outcomes in patients who remained on "mono-therapy" throughout the trial. **Methods:** Treatment groups were compared by the log-rank test without adjustment for covariates. Relative risk (RR) with 95% CI's were obtained using Cox proportional hazards models with treatment allocation as the only covariate. The significance of the association between the two treatment groups was evaluated using Fisher's Exact test. **Results:** During the trial 3726 (59%) randomised patients remained on their initially prescribed therapy without the requirement for additional antihypertensive therapy. At baseline the two treatment groups were well balanced with respect to demography and additional risk factors. After 3 years of follow-up the achieved BP was comparable in both groups (nifedipine GITS 136.7/80.4 mmHg; co-amilozide 135.9/81.0 mmHg). For the primary composite endpoint there were 111 (5.8%) events in the nifedipine group and 90 (5.0%) in the co-amilozide group with a relative risk of 1.17 (95% CI 0.88, 1.56: $p=0.277$). For the secondary composite endpoint there were 218 (11.4%) events in the nifedipine group and 198 (10.9%) in the co-amilozide group - relative risk of 1.04 (95% CI 0.85, 1.28: $p=0.716$). None of the individual components of the primary and secondary endpoints showed statistical significant differences between the treatment groups although there was a trend for angina (worsening or new) to be reduced by nifedipine GITS–(RR = 0.60 : CI 0.36, 0.99): $p=0.058$). **Conclusion:** Whilst retrospective analyses cannot be considered to be definitive, theses results indicate that the CV outcomes in high risk hypertensives are comparable in patients who were exclusively treated with nifedipine GITS or co-amilozide. Given the central role of diuretics in hypertension treatment guidelines, these findings indicate that antihypertensive therapy with nifedipine GITS is equivalent to a regimen based upon a fixed combination of diuretics.

**P609**

## Ambulatory blood pressure monitoring with aliskiren or telmisartan in hypertensive patients during active treatment and after 1 week withdrawal (ASSERTIVE)

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**Introduction:** Many patients miss occasional doses of antihypertensive medication, which can, over a long term, adversely affect BP control and increase cardiovascular risk. Interestingly, >50% of these omissions are part of a sequence of ≥2 days. Drugs with a prolonged duration of action may thus help maintain BP control in patients who are not compliant. **Objectives:** The ASSERTIVE (AliSkiren Study of profound antihypERtensive efficacy in hyperTensIVE patients) study compared the sustainability of BP-lowering efficacy of aliskiren (ALI) and telmisartan (TEL) after 1 week of treatment withdrawal in patients with hypertension. **Methods:** Eligible patients (n = 818, mean sitting systolic blood pressure ≥ 140 - ≤ 180 mmHg and 24-h mean ambulatory SBP [MASBP] ≥ 135 mmHg were randomized to ALI 150 mg or TEL 40 mg for 2 weeks, up-titrated to double these doses for 10 weeks, followed by 1-week of treatment withdrawal. The primary efficacy measure was change in MASBP from end of active treatment (EOA) to end of treatment withdrawal (EOW). Secondary efficacy measures included changes in 24-h mean ambulatory diastolic BP (MADBP) from EOA to EOW, changes in MABP from baseline (RAN) to EOA, and changes in circadian variation of MABP from EOA to EOW and RAN to EOA. **Results:** Both ALI and TEL resulted in similar changes in the ambulatory BP efficacy parameters during the active treatment period (RAN to EOA). During therapy withdrawal (EOA to EOW), ALI resulted in a significantly smaller increase in MASBP than TEL (least-squares mean [LSM] difference: −3.8 mmHg, $p<0.0001$) (Table). Morning surge in MASBP, the critical last 4-h of the 24-h dosing interval, was significantly less in ALI *vs.* the TEL group (LSM difference: −3.5 mmHg, $p<0.01$). Similarly, rise in daytime/night-time MASBP from EOA to EOW was also significantly smaller with ALI *vs.* TEL (LSM difference: −4.1/−2.6 mmHg, both $p<0.01$). Overall, a significantly ($p<0.0001$) smaller decrease in smoothness index for MASBP was observed in ALI *vs.* TEL group. Smaller differences were observed for MADBP.

**Image/graph I:**

| Parameter | Aliskiren (N = 412) | | Telmisartan (N = 406) | | Aliskiren *vs.* Telmisartan |
|---|---|---|---|---|---|
| **Baseline [mean ± SD (mmHg)]** | | | | | |
| | *n* | *MASBP* | *n* | *MASBP* | |
| *24-h* | 405 | 146.1 ± 9.2 | 401 | 146.9 ± 9.5 | |
| *Last 4-h* | 403 | 144.9 ± 12.2 | 400 | 145.7 ± 12.4 | |
| *Daytime* | 405 | 149.0 ± 9.5 | 401 | 149.8 ± 9.61 | |
| *Night-time* | 404 | 135.1 ± 12.2 | 400 | 136.3 ± 12.7 | |
| *Smoothness index* | 345 | 0.9 ± 0.90 | 348 | 1.0 ± 1.04 | |
| **LSM Change from EOA to EOW (treatment withdrawal period); mean ± SEM (mmHg)** | | | | | |
| | *n* | *MASBP* | *n* | *MASBP* | |
| *24-h* | 330 | 2.7 ± 0.5 | 336 | 6.5 ± 0.5 | −3.8* |
| *Last 4-h* | 307 | 1.5 ± 0.7 | 307 | 5.0 ± 0.7 | −3.5** |
| *Daytime* | 330 | 2.8 ± 0.5 | 336 | 6.9 ± 0.5 | −4.1** |
| *Night-time* | 312 | 2.1 ± 0.6 | 316 | 4.7 ± 0.6 | −2.6** |
| *Smoothness index* | 322 | −0.25 ± 0.03 | 330 | −0.52 ± 0.03 | 0.27* |
| **LSM change from RAN to EOA (active treatment period); mean ± SEM (mmHg)** | | | | | |
| | *n* | *MASBP* | *n* | *MASBP* | |
| *24-h* | 350 | −11.4 ± 0.6 | 351 | −12.3 ± 0.6 | 0.9 |
| *Last 4-h* | 336 | −11.1 ± 0.7 | 334 | −11.7 ± 0.7 | 0.5 |
| *Daytime* | 350 | −11.6 ± 0.6 | 351 | −12.7 ± 0.6 | 1.1 |
| *Night-time* | 339 | −10.7 ± 0.6 | 337 | −10.8 ± 0.6 | 0.16 |
| *Smoothness index* | 345 | 0.89 ± 0.05 | 348 | 1.02 ± 0.05 | −0.13 |

Data are shown as least-squares (LS) mean ± SEM
n includes patients who have measurements at analysed time-points.
*p < 0.0001 and **p < 0.01 based on ANOVA model with treatment and region as factors.
MASBP, mean ambulatory systolic blood pressure; EOA, end of active treatment period; EOW, end of 7-day treatment withdrawal period; RAN, randomization; LSM, least squares mean; SEM, standard error of LS mean; SD, standard deviation of mean

**Conclusion:** ALI provides clinically relevant BP reductions during active treatment similar to TEL, but results in significantly sustained BP lowering during treatment withdrawal than TEL.

**P611**

## Elevated blood pressure among emirati youth: automated versus manual measurement

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**Introduction:** Although obesity is fast increasing among youth in United Arab Emirates, there are few data on the prevalence of elevated blood pressure (BP) in youth. **Objectives:** This study was conducted to compare the prevalence of elevated BP among youth with standard mercury sphygmomanometer and automated device. **Methods:** We conducted a school-based survey of a representative sample of youth (n=1524) aged 12 to 18 years. Resting BP was measured with an automated device and a manual sphygmomanometer by trained nurse. Additional measures included height, weight, and abdominal circumference, age-appropriate questionnaire, and a fasting blood draw. The prevalence of "high normal" and "elevated" BP was assessed by comparing the subjects' SBP and DBP with age-, gender-, and height-specific 90$^{th}$ and 95$^{th}$ percentile reference values from the US National High Blood Pressure Education Program. Elevated BP was defined as either systolic or diastolic BP at or above the 95$^{th}$ percentile. **Results:** Blood pressure data were available from 1,502 youth. Of these 9% (n=148) had elevated PB with the automated device, and 5% (n=74) with the manual method. There was significant correlation ($p<0.05$) of overweight and obesity with elevated BP (automated or manual) after adjustment for age, gender, ethnicity and family history of hypertension. **Conclusion:** There is significant disparity in the prevalence of elevated BP in youth depending on the type of instrument used to measure blood pressure with implications for care.

**P612**

## Predictors of sustained hypertension in children and adolescents with white coat hypertension

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**Introduction:** The White Coat Hypertension (WCH) represent a cardiovascular condition prior to the development of Sustained Hypertension (SH) in children and adolescents. **Objectives:** To determine the variables that predict the development of Sustained Hypertension (SH) in children and adolescents with white coat hypertension (WCH). **Methods:** This study included 184 patients (91 boys and 93 girls, aged 10–19 years). At baseline, office blood pressure (BP) and a first ambulatory BP monitoring (ABPM) were performed to all patients. We included only patients with WCH. All subjects with WCH, after follow-up (3.04±1.51 years), were undergoing a second ABPM to identify new SH. A logistic regression model was used to evaluate the effect of age, gender, BMI, and initial office BP on the development of SH in patients with WCH. **Results:** At baseline, we identified 22 patients with WCH (12.0%) of these 16 were men (72.72%). After follow-up, 40.9% (n=9) of WCH developed HS (all were men, mean age 15.00±1.87 years). The patients WCH who developed HS had higher baseline office systolic BP (141.75±6.88 vs. 134.07±6.59 mmHg, P= 0.016) and daytime systolic BP for ABPM (128.88±5.01 vs. 123.30±6.30 mmHg, P= 0.039) than those without SH. The only variables that correlated significantly with SH were baseline office systolic BP and gender. Logistic regression analysis showed that baseline office systolic BP (OR = 1.191, 95% CI = 1.013–1.401, P = 0.034) predicted significantly SH in the follow-up. **Conclusion:** In this group of children and adolescents with WCH, baseline office systolic BP predicted HS, regardless of age and BMI of the patient. Male with higher values of systolic blood pressure present an increased risk of Sustained Hypertension.

**P613**

## Early morning hypertension (EMH) and cardiovascular risk

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**Introduction:** Early morning hypertension index (EMHI) may be associated with an increase in cardiovascular events. EMH can be calculated from the difference between the 2h blood pressure mean after waking up and the blood pressure mean among the three lowest blood pressures during sleeping. **Objectives:** Assess the relationship between early morning hypertension and cardiovascular events in a five-year follow up. **Methods:** From January 2005 to December 2006, 1208 patients that underwent to Ambulatory blood pressure monitoring (ABPM) were evaluated regarding their EMHI which were correlated to 5 years hard end points (stroke and/or, myocardial infarction (MI) and/or death) follow up. Hard end point information was possible to be obtained only from 633 patients. These patients were split in two groups regarding their EMHI above or below 41 mmHg. **Results:** A higher number of deaths were found in EMHI group > 41 mmHg ($p=0.01$). However, both groups did not show any difference in MI ($p=0.91$) or stroke ($p=0.39$), as well as in the combined analysis of all events assessed ($p=0.51$). **Conclusion:** Based on these results one can conclude that EMHI above 41 mmHg may expose the patient to a higher risk of death. This may also explain the higher prevalence of early morning cardiovascular deaths compared to other periods along the day.

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**P614**

## Relationship between day-night rhythm of blood pressure and ambulatory arterial stiffness index in patients with essential hypertension

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**Introduction:** Prevalence of hypertension in Chinese people is more than 20 %, we need to measure degree of arterial stiffness**. Objectives:** Ambulatory arterial stiffness index (AASI) has been used to reflect the dynamic relation between diastolic and systolic blood pressure throughout the whole day. The aim of our study was to investigate the relationship between the AASI and day-night rhythm of blood pressure in patients with essential hypertension. **Methods:** We retrospectively analyzed the ambulatory blood pressure monitoring(ABPM) recordings. According to the monitoring result, 328 patients with essential hypertension were divided into three groups: dippers ($n$ =114), non-dippers ($n$ =152), and reverse-dippers ($n$=62). Meantime, AASI was derived from 1 minus regression slope of diastolic against systolic blood pressure. **Results:** No significant differences were found among the three group s in age, body mass index(BMI), serum total cholesterol, fasting blood glucose, 24 h mean systolic blood pressure (SBP), 24 h mean diastolic blood pressure (DBP), mean arterial pressure (MAP), heart rate (HR), and pulse pressure (PP) ($P$□0.05). However, significant differences were found in nighttime mean SBP, nighttime mean DBP and AASI among the three groups ($P$<0.01). **Conclusion:** Day-night rhythm of blood pressure and AASI are closely correlated in patients with essential hypertension.

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**P615**

## Relationship of nocturnal blood pressure and cardiovascular risk factors among young and healthy individuals

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**Introduction:** There is growing evidence that nighttime ambulatory blood pressure (BP) is a better predictor of cardiovascular outcome than daytime BP in patients with hypertension, but data in the

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literature on the prognostic significance of the nighttime dipping pattern are not consistent and independence from 24-hour BP has not often been studied. **Objectives:** The aim of our research is to identify the dipping pattern of nocturnal BP and the abundance of dipping categories among normotensive young people (under 35 years old) without cardiovascular diseases; to determine the relationship between dipping categories on the one side and risk factors of cardiovascular diseases and the patients life pattern on the other side; to determine the impact of risk factors on nocturnal BP. **Methods:** In our prospective study we examined 98 normotensive young people without cardiovascular diseases. The 24-hour ambulatory blood pressure monitoring was used to estimate nocturnal BP and its dipping pattern. The questionnaire was carried out to determine the patients' life-style and cardiovascular risk factors. **Results:** The mean patients' age–28,62 years (±4 SD). There are 51 men (52%) and 47 women (48%) among 98 examined patients. 63 patients (64,3%) have normal weight, 22 (22,4%) are overweight and 13 (13,3%) are obese. 16 patients (16,3%) smoke, 46 (46,9%) are physically active. Dipping categories are: extreme dippers–11 (11,2%), dippers– 41 (41,8%), nondippers– 43 (43,9%), reverse dippers–3 (3,1%). It was estimated that mean nocturnal BP among men is 10 mmHg higher then among women ($p<0,001$), obese patients have their mean nocturnal BP higher then patients with normal BMI (127±12/74±6 vs. 105±12/60±8 mmHg; $p<0,001$). The nocturnal BP decrease index among smokers is lower than nonsmokers (7±7 vs. 13±6%; $p<0,01$), on the contrary sporty patients have this index higher (14±7 vs. 10±7%; $p<0,05$). **Conclusion:** It was estimated that there is a direct relationship between cardiovascular risk factors and the figures of nocturnal BP. Dipping categories can be determined by the patients life style. Our findings and further research can increase the efficiency of cardiovascular disease prevention.

**Image/graph II:**

**Tabl.1. Results of 24-BP monitoring and During Arterial Stiffness Examining**

| | Group 1, n=20 | Group 2, n=28 | P |
|---|---|---|---|
| Pulse Blood Pressure (PBP), mm.Hg | 43.5 (39.0;45.0) | 49.5 (42.0;45.0) | <0.01 |
| Augmentation Index modified (AIx-75), % | -28.5 (-46.0;-18.0) | -14.0 (-28.5;-7.5) | <0.05 |
| Arterial Stiffness Index modified (ASI100-60), c.u. | 114.0 (104.0; 124.0) | 125.0 (110.0;160.0) | <0.05 |
| Pulse Transit Time (PTT2) , mc | 110.1 (105.4;117.5) | 98.6 (92.0;110.0) | <0.01 |
| Pulse Transit Time modified (PTT2100-60), mc | 125.5 (102.0;142.0) | 104.5 (100.0;120.0) | <0.05 |
| Ambulatory arterial stiffness index (AASI), c.u. | 0.33 (0.23;0.40) | 0.40 (0.29;0.46) | NS |

## P616

## 24-hour dynamics of blood pressure and vascular stiffness in women with different menopausal status

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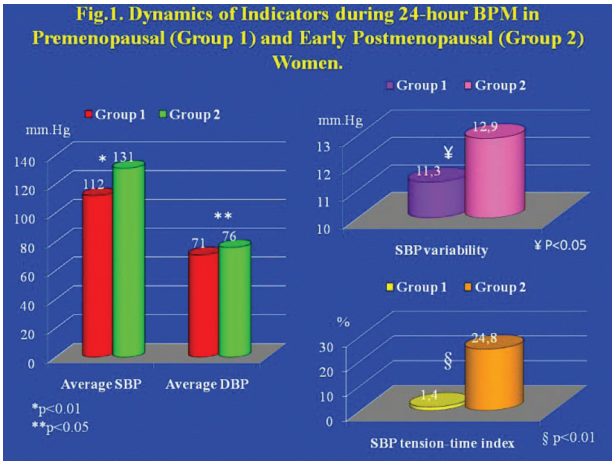
**Introduction:** Recently one of the most intensive investigated directions has been determining the role of the vascular wall in pathogenesis of hypertension. Further study of menopause impact on the vascular stiffness is required. **Objectives:** To estimate 24-hour changes in vascular stiffness and their correlation with blood pressure indicators in women with different menopause status. **Methods:** the study included 48 women, divided into two groups: group I included 20 premenopausal women, average age was 49.1(46.4;51.0), body mass index (BMI) 26.3(23.8;28.9)kg/m2, waist circumference was 89.0(71.5;93.0)cm, group 2 included 28 early postmenopausal women, average age was 53.2(49.0;56.0), BMI was 29.2(27.2;33.1)kg/m2, waist circumference was 93.0(86.0;104.0)cm. The average age of menopause was 50.3(48.0;52.0), mediana menopause length was 3.5(2.0;5.0). All women underwent clinical examination, 24-hour blood pressure monitoring (BPM): valued mean systolic blood pressure (SBP), diastolic blood pressure (DBP); pulse blood pressure (PBP); tension-time index (TTI); day and night BP variability. During arterial stiffness examining were estimated augmentation index (AIx), arterial stiffness index (ASI), pulse transit time (PTT2) and ambulatory arterial stiffness index (AASI), modified indices ÒÒ2100–60, ASI100–60 AIx-75. All women underwent ECHO-KG with aortic pulse wave velocity (PWV) determining. **Results:** During 24-hour BPM average SBP, DBP, TTI SBP, SBP variability were significantly higher in group 2 than in group 1(Fig.1). Significant increase of PBP, AIx-75, ASI100–60 and decrease of PTT2100–60 was observed in group 2.(Tabl.1). Mediana PWV was significantly higher in group 2 vs group1: 7.2(5.9;8.3)m/s and 6.4(5.7;7.3)m/s respectively ($p<0.05$). Moderate correlations were determined between PWV with PBP ($R=0.43, p<0.01$), AIx-75 ($R=0.35, p<0,01$), ÒÒ2100–60 ($R=-0.5, p<0.0001$), SBP variability ($R=0.57, p<0.00001$) and DBP variability ($R=0.60, p<0.0001$). Moderate correlations were determined between SBP and ASI100–60 ($R=0.53, p<0.0001$), PBP and ASI ($R=0.64, p<0.0001$), DBP and ASI ($R=0.32, p<0.05$). Relative correlations AIx, ASI, AASI were determined between AIx-75 and ASI ($R=0.45, p<0.0001$).

**Image/graph I:**




**Conclusion:** Predominant SBP increase, higher levels of PBP, insufficient SBP and DBP nocturnal decrease and increased BP variability are observed in menopause. The dynamics of the arterial stiffness indicators means the decrease of elastic characters in arteries mostly in postmenopausal women and these indicators must be analyzed in combination.

## P617

## Association of carotid artery atherosclerosis with functional status of endothelium in patients with and without hypertension

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**Introduction:** Endothelial vasodilator dysfunction, assessed by brachial artery flow-mediated dilatation (FMD) is an indicator of subclinical atherosclerosis; therefore, relationship between endothelial functional status and carotid atherosclerosis in HTN patients was not properly studied. **Objectives:** Aim of the study was to test hypothesis, that hypertensive (HTN) patients with carotid artery (CA) atherosclerotic plaques have more deteriorated vascular endothelial function in comparison with HTN individuals without plaques in CAs. **Methods:** 74 patients with arterial HTN (mean age±SD, 52.27±2.34) were included in the study. All of them underwent to the carotid and brachial artery ultrasound. Patients with cardiovascular, peripheral and cerebrovascular diseases, diabetes mellitus, smokers, pregnant as well as obese were excluded from the study. **Results:** Compared with HTNes (n=31), patients with arterial HTN and CA atherosclerosis (n=43) had higher initial blood vessel diameter (4.29±0.22 vs. 3.79±0.19; $P<0.01$), lower absolute change of vascular diameter after occlusive hyperemia test, percentage index of FMD and endothelium independent vasodilatation (0.21±0.11 vs. 0.47±0.04; $P<0.01$, 5.05±2.58 vs. 12.45±1.07; $P<0.01$ and 8.98±1.7 vs. 13.1±1.12; $P<0.05$ retrospectively). Initial blood flow velocity, as well as absolute change of it in brachial artery after occlusive hyperemia test was lower in HTN patients with CA atherosclerosis (82.28±3.55 vs. 91.86±4.01; $P<0.01$ and -3.43±2.64 vs. -9.7±1.51; $P<0.01$, retrospectively). **Conclusion:** Obtained data proof our hypothesis that patients with hypertension and carotid artery atherosclerosis have more deteriorated vascular endothelial function than patients with only hypertension and consequently, they carry an additional risk for vascular complications.

## P618

## Comparative assessment of percentage body fat versus body mass index as anthropometric measures of blood pressure

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**Introduction:** Blood pressure correlates positively with body mass index (BMI) which is the quotient of weight (Kg) and height squared ($m^2$). It could be high even in individuals who are heavy from muscle and bone mass. With the finding that visceral adiposity is more responsible for cardiovascular morbidity than total mass, attention diverted to measures of body fat (abdominal girth, waist hip ratio and percentage body fat) as alternate surrogate markers of blood pressure and cardiovascular disease (CVD). **Objectives:** We therefore applied data generated during a CVD survey of old boys attending the annual re-union of our alma-mater in testing which of the measures better correlates with blood pressure. **Methods:** Consenting old boys of Government Secondary School, Owerri, Nigeria attending the 2010 annual re-union were given forms to fill their personal and medical histories. Finally they had their blood pressures, weight, percentage body fat and height measured. BMI was calculated from weight and height, and percentage body fat in those who had valid results determined with an electronic weighing scale (Body fat bath scale. Nature's Gift for Life, Texas, U. S. A.) Mean arterial pressure (MAP) was determined from systolic BP and diastolic BP. BMI and percentage body fat were correlated with MAP subsequently. **Results:** Thirty-six subjects with valid

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percentage body fat results are reported on. Whereas BMI relationship with MAP did not attain statistical significance (r=0.318), percentage body fat did (r=0.346. p=0.05). Interestingly BMI correlated significantly with percentage body fat (r=0.935. p=0.01). **Conclusion:** Body fat rather than whole mass (fat, muscle, bone) is more critical in CVD morbidity in a setting of optimal weight, overweight or obesity. Even when BMI is in the normal range, individuals with high levels of visceral adipose tissue are characterised by higher BP, dyslipidaemia, insulin resistance and pro-thrombotic state; all increasing CVD risk. This study has shown that percentage body fat although correlating strongly with BMI, is a better surrogate marker of BP level and hence CVD risk. Where available, measures of percentage body fat should be relied upon more than BMI in determining degree of BP and CVD burden in individuals and groups.

**P619**

## Markers of left and right ventricular remodelling in a native African hypertensive cohort

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**Introduction:** Although hypertension affects every ethnic group, the consequences are said to be more devastating among blacks. One of the main manifestations of hypertension's end-organ effects especially in blacks is hypertensive heart disease which includes left ventricular hypertrophy (LVH), increasing vascular and ventricular stiffness and diastolic dysfunction which ultimately lead to heart failure (HF) if not adequately treated. Although Brain natriuretic peptide is recognised as an indicator of the presence and severity of heart failure including hypertensive (HF) in native Africans, the diagnostic value in differentiating hypertensive LVH without HF from hypertensive HF due to systolic and/or diastolic dysfunction is unclear. **Objectives:** We initiated a cohort study in 250 Nigerian patients to study the role of novel biomarkers as well as natriuretic peptides in this cohort. **Methods:** Prospective cohort study. Echocardiography was performed on all subjects. Measurements taken include left ventricular dimensions and transmitral pulse wave Doppler flow. LVH was considered present when left ventricular mass/height$^{2.7}$ exceeded 46.7gm/m$^{2.7}$ in women and 49.2gm/m$^{2.7}$ in men. Right ventricular (RV) systolic function was assessed on echocardiography using tricuspid annular plane systolic excursion (TAPSE) method. Plasma NT-pro BNP was measured using electrochemiluminescence type immunoassay. **Results:** Preliminary data on a subgroup of 88 patients studied will be presented. 60.2% were male, 39.8% female and mean age is 52.0(10.7) years. There was no significant difference in the NT pro BNP levels between hypertensive subjects with LVH and those without. There is however a significant difference when the NT pro BNP levels of hypertensive subjects with LVH but without HF was compared with those with hypertensive HF (430.80fmol/ml vs582.39fmol/ml, p-value=0.004). In addition, subjects with hypertensive HF have significantly worse RV systolic function compared to hypertensive subjects with LVH but without HF, with TAPSE values (23.4mm vs 16.6mm,p-value=0.000). **Conclusion:** NT pro BNP may be a useful biochemical marker in differentiating between hypertensive heart failure and hypertensive left ventricular wall hypertrophy without heart failure in native African Population. The contribution of RV function to progression of disease needs to be further investigated.

**P620**

## Prediction of risk for preeclamsia-eclampsia in pregnant women by a classification and regression tree analysis using easy clinical variables

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**Introduction:** Estimation of preeclampsia/eclampsia (PE) risk in pregnant women by mean of clinical variables may help general practitioners guide care. **Objectives:** We sought to develop a practical user-friendly tool for estimating the risk of PE in hospital setting. **Methods:** Retrospective analysis of database of 15469 consecutive deliveries, assisted during the period Nov-98/Jul-08. Preeclampsia was defined by blood pressure ≥140–90 (2 measurements) and proteinuria, eclampsia was considered in this setting by the presence of unexplained seizure, convulsion, or altered mental status. Firstly, multiple regression analysis was performed, and with independent variables, a classification and regression tree (CART) analysis was carried out to identify the best predictors of PE. The population was randomly split in derivation (N=7663) and validation (N= 7806) cohorts. **Results:** PE was identified in 623 patients, and the prevalence in derivation and validation was similar (4.3 and 4.3%, p=ns). Variables independently associated with PE were the followings: primipara (OR=2.3), maternal age ≥35 years (OR=2), chronic hypertension (OR=2.3), multifetal gestation (OR=3.4), obesity (OR=2), interpregnancy period ≥3 years (OR=1.4), smoker (OR=2.1) and previous abortion (OR=1.3). In derivation cohort, CART analysis indicated that the best predictors for PE were maternal age ≥35 years, obesity, primipara, smoker and multifetal gestation. A simple risk tree identified patient groups with PE ranging from 2.6% to 14.4%. Four risk groups were identified: 1-low (58.9% of patients): age below 35, no primipara, single gestation; 2-intermediate-low (26.5%): age below 35, primipara, non smoker, and age ≥ 35, non obese, 3-intermediate-high (12.4%): age below 35, primipara, smoker, and 4-high (2.2%) age below 35, no primipara, multiple gestation, and age ≥ 35, obese. The prevalence of PE in groups 1 to 4 was 2.5, 4.2, 9.7 and 12.2% (p<0.0001), with a risk of 1, 1.7, 4.3 and 5.5 (p<0.0001), respectively. In validation cohort, the proportion of subjects in groups 1 to 4 was: 58.4, 26.8, 12.3 and 2.4%; with PE prevalence of 2.6, 4.7, 7.5 and 12.7% (p<0.0001), and risk of 1, 1.8, 3 and 5.4 (p<0.0001). **Conclusion:** These results suggest that pregnant women at low, intermediate, and high risk for PE can be easily identified using data obtained from maternal history and current pregnancy during a routine evaluation. This risk tree provides clinicians with a validated, practical tool for PE risk stratification.

**P622**

## Impact of comprehensive interventions on awareness, treatment and control of hypertension from communities in ShenZhen City, China

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**Introduction:** Hypertension is a common health problem experienced by people from all parts of the world. Moreover, it is a major risk factor for cardiovascular disease and treatment and control of hypertension reduces risk. Comprehensive patient-activation interventions have been advised to improve awareness, treatment and control for blood pressure. **Objectives:** We aimed to evaluate the impact of comprehensive interventions on awareness, treatment, and control of hypertension from communities in ShenZhen city, China. **Methods:** Comprehensive interventions were applied to 752 cases randomly selected from 3 communities in ShenZhen city since June, 2008. Hypertension is defined as either: a systolic pressure consistently at 140 or higher or a diastolic pressure consistently at 90 or higher. Hypertension control was defined as systolic BP values of less than 140 mmHg and diastolic BP values of less than 90 mmHg. Comprehensive interventions included offering health brochure, lecture on hypertension, personalized health education, behavior and lifestyle intervention, and medication treatment. Proportion of awareness, treatment, control of hypertension, and proportion of smoking, regular alcohol consumption, excessive salt intake, regular exercise were recorded before intervention and 3 months, 6 months, 12 months, 18 months, and 24 months later, respectively. **Results:** After 2-year intervention, awareness increased from 39.92% to 86.96% ($\chi^2$=359.2, $P$<0.001), treatment increased from 25.26% to 68.22% ($\chi^2$=278.7, $P$<0.001), control increased from 11.30% to 32.71 %($\chi^2$=100.4, $P$<0.001), while proportion of smoking, regular alcohol consumption, excessive salt intake, and regular exercise had no significant changes before and after intervention□$P$>0.05□. **Conclusion:** Comprehensive interventions on behavior and lifestyle of patients suffering from hypertension may improve their awareness, treatment and control of hypertension. Comprehensive intervention may be the best and most economic way to control hypertension.

**P623**

## Physicians observational work on patient education according to their vascular risk: POWER study

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**Introduction:** The POWER study is a 6-month, multicenter, open-label, non-comparative and observational study of hypertensive subjects treated with eprosartan. **Objectives:** The objectives were to assess the systolic blood pressure (SBP) reduction related to cardiovascular (CV) risk reduction in a large hypertensive study population. **Methods:** The study was conducted in 16 countries. The dosage of eprosartan was 600 mg od. Three study visits were scheduled: at baseline (V1), then 1 to 3 months (V2) and 6 months (V3), after starting eprosartan therapy. BP was evaluated at each visit by measuring twice the sitting SBP and the diastolic blood pressure (DBP) over a period of 5 minutes. The CV risk was assessed through the SCORE$^0$ and Framingham® *(for Canada only)* risk score systems. Suspected Adverse Drug Reactions and heart rate (HR) were recorded. **Results:** The results were obtained in 26192 hypertensive patients. At V1, mean age was 61.3±12.2 years and mean SBP/DBP were respectively 160.4±14.3/93.6±9.7 mmHg. The main current pathologies were diabetes (22.6% of patients), left ventricular hypertrophy (19.4%) and arteriosclerosis (19.3%). Family history of CV disease was reported for 41.1% of patients, of which history of coronary artery disease and angina pectoris were the most frequently reported (respectively 17.5% and 13.2%). The respective mean change in SBP and DBP between V1 and V3 was -25.8±14.4 and -12.6±9.5 mmHg (p<0.0001). BP normalization (SBP<140 mmHg and DBP <90 mmHg) was achieved in 62.8% of patients. Between V1 and V3, the calculated SCORE® risk and the calculated Framingham® risk decreased of at least one class in 55.9% and 41.0% of patients, respectively. An absolute change in SCORE$^0$value was observed in both genders and all age classes, but was more marked in men and older patients (p<0.001). Significant absolute changes in other risk factors were also observed at V3: reduction of BMI -0.4±1.2 kg/m$^2$ (p<0.0001), reduction of total cholesterol -17.1±28.9 mg/dl (p<0.0001), 6.1% (all countries except Canada) and 5.2% (Canada) smokers stopped smoking. No safety issue was reported after treatment and mean HR remained within clinically acceptable limits throughout the study. **Conclusion:** The hypertension control within the general framework of total CV risk management proved to be feasible in daily practice. This study has confirmed on a large non-selected population the ability of an eprosartan-based therapy to reduce BP, especially its systolic component and, as a result, to decrease the SCORE® risks values.

**P624**

## T-Cell production of interferon-γ amplifies macrophage expression of monocyte chemoattractant protein 1 contributing to angiotensin II-induced cardiac inflammation and fibrosis

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**Introduction:** The inflammatory response plays a critical role in hypertension-induced cardiac remodeling, but how inflammatory responses are activated in hypertension and their specific roles in regulating cardiac remodeling remain unclear. **Objectives:** Angiotensin II infusion increases interferon γ (IFN-γ) expression, we aimed to determine the cell source for its

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production and its cellular targets in hypertension-induced inflammation and cardiac remodeling. **Methods:** IFN-$\gamma$ knockout mice and age-matched wild type (WT) mice were infused with angiotensin II (Ang II) at a dose of 1500ng/kg/min for 7 days using the osmotic pumps. Blood pressure was measured before and after operation. The mRNA and protein level of hearts, harvested at the 7$^{th}$ day after operation, were detected by Real-time PCR and immunohistochemical staining respectively. T cells and bone-marrow–derived macrophages (BMDMs) isolated from WT and IFN-$\gamma$ knockout mice were co-cultured, while cytokine production and macrophages migration were detected using Cytometric Bead Array (CBA) kits and transwell system respectively. **Results:** Ang II infusion increased blood pressure in both WT and IFN-$\gamma$–knockout mice, and it didn't affect the ratio of heart weight to body weight in two groups. Knockout of IFN-$\gamma$ prevented Ang II-induced infiltration of macrophages and T cells into left-ventricular tissue; expression of tumor necrosis factor $\alpha$, monocyte chemoattractant protein 1 (MCP-1) and transforming growth factor $\beta$1, as well as cardiac fibrosis, including the expression of $\alpha$-smooth muscle actin and collagen I (all $p<0.05$). Co-culture of T cells and BMDMs from WT mice produced more IFN-$\gamma$ than did co-culture of IFN-$\gamma$–knockout T cells and WT BMDMs. Moreover, IFN-$\gamma$ produced by T cells stimulated MCP-1 expression in macrophages, which resulted in a forward-feed macrophage migration. **Conclusion:** IFN-$\gamma$ mediates T-cell stimulation of macrophages to amplify MCP-1 expression, which results a forward-feed recruitment of macrophages, thus contributing to Ang II-induced cardiac fibrosis.

**P625**

## Impact of warfarin and statin therapy on systolic hypertension

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**Introduction:** Warfarin, a vitamin K antagonist has been used as an anticoagulant for years. Some animal studies have shown that warfarin can cause aortic medial calcification and proportional elevation of systolic blood pressure. On the other hand, there was also animal data demonstrated that atorvastatin protects aortic media from warfarin-induced calcification and elevation of systolic blood pressure. Few human studies have demonstrated that at conventional dose, warfarin did not increase systolic blood pressure. **Objectives:** We aim to examine the impact of statin on systolic blood pressure in patients taking warfarin. **Methods:** We retrospectively analyzed patients enrolled in our INR clinic that were on warfarin for at least one year duration. The primary end point was the change in blood pressure (BP) and the change in antihypertensive medications at latest follow-up based on the World Health Organization's (WHO) "Defined daily doses" (DDD) guidelines. **Results:** A total of 138 patients were included in the analysis, mean age 62.2$\pm$13 years old, 59.4% (n=82) male were recruited. Thirty (21.7%) of them have diabetes mellitus, 31.9% with hyperlipidaemia and 54.3 % had hypertension. The indications for warfarin were atrial fibrillation 73.9%, pulmonary embolism/deep vein thrombosis 3.6% and others 22.5%. They were followed up for a mean of 4.4$\pm$3.1years. Mean dose of warfarin was 3.5$\pm$1.6mg. There was no significant change between initial systolic BP (SBP) and current SBP, 127.3$\pm$18mmHg vs. 125.3$\pm$16mmHg, p=0.27. However, there was a significantly higher dose of antihypertensive (higher DDD) prescribed, 1.41$\pm$1.1 vs 2.00$\pm$1.4, $p<0.001$. In addition, when changes in DDD at follow-up were analyzed in multiple regression models adjusting for different variables, the only variable that predicted the change was age regardless of statin use, warfarin dosage or duration and other co-morbidities such as diabetes or hyperlipidaemia. **Conclusion:** There is a notable increase in antihypertensive use which translates to higher blood pressure at 4.4 years follow up. This preliminary study concludes that age-related medial elastocalcinosis is the only factor that results in progressive increase in SBP. Warfarin use did not result in SBP increment and statin use did not protect against rise in SBP with time.

**P626**

## What is the importance of preoperative electrocardiographic abnormalities on postoperative outcome in hypertensive patients submitted to moderate/high risk surgery

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**Introduction:** Surgical procedures are common among hypertensive patients over 50 years old. Electrocardiogram (ECG), recommended by some guidelines, is routinely ordered for this subset of patients. However, the role of ECG abnormalities in such patients has not been studied. **Objectives:** The present study evaluated the importance of the preoperative ECG abnormalities in hypertensive patients submitted to moderate/high risk noncardiac surgery. **Methods:** Two hundred thirty-four patients (61.1 $\pm$ 11.6 years old; 90.1% female) with cancer and hypertension as isolated co-morbidity were evaluated in a prospective design. All patients were submitted to elective surgical intervention ($\geq$ 2 h duration) to treat intracavitary tumor disorders. The patients were divided into two groups: group I (normal) and group II (abnormal ECG). Patients in these groups were subdivided into two other groups according to postoperative outcome. The influence of age, previous chemotherapy, and surgical risk (ASA) on ECG abnormalities was estimated. The role of age, previous chemotherapy, surgical risk, type of surgery, and surgical duration on outcome was also evaluated. Adverse outcomes were considered any cardiovascular complication or death. **Results:** The average time of the surgery was 3.20 $\pm$ 1.69 h. Of the 234 patients, 182 (77.7%) had a normal ECG (group I) and 52 (22.3%) had at least one abnormality on the ECG (group II). Six patients (3.3%, CI 0.7–5.8) from group I and three patients (5.5%, CI 0.0–12.1) from group II had adverse outcomes ($p$ = 0.420). Age (59.8 years, CI 58.2–61.4; 65.8 years, CI 62.4–69.2; $p$ = 0.001) and surgical risk (11.4%, CI 6.5–16.1; 49.3%, 37.2–61.2; $p$ <0.001) were associated with ECG abnormalities. The duration of surgery (3.1 h, CI 2.8–3.3; 5.7 h, CI 4.4–7.0; $p$ <0.001) was the single variable analyzed that influenced outcome. Age ($p$ = 0.285) and surgical risk ($p$ = 0.718) influenced ECG abnormalities but did not impact postoperative outcomes. **Conclusion:** The results from this study demonstrated that ECG abnormalities in this population are common, but these abnormalities did not impact postoperative cardiovascular outcomes.

**P627**

## Study on protein expression of small conductance calcium-activated potassium channel in mesenteric artery smooth muscle cell from patients with hypertension

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**Introduction:** Small calcium-activated$K^+$ channel ($SK_{Ca}$) is key player in the regulation of endothelium-dependent vasodilatation. Expression levels of both mRNA and protein SK3 were significantly reduced in MAs of ANG II-14d rats. Presently, expression level of protein SK2 in essential hypertension patients has not been mentioned. **Objectives:** The aim of this study was to measure the expression levels of protein SK2 in both hypertension (HT) and normal arterial pressure (NT) patients. **Methods:** Protein of mesentery artery samples used in this research was obtained from 8 NT and 8 HT patients. For those experiments which finally the amount of expressed desired protein could be normalized to an abundant housekeeping protein (like GAPDH), the arterial protein extractions was detected by western blot. The statistical analysis was done using independent-samples T test by SPSS 17.0. **Results:** Average age of HT used in this research was 59.2500$\pm$1.2256, while the age of NT was 56.6250$\pm$8.7331. The relative expression of SK2 protein in HT was 1.0387$\pm$0.4535, while in NT was 1.7269$\pm$0.5825, $P<0.05$. The difference in these two groups achieved significant difference level. Expression level of protein SK2 was significantly down-regulation in essential hypertension patients. **Conclusion:** Expression level of protein SK2 was significantly down-regulation in essential hypertension patients. It predicted SK2 may be another important regulator of $SK_{Ca}$ active, that may led to the abnormal of vascular smooth muscle hyperpolarization and the occurrence of hypertension.

**P628**

## The role of Hhpertension as a cause of ESRD in Iran

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**Introduction:** Hypertension and metabolic diseases is the most common disorders with board complications. **Objectives:** In this research we evaluate the role of hypertension and diabetes mellitus in presence of end stage renal disease (ESRD). **Methods:** We retrospectively reviewed the medical records of our ESRD patients from January 1999 to March 2010. The ESRD was defined as chronic and irreversible loss of kidney function requiring dialysis. We included only adult ESRD patients on maintenance hemodialysis, more than 2 month before entering the study.SPSS (version 15) software was used for data analysis. **Results:** In our study, a total of 1000 adult ESRD patients, with mean age of 51.54 $\pm$ 16.39 years were included. The male to female ratio was 1.3: 1 which had no significant changes during the period of study. The mean age of our patients at starting of hemodialysis was 41.23 years in 1999, but it increased to 56.91 years in 2010, which is up 15.68 years during this period. In overall, the most common causes of ESRD were Diabetes Mellitus (n=282, 28.2%), Hypertension (n=265, 26.5%), unknown (n=242, 24.2%), Glomerulonephritis (n=79, 7.9%), Obstructive Uropathy (n=70, 7%), Cystic Kidney Disease (n=51, 5.1%) and unirenal (n=1, 0.1%). Although, two main causes of ESRD in patients aged *40 years*and older (n=761)were also Diabetes Mellitus (n=255, 33.5%) and Hypertension, however, in patients with <40 years of age (n=239), the most common causes were unknown and Glomerulonephritis. There were no significant difference in the main causes of ESRD (Diabetes Mellitus and Hypertension) between men and women (P= 0.26 and P= 0.48). **Conclusion:** Based on our findings, the most common causes of ESRD in Khuzestan province, Iran were diabetes mellitus and hypertension similar to developing countries. Thus, by controlling hypertension and diabetes mellitus could lead to decline their complications, especially ESRD.

**P630**

## Correlating microalbuminuria with left ventricular hypertrophy in hypertensive patients seen in LUTH Lagos, Nigeria

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**Introduction:** Hypertension is a leading non-communicable disease in Nigeria. To reduce the burden of cardiovascular disease, management strategies are now focusing on preventive measures. Left ventricular mass and microalbuminuria have been found to be independent predictors of cardiovascular morbidity and mortality. The association between left ventricular mass and microalbuminuria has been established in some studies. This relationship has not been widely studied in Nigeria. This study was carried out to add to the body of knowledge of hypertension in Nigeria and to provide data in proper identification, stratification and better management of patients. **Objectives:** To correlate microalbuminuria with left venteicular mass in hypertensive patients. **Methods:** One hundred and fifty individuals were recruited for the study. This comprised of one hundred hypertensive cases (48 males and 52 females) and fifty controls (20males and 30 females). The basic anthropometric parameters and blood pressure were done for each individual. Echocardiography was performed according to the American

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Society of Echocardiologists guideline. The modified cube formula was used to calculate left ventricular mass. Left ventricular hypertrophy was defined as left ventricular mass indexed to height2.7 >51g/m2.7. The Micral strip was used to determine microalbuminuria using early morning urine. **Results:** The basic anthropometric parameters were comparable in the two groups. The frequency of microalbuminuria was 48% in the cases and 8% in the controls while the frequency of left ventricular hypertrophy using LVM/ht2.7 was 32.3%. 44.4% of cases had normal left ventricular geometric pattern. 27.3%, 15.2% and 13.1% had concentric remodeling, eccentric hypertrophy and concentric hypertrophy respectively. This was significantly different from the controls where 85.7%, 10.2%, 4.1%, 0% had normal, concentric remodeling, eccentric hypertrophy and concentric hypertrophy respectively. There was a trend of increasing LVM with increase in microalbuminuria but this increase was not statistically significant. The proportion of cases with microalbuminuria was higher in those with abnormal left ventricular wall geometry 68.6% than in those without (31.4%). This difference was found to be significant. **Conclusion:** This study shows that abnormal left ventricular wall geometry was associated with presence of microalbuminuria in hypertensive patients. There was also a trend of increasing left ventricular mass with increase in microalbuminuria.

**P631**

## Prognostic Value of Blood Pressure and Blood Pressure Control in Patients With Coronary Artery Disease: Evidence From the "ACTION" Database

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**Introduction:** The placebo-controlled ACTION trial examined the effects of Nifedipine GITS on clinical outcomes in patients with stable symptomatic coronary artery disease (CAD). **Objectives:** A retrospective analysis of the ACTION database evaluated the relationships between (a) cardiovascular (CV) outcomes and baseline blood pressure (BP) and (b) CV outcomes and control of BP. **Methods:** Analyses were performed using multivariate Cox proportional hazard model to test the relationships between CV outcome and (a) baseline blood pressure (BP) and (b) achieved BP after 6 weeks of the trial (the time titration of both placebo and nifedipine GITS was complete). The study population were also divided into 4 groups according to the proportion of visits in which BP was in controlled to as mm Hg. Data were analysed by unadjusted clinical outcomes for the major pre-specified ACTION outcomes. **Results:** With baseline systolic BP (SBP) sub-divided into quintiles, a statistically significant ($p<0.001$) and consistent trend was identified between baseline SBP and risk for all the major endpoints pre-specified in the trial design, with the exception of coronary angiography. Thus, lowest CV risk was apparent in those patients with baseline systolic BP ≤120mmHg. The trend was more pronounced for stroke than for myocardial infarction (MI) with hazard ratios in the lowest quintile of 0.45 (0.28,0.72) and 0.79 (0.60,1.02) for stroke and MI respectively compared to the referent highest quintile (SBP150mmHg). Adjusting the model for treatment and for the use of antihypertensive therapy at baseline did not modify the outcomes in any statistical or meaningful fashion. Comparable results were obtained for the analysis using the achieved BP levels at 6 weeks. For diastolic BP significant and consistent trends were much less apparent across the quartiles of BP and were only observed for debilitating stroke. The rate of all of the pre-specified cardiovascular endpoints declined as the proportion of visits with BP control increased. The greatest difference in outcomes between groups with different proportions of visits with BP control was observed for the risk of stroke, but was still apparent for all the other endpoints including the primary efficacy endpoint and MI. **Conclusion:** Whilst the retrospective nature of the analyses means that these findings must be interpreted cautiously, the results highlight the importance of early and consistent BP control during long term follow-up.

**P633**

## High normal blood pressure is an independent risk factor for cardiovascular disease among middle aged, but not in elderly populations: a prospective cohort study

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**Introduction:** Data are conflicting and sparse regarding the impact of high normal blood pressure (systolic pressure of 130 to 139 mm Hg or diastolic pressure of 85 to 89 mm Hg) on incident cardiovascular disease (CVD) among middle aged vs. elderly population. **Objectives:** To assess the independent risk of CVD according to blood pressure categories among middle age and elderly populations in a Middle Eastern community based cohort of the Tehran Lipid and Glucose Study (TLGS). **Methods:** In this study during 9.3 years of follow up, we examined the risk of different blood pressure categories among 6273 participants ≥ 30 years of TLGS who were free of CVD at baseline. Cox regression analysis was used to estimate the hazard ratio (HR) of cardiovascular disease (CVD) and coronary heart disease (CHD) for normal blood pressure group (systolic pressure between 120–129 mmHg or diastolic pressure between 80–85 mmHg), High normal blood pressure group and hypertension group (systolic pressure ≥140mmHg or diastolic pressure ≥90mmHg or taking antihypertensive drugs), considering those with optimal blood pressure (systolic pressure <120mmHg and diastolic pressure <80mmHg) as reference. **Results:** During follow up, 512 CVD events occurred. There was a significant interaction between age groups (i.e. middle aged and elder group) and blood pressure categories (P= 0.005 for high normal blood pressure and P= 0.007for hypertensive group) regarding CVD events. In risk factor adjusted analysis, the HRs (95%CIs) of CVD were 1.62(1.11–2.37) and 2.20(1.57–3.09) for middle aged with high normal and hypertensive blood pressure group, respectively. In elderly participants (≥ 60 years), HR was 2.09(1.36–3.21) only for the hypertensive ones. Similar results were achieved for CHD events in multivariate analysis. **Conclusion:** High normal blood pressure is a risk factor for incident CVD/CHD only among middle aged populations. Furthermore, the effect of hypertension on incident CVD was stronger among the younger population. Further clinical research needs to determine whether lowering high normal blood pressure can reduce the risk of CVD among younger population.

**P634**

## Direct comparison between brachial arterial pressure obtained by the oscillometric method and central arterial pressure using the invasive method

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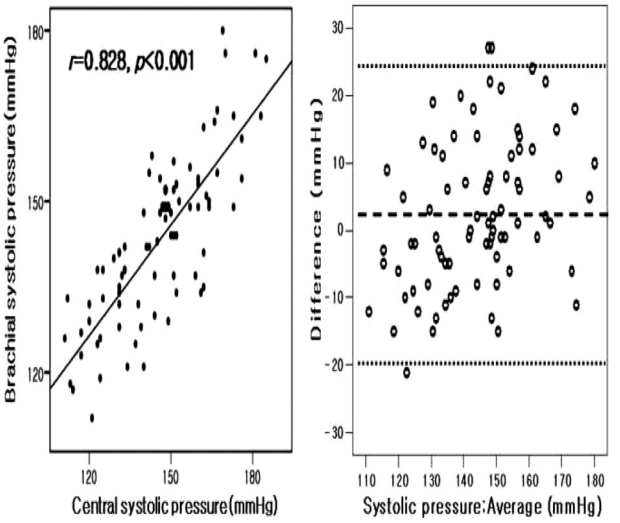
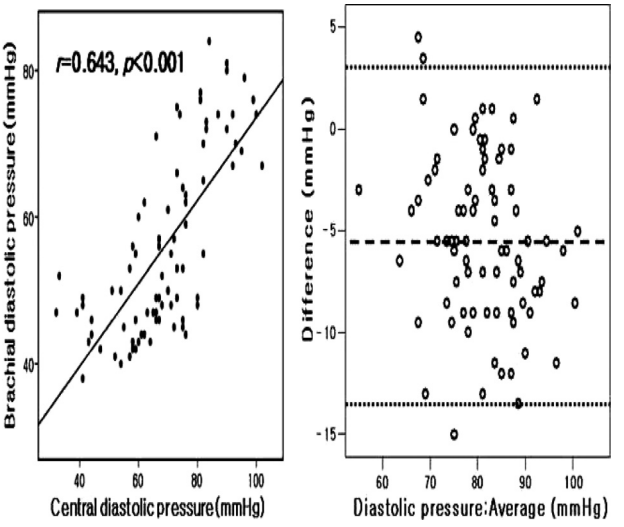
**Introduction:** The importance of central blood pressure evaluation for cardiovascular risk stratification has been emphasized. **Objectives:** The aim of this study is to evaluate whether brachial blood pressure obtained by the oscillometric method accurately reflects central blood pressure. **Methods:** Study subjects consisted of 84 consecutive patients with suspected coronary artery disease who underwent cardiac catheterization. Central blood pressure was invasively measured in the origin of the left subclavian artery by using the fluid-filled system, and at the same time, brachial blood pressure in the left upper arm was measured by the oscillometric method. **Results:** No significant difference was found between central systolic pressure and brachial systolic pressure (144.49±18.84 vs. 142.44 ± 14.96 mmHg, $p=0.063$). Bland-Altman analysis accounted for only a small bias of +2.25 mm Hg, and the limits of agreement were 24.15 mmHg and-19.65 mmHg. Central diastolic pressure was significantly lower than brachial diastolic pressure (75.80±8.74 vs. 86.70 ± 10.48 mmHg, $p<0.001$). Bland-Altman analysis showed a significant bias of -5.45 mmHg, and the limits of agreement were 2.83 mmHg and -13.73 mmHg.

**Image/graph I:**




**Image/graph II:**

**Conclusion:** These results indicate that central systolic pressure can be directly estimated from brachial systolic pressure using the noninvasive oscillometric method and observed biases

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seem to remain within the practical range. However, use of the brachial diastolic pressure and pulse pressure measured by the noninvasive oscillometric method is doubtful in clinical practice because of their large biases.

**P635**

## Adherence to medication among adults with hypertension in urban areas of Bangladesh

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**Introduction:** Keeping pace with other developing countries, Bangladesh is also facing demographic and epidemiological transition. This transition is giving Bangladesh a double burden of malnutrition. Currently the country has one third of its adult women having BMI <18.5 and almost one in every eight women have the BMI more than 25. This double burden is resulting in double burden of disease–both communicable and non communicable diseases. Adherence to medication is an important issue in case of NCDs. **Objectives:** This paper has been prepared to assess the medication adherence information among adults residing in urban areas of Bangladesh using the Bangladesh Urban Health Survey (UHS) data. **Methods:** Based on the sampling frame of the "Slums of Bangladesh; Mapping and Census" 2005 and the Mahalla mapping, first eight domains were selected from the six City Corporations of Bangladesh and District Municipalities for the UHS. Then from each of the statistical domains, 64 PSUs were randomly selected. ON the next step 25 households were selected randomly from each of the household listing master plan. A total of 65000 adults were interviews from 12,800 households were interviewed for the UHS. **Results:** The prevalence of hypertension (individuals being under medication for hypertension or with high systolic blood pressure of >140 mm Hg, or with high diastolic blood pressure of >90 mm Hg) is present among one forth of Bangladeshi women living in slums and more than one third women living in non slum areas of urban Bangladesh. Among males the corresponding proportions are a bit low with almost one in every five adult living in slums and one in every four adults living in non slums having hypertension. Among individuals with hypertension, female were more under medication and have normal blood pressure (48% in slums, 44% in non-slums) than male (24% in slums and 32% in non-slums). The male participants were more likely (61% in slums and 38% in non-slums) than female (38% in slums and 31% in non-slums) to be not using medication and having high blood pressure. **Conclusion:** In this study the prevalence of hypertension was higher than any other previous studies particularly in the non-slum population. Adherence to medication was found to be rather low in both males and females based on the study findings.

**P636**

## Relationship between plasma aldosterone levels and left ventricular mass in hypertensive africans

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**Introduction:** Hypertension is the most common cardiovascular disease worldwide and is a major cause of morbidity and mortality. Hypertension is more severe in blacks when compared with subjects of caucasian extraction. Studies have suggested that the activity of the renin-angiotensin-aldosterone system play a major role in the target organ damage such as left ventricular hypertrophy occuring in hypertension. Very few studies had evaluated this relationship in African hypertensives. **Objectives:** We sought to determine the relationship between plasma aldosterone and left ventricular mass in untreated African hypertensives. **Methods:** We recruited 82 newly diagnosed and untreated hypertensives and 51 normal controls. Measurments obtained included echocardiographic LVmass index, plasma aldosterone and renin, and 24-hour urinary excretion of sodium and potassium. **Results:** The hypertensive subjects had lower renin levels(2.15[0.87] vs 1.97[0.30]ng.mL-1 p=0.0002), higher LVmass index(48.8[11.2] vs 43.1[11.0]g.m-2.7 p=0.0008) when compared with the controls. There were no differences in the plasma aldosterone levels and the urinary excretion of sodium and potassium. There were no univariate association between LV mass index and plasma aldosterone($r=0.05$,$p=0.57$), plasma renin($r=0.04$,$p=0.61$). In a multivariate model involving LVmass index and age, sex, plasma aldosterone, plasma renin and systolic blood pressure(SBP), only age($p=0.03$) and SBP($p=0.12$) were independently associated with the LV mass index($r^2=0.11$, $p=0.024$). **Conclusion:** In this group of hypertensive Africans, there is no independent association of plasma aldosterone with LV mass. The height of the blood pressure and the age of the subjects determined the LV mass.

**P637**

## Prevalence of Prehypertension in a "Healthy" Population

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**Introduction:** The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation and Treatment of High Blood Pressure (JNC 7) introduced prehypertension as a new classification of blood pressure. **Objectives:** It is well known that high blood pressure is a cardiovascular risk factor, but below 140/90 mm Hg there are strong associations between cardiovascular risks and blood pressure too. Prehypertension progresses to clinical hypertension at a rate of 19% over 4 years. **Methods:** We studied 20499 Hungarian policemen (no treated for hypertension) 18543 men, age 18–61 y. Prehypertension was defined as systolic blood pressure (BP) 120 to 139 or diastolic BP 80 to 89 mm Hg. **Results:** We have found 11685 subjects with prehypertension (57.00%). The distribution of prehypertension by gender was: 56.82% men and 58.37% women of the total subjects. The systolic BP was 124.14±5.74 mm Hg, the diastolic BP was 77.93±5.89 mm Hg. Pulse pressure (PP) was 46.27±5.89 mm Hg. The mean arterial pressure (MAP) was 93.33±6.89 mm Hg.The mean BMI in prehypertensive patients was 25.70±3.63 kg/m$^2$. **Conclusion:** We have found significant prevalence of prehypertension in this "healty" population. The majority of prehypertensive subjects had abnormal BMI and widened (high) PP (>40 mmHg). The continuous nature of the relationship between BP and cardiovascular disease, most BP-associated cardiovascular complications occur in individuals with prehypertension. First lifestyle changes and close follow up are recommended in all patients with prehypertension.

**P638**

## Influence of several different work stressors on lipid levels, cardiovascular events occurrence and working ability in patients who suffer arterial hypertension in south serbia

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**Introduction:** Stress and strain have long been associated with the work people do. Work stressors can be identified in almost all aspects of one's job. **Objectives:** To investigate occupational stress index and influence of several different work stressors on lipid levels, working ability and cardiovascular events in hypertensive workers in South Serbia. **Methods:** The study included 817 persons who work as professional drivers, construction workers, production line workers and bankers of whom 504 composed group with arterial hypertension (40 to 60 years of age, majority were males), 313 were age and sex matched controls without hypertension. Clinical examination was performed. Blood was sampled for analysis. We analyzed in details work stressors s by using questioners with 79 different factors and Occupational Stress Index (OSI) was calculated with permission of dr Belkic. We made comparisons regarding the total burden, as well as the nature of the occupational stress burden (Underload, High demand, Strictness, Extrinsic Time Pressure, Aversive/Noxious Exposures,Threat-avoidant vigilance/disaster potential, Conflict/uncertainty). **Results:** Highest OSI was calculated in professional drivers (88.66±3.89), bankers (87.47±3.47) while production line workers had OCI of 60.20±3.23, $p<0.001$. Total OSI was significantly higher in examined group compared to controls ($p<0001$). Conflict as stress dimension was higher in examined group (14.48±7.05 vs 9.57±4.43; $p<0.001$); as well as extrinsic time pressure, high demend, strictness and noxious exposures ($p<0.001$). There was a linear correlation between blood pressure levels and total OCI ($p=0.002$).Lipid levels were higher in examined group ($p<0.001$) and linearly correlated with OSI ($p<0.001$). Glucose levels were higher in bankers in comparison to professional drivers and production line workers, $p<0.001$. Angina pectoris was present in 11% of professional drivers, 3.9% of production line workers and 18.3% of bankers and in this subgroup of persons OSI was significantly higher, $p<0001$.Previuos myocardial infarction was noted in 17.3% of bankers. Better working ability correlated with lower OCI. **Conclusion:** Hypertension appearance in working population is related to high OSI which in turn is related to high lipid levels. Bankers and professional drivers are at high risk for coronary event. Further steps are needed to reduce the level of work stressor and provide a better quality of live in individuals.

**P639**

## The prevalence of hypertension in Japan

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**Introduction:** There were many reports on the prevalence of Hypertension (HT) such as Framingham study, Hisayama-cho study and so on. However, there were few reports on the prevalence of HT using medical check-up (Ningen-doc) data in general population in Japan. **Objectives:** We conducted population-based study to clarify the prevalence of HT in general Japanese population. **Methods:** We analyzed 90,143 people (male:49.1%, age:46.3±12.0 years) who had annual medical check-up (Ningen-doc) in our hospital from January 2004 to June 2010. The criteria of hypertension is as follows; systolic hypertension (SHT): 140mmHg or over in systolic blood pressure (BP) and diastolic hypertension (DHT) 90 mmHg or over in diastolic BP. We analyzed present illness and medication that was prescribed in patients with HT. **Results:** In total, 90,139 people (100.0%) had checked BP and were enrolled in this analysis. 13,734 people (15.2%, male:9,044) had HT. Graph1 showed that 9,333 people (10.4%, male:6,039) had SHT, and 7,279 people (8.1%, male:5,097) had DHT. The prevalence of HT increased with age (Graph 2). HT was more prevalent in males (20.4%) than in females (10.2%).

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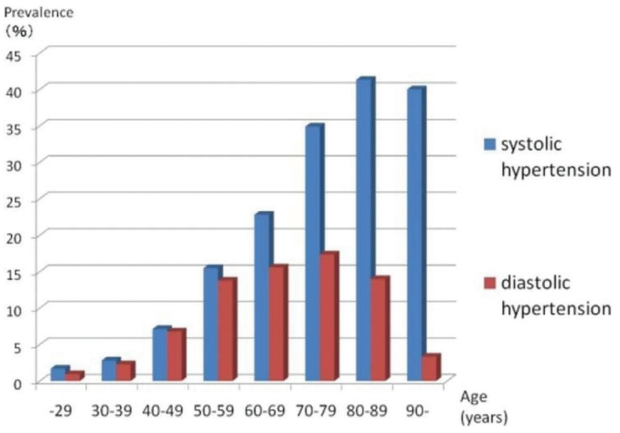
**Image/graph I:**

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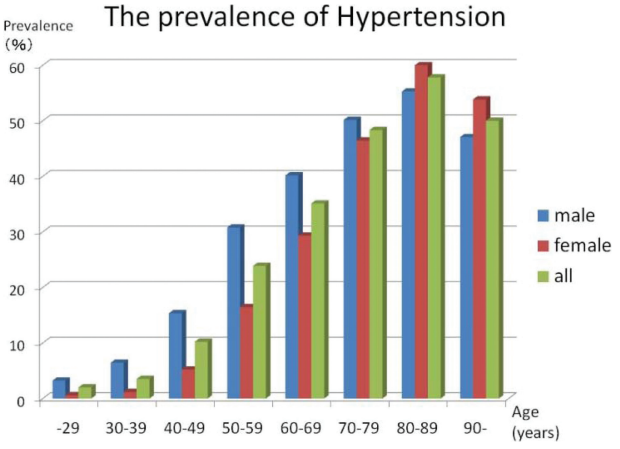


**Conclusion:** The prevalence of HT in Japanese people in this study was getting higher with age, especially in SHT.

**P640**

## Correlation study between of arterial hypertension and overweight/Obesity

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**Introduction:** Arterial hypertension (AH) is one of the main causes of the cardiovascular diseases (myocardial infarction and heart failure). Arterial hypertension leads to complications such as cerebral insult, myocardial infarction, coronary artery disease, renal dysfunction and heart failure. **Objectives:** The study aims to establish correlation between arterial hypertension and overweight/obesity among Mongolian people. **Methods:** In the study have been involved 3411 people aged of 15–64. Out of them 1674 (49%) were men and 1737 (51%) were women. AH classification was used according to the National Guidelines of the Arterial Hypertension for Mongolian adults. In the study outcome analysis, the statistical program SPSS-12.0 was used for data creating, checking, processing and compiling of the results. **Results:** Among people involved in the study, 29.3% had arterial hypertension and 70.7% had normal blood pressure. 18.6% of the total studied people had AH of I degree, 6.2% - AH of II degree and 4.5% - AH of III degree. By regions of AH prevalence, in Ulaanbaatar, AH was 30.2%, in the Western region - 29.4%, in the Khangai region - 28.3%, in the Central region - 28.2%, in the Eastern region - 29.8%. There was no significant difference in AH prevalence for the regions (□2–=11.715, p<0.469). For overweight, obesity, by regions, in the Central region and Ulaanbaatar, overweight and obesity rate was higher than in other regions. The highest rate of the overweight, obesity observed in the people aged of 35–44 years (29.7–38.6%) which are most active ages for employment. **Conclusion:** Arterial hypertension incidence becomes more frequent with increase in Body Mass Index. Risk of arterial hypertension is 1.8 more frequent in I degree, 4.2 more frequent in II degree, 19 more frequent III degree of the obesity.

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**P641**

## Nocturnal onset of acute myocardial infarction and hospitalization time in patients at high risk of obstructive sleep apnea

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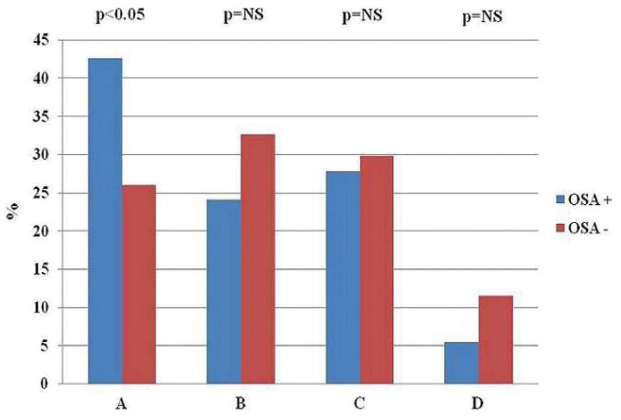
**Introduction:** The obstructive sleep apnea (OSA) is the most common type of sleep apnea, associated with a 70% relative increase risk of cardiovascular morbidity and mortality. **Objectives:** The aim of this prospective study was: (1) identification by means of Berlin questionnaire (BQ) and Epworth sleepiness scale (ESS) patients at high risk of OSA among consecutively admitted Acute Coronary Syndromes (ACS) patients who had undergone for invasive treatment; (2) evaluation the relationship between high risk of OSA, nocturnal onset of acute myocardial infarction and hospitalization time. **Methods:** We prospectively studied consecutive patients satisfying entry criteria, mean age 57.1±8.7 SD, 68% males admitted to the tertiary university hospital. A total of 158 acute myocardial infarction patients evaluated for potential OSA were given a sleep questionnaire (BQ and ESS). High risk was defined as cumulative high risk based on BQ, and ESS scores10. **Results:** Fifty four (34.2%) patients were at high risk and 104 (65.8%) at low risk of OSA. Patients at high risk of OSA had often history of hypertension (92.6% vs. 55.8%; p<0.0001) and diabetes mellitus (37% vs. 15.4%; p=0.0049). On admission patients at high risk of OSA had significantly higher mean body mass index (32.3±4.6 vs. 27±3.8 kg/m$^2$; p<0.0001), mean body surface area (2.1±0.2 vs. 1.9±0.2; p<0.0001), and were more often obese (64% vs. 22,7%; p<0.0001). Patients at high risk of OSA had significantly higher resting heart rate (83±14 vs. 80±22 beats per minute; p=0.036), systolic blood pressure (149.9±34.2 vs. 128.4±23.6 mmHg; p<0.0001), diastolic blood pressure (87.7±17.4 vs. 76.2±12.1 mmHg; p<0.0001) and higher level of C-reactive protein (24.3±36.5 vs. 11.1±18.4 mg/l; p=0.068). OSA high risk patients (OSA+) required significantly longer hospitalization time (10.4±5.24 vs. 8.7±4.04 days; p=0.01) and have often onset of acute chest pain between midnight and 5.59 am (42.6% vs. 26%; p<0.05) compared to the patients at low risk (OSA -). (Fig.1)

**Image/graph I:**




**Conclusion:** Patients at high risk of OSA have an increased risk of acute myocardial infarction during the night and require longer hospitalization time, as compared to the patients at low risk.

**P642**

## Sodium and potassium intake of urban dwellers in Yazd-Iran

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**Introduction:** High blood pressure is one of the major established risk factor of cardiovascular and cerebrovascular diseases (1). Sodium ion from salt (NaCl) has been proven to be a major determinant of high blood pressure. There are benefits from modest reductions of blood pressure from reducing salt intake. A two mmHg reduction of mean blood pressure in general population can reduce cardiovascular diseases mortality by 17 % (2). **Objectives:** This study aims to assess daily salt intake of people aged 20–74 years according to the 24-hours urinary sodium execration in Yazd urban population in central Iran. **Methods:** This is a sub-study of

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Yazd Healthy Heart Project. From autumn 2004 to summer 2005, 2000 people of the urban population of Yazd City, aged 20–74 years, were enrolled in this cross sectional study based on cluster random sampling. Overall 219 participants 20–70 years were enrolled in this sub-study. **Results:** Sodium measure in 24 hours urine was 171.7± 82.9 mmol/L in males and 127.8 ± 56.1 mmol/L in females (P <0.0001). While, potassium measure in 24 hours urine was 49.4 ± 23.2 mmol/L in males and 41.5 ± 25.1 mmol/L in females, (P = 0.2). Estimated average daily salt (NaCl) intake was 10.0 ± 4.8g/day in men and 7.5 ± 3.3g/day in women (P<0.0001). Only one participant had the ideal Na/K ratio of less than one. **Conclusion:** in Yazd urban area, the daily sodium intake is high, and daily potassium intake is low. This is similar to what observed four decades ago in an area not far from Yazd (3). However, in developed countries such as Japan and Belgium salt consumption reduced by more than 50% over the same period (4). Thus, efforts must be directed towards health promotion interventions to increase public awareness in order to reduce sodium intake and increase potassium intake.

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**P643**

## Assessment of whole grain dietary intake gaps to inform industry action

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**Introduction:** Appropriate consumption of whole grains (WG) is associated with prevention of weight gain and reduced risk of cardiovascular and other chronic diseases. Despite these benefits, global consumption of whole grains remains low and objective targets to guide increased product development to meet global intake recommendations do not exist. **Objectives:** To further address this need, we performed an analysis of the different dietary recommendations for whole grains that exist globally as a prelude to modeling the target increases necessary to meet country-specific intake gaps. **Methods:** A literature search of existing surveys was performed using PubMed, Medline and government websites. Country dietary guidelines were identified per age group in >10 countries and corrected for serving sizes. **Results:** Dietary guidelines for WG consumption ranged from 16 to 117 g/day per country, however only 15 out of 50 countries have set numerical targets. Survey data on WG intake was sparse, with few countries reporting this as part of their national survey results. Preliminary data analysis indicates that where WG intakes are available, there are large variations in intakes within population groups, and only a small percentage of individuals are achieving their local recommendations. **Conclusion:** A large gap exists between recommended and actual intake of WG. Dietary recommendations vary widely between countries. There is a great need globally for more surveys assessing WG intake to inform industry action. Currently planned country dietary intake surveys would benefit from consistent and comparable methodologies.

**P644**

## Association of trans fatty acid and markers of systemic inflammation in Asian Indians

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**Introduction:** The excess burden and the early development of lifestyle disease in Indians are not explained by conventional risk factors. Systemic Inflammation has been implicated as an emerging non lipid risk factor for coronary artery disease, insulin resistance and diabetes. Trans fatty acid (TFA) are suspected to influence systemic inflammation due to their pro inflammatory effect. Hence we have studied the association of TFA assessed in adipose tissue with inflammatory markers. **Objectives:** To study the association of trans fatty acid and markers of systemic inflammation. **Methods:** Adipose tissue was collected from the subjects (N=74) through needle biopsy, lipids were extracted, converted to methyl esters and run on GC. The trans isomers of palmitic, oleic, linoleic and linolenic acids were identified by comparing their retention time with standard. IL6, TNF-alpha and CRP were estimated in serum. Spearman correlation was computed to look at the relation of TFA with inflammatory markers. **Results:** Trans isomer of palmitic and linolenic acid was more abundant than trans isomers of oleic acid. Positive significant correlations ($p \leq 0.05$) were observed between trans isomers of linolenic acid with CRP ($r=0.26$), IL6 ($r=0.26$), TNF$\alpha$ ($r=0.26$) and between CRP and trans isomer of palmitic acid ($r=0.24$). However similar results were not observed for other trans isomers identified. IL6 and CRP were also significantly correlated ($r=0.47$ $p \leq 0001$). **Conclusion:** Atherosclerosis is an inflammatory process in which markers such as CRP and IL-6 may directly influence plaque vulnerability and rupture. This study also subtly points to the fact that TFA can cause an increase in inflammatory markers like CRP, IL6 and TNF-$\alpha$. IL6 also controls CRP production. Asian Indians consume more fried food and high fat dairy products. There is a lacuna in the data of TFA profile of Asian Indians. Findings of western studies, where the emphasis is on elaidic acid found in meat and margarines is not true for Asian Indians ,here the emphasis has to be on improving quality of cooking oil which is the major source of trans isomer of linolenic acid.

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**P645**

## The useful tool of a dietary questionnaire at a cardiac rehabilitation program, in the identification of patients with nutritional risk

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**Introduction:** One of the most difficult targets to achieve at a Cardiac Rehabilitation Program is the weight loss, the long term weight loss maintenance, and the adherence in an integral program of lifestyle changes. **Objectives:** To evaluate by a nutritional questionnaire the dietary style and habits of patients that are part of a CRP program, so as to identify those patients who require a more personalize and individual nutritional assessment. **Methods:** The Nutrition Division at HUFF, designed a qualitative questionnaire to know the dietary style of patients, which was classified according to results obtained at 3 scores.
Score A: 20 a 30 points, A low fat dietary style healthy for the heart was adopted.
Score B: 16 a 19 points The moderation concept was added, but still needs to eliminate fat and cholesterol from the chosen foods.
Score C: 10 a 15 points Must reformulate the dietary style in a global way, so as to be able to reduce total fats and cholesterol. An individual and more personalize interview with a matriculated nutritionist is suggested. Every patient was given the corresponding results in a written report.
**Results:** Score A: 122 patients obtained 20 to 30 points, Score B: 9 patients obtained 16 to 19 points, Score C: 2 patients obtained 10 to 15 points.

| | | |
|---|---|---|
| Score A | 122 patients | 20 a 30 points |
| Score B | 9 patients | 16 a 19 points |
| Score C | 2 patients | 10 a 15 points |

**Conclusion:** The implementation of a nutrition questionnaire with scores and its corresponding devolution and results return could be a simple and useful tool in order to identify patients with nutritional risk and be able to refer to a nutritional specialist at the proper time. Also, the return of the results to patients in cardiac rehabilitation program strengthens the adherence to lifestyle changes and nutritional education is made frequently.

**P646**

## Improving the quitting rate with pharmacological therapy in cardiovascular and non-cardiovascular diseases smokers

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**Introduction:** Despite the high prevalence of smoking, nicotine addiction, and, subsequently, cardiovascular and other diseases related to smoking behaviour, the antismoking strategy of pharmacological therapy combined with psychological support is still underused in our area. **Objectives:** The assessment of the abstinence rate in a population of smokers which has been administered several pharmacotherapeutic regimens and psychological support. **Methods:** We enrolled 1934 patients (pts.) in this study which were evaluated in two centers during the period August 2008–March 2010. We used standard questionnaires, physical examination, Fagerstroem tests, etc.. Pts. were administered the following therapeutical regimens: nicotine patches 15 mg, bupropion 150 mg, varenicline 0,5 and 1 mg, together with antismoking counselling and psychological support. The final evaluation was performed after 6 months. **Results:** The therapeutic regimen with nicotine patches 15 mg, in 140 pts. with low or medium nicotine addiction, lead to a rate of abstinence of 34,29%; the bupropion 150 mg regimen in 1360 pts. with diverse degrees of addiction lead to a rate of abstinence of 35,96%, the varenicline regimens of 0,5 and 1 mg in 456 pts. with severe addiction lead to an abstinence rate of 46,27%. For all types of regimens, the rate of abstinence was 37,91%. Among the 224 pts. who declared cardiovascular disease (CAD, HTN, PAD, stroke, etc.), 103 pts. (45,96%) were abstinent at the final assessment. **Conclusion:** These results confirm the value of pharmacologic therapy combined with psychological support in antismoking strategy. The administration on a large scale of this therapy may be a way of decreasing the prevalence of tobacco consumption and, subsequently, a reduction of the risk of cardiovascular and other diseases related to smoking.

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**P647**

## The effect of smoking on body mass index is not altered by socio economic status or drinking habits in the Seychelles

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**Introduction:** BMI is generally lower in smokers than in non smokers, although few data have been reported in the African region. **Objectives:** We aimed to examine this association in the Seychelles (African region) and to assess whether the effect of smoking on BMI was altered according to socio-economic status (SES) and alcohol intake. **Methods:** We used data from three population-based surveys among adults aged 25–64 years in 1989, 1994 and 2004 in the Seychelles (1585 men and 1818 women in total). We restricted analyses to men in view of the much lower prevalence of occasional or regular smoking and drinking in women. Socio economic status (based on occupation) and drinking habits were assessed similarly in the three surveys. **Results:** The overall prevalence of occasional or regular smoking was 45% in men. The effect of smoking on BMI was fairly consistent when stratifying by drinking status and SES, ranging from -1.38 kg/m$^2$ for non-drinkers with low SES to -1.98 kg/m$^2$ for drinkers with middle or high SES. In multivariate analysis adjusting for age, year of survey, drinking status and SES, mean BMI was 1.51 kg/m$^2$ lower in occasional or regular smokers than in non-smokers or ex-smokers ($p<0.001$). In addition, heavy drinking (>120 grams) was associated with reduced BMI of 0.80 kg/m$^2$ compared to non or moderate drinkers ($p=0.01$) and middle or high SES was associated with an increased BMI of 1.38 kg/m$^2$ compared to low SES ($p<0.001$). There was no significant interaction with regards to the association of smoking on BMI in relation to SES and alcohol drinking. **Conclusion:** Our data confirm that BMI is lower in smokers than in non-smokers in a population of the African region and show that this relationship is not altered by SES or alcohol intake.

**P648**

## Change in prevalence of hardcore smokers after a comprehensive smoke-free legislation in Hong Kong

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**Introduction:** Hong Kong has a long history in tobacco control since early 1980s, and the intensity of tobacco control measures has increased sharply starting 2007 with a comprehensive smoke-free legislation implemented on 1 Jan 2007. The overall smoking prevalence in Hong Kong declined gradually from 15.7% in 1990 to 11.8% in 2008. However, there were still 679,500 daily smokers aged □ 15 years, 55.5% of them had never tried and did not want to give up smoking; and 92.0% of those who did not want to quit would not try any existing cessation service in 2008. The remaining seems to be a sizable group of hard core smokers who are resistant to giving up smoking, or a hardening of the smoking population as a whole had occurred in Hong Kong. **Objectives:** To estimate the age- and sex-specific prevalence of hardcore smokers before and after the comprehensive legislation in Hong Kong. **Methods:** Population data on pattern of smoking from Thematic Household Survey (THS) in 2005 and 2008 were obtained. The response rate was 77% for THS2005 and 75% for THS2008 respectively. We included current daily smokers who were □15 years old in the analysis. A total of 3740 and 2958 current daily smokers responded to the THS2005 and THS2008 respectively. We defined hardcore smokers using six criteria: (1) daily smokers, (2) had a smoking history of at least 6 years, (3) had no history of quit attempts in the past, (4) did not want to give up smoking, (5) smoked at least 11 cigarettes per day on average, and (6) were 26 years or above. We computed the age- and sex-specific prevalence of hardcore smokers by survey year. **Results:** Overall speaking, 21.8% and 27.4% of Hong Kong daily smokers aged 15 years or older was considered hardcore in 2005 and 2008 respectively. The prevalence of hardcore smokers increased from 23.8% to 29.4% in men and from 10.6% to 16.3% in women, and also increased in all the five age groups from 2005 to 2008. The hardcore smoking prevalence increased with age, reaching the highest in the 50–59 year age group, and then dropped in the 60+ age group in both cohorts. **Conclusion:** The increase in the proportions of hardcore smokers from 2005 to 2008 suggests that a hardening of the smoking population may be occurring in Hong Kong, regardless of smokers' gender. Further studies on investigating the suitability of current tobacco control measures in helping hardcore smokers to quit, and developing appropriate interventions is urgently needed, as most of the smoking cessation evidence is not based on hardcore smokers.

**P649**

## Tobacco control policy development in uruguay: achievements and challenges

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**Introduction:** Uruguay had the highest smoking prevalence and tobacco smoke exposure in indoor public places in Latin America (LA) and no significant tobacco control policy. Few years after WHO-Framework Convention on Tobacco Control (FCTC) the tobacco control situation changed dramatically. **Objectives:** Describing how tobacco control evolved after FCTC got into force, sharing first outcomes and identifying obstacles and challenges ahead. **Methods:** A retrospective revision from different sources of information: international and research, personal communications, and other sources. **Results:** Uruguay: Tobacco related diseases killed 12 people every day, 4 of them due to cardiovascular diseases (1); the highest prevalence of lung cancer (2) and COPD (3) in Latin America (LA). Smoking prevalence, in adults and youth, maintained steady in 32% since 1998 to 2006 (4), 27% of medical doctors (MD) were smokers (5), and 94% of indoor places contaminated with high ETS (6). Uruguay ratified FCTC (2004) and started its implementation (2005): became a smoke-free country, increased tobacco taxes and prices, banned tobacco advertising (but point of sales), set 80% pictured warning labels in tobacco packaging, and others. First evaluations: indoor air contamination levels decreased in 90% (7), adult prevalence decreased to 25% (8), youth prevalence decreased to 18,4% (9) and medical doctors prevalence to 9,8% (10). After the smoking ban, Acute Myocardial Infarction (AMI) admissions to hospitals decreased 22% (11). Tobacco revenues increased significantly and tobacco sales also decreased (12). Uruguay became an international tobacco control leader and Philip Morris International initiated an international investment arbitration process against the country. **Conclusion:** FCTC implementation in Uruguay showed that FCTC is an excellent tool for curbing the tobacco epidemic also in non developed countries and has impact in short time.

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**P650**

## Short-term treatment with omega-3 fatty acids prevents the smoking-induced impairment of vascular elastic properties in young individuals

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**Introduction:** Smoking is associated with arterial stiffness and increased cardiovascular risk. Omega-3 fatty acids can modify cardiovascular risk factors. **Objectives:** In the present study we assessed the hypothesis that omega-3 fatty acids can improve arterial wall properties in cigarette smokers. **Methods:** We studied the effect of a 4 weeks oral treatment with 2gr/day of omega-3 fatty acids in 16 healthy smokers (aged 27.8±2.94y) on two occasions (day 0: baseline and day 28). The study was carried out on two separate arms, one with omega-3 fatty acids (2 gr/day) and one with placebo, according to a randomized, placebo-controlled, double-blind, cross-over design. Measurements were carried out before (pSm) and immediately after (Sm0) cigarette smoking. Carotid-femoral pulse wave velocity (PWV) was measured as an index of aortic stiffness and augmentation index (AIx) as a measure of arterial wave reflections. **Results:** At baseline measurements, compared to pSm, cigarette smoking caused an increase in AIx (0.81±12.58 % vs 5.54±9.84 %, $p<0.005$) and PWV (5.90±0.62 m/sec vs 6.30±0.76 m/sec, $p<0.001$). Though, compared to baseline, treatment with omega-3 fatty acids blunted the acute smoking induced increase in AIx and PWV in no statistical significant values. Furthermore, compared to baseline measurements, treatment with omega-3 fatty acids improved Sm0 values of AIx (5.54±9.84 % vs -0.56±11.40 %, $p=0.001$) and PWV (6.30±0.76 m/sec vs. 5.88±0.81 m/sec, $p<0.05$), while there was no significant difference with placebo administration. **Conclusion:** Short-term treatment with omega-3 fatty acids improves arterial stiffness and moderates the acute smoking induced impairment of vascular elastic properties in healthy smokers.

**P651**

## Stress psychophysiological responses and smoking relapse: potential linkages and implications for treatment

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**Introduction:** Tobacco use is a leading cause of coronary heart disease, ischemic stroke, and peripheral vascular disease. Despite the accelerated efforts to develop effective smoking cessation strategies, the long-term success rates of abstinence have been disappointing. Stress is a widely cited precipitant of smoking relapse, and efforts to address this factor may enhance the long-term outcome of smoking cessation. **Objectives:** Our research seeks to identify psychosophysiological and biological mechanisms that mediate effects of stress on tobacco use and relapse. **Methods:** The methods include cross-sectional and longitudinal assessment of cardiovascular, hormonal, and mood responses to stress. We collect these measures before, during, and after exposure to acute laboratory stressors (public speaking and cognitive challenges) and use them as predictors of smoking relapse. **Results:** Our research to date has demonstrated that 1) attenuated adrenocortical functions during abstinence are associated with enhanced desire to smoke and deterioration of mood and performance compared with ad libitum smoking, and 2) smokers exhibit greater basal cortisol levels, but attenuated cardiovascular and cortisol responses to stress compared with non-smokers. A series of recent studies in smokers interested in cessation demonstrates that participants who relapsed within a four-week period exhibited attenuated blood pressure, cortisol and adrenocorticotropic responses to stress. Hormonal associations with smoking relapse are more

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consistent in men, while intensity of negative affect is a consistent predictor of smoking relapse in women. **Conclusion:** We conclude that perturbed systems involved in the stress response may exacerbate withdrawal symptoms and contribute to the rapid relapse observed in the majority of smokers. Our results have treatment implications in terms of developing novel behavioral and pharmacological interventions for tobacco addiction targeting stress-related systems. (This research was supported in part by NIH grants R01DA016351, R01027232, and R21CA88272)

**P652**

## Serum MCP-1 levels are increased with duration of smoking and blood pressure in smoking patients

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**Introduction:** Oxidative stresses caused by cigarette smoking induce vascular inflammation. MCP-1 (monocyte chemoattractant protein-1) is a proinflammatory cytokine and known to promote monocyte migration. MCP-1 is increased in its expression levels at atherosclerosis region and acts as an inducer of monocyte migration to blood vessel wall. **Objectives:** It has been reported that serum MCP-1 levels were elevated in smoking patients with polycythemia. However, the precise role of MCP-1 in smokers is unknown. In this study, we examined the relationship between serum MCP-1 levels and smoking- and atherosclerosis-related factors. **Methods:** We measured MCP-1 levels in sera from 200 current smokers and 80 non-smokers by ELISA. **Results:** The MCP-1 levels showed no correlation with metabolic parameters such as HbA1c, LDL-cholesterol and HDL-cholesterol. The levels showed no correlation with the number of cigarettes per day, Brinkman index, or the tobacco dependence screener (TDS) score. However, the MCP-1 levels were positively correlated with age ($r=0.307$, $p<0.0001$), duration of smoking ($r=0.343$, $p<0.0001$), systolic blood pressure ($r=0.221$, $p<0.005$) and diastolic blood pressure ($r=0.139$, $p<0.05$). The multivariate regression analysis revealed that the independent determinants of the MCP-1 levels were duration of smoking ($\beta=0.305$, $p<0.0001$) and systolic blood pressure ($\beta=0.162$, $p<0.05$). On the other hand, the serum MCP-1 levels in non-smokers were significantly correlated with age ($r=0.303$, $p<0.01$), but not with systolic or diastolic blood pressure. The multivariate regression analysis revealed that the independent determinants of the MCP-1 levels in non-smokers were age ($\beta=0.418$, $p<0.001$) and BMI ($\beta=0.285$, $p<0.05$). The MCP-1 levels were significantly increased ($p<0.001$) in hypertensive smokers than non-hypertensive smokers. However, in non-smokers, the MCP-1 levels were similar between hypertensive and non-hypertensive patients. **Conclusion:** Serum MCP-1 levels are increased with duration of smoking and blood pressure in smoking patients. In non-smoking patients, however, MCP-1 levels showed no correlation with blood pressure. Thus, long period of smoking may induce expression of MCP-1, which may be involved in increased systolic blood pressure in smokers.

**P653**

## Correlates of self-reported heart problems: findings from community-based cross sectional study of a sample of UK-resident yemeni khat chewers

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**Introduction:** Khat chewing is often associated with tobacco use which impacts on health. **Objectives:** This cross-sectional study aimed to 1) explore and validate aspects of self reported tobacco smoking and khat use amongst khat chewers; and 2) identify correlates of self-report heart problems amongst khat chewers. **Methods:** This study recruited a purposive sample of 204 UK-resident Yemeni khat chewers during random visits to Khat sale outlets. Data was collected via a face-to-face structured interview. Data analyses included descriptive, chi-squared tests and a forward stepwise regression. **Results:** The mean age of respondents was 44.84 years (SD ±19.70) (range 18–87). Sixty-six percent had a low level of education and 65% were unemployed. Of 133 self-reported tobacco smokers, 68% were regular smokers with a mean (sd) carbon monoxide score (20.53 ±12.12 ppm) and 32% were episodic smokers with a mean (sd) carbon monoxide score of (16 ±15.66 ppm). Thirty-six percent of khat chewers reported a high composite khat chewing behaviour. Eleven percent self-reported heart problems that included hypertension. In preliminary analysis chewers self reporting heart problems were more likely older, had a high khat chewing composite behaviour, were more likely khat dependent, less likely to smoke tobacco, had a low level of social participation, were living alone, and had a low level of education and inadequate English language skill proficiency ($p\leq0.05$). Multivariate analysis showed that increase in age was correlated ($p=0.05$) with self-reported heart problems. Tobacco abstinence was protective for self-reported heart problems. **Conclusion:** In this sample self-reported heart problems correlated positively with age and negatively with tobacco smoking. Further exploration of these correlations in other samples is indicated.

**P654**

## Hyperlipidemia associated with obesity perturbs improvement of blood fluidity by smoking cessation

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**Introduction:** Blood rheology or fluidity, which is expressed as "viscous" or "non-viscous," reflects the blood viscosity and the state of microthrombus formation. Reduced blood fluidity has been suggested to lead to cardiovascular thrombotic events such as myocardial and cerebral infarction. While cigarette smoking is an independent risk factor for cardiovascular events, to date, a useful and convenient method of predicting such events in smoking individuals has not been established. **Objectives:** The present study investigated improvement of blood fluidity by smoking cessation. **Methods:** The Micro Channel Array Flow Analyzer (MC-FAN) is an instrument which measures the blood fluidity by employing the micro-channel method using a capillary model. We assessed blood fluidity in smoking patients by measuring the blood passage time (BPT) in aliquot (100$\mu$l) of blood samples using the MC-FAN. **Results:** BPT was significantly related with smoking variables such as daily consumption of tobacco, Brinkman's index, and FTND score. Overall, smoking cessation significantly ($p=0.015$) decreased BPT (implying improvement of fluidity) from 57.7 sec to 52.3 sec ($n=126$) at 3 months after the start of therapy. However, as BPT increased (implying deterioration of blood fluidity) in some patients, we examined factors that perturb the improvement of blood fluidity by smoking cessation. Patients were divided into the group exhibiting improvement of blood fluidity after smoking cessation (I, $n=49$), that showing deterioration (D, $n=27$) and that showing no change (N, $n=50$). West circumference and body mass index significantly increased after smoking cessation in N and D, but not in I. In contrast, serum HDL-cholesterol levels significantly increased in I, but not in N and D. Notably, serum triglyceride levels markedly increased after smoking cessation in D ($p=0.003$, before:163.8±15.8, after:268.2±37.0 mg/dl), moderately increased in N ($p=0.012$, before:127.0±11.0, after:151.3±13.4 mg/dl), but not significantly in I ($p=0.366$, before:176.0±14.6, after:191.3±16.9 mg/dl). **Conclusion:** While decreased blood fluidity in smoking patients improves by 3 months of smoking cessation, obesity-associated hyperlipidemia after the cessation perturbs such improvement. Thus, management of hyperlipidemia associated with smoking cessation would further augment the improvement of blood fluidity, and reduce the risk of cardiovascular events.

**P656**

## Prevalence of hypertension among the adult population of Ahvaz-Iran

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**Introduction:** Hypertension is one of the most important modifiable risk factors for cardiovascular disease (CVD). **Objectives:** A survey was conducted to estimate of prevalence of hypertension in the adult population of Ahvaz city-Iran. **Methods:** This is a cross-sectional survey that was performed among 5000 people aged 25–75 years in Ahvaz city by multistage cluster sampling from January 2008 until December 2010. Two blood pressure measurements were obtained by trained observers using a standard sphygmomanometer after a 5 minute seated rest. Information on history of hypertension and use of antihypertensive medication was obtained using a standard questionnaire. Body mass index (BMI) and waist to hip circumference were measured. **Results:** The prevalence of hypertension (systolic blood pressure≥140 mm Hg, diastolic blood pressure ≥90 mm Hg) in men and women were 32.3% and 25.6%, respectively. In both sexes, prevalence of hypertension increased with age. No significant difference was identified in prevalence of hypertension in rural (30.5%) and urban (31.1%) regions. Among hypertensive participants, 51.2% were aware of their hypertension, only 16.2% were currently taking antihypertensive medication, and 32.6 % had their hypertension controlled. Also, gender, diabetes, obesity, high triglycerides, high cholesterol, and abdominal obesity were positively associated with hypertension ($P<0.002$). **Conclusion:** In the current study the prevalence of hypertension is high. Hypertension must be controlled and prevented by education and changing the life style of people in this area of Iran.

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**P657**

## Relationship between body mass index and abdominal obesity with hypertension in 20–70 year old population of Ahvaz

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**Introduction:** Hypertension is the most important risk factor for death in industrialized countries. It increases hardening of the arteries thus predisposes individuals to heart diseases.

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**Objectives:** The purpose of the present study was to investigate the association between body mass index (BMI) and abdominal obesity with hypertension in 20–70 year old population of Ahvaz. **Methods:** This study is a population-based case-control study. In this study, 500 individual of student's parents from 10 schools in Ahvaz were randomly selected as the subjects. They were examined by a physician and a nurse through an interview and physical examination and divided into two groups: control (normotensive) and case (hypertensive) group. The anthropometric measures and blood pressure of subjects were measured and recorded. A questionnaire was completed for both groups. **Results:** 240 and 260 out of 500 participants were classified in case and control groups, respectively (48% male and 52% female).The average age was 36.11 years old for control group and 39.23 years old for case group. There was a significant relation between age and prevalence of hypertension. In addition, an association of increased BMI and abdominal obesity with high blood pressure was detected. **Conclusion:** Hypertension is a serious public health problem in most countries. Dietary and lifestyle changes can improve blood pressure control and decrease the risk of associated health complications.

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**P658**

## Trends of the Awareness, Treatment and Control Rates of Hypertension in Iran

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**Introduction:** Previous studies in Iranian population showed that despite improvement in the awareness, treatment and control rate of hypertension the situation is not desirable. **Objectives:** We aimed to evaluate the changes over time in the prevalence, awareness, treatment, and control rate of hypertension in intervention and reference areas of a comprehensive community trial with reference area. **Methods:** In 2000–2001, the baseline survey was conducted in three counties. Isfahan and Najaf-Abad had 1,895,856 and 275,084 population, as venues of intervention; and Arak, a provincial county with a population of 668,531, as the reference area. Its interventions were conducted through 10 projects with different target groups The aims of the interventions are to improve the knowledge, attitude and behaviors of general population, hypertensive patients, their relatives and health professional. Hypertension was defined as blood pressure $\geq$140/90 mmHg in non-diabetic patients and $\geq$130/80 mmHg in diabetic individuals and or taking antihypertensive medications. **Results:** The prevalence of hypertension had a non-significant decrease from 20.5%to 19.6%, in the interventional area whereas in the reference area, it raised from 17.4% to 19.6% ($P = 0.003$). Awareness, treatment and control rates of hypertension had better improvement in urban and rural part of the interventional area compared to reference area. The awareness, treatment, and control rates of hypertension increased significantly in the adults more than 40 years, as well as in all groups of body mass index in interventional areas without significant change in the reference area. Mean systolic blood pressure of study population in the interventional area decreased from 116.13 $\pm$19.37 to 112.92 $\pm$ 18.27 mmHg ($p<0.001$) without significant change in reference area. **Conclusion:** Conclusion: the activities of this community study helped in improving hypertension prevalence, awareness, treatment and control in Iran. We think The results of this large sample size, quality controlled and comprehensive integrated interventions of IHHP can be generalized to other developing countries.

**P659**

## Hypertensive Disease Epidemiologic Survey and Risk Factors Investigation in Urban and Rural Areas in Guannan County Jiangsu Province

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**Introduction:** Hypertension is formed in different kinds of risk factors ,and it harm to human health seriously .However, the risk factors can not be the same completely in different period, different places and different groups. **Objectives:** To survey the epidemiological features of hypertension and its major risk factors in urben and rural residents of Guannan county and to provide a scientific basis to establish a plan for prevention and control. **Methods: A** total of 443 residents from urban and rural area aged 20–69 years-old were investigated by stratified random sampling.The fasting plasma glucose(FPG), uric acid(UA), total cholesterol(TC), triglyceride(TG), high density lipoprotein cholesterol (HDL-C), low density lipoprotein cholesterol(LDL-C) of the study samples were measured.the hypertension risk factors were implemented with the non-conditional logistic regression method. **Results:** The morbidity rate of hypertension (MRH) in this area was 35.9%. The age-standardized MRH was 28.0%. By multiple factorial logistic regression analysis(LRA), There was a positive correlation between hypertension and drinking, family history of hypertension(FHH), hypercholesterolemia, high UA level, body mass index(BMI) and advanced age ($OR>1.0$, $P<0.05$). **Conclusion:** The morbidity rate of hypertension in this area was higher than the average level in the whole country. The major risk factors of hypertenson were drinking, family history of hypertension, hypercholesterolemia, high UA level, BMI and advanced age.

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**P660**

## Knowledge in the Population, Prevalence and Control of Arterial Hypertension in Ten Locations in Argentina

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**Introduction:** In Argentina, the available information about epidemiology of the arterial hypertension is limited. The majority of the studies made in other countries show high prevalence, poor knowledge and a low degree of control in hypertensive people. **Objectives:** To evaluate the degree of knowledge, treatment and control of arterial hypertension in the population of ten locations in Argentina. **Methods:** "Health Education Tents" were set up in the cities of Victoria, Entre Ríos province; Córdoba, Córdoba province; Junín, Bahia Blanca and Mar del Plata, Buenos Aires province; San Miguel de Tucumán, Tucumán province; Cipolletti, Rio Negro province; Neuquén and Rincón de los Sauces, Neuquén province and five squares in Buenos Aires City during a media campaign about prevention of cardiovascular risk factors. 5152 people attended spontaneously, sat for ten minutes and answered a survey about cardiovascular risk factors. During this period, arterial pressure was measured three times at one minute intervals; the first reading was discarded and the average of the last two was calculated. **Results:** Mean age was 56$\pm$12 years. Female: 58,7%.

| | Known hypertensive 1649 (32%) | | Treated 1163 (70,5%) | | Controlled 521 (44,8%) | |
|---|---|---|---|---|---|---|
| Age Group | Male | Female | Male | Female | Male | Female |
| <25 years | 3 | 7 | 0 | 1 | 0 | 0 |
| 25 to 49 years | 78 | 94 | 29 | 37 | 10 | 20 |
| 50 to 75 years | 469 | 646 | 354 | 452 | 115 | 246 |
| >75 years | 163 | 189 | 132 | 158 | 54 | 76 |
| Total | 713 (43%) | 936(57%) | 515 (44%) | 648 (56%) | 179(34%) | 342(66%) |

28% of the patients who denied being hypertensive had a systolic arterial pressure of 140 mmHg or higher and a diastolic one of 90 mmHg or higher. **Conclusion:** Despite the progress made in the last decades in terms of knowledge of arterial hypertension disorder and the availability of efficient drugs for its treatment, there are still a large number of patients who ignore being hypertensive; and among those who know about their condition, there are many who do not have it controlled. This observation is more significant among the male population and elderly individuals and shows the need to develop new health policies to obtain better control of this disorder.

**P661**

## High prevalence of multiple cardiovascular risk factors among treated hypertensive patients in China

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**Introduction:** It has been recommended by hypertension guidelines that the management of hypertension should target on global risk rather than only elevated blood pressure. But little information is available for the profiles of multiple risk factors among hypertension patients in China. **Objectives:** To investigate the prevalence of concomitant multiple cardiovascular risk factors among treated hypertensive patients in China. **Methods:** China National Survey for Determinants of Detection and Treatment Status of Hypertensive Patients with Multiple Cardiovascular Risk Factors (CONSIDER) was a nationwide cross-sectional study carried out in 2009. Totally 5206 treated hypertensive patients aged 35–74 years were recruited consecutively from the outpatient clinic of 46 hospitals in 22 provinces. **Results:** The mean age of study subjects was 58.4$\pm$9.6, and 49.7% was males. Dyslipidemia was most prevalent (81.2%) risk factor, followed by physical inactivity (56.0%), dysglycemia (51.4%), and obesity (18.4%). The smoking rate was 35.5% in men and 1.6% in women. Compared with older patients, younger patients (35–44 year) had higher prevalence of physical inactivity, smoking (in men) and obesity. In total, 96.2% of the hypertensive patients had at least one of the above five cardiovascular risk factors, 77.1% had two and more, and 39.8% had three and more. The proportion of patients with three and more other risk factors were higher in men than that in women (47.8% *vs.* 31.8%, $p<0.01$). The younger patients actually had higher proportion with three and more other risk factors than elder group. Dyslipidemia was most common (60.1%) in patients with one risk factor, dyslipidemia combined with physical inactivity (37.3%) and dyslipidemia combined with hyperglycemia (36.3%) were the two most common profiles in

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patients with two risk factors, and dyslipidemia combined with hyperglycemia and physical inactivity were most common in patients with three risk factors (64.2% in men and 38.3% in women). **Conclusion:** Coexistence of multiple cardiovascular risk factors is common among treated hypertensive patients in China, particularly in men and in younger patients. There is an urgent need for more effective and comprehensive strategies for the management of global risk for hypertensive patients.

**P662**

## Risk of developing arterial hypertension and its prevalence in a sample population of Porto Velho Rondônia (Brazil Amazon)

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**Introduction:** Hypertension is one the most prevalent risk factors worldwide and its has become a public health challenge. There are no epidemiological data on hypertension in the Amazon region. The risk of developing hight blood pressure (BP) in the short term is unknown. **Objectives:** To assess the prevalence of hypertension and other main cardiovascular risk factors in a sample amazon population from the community of Porto Velho in Rondonia-Brazil. Another objective in this study was to estimate the risk of developing high BP over the next four years. **Methods:** Cross-sectional study, descriptive, whose sample consisted of individuals living in the area of a primary care units. The demographic data were recorded and two measurements of blood pressure were obtained by trained observers.The sample was random and used a standard questionnaire, which addressed risk factors as diabetes mellitus,hypertension, dyslipidaemia, medication use, smoking and parental hypertension.Measures have been verified as BP, weight, height and waist circumference and required tests such as fasting blood glucose and lipid profile.After this first phase that occurred throughhome visits between September and December 2010 followed by the compilation of data in Epilnfo statistical program and performed Hypertension Risk Score(Incidence of hypertension -systolic BP above 140 mmHg, diastolic BP above 90 mmHg or antihypertensie treatment)in four years, based on the Framingham Heart Study. **Results:** Included 877 individuals, 355 (40.5%) males.The average age is53 years, (SD: +/-12.04) From the sample, 348(39.69%) reported having a previous diagnosisof hypertension, 461 (52.56%) denied having hypertension while 68 (7.75%) did not know.Of the 529 people who had not or could not say, 94 (17.16%) had BP levels above recommended ($>$ 140 mmHg for systolic BP and/or $>$ 90mmHg for diastolic BP). Of these 529 participants, 435 had blood pressure levels considered normal and when the calculation of risk of developing hypertension over the next four years found that belong to low risk ($<$5%) 137 people (31.49%), 33 individuals (7.58%) to medium risk (50–10%) and 265 (60.91%) had high risk ($>$ 10% chance to develop hypertension). **Conclusion:** The prevalenceof hypertensionin this population was high. Most individuals have normal BPpresent high risk for developing hypertension infour years. Thereforeit is necessary, effective action to control and optimize primary prevention in Amazon.

**P663**

## Christians-Muslims differences in clinical manifestation and risk factors of stable coronary artery disease in tyumen region of Western Siberia

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**Introduction:** Coronary artery disease (CAD) is common and multifactorial. But the influence of religious status on CAD is not well defined. **Objectives:** To assess Christians -Muslims differences in clinical manifestation and risk factors of stable CAD in Western Siberia. **Methods:** This retrospective study involved 6752 Christians (A) and 321 Muslims (B) selected from 7280 consecutive stable patients with angiographic established CAD ($>$50% stenosis) included in local registry of patients undergoing coronary angiography. **Results:** Patients of B were younger than A (53.87.9 vs 55 8.1 years, $p<0.001$). History of heart rhythm disorders and arterial hypertension rates were higher in A (24.5% vs 16.5%, $p=0.001$ and 86.8% vs 82.2%, $p=0.026$, respectively) as well as the value of body mass index ($30.0\pm4.9$ vs $29.3\pm4.7$ kg/m$^2$, $p=0.004$). Rates of smoking, diabetes mellitus, alcohol drinking, history of myocardial infarction, thyroid disorders, total cholesterol and blood glucose levels did not differed significantly between groups. No difference between A and B was observed for severity of heart failure and angina pectoris. According to echocardiographic measurement patients of A compared to B had higher aortic and right ventricular dimensions ($34.9\pm3.7$ vs $34.5\pm3.8$ mm, $p=0.026$ and $25.4\pm2.8$ vs $25.0\pm2.7$ mm, $p=0.005$, respectively). The rates of left main coronary and right coronary lesions were higher in A compared to B (9.7% vs 6.2%, $p=0.039$ and 50.8% vs 43.0%, $p=0.006$, respectively). Multivariate analysis showed independent significant relations between confessional status and age, body mass index, history of heart rhythm disorders and atherosclerotic lesion of right coronary artery. **Conclusion:** In Tyumen region of Western Siberia Muslims cohort of patients with CAD was younger compared to Christians. Some manifestations of CAD were more severe in Christians compared to Muslims independent on age.

**P664**

## Blood pressure, heart rate and psychological anxiety in adult populations

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**Introduction:** It has been postulated that anxiety is the source of a large number of diseases, both the psychic and organic, including hypertension, considered as the hidden enemy. It is important to confirm or refute this association between hypertension and anxiety connotes a lifestyle very vulnerable to stress. **Objectives:** To examine the relationship between Psychological Anxiety (PA) and systolic blood pressure (SBP), diastolic blood pressure (DBP) and heart rate (HR) in adult subjects. **Methods:** In 163 individuals, 123 females and 40 males, mean age 36,44 years (SD= 10,484) blood pressure and HR were recorded in one day doctor's visit, in sitting position the oscillometric method (DINAMAP) was used in all individuals. All patients completed the Zung test for PA that evaluates affective and somatic symptoms of anxiety. Linear regression was used to evaluate the effect of PA on SBP, DBP and HR. **Results:** The linear regression showed that there is a highly significant relationship ($p<0.01$) between PA and the HR, SBP and DBP in females $<$74 years. The estimated models were: HR=59,205+598*PA (R =0,151); SBP=117,161+0,946*PA (R=0,140); DBP=64,348+0,330*PA (R=0, 96). In males between 75 and 81 years showed a significant relationship ($p<0.05$) PA with HR. The model was: HR=30,931+1,202*PA (R=0,236). **Conclusion:** PA was related significantly with HR, SBP and DBP in females $<$74 years, suggesting that these females may be more susceptible to PA as a determinant to HR, SBP and DBP than males in this age group. In male gender was evident that the patients between 75 and 81 ages the PA is related with HR suggesting that these individuals may be more vulnerable to PA as a determinant to HR than females in this age group.

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**P665**

## History of hypertensive pregnancy disorders in young women with ST-elevation myocardial infarction

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**Introduction:** Hypertensive pregnancy disorders(HPD), like gestational hypertension (GH), preeclampsia (PE) and the HELLP syndrome, occur in almost 10% of pregnancies in Dutch females (registry 2008). Several studies have identified HPD and gestational diabetes mellitus (GDM) as female-specific risk factors for early cardiovascular events in women. **Objectives:** In this study we retrospectively evaluated the obstetric history in women with an acute ST-elevation myocardial infarction (STEMI) $<$65 years of age. **Methods:** A total number of 763 consecutive women $<$65 years of age, referred for primary percutaneous coronary intervention for STEMI in our hospital between 1998 and 2010 were sent a questionnaire on their previous obstetric history. **Results:** Data of 500 respondents were available (response rate 66%), of whom 419 had pregnancy in history. Participants were stratified into 3 groups according to age at time of STEMI: $<$50 years, between 50–60 years and $>$ 60 years. No significant differences in the occurrence of various types of HPD were present. However, occurrence of serious pregnancy complications, defined as composite endpoint of preeclampsia, HELLP syndrome and stillborn child, were more prevalent in the youngest age-group. Logistic regression analyses with correction for traditional risk factors for cardiovascular disease, confirmed this non-significant trend. **Conclusion:** In our relatively small cohort we found no significant differences in the prevalence of HPD within 3 age-groups of STEMI patients $<$65 years. There was a non-significant trend however for more serious previous pregnancy complications in the youngest age-group. Larger data are needed to confirm our findings.

**P666**

## Prevalence of normal electrocardiograms in primary care patients: a study by a telemedicine service in Brazil

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**Introduction:** The electrocardiogram (ECG) is a method of investigation of the cardiovascular system, with established diagnostic and prognostic significance, easy to perform, low cost and wide clinical utility. Knowledge of the proportion of normal ECGs and ECG abnormalities in primary care patients is extremely important. Associated with the knowledge of epidemiological data of the population, it allows to estimate the proportion of patients that require further

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investigation. **Objectives:** To assess the prevalence of normal ECGs in patients who were attended at primary care centers of 608 cities in Minas Gerais, Brazil. **Methods:** In this observational and retrospective study, all 12-lead standard digital ECG analyzed by cardiologists of the Centro de Telessaúde do Hospital das Clínicas da Universidade Federal de Minas Gerais, a public telemedicine service in Brazil, in January 2011 were assessed. This service attends primary care of 608 cities in Minas Gerais province.ECGs were sent by remote professionals through internet to be analyzed by cardiologists who are trained and experienced in the analysis and interpretation of ECG. The prevalence of normal ECGs was assessed. **Results:** During the study period, a total of 19,370 ECGs were analyzed (mean patient age 51 ± 19 years, 58.5% women), 54.6% of them were normal. This proportion was higher in women (60.5 vs. 54.1%, p <0.001). Progressive decrease in the prevalence of normal ECG was observed with increasing age: 75.8% from 30 to 39 years, 67.2% from 40 to 49, 56.4% from 50 to 59, 46.6% 60 to 69, 34.9% from 70 to 79 years and 24.2% in octogenarians. Additionally, the prevalence of normal ECGs was lower in patients with hypertension (45.1% vs. 64.2%, p <0.001) and diabetes (45.5% vs. 58.6%, p <0.001). Among the ECGs of patients under investigation for chest pain, 59.3% had no ECG abnormalities. **Conclusion:** This study showed that in primary care patients, normal ECGs account for more than 50% of all examinations, but this prevalence decreases with aging and comorbidities. Furthermore, it was observed that most ECGs performed to investigate chest pain in primary care had no abnormalities.

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## Very elderly patients in a cardiology ward: clinical features and mortality predicting factors

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**Introduction:** Very elderly patients (age over 84 years) are usually underrepresented in clinical trials and guidelines although their prevalence is increasing in Cardiology wards. **Objectives:** This study aims to evaluate the clinical features and identify mortality-predicting factors in a population of very elderly patients admitted to a Cardiology ward. **Methods:** Observational retrospective study conducted over a one-year period (January to December 2009). The study endpoint was in-hospital mortality. Between-groups comparisons of continuous variables were performed using nonparametric tests and categorical variables were compared through the Chi-square test. **Results:** In the study period there were 85 admissions of very elderly patients (60.0% female; age 88.0±2.8 years). The most common causes of admission were bradydysrhythmias (47.1%) and acute coronary syndrome (36.5%), mainly non ST-segment elevation, and the most common diagnosis at the time of discharge were bradydysrhythmias (in 50.6% of all patients) and ischemic heart disease (44.7%). Conventional cardiovascular risk factors were very prevalent: 77.6% of all patients had arterial hypertension, 24.8% type 2 diabetes and 24.7% dyslipidemia. About 21% of all patients were submitted to temporary pacemaker implantation, 42.4% to definitive pacemaker implantation and 20% to cardiac catheterization. Among the 10 patients with ST-segment elevation acute myocardial infarction only 4 were submitted to primary angioplasty. The global in-hospital mortality rate was 11.8%. Patients in the non-survivor group were more likely to be submitted to a primary angioplasty (odds ratio 31.7, 95% CI 2.9–346.9; p=0.005) or an electrical cardioversion (odds ratio 10.3, 95% CI 1.7–60.9; p=0.02). A diagnosis of bradydysrhythmia (odds ratio 0.21, 95% CI 0.04–1.04; p=0.049) and implantation of a definitive pacemaker (odds ratio 0.13, 95% CI 0.02–1.05; p=0.039), particularly dual-chamber (p=0.056), were associated with better in-hospital survival. **Conclusion:** Very elderly patients are becoming an increasingly important group in Cardiology wards, showing a high prevalence of conventional cardiovascular risk factors and a significant in-hospital mortality. In this study the performance of a primary angioplasty or an electrical cardioversion were mortality predicting factors and a diagnosis of bradydysrhythmia and implantation of a definitive pacemaker were survival predictors.

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## Experimental wood smoke inhalation increase arterial stiffness

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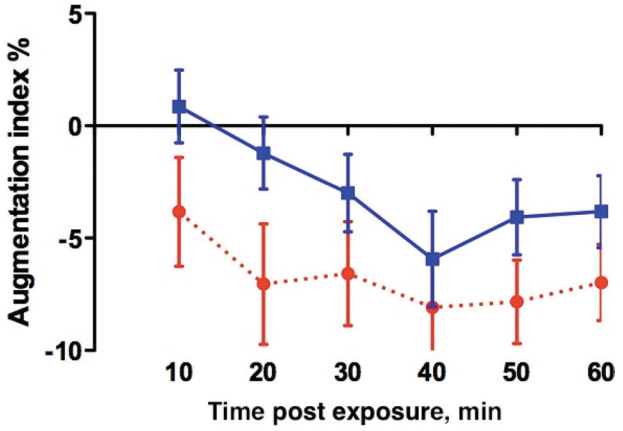
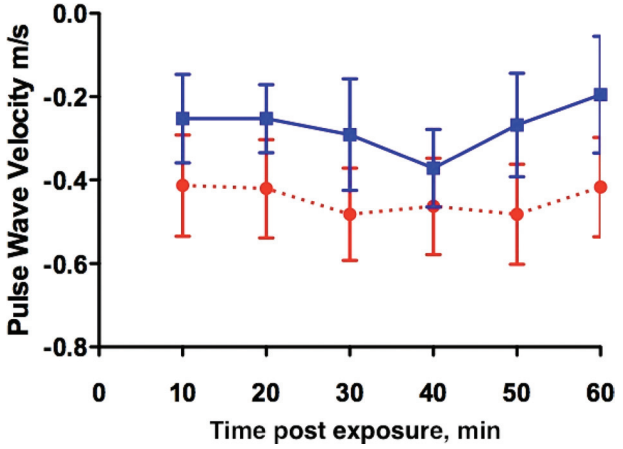
**Introduction:** Air pollution is a risk factor for cardiovascular disease and is estimated to contribute to millions of deaths worldwide annually (WHO 2009). Wood smoke (WS) is, on a global scale, a major source of particulate air pollution, and it is recognized that exposure to WS contributes significantly to lung diseases, less is known about its effects on the cardiovascular system (Naeher et al. 2007). **Objectives:** In this study we assessed the effect of exposure to WS on central arterial stiffness. **Methods:** 14 healthy non-smoking subjects (8 males) participated this randomised double-blind crossover study. The subjects were exposed to diluted WS and filtered air for three hours performing moderate intermittent exercise on two separate occasions. WS was generated in a partial air-starved firing procedure. The WS was diluted with filtered air and fed into a controlled environment exposure chamber. The diluted WS in the chamber had an average $PM_1$ concentration of 314±38 $\mu g/m^3$, $NO_x$ and CO concentrations were 0.41±12 ppm and 26±5.8 ppm, respectively. Heart rate (HR), blood pressure (BP) and central arterial stiffness were measured before and over the hour following the exposure in a quiet temperature controlled room. Central arterial stiffness was determined with pulse wave analysis (augmentation index corrected for heart rate [Aix], augmentation pressure [AP]) using a handheld high-fidelity tonometer and the SphygmoCor™ apparatus (AtCor Medical, Sydney, Australia) and carotid-femoral pulse wave velocity (PWV), measured using the Vicorder (Skidmore Medical, UK) apparatus. **Results:** Systolic and diastolic BP did not differ following either exposure (p=0.86 and p=0.21). Heart rate was increased after wood smoke exposure as compared to filtered air (p=0.03) as was AIx, AP, and PWV (p=0.0003, p=0.004 and p=0.005 respectively) reflecting an acute increase in arterial stiffness.

**Image/graph I:**




**Image/graph II:**




**Conclusion:** A single brief exposure to WS is associated with acutely increased central arterial stiffness and elevated HR. Whilst the increases are small, they could represent an increased risk to susceptible individuals such as those with pre-existing cardiovascular disease. This calls for further studies investigating the relationship between biomass smoke and cardiovascular health.

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**P670**

## Urban air pollution associated with plasma d-dimer and decreased heart rate variability

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**Introduction:** Among mechanisms link to air pollution and cardiovascular disease, increased coagulation profile has been proposed and confirmed. However, there is still lack of evidence to demonstrate increased fibrinolytic pathway by increased levels of plasma D-dimer after particulate matter (PM) air pollution exposure. **Objectives:** To investigate the mechanism behind the triggering effect of PM air pollution on cardiovascular events, focus on fibrinolytic parameters and autonomic balance. **Methods:** A panel study of 61 patients living in Taipei metropolis with multiple CVD risk factors was prospectively conducted to investigate the changes of blood markers of inflammation and coagulation, and heart rate variability (HRV) after short-term exposure to urban air pollution. Between April and June of 2005 and 2006, two measurements (one year apart) were made in each participant of high-sensitivity C-reactive protein (hs-CRP), plasminogen activator fibrinogen inhibitor-1 (PAI-1), tissue-type plasminogen

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activator (tPA), fibrinogen, and D-dimer in plasma, and HRV. Gaseous and particulate air pollutants were measured at one PM supersite monitoring station in Taipei metropolis. We used linear mixed-effects models to associate biological markers with individual air pollutants averaged over 1- to 3-day periods before measurements were performed. **Results:** We found that increases in plasma D-dimer levels associated with levels of particle matter with aerodynamic diameters less than 10 $\mu$m ($PM_{10}$), nitrate, total carbon, organic carbon, elemental carbon, and sulfate in single-pollutant model. The levels of hs-CRP increase in association with carbon monoxide and sulfate exposure. Decreases in HRV indices were associated with increases in levels of $PM_{10}$, $PM_{2.5}$, and sulfate. **Conclusion:** Urban air pollution has a significant effect on blood measures of D-dimer in subjects at high-risk for CVD, with $PM_{10}$, organic and elemental carbon particles, and sulfate as major pollutants. In addition, autonomic imbalance increased with $PM_{10}$, $PM_{2.5}$,* and sulfate concentrations.

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**P671**

## ERK5 knock down aggravates detrimental effects of hypothermal stimulation on cardiomyocytes via bim upregulation

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**Introduction:** Cold stress triggers pathological changes in cardiovascular system. Mechanism of cold induced myocardial injury remained unclear. ERK5/Bim pathway is potential targets for therapeutic intervention in hypothermal stimulation induced myocardial injury. **Objectives:** To investigate role of ERK5/Bim pathway in hypothermal stimulation-induced damage or apoptosis of cardiomyocytes. **Methods:** Rat specific siRNA were used to knock down ERK5 or Bim in neonatal rat cardiomyocytes (CMs). Hypothermal stimulation was performed as CMs incubation in 35 centi-degrees, 5% $CO_2$ incubator for 8 hours/day for 4 days. Control group was persistently incubated under normal 37 centi-degrees condition. We setted control group (C); hypothermal stimulation group (S); hypothermal stimulation plus noncoding siRNA group (SN); hypothermal stimulation plus Bim siRNA group (SB); hypothermal stimulation plus ERK5 siRNA group (SE); hypothermal stimulation plus ERK5 and Bim double siRNA group (SBE). Bim or ERK5/p-ERK5 protein expression was detected by western blot. Intracellular calcium was measured by Fluo-3AM probe loading method. ROS was detected using carboxy-H2DCFHDA labelling. Mitochondrial membrane potential ($\Delta\Psi$m) was evaluated by JC-1 staining. Detection of apoptosis was performed using Annexin V-FITC/PI apoptosis detection kit. **Results:** In CMs which under hypothermal stimulation, ERK5 siRNA promoted expression of Bim protein (S: $1.04\pm0.09$ vs. SE: $1.54\pm0.14$, $P<0.05$). Bim siRNA didn't influence ERK5 expression but attenuated production of p-ERK5. ERK5 siRNA induced higher apoptosis rate in hypothermia stimulated CMs (S: $32.5\pm2.01\%$ vs. SE: $41.3\pm4.21\%$, $P<0.01$), while Bim siRNA effected oppositely and canceled pro-apoptotic effect of ERK5 siRNA (SB: $15.9\pm1.02\%$; SBE: $27.01\pm2.82\%$). Intracellular $Ca^{2+}$ overload and ROS activity were more severe in SE group, while lighter in SB group, when compared with S or SN group. Bim siRNA rescued higher intracellular $Ca^{2+}$ overload and ROS activity that induced by ERK5 siRNA. $\Delta\Psi$m was more significantly damaged in SE group. Bim siRNA attenuated inhibition to $\Delta\Psi$m that induced by hypothermal stimulation, and canceled the detrimental effect of ERK5 siRNA. **Conclusion:** ERK5 knock down releases inhibition to Bim expression, induces aggravated apoptosis in CMs under hypothermal stimulation, which related to higher intracellular $Ca^{2+}$ overload, ROS activity, and more severe $\Delta\Psi$m damage. Results revealed regulative role of ERK5/Bim pathway in hypothermal stimulation-induced injure or apoptosis of cardiomyocytes.

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## Is the response to treadmill exercise testing of normal children and adolescents in emergent countries different from developed countries?

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**Introduction:** Although efforts are being made forward use stress test (ST) in post-interventions periods, normal parameters in children and adolescents were not well established, mainly in emergent countries. **Objectives:** To establish reference parameters for aerobic and functional capacity (FC) of cardiovascular responses to ST in an emerging country and compare them with those observed in developed countries. **Methods:** A prospective study was conducted with 114 children between 4 and 18 years old, 66 male, referred for suspected heart disease, not confirmed after clinical examination, EKG, chest X-ray and echocardiogram and referred for ST by Bruce protocol for a complete functional evaluation. The participants were divided by gender and distributed according to age, and then analyzed FC, the Maximum Heart Rate (HRmax) achieved, systolic and diastolic blood pressures (SBP, DBP) and double product (DP) as well as clinical and electrocardiographic changes. This study was approved by institutional ethical board for human research. **Results:** FC increased with age, except for girls over 14 years old (12.25 at 11–14 years old vs 10.71 over 14 years old, $p=0,070$). The FC was higher in males than females teenagers ($p<0.0001$). The HRmax was always above 180bpm, no significant differences according to age and gender, except in girls under 7 years old that reached 195 bpm against 182 for boys ($p=0,029$). The change in SBP with exercise ranged from 20.8 mmHg in girls younger than 7 years to 42.3 mmHg in boys more than 15 years. DBP decreased with effort in all cases (ranging from -5.0 to -16.3mmHg). The DP at maximum stress was always greater than 20,000 and greater in adolescents because of higher values of SBP achieved. The EKG during exercise showed no abnormalities, only apiculate T wave in lead V2 in early recovery. **Conclusion:** The FC of children from emergent countries was not different from published data observed in developed countries. The absence of correlation between HRmax and age precludes the use of Karvonen formula to estimate it. The DP should be over 20,000 in normal children. The SBP increase and DBP decrease following the normal adulthood profile.

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## Prevalence of mitral valve prolapse in Russian population

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**Introduction:** Epidemiology of mitral valve prolapse (MVP) has been described in different ethnic groups with controversy data on prevalence depending on age, sex, echocardiographic criteria and ethnicity itself. **Objectives:** We studied prevalence of MVP in russian population using a large echocardiographic database. **Methods:** We retrospectively analyzed 11,749 echocardiograms performed between 2008 and 2010 in out-patient department of Almazov Federal Heart, Blood and Endocrinology Centre for different clinical reason. The echocardiograms were performed on commercially available system (Vivid 7 Dimension, G). MVP was diagnosed bybillowing of 1 or both mitral leaflets >2 mm above the mitral annulus in the long-axis parasternal view. By maximal leaflets thickness 5 mm MVP defined as classic, otherwise as nonclassic.

**Results:**

| | MVP | Without MVP | p< |
|---|---|---|---|
| Anterior leaflet length, mm | 24.8±3.5 | 21.6±2.0 | 0.001 |
| Anterior leaflet thickness, mm | 3.6±1.3 | 2.5±0.5 | 0.001 |
| Posterior leaflet length, mm | 11.6±1.8 | 10.8±1.6 | 0.01 |
| Posterior leaflet thickness, mm | 4.0±1.0 | 2.8±0.6 | 0.05 |
| Mitral annular diameter, mm | 31.3±3.7 | 26.0±3.6 | 0.01 |

The echocardiographic prevalence of MVP was 1.8% (216 subjects). 70 (0.6%) of them had classic and 146 (1.2%) nonclassic MVP. The prevalence of MVP was similar in female (1.9%) and male (1.6%) patients. The mean age of patients with MVP was 50.1 ± 19.5 versus 51.6 ± 18.9 years in those without MVP. Subjects with MVP had a significant longer and thicker leaflets and larger mitral annulus diameter than others (Table). Degree of mitral regurgitation was higher, often late-systolic in MVP ($p=0,003$). Age, sex, height, weight, left ventricular end-diastolic and end-systolic diameters and volumes, and left ventricular ejection fraction, diastolic function parameters were similar in subjects with and without MVP. The prevalence of tricuspid and aortic valve prolapses was higher in subjects with MVP ($p=0,005$). **Conclusion:** In the large sample of urban Russian population the prevalence of MVP is lower than what was previously reported (e.g. Framingham Heart Study).

**P674**

## National trends mask important county-level spatio-temporal trends in gender disparities for heart disease mortality, United States, 1970–2006

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**Introduction:** Worldwide, women have historically had lower heart disease (HD) death rates than men. In the US, this gender disparity (GD) widened during the mid 1900s but has subsequently narrowed given steeper rates of HD mortality decline among men than women. Local trends, especially across race groups, may be different from these national trends. **Objectives:** Examine spatio-temporal trends of GD in HD mortality at the county level in the US. **Methods:** The study population included all black men (BM), black women (BW), white men (WM) and white women (WW), aged ≥ 35 years. Deaths recorded as 'Diseases of the Heart' for the underlying cause of death were obtained from the National Center for Health Statistics. International Classification of Disease (ICD) codes were used for the ICD-8, ICD-9 and ICD-10 revisions. Comparability ratios were 1.01 and 0.99 respectively, so no adjustments were needed. Bayesian hierarchical models were used to generate spatially-smoothed estimates of HD mortality for each race-gender-county. For each 2-year period, gender disparity was classified as status quo (SQ), convergence (CV), or crossover (CR) as determined by rates for women being less than, equal to, or greater than those for men, respectively. Summarized temporal trends of GD were used to classify each county as SQ, CV, or CR. **Results:** An increasing trend in the occurrence of CV and CR events was observed for each of the GD groups except for WW-WM, with steep increases in the number of CV events beginning in the 1989–90 period. By the end of the study period, the number of CV events was 198 for BW-WM, and 105, 91, and 12 for BW-BM, WW-BM, and WW-WM, respectively. The number of CR events was also

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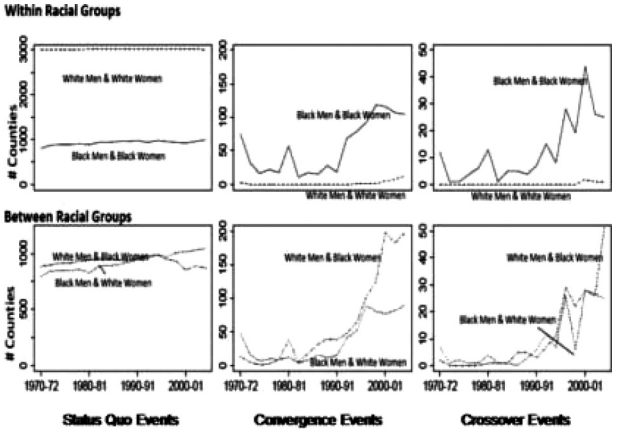
largest for BW-WM (51), followed by BW-BM and WW-BM (each with 25 CR events) and lowest for WW-WM (1).

**Image/graph I:**




**Conclusion:** In an increasing number of counties, HD mortality rates in women are becoming similar to or higher than rates for men. This finding suggests that environmental factors can override female biological protectiveness for HD. The actual causes of these trends are uncertain and deserve definitive examination.

**P675**

## Are we there yet? closing the gap in indigenous health in Australia: monitoring clinical performance in aboriginal and Islander Community control health services in Queensland

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**Introduction:** Aboriginal people in Australia continue to experience a high burden of chronic disease, including cardiovascular disease. Aboriginal Medical Services (AMSs) are a significant component of the effort to reduce this burden and must be supported to deliver the highest quality care. **Objectives:** To evaluate clinical health care performance in Queensland Aboriginal and Islander Health Council (QAIHC) member Aboriginal Medical Services (AMSs) in Australia. **Methods:** In October 2009, AMSs in Queensland began to use a standard indicator set, the QAIHC Core Indicators, to monitor recorded prevalence and management performance on a number of key risk factors, clinical care activities and chronic diseases. Data is extracted monthly from clinic electronic medical record systems (EMRs) and submitted to a web based portal for services to review their performance over time and benchmarked. A copy of the data is also sent to the QAIHC data repository to allow agreed secondary analysis to occur. In July 2011 longitudinal data was analysed to examine trends in the number of participating services, proportion of patients with current recording of key health care activities and the prevalence of risk factors and cardiovascular disease. **Results:** From October 2009 to July 2011, AMSs sending data *for the QAIHC Core Indicators* increased from 6 to 15 participants; the number of patients for whom data was captured increased from 10,800 to 26,004 of whom 19,634 (75.5%) were regular Indigenous patients in July 2011. The aggregated performance of participating services was consistent and excellent on the recording of a number of number of key risk factors and health care activities (for example tobacco use, blood pressure) and poor for others, with some improvement over time. Performance Variation in performance between services was greatest for care planning and health check activity. Hypertension was identified in a total of 2567 (19.2%) regular Indigenous adult patients, with a range in prevalence of 12–36% across the 15 services. The care delivered for hypertension was universally good. **Conclusion:** The prevalence of hypertension is high in the Aboriginal Community in Australia, its management by AMSs across Queensland meeting best practice standards. Indicator sets built into existing information systems provides useful timely information for Aboriginal Medical Services. Lessons learnt should enable a similar system to be implemented in AMSs across Australia in 2012.

**P676**

## Cardiovascular research output and actual citation impact of Argentina, India, and South Africa: a bibliometric approach

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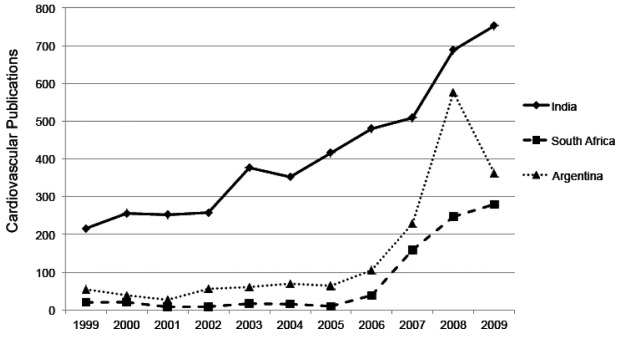
**Introduction:** Global cardiovascular research output and research quality appears to be increasing, particularly in low- and middle-income countries. However, there are limited objective data evaluating these potential trends. **Objectives:** To evaluate the cardiovascular research output and research quality of three middle-income countries: Argentina, India, and South Africa between 1999 and 2009. **Methods:** We created a bibliometric filter to capture cardiovascular research articles published in the *Web of Science* based on specialist journals and title words. Two co-authors with expertise in cardiovascular medicine (MDH, GSB) tested and refined this filter to achieve >90% precision and recall of cardiovascular research papers. We determined the research output of three countries (Argentina, India, South Africa) and estimated research quality from their mean actual citation impact (ACI) from 1999 to 2006. **Results:** Argentina published 1,657 cardiovascular research papers, India 3,403, and South Africa 838 between 1999 and 2009 in the *Web of Science*, with a substantial increase in production over that time period, particularly after 2006 (Figure 1). Five-year mean ACI values between 1999 and 2006 were 3.1 (SE = 0.4) for Argentina, 2.4 (SE = 0.3) for India, and 6.2 (SE = 0.9) for South Africa.

**Image/graph I:**

**Figure 1. Web of Science Cardiovascular Publications by Country (1999-2009)**




**Conclusion:** These data provide objective evidence that cardiovascular research output has substantially increased in Argentina, India, and South Africa over the past decade. Potential reasons for these increases include increased number of journals published in *Web of Science*, increasing interest in cardiovascular research, increased availability of local resources for research, and increased in research output associated with more international collaborators. The potential reasons for these increases, as well as reasons for differences in ACI across the three countries, merit further investigation.

**P677**

## The level of HDL in patients with CAD comparing to patients with normal coronary in the Arab and eastern population comparing to the western population

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**Introduction:** It is well known that elevated LDL has a significant risk factor for developing CAD. There is a large number of studies to confirm that association, however, low HDL has been proposed as a risk factor for CAD but there is only limited number of data in that regard, especially in the Middle East. **Objectives:** To evaluate the prevalence of low HDL in patients with CAD by angiogram comparing to the level of HDL of patients with normal coronary. The analysis includes the ethnicity and sex of the subject. **Methods:** Chart review and angiogram review of all patients who underwent coronary angiogram at a single center in Dubai. Every patient who underwent angiogram will retrieve his/her lipid profile which was done just before or after angiogram. Also included in the study are the demographic data of the patients. The patients were divided into Easterns and Westers. The Eastern group includes people from the Middle and Far East. The Western includes Europeans and Americans. **Results:** The total number of patients in the study was 635. 473 were males, and 162 were females. 444 were Easterns, 191 were Westerns. Mean age for males was 54, and 61.7 for females. Mean age for Easterns was 56.7, and 54 for Westerns. For subjects with normal coronary the mean LDL,HDL values for Easterners: 2.95,1.25, Westerners: 3.10,1.39 (p=0.4,0.067). For subjects with abnormal coronary the mean LDL,HDL values for Easterners: 2.82,1.10, Westerners:

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3.20,1.18 (p=<0.001,0.015). For males with normal coronary the mean LDL,HDL values for Easterners: 2.87,1.11, Westerners: 3.12,1.22 (p=0.25,0.064). For females with normal coronary the mean LDL,HDL values for Easterners: 3.08,1.47, Westerners: 3.04,2.01(p=0.92,0.001). For males with abnormal coronary the mean LDL,HDL values for Easterners: 2.91,1.03, Westerners: 3.24,1.11 (p=0.006,0.015). For females with abnormal coronary the mean LDL,HDL values for Easterners: 2.60,1.25, Westerners: 2.91,1.75 (p=0.23,0.009).

**Conclusion:**

- HDL level is lower in patients with CAD compared to individuals with normal coronaries in all studied ethnic groups.
- HDL in eastern population is lower than that in western population in the presence or absence of CAD.
- HDL level in females is higher than the level in males whether they have CAD or not, in both eastern and western populations.
- There is no statistical significant difference in LDL values in subjects with normal coronary whether male or female, however, in patients with abnormal coronary the LDL values were lower in Eastern males comparing to Western males.

**P678**

## Secular trends in cardiovascular risk profile and mortality amongst stroke admissions in a district general hospital population in the UK: 1997–2006

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**Introduction:** Stroke is the third most common cause of death in developed countries and is a leading cause of severe disability. In recent years there have been major advances in the identification and management of vascular risk factors together with improved treatment of acute stroke. Previous studies in the UK have focussed exclusively on inner-city tertiary hospitals, and have demonstrated temporal trends and ethnic disparities in vascular risk profile. **Objectives:** This study investigates first-in-lifetime non-haemorrhagic stroke admissions to a suburban district general hospital in the UK, serving a predominantly Caucasian population. We examined secular trends in admission rates, demographics, cardiovascular risk profile, and mortality. **Methods:** Information from the Hospital Activity Analysis was used to construct a database of 2213 first-in-lifetime non-haemorrhagic stroke patients admitted to a large suburban district hospital in outer Birmingham, UK during the period 1997–2006. ICD-10 criteria were utilised for disease classification and written hospital case notes were consulted for more detailed information. **Results:** Admission rates for first-in-lifetime non-haemorrhagic stroke decreased from 1.52 per 1000 admissions in the period 1997–2001 to 1.42 during the period 2002–2006 ($P<0.05$). This was mainly attributable to the decrease in the majority (94.6%) European Caucasian ethnic group from 1.74 to 1.52 per 1000 admissions over the time period(P=0.04). The Afro-Caribbean group showed an increase from 1.88 to 3.11 per 1000 admissions ($P=0.01$). South Asians and Afro-Caribbeans were younger at admission compared to Caucasian patients ($P<0.001$). South Asians and Afro-Caribbeans had a higher prevalence of hypertension and diabetes compared to Caucasians ($P<0.05$). Hyperlipidaemia was found to be higher in the Afro-Caribbean population compared to the other ethnic groups ($P<0.05$). The majority of studied vascular risk factors such as diabetes, hypertension, hyperlipidaemia, peripheral vascular disease, atrial fibrillation, ischaemic heart disease increased from the period 1997–2001 to 2002–2006 possibly reflecting improved detection. **Conclusion:** Incidence of first-in-lifetime non-haemorrhagic stroke in Afro-Caribbeans increased during the period 1997–2006. This may be due to the higher prevalence of hyperlipidaemia and hypertension in these patients. Our work suggests the role of targeted stroke primary prevention measures in ethnic minorities in the UK.

**P679**

## Secular trends in the cardiovascular risk profile of acute mi admissions in a district general hospital in the United Kingdom (1997–2005)

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**Introduction:** Myocardial Infarction(MI) is the main cause of death in Europe and accounts for over 3 million deaths per year. Over the last decade, improved detection and vigorous management of known risk factors such as hypertension, diabetes etc has occurred in the UK attributable to changes in clinical guidelines and targets in primary health care. **Objectives:** We hypothesised that trends in rate of MI and the cardiovascular risk factor profile of patients suffering from MI has changed over the last decade. We investigated the secular trends of patients with MI in a large district general hospital serving a multiethnic population during the years 1997–2005. **Methods:** Anonymous information on acute MI patients attending a large multi-ethnic general hospital in Birmingham, UK in the period 1997–2005 was obtained from the local health authority computerised hospital activity analysis register. We observed trends of acute MI admissions according to demographics and co-morbidities including type 2 diabetes mellitus, hypertension, hyperlipidaemia etc were diagnosed according to national guidelines. **Results:** Between 1997–2005, 3473 patients were admitted with acute MI. Mean age 69.0years. The majority of these patients were European Caucasian(EC = 93.5%). South Asian(SA) patients were significantly younger compared to EC and Afro-Caribbean(AC) counterparts (p<0.001). Hypertension and Diabetes were significantly higher in both the SA and AC groups. Dividing the study period in three groups over the study period, the number of admissions for MI decreased from 1844 (53.1%) in 1997–1999 to 760 (21.9%) 2003–2005. In terms of risk factors for Acute MI patients, hypertension and diabetes increased from 18.4% and 9.7% to 28.4% and 16.6% in 2003–2005, possibly reflecting improved detection.. Interestingly the decrease in MI admissions was not uniform across all ethnic groups. In the AC group the admission rate as a proportion of total MIs increased from 0.1% to 7.1% in 2003–2005. **Conclusion:** The decrease in MI admissions, accompanied by increases in the main risk factors such as hypertension and diabetes reflect the positive impact of national initiatives to improve detection and management of cardiovascular risk factors. The decrease is not uniform across all ethnic groups having significantly increased in the AC group. This finding suggests that there are ethnic inequalities in the delivery of healthcare. Our challenge now is to delineate and resolve such disparities.

**P680**

## Acculturation, coronary artery disease and carotid intima media thickness in the south asian immigrants: unique population with increased risk

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**Introduction:** South Asian Immigrants (**SAIs**) are the 2nd fastest growing Asian immigrant population in the US with high rates of coronary artery disease (**CAD**) and type 2 diabetes (**T2D**). There is need to identify markers that can help in identifying high risk groups at early stage so CAD can be prevented. **Objectives:** Tomeasure the level of acculturation and its association with, CAD, sub-clinical CAD, CAD risk factors and T2D in SAIs in the US. **Methods:** Using an epidemiologic cross-sectional study design, 159 SAIs between the ages of 35–65 years were recruited. Sub-clinical CAD was assessed using common carotid artery intima media thickness (**CCA-IMT**) as a surrogate marker for atherosclerosis. Scaled (The Suinn -Lew Asian Self-Identity Acculturation scale-**SL-ASIA Scale**) and non-scaled (≥ 10 years stay in the US) methods were used to measure the acculturation. **Results:** 67.7% of SAIs were identified to have high acculturation based on SL-ASIA scale. On the logistic regression age-adjusted model, ≥ 10 years stay in the US (p=0.006), cholesterol level ≥ 200 mg/dl (p<0.001), BMI ≥ 23 (p=0.004), and family history of CAD (0.007) were found to be significantly associated with CAD.T2D was associated with high acculturation (p<0.001) and CCA-IMT (p=0.01) beside other CAD risk factors. **Conclusion:** Acculturation may play a major role in predisposing immigrant population to CAD. However not sufficient research has been done in this field. Furtherstudies are needed to provide large scale information on acculturations and its association with CAD. This is a promising area for further research.

**P681**

## Quality of in-hospital management in women with acute coronary syndrome in China: results from the bridging the gap on CHD secondary prevention in China (BRIG) project

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**Introduction:** Coronary heart disease (CHD) is the major cause of death in women of China and also in many regions of the world. Our previous study showed that, in the out-patient department in China, the quality of care for high risk CHD patients was worse in women than that in men. However, little data is available on the quality of care for women hospitalized for acute coronary syndrome (ACS). **Objectives:** In the present study, we aimed to assess the quality of care for women with ACS in China. **Methods:** A total of 65 hospitals from all 31 provinces of mainland China and the Hong Kong special administrative region were recruited using a multistage non-randomized sampling approach. A questionnaire including in-hospital medication and procedure information was completed according to the medical records of 3168 ACS patients, of which 1010 were women. **Results:** Only 35.1% of the women with ACS received clopidogrel/ticlopidine, 88.7% of these patients received aspirin, 58.4% received a low molecular weight heparin, 68.0% received an angiotensin-converting enzyme inhibitor/angiotensin receptor blocker, 66.5% received a $\beta$-blocker, and 66.1% received a statin. Only 8.9% of these patients received all the above mentioned six medications. Only 24.6% of these patients received reperfusion therapy (including percutaneous coronary intervention, thrombolytic therapy, and coronary artery bypass graft), of which 74.4% received percutaneous coronary intervention. The treatment rates of all the guideline recommended strategies were lower in women than those in men and this distinction was most significant in patients with unstable angina. **Conclusion:** Substantial portion of women with ACS did not receive proper treatment during hospitalization in China than men did. The quality of care for women with ACS in China was unsatisfied and was in urgent need of improvement.

**P682**

## Comparison of patient-reported optimal cardiac care services and publicly reported performance data

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**Introduction:** Despite widely available evidence-based treatment guidelines, only about 50% of US coronary heart disease (CHD) patients meet all of 4 optimal cardiac care (OCC) criteria,

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i.e. BP and LDL at target, no tobacco use, on aspirin. Since most CHD secondary prevention is delivered by primary care (PC), we are implementing and evaluating a nurse-led physician-directed system (NLPD) for achieving CHD secondary prevention goals in a private PC medical group. **Objectives:** Prior to implementing the intervention, we obtained patient reported baseline rates of care and compared them with performance data for the same practice published online by Minnesota Health Scores (MHS). **Methods:** We mailed surveys to randomly selected CHD patients from the 5 PC clinics to assess patient report of OCC services received as of their last clinic visit. Descriptive data for each criterion and a composite score (blood pressure check, cholesterol test, taking aspirin or contraindicated, tobacco free) are presented. **Results:** 75% (N=456) of randomly selected CHD patients responded to the mailed satisfaction survey. Mean age was 70.1 (SD = 10.4); 71% were men. Pre-intervention CHD Patient Self-report of OCC Services.

**Image/graph I:**

| OCC Criterion | N (%) | MHS Performance, N = 367 |
|---|---|---|
| **Blood Pressure (BP):** | | **BP < 130/80 75%** |
| Checked last visit | 435/456 (95) | |
| On BP med if has hypertension | 314/324 (97) | |
| Written or MD advice | 346/456 (76) | |
| **Cholesterol:** | | **LDL < 100mg/dl 78%** |
| Test past 2 years | 441/456 (97) | |
| On cholesterol med if indicated | 352/369 (95) | |
| Written or MD advice | 317/456 (70) | |
| **Aspirin:** | | **daily aspirin use 97%** |
| Taking aspirin or contraindicated | 399/456 (88) | |
| Asked if on aspirin | 336/456 (74) | |
| Written or MD advice | 238/456 (52) | |
| **Tobacco:** | | **tobacco free 75%** |
| Tobacco Free | 389/456 (85) | |
| Advised to quit if smoking | 42/51 (82) | |
| Written or MD advice | 40/51 (78) | |
| **Composite:** | 353/456 (76) meet criteria | 51% meet all 4 goals |

**Conclusion:** Although the proportion of patients who report receiving OCC services is high, there is a significant gap between the proportion receiving a service and the proportion at goal for the service. The intervention will test whether a financially feasible clinical care system can reduce this discrepancy.

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**P683**

## Provider and staff beliefs and attitudes about creating care systems for the secondary prevention of coronary heart disease in a private medical group

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**Introduction:** We are conducting an NIH-sponsored trial to determine whether a Nurse-Led Physician-Directed (NLPD) coronary heart disease (CHD) secondary prevention system (SPS) can be developed to increase rates of optimal cardiac care (OCC) and increase patient and provider satisfaction. The system must also be economically feasible for the medical group. **Objectives:** To elicit the attitudes and beliefs that care providers and other employees hold about a CHD SPS. These data will be used to guide program development. **Methods:** We surveyed all providers and staff who care for CHD patients. Three scores were created and rescaled to a range of 1 (strongly disagree) to 10 (strongly agree). Cronbach's alpha values ("a") were calculated. **Results:** 178 providers and staff from 5 clinics (76%) responded to the survey. 79.3% were female; 33% were providers, 67% were clinical services staff. Mean years in patient care were 12.6 (SD 10.4). Perceived need to improve the way in which to achieve OCC (a=0.93) averaged 6.3 (SD 2.3). Support for the development of SPS (a=0.75) averaged 7.6 (SD 1.3). Perceived leadership commitment to improve SPS (a=0.93) averaged 7.8 (SD 1.8). **Conclusion:** These data demonstrate that providers and other employees perceive a need to improve the delivery of CHD secondary prevention services, support the development of SPS to provide OCC, and perceive that leadership is committed to increasing OCC rates. These attitudes and beliefs create a strong platform upon which to build an economically viable CHD SPS that increases OCC while increasing patient and provider satisfaction.

**P684**

## Is there relationship between type of antiphospholipid antibody and cardiac manifestations in patients with antiphospholipid syndrome?

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**Introduction:** Antiphospholipid syndrome (APS) patients suffer from various cardiovascular manifestations with the presence of antiphospholipid antibodies (aPL). **Objectives:** To evaluate possible relationship between type of aPL and cardiac manifestations in patients with APS. **Methods:** We analyzed 374 APS patients: 260 PAPS (69.5%) (76.2% female and 23.8% male) average age 45.60±13.33 years and 114 (30.5%) SAPS (SLE) patients (87.7% female and 12.3% male) average age 46.29±15.01 years. aPL analysis included analysis of aCL (IgG/IgM), $\beta$2GPI (IgG/IgM) and LA. In all patients echocardiography study was performed in order to reveal presence of vegetations, pseudoinfective endocarditis, intracardiac thrombus and valve thickening or dysfunction. Data considering acute myocardial infarction, unstable angina, coronary artery bypass grafting (CABG) or percutaneous coronary artery angioplasty (PTCA) as well as presence of cardiomyopathy or heart failure were also collected. **Results:** There was 35.8% aCL-IgG, 53.8% aCL-IgM, 31.9% $\beta$2GPI IgG, 37.3% $\beta$2GPI IgM and 51.2% LA positive PAPS patients. Among SAPS patients 58.8% were aCL-IgG, 63.2% aCL-IgM, 42.1% $\beta$2GPI IgG, 43.9% $\beta$2GPI IgM and 49.1% LA positive. In PAPS patients aCL-IgM positivity was connected to lower incidence of overall cardiac manifestations (p=0.044) but LA presence was higly statistically significantly related to myocardial infarction occurrence (p=0.004). On the other hand, in SAPS patients aCL IgM positivity was significantly related to pseudoinfective endocarditis occurrence (p=0.036) and $\beta$2GPI IgM presence was connected to valve thickening and dysfunction (p=0.027). In all other cardiac manifestations no significant relationship was found in PAPS as well in SAPS patients. **Conclusion:** Future analysis will reveal positive or negative prediction value of specific aPL considering cardiovascular manifestations in patients with APS.

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**P685**

## The role of thoracic fat in coronary artery disease

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**Introduction:** The body mass index (BMI) is an adiposity measure commonly used. The pathogenic value of visceral fat deposits has been highlighted in numerous studies and many quantifiers have been investigated in this regard. **Objectives:** To assess the relationship of BMI, different kinds of thoracic fat with the cardiovascular risk (CVR) and the prevalence of coronary atherosclerosis(AT) and significant coronary artery disease (sCAD). **Methods:** A retrospective study of 148 consecutive patients (P) who underwent cardiac MDCT (Phillips Brilliance, 16-slices): 37.8% men, 62±13 years, 23.6% diabetics, 73.6% hypertensive, 51.4% with dyslipidaemia and 12.2% smokers. Thoracic fat volumes ($cm^3$) were measured with an Aquarius 3D–TeraRecon workstation: pericardial fat (PF: adipose tissue located within the pericardial sac), intrathoracic extra-pericardial fat (IF: adipose tissue located within the chest outside the pericardial sac) and chest fat (CF: adipose tissue upper the rib cage). The relationship between these values, BMI, AT and sCAD (identified by MDCT) was evaluated. P were then separated into 2 groups: IF+ (IF≥67.7$cm^3$) e IF- (IF$^3$), which were compared regarding analytical parameters, CVR factors (CRF) and scores (CRS), the calcium score (CS) and the presence of AT and sCAD. **Results:** The ROC curve analysis identified the IF as the measure of adiposity best related to sCAD: AUC 0.63, CI95%, p=**0.**046 (vs PF: AUC 0.58**,** pns; CF :AUC 0.42, pns; BMI: 0,49, pns). It also identified the best threshold for this association: 67,7$cm^3$ (sensibility 77%, specificity 52%). The P IF+ were mostly male (48.8 vs 25.4, p=0.004), older (67±10 vs 57±14, p<0.001), had higher BMI (30±4.8 vs 28±4.0Kg/$m^2$, p=0.002), prevalence of diabetes (32.0 vs 16.7%, p=0.035), hypertension (HT: 89.6 vs 66.2%, p=0.001) and renal dysfunction (GFR (MDRD): 78±25 vs 90±24 mL/min/1.73$m^2$, p=0.016).The CRS were higher for IF+ (Framingham: 15±7.5 vs 13±6%, p<0.001; SCORE 3.4±3.2 vs 1.4±1.2%, p<0.001) as well as the CS: 350±837 vs 178±75, p=0.01. The group IF+ had also a higher prevalence of AT (75 vs. 47.7%, p=0.01) and sCAD (21.3 vs. 7.5%, p=0.020). By multivariable regression only the male gender was an independent predictor of sCAD (OR 3.38, CI95%, p=0.019). **Conclusion:** According to these data, IF was related with sCAD. This association was found in a context of higher CVR, which was identified by a value of IF≥67.7$cm^3$. It was not an independent predictor of sCAD, which suggests its value as a marker of metabolic risk, similar to the abdominal fat.

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## Efficiency of various parameters of obesity for identifying severity of coronary artery disease in egyptian patients

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**Introduction:** The prevalence of obesity is reaching epidemic proportions in many countries. Recently, Egypt is enlisted as one of the top 10 fattest countries in the world. However, little is known about which parameter of obesity can be associated with severity of coronary artery disease (CAD). **Objectives:** In this study, we examined the relationship between various parameters of obesity and extent of CAD in Egyptian patients. **Methods:** The study population consisted of 450 patients (mean age 53 ± 9 years, 56.9% were males) in whom elective coronary angiography was performed. All patients had measurement of body mass index (BMI), waist-to-height ratio (WHtR) and waist-to-hip ratio (WHR). Obesity was defined as BMI 30 or more, WHtR >0.5 or WHR >0.85 in females and >0.90 in males. Markers for significant CAD were 3 or more vessel disease (VD) of any plaque severity, >3 plaques causing 50% or more luminal stenosis (LS) or 1 or more proximal plaque (PP) causing >50% LS. CAD was considered severe if the patient had any combination of these markers. We used receiver operating characteristic (ROC) curves to find the association of various obesity parameters with severe CAD. **Results:** According to BMI, markers of significant CAD were met less frequently in obese patients compared to non obese. Unexpectedly, 1 or more PP causing >50% LS was met in only 41.4 of obese patients vs. 52.8 of non obese, p= 0.018. Classifying patients according to WHtR failed to show any significant difference between obese and non obese patients as regards prevalence of significant or severe CAD. Increased WHR was the only measure of obesity that showed increased prevalence of >3 VD (15.3 vs. 2.7, p= 0.045), 31 PP causing >50% LS (49.9 vs. 18.9, p<0.000) and severe CAD (19.6 vs. 5.4, p= 0.043). WHR had the highest AUC in men (0.625, 95% confidence interval 0.551–0.718, p= 0.002). In women, WHR had the highest area but with no statistical significance (0.588, 95% confidence interval 0.477–0.700, p= 0.135). **Conclusion:** Compared with BMI and WHtR, WHR showed the best association with severe CAD in Egyptian patients.

P687

## EuroSCORE or local model in predicting outcome after cardiac surgery?

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**Introduction:** During the past decade results in cardiac surgery have considerably improved. This improvement, mostly due to technological progress and changed patient risk profile, can affect the precision of current scoring systems in establishing the real operative risk. **Objectives:** To assess whether there is a reason to create local cardiac surgery risk evaluation model. **Methods:** A group comprised of 1259 consecutive patients who underwent coronary (63%), valvular (21%) and combined cardiac surgery (16%) in 2010 was included in the prospective study. The risk factors composing the EuroSCORE and 31 more, not included in the model, were analyzed. For statistical computation T-test, chi-square test, univariate and multivariate analysis were used. **Results:** The following risk factors, consisting the EuroSCORE, were confirmed as independent predictors of mortality: age (OR 1.137, 95% CI 1.078–1.199, p<0.01), chronic pulmonary disease (OR 3.28, 95% CI 1.387–7.758, p<0.05), extracardial arteriopathy (OR 0.282, 95% CI 0.14–0.567, p<0.01), previous cardiac surgery (OR 0.251, 95% CI 0.073–0.868, p<0.05), elevated serum creatinine (OR 0.057, 95% CI 0.014–0.233, p<0.01), critical preoperative state (OR 0.036, 95% CI 0.01–0.133, p<0.01), unstable pectoral angina (OR 0.383, 95% CI 0.183–0.802, p<0.01), left ventricular dysfunction (OR 0.952, 95% CI 0.952–0.98, p<0.01), recent myocardial infarction (OR 0.253, 95% CI 0.123–0.517, p<0.01) and emergency surgery (OR 0.141, 95% CI 0.039–0.506, p<0.05). Other risk factors established as an outcome predictors were: diabetes mellitus (OR 0.369, 95% CI 0.149–0.917, p<0.05), body surface area (OR 0.176, 95% CI 0.031–1.004, p=0.05), operations performed within 48 hours to 21 days after myocardial infarction (OR 0.123, 95% CI 0.044–0.344, p<0.01), diffused coronary artery disease (OR 0.188, 95% CI 0.078–0.45, p<0.01), preoperative atrial fibrillation (OR 0.359, 95% CI 0.152–0.846, p<0.05) and left ventricular mass index (OR 1.008, 95% CI 1.001–1.015, p<0.05). **Conclusion:** This study is not intended to deny the validity of the existing EuroSCORE. However, the one-year results show that certain risk factors, not included in the EuroSCORE, have significant impact on postoperative outcome. For this reason, we have started to design our local model for cardiac operative risk evaluation (Vojvodina-SCOR), based on four-year Project, supported by Provincial Secretariat for Science and Technological Development-Vojvodina.

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## Early determinant factors of carotid intima-media thickness in adolescents

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**Introduction:** Atherosclerosis begins in childhood and progresses over decades. To prevent cardiovascular disease it is important to identify asymptomatic people at risk. Carotid intima-media thickness (IMT) is a noninvasive tool to detect a preclinical stage of the atherosclerotic process. Objective: The aim of this study was to identify the effect of early factors on IMT in adolescents. **Objectives:** The aim of this study was to identify the effect of early factors on IMT in adolescents. **Methods:** There were 272 participant adolescents, mean-age=15 years, 107 males and 165 females. Anthropometric (weight, height, waist circumference (WC) and body mass index) and clinical data [systolic and diastolic blood pressure (BP)] were collected in all subjects. Serum glucose and lipids, as well as C-reactive protein (CPR) were determined. Subjects underwent two-dimensional echo-color Doppler scanning of the carotid arteries. The arithmetical mean of the IMT value was calculated. **Statistical analysis**: Pearson Correlation was used to determine associations between IMT and variables of weight, WC, body mass index, BP, PCR, glucose, and lipids; the stepwise regression analysis was applied to estimate the best model to explain the effects of those factors that correlated withIMT. **Results:** Mean IMT was 0.44±0.07 mm in all subjects, 0.45±0.07 in males and 0.43±0.07 in females (p<0.001). Weight, height, BMI, WC, systolic and diastolic BP and CPR were highly significant associated with IMT (r= 0.32, 0.19, 0.23, 0.34, 0.21, 0.19 and 0.31, respectively). The lineal regression analysis determined the following factors as those with the highest effects on IMT: WC, PCR and diastolic BP, being the obtained best model: IMT = 0.193 + 0.002 (WC) + 0.021 (PCR) + 0.002 (diastolic BP), $R^2$ = 0.26. **Conclusion:** In adolescents, there are clinical and laboratory factors that may help detect the presence of initial atherosclerosis process due their effects on the IMT. The most important early determinants of IMT are: WC, PCR and diastolic BP in this study.

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## Association of glomerular filtration rate with high-sensitivity cardiac troponin T in a community-based population study in beijing

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**Introduction:** The reduced level of glomerular filtration rate (GFR) is an independent risk factor for cardiovascular disease (CVD) mortality and persistently elevatedcardiac biomarkers are frequently observed in patients with end-stage renal disease. In general population, however, the clinical use of the serum levels of cardiac biomarkers has limitations because of the low sensitivity of the assay system. Recently, a highly sensitive cTnT (hs-cTnT) assay has become commercially available. **Objectives:** In the present study we investigated the cTnT level using highly sensitive commercial assay, evaluated the assosiation of eGFR with hs-cTnT in community-based population in Beijing. **Methods:** The serum hs-cTnT levels were measured in a community-based population (n=1497; 48.1% men; aged ≥45 years) living in Pingguoyuan area of the Shijingshan district, a metropolitan area in Beijing, China. The lower detection limit of the hs-cTnT assay used in the present study was 3 pg/mL. eGFR was evaluated by the Chinese modified Modification of Diet in Renal Disease equation. Anthropometry, blood pressure, fasting plasma glucose (FPG), serum total cholesterol (TC), triglyceride (TG), low-density lipoprotein cholesterol (LDL-C), high-density lipoprotein cholesterol (HDL-C), uric acid (UA) and NT-proBNP were measured. Pearson's correlation and a multivariate logistic regression modelling were used to used to establish the relationship between eGFR value and detectable hs-cTnT value. **Results:** With the highly sensitive assay, detectable hsTnT levels were seen (> 3pg/mL) in 798 subjects (54.9%) and concentrations of cardiac troponin T were at or above 13.3 pg/mL in 178 patients (11.9%). The level of hs-cTnT was increased in patients with hypertension, diabetes, coronary artery disease and/or renal insufficiency. The result of Pearson correlation showed that eGFR was associated with hs-cTnT (r =-0.14□*P*<0.001). After adjustment for other risk factors, the results of multivariate logistic regression analysis showed eGFR were independently inversely associated with hs-cTnT (adjusted odds ratio, 0.57; 95% CI, 0.36 to 0.77; P<0.001) in this study group. **Conclusion:** The present study showed that after adjusting for multiple potential confounders, eGFR were significantly associated with cardiac troponin T concentrations as measured with a highly sensitive assay in this community-based subjects.

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## Relationship between normal body mass indexes and cardiovascular risk factors in central part of Iran

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**Introduction:** Regarding the importance of obesity and also limited studies to determine normal body mass (BMI) indexes in our country. **Objectives:** determine the relation between real BMI indexes and cardiovascular risk factors in control part of Iran. **Methods:** Data of this cross-sectional study was obtained from implementation of phase I of IHHP. First stage of this study conducted in late 1999 on 3718 individuals aged ≥19 years with normal BMI and waist circumference (WI) in provinces of Isfahan and Markazi. Fasting blood samples were taken by standard methods for two hours post load plasma glucose (2hhp), Serum lipids, blood pressure and BMI indexes. **Results:** The odd ratio (OR) of dislipidemia in women WC of second and forth quarter was 1.56(1.05–2.3), 1.57(1.05–1.34) respectively. There was significant difference in third quarter men compare to the first quarter ones (1.04, 1.65, 1.31 respectively) at P<0.05 level. This different was also significant in BMI odd ratio of third, forth and first quarter men (1.84(1.45–2.33), 1.36(1.99–1.70) respectively) at P<0.05 level. The prevalence odd ratio of two risk factors in third and forth quarter women in compare to first quarter increase significantly (2.6(1.45–4.65), 2.06(1.13–3.71)at P<0.05 level. The OR of at least two risk factors were higher for men in BMI and we normal quarter in compare to the lower one. **Conclusion:** Finding of this study indicated that predicting cardiovascular risk factors by using recommended normal (real) boundary of BMI and WC is not a proper method. Because it seems that proper levels of these indexes is lower than the recommended ones.

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**P691**

## Markers of inflammation in acute aortic syndromes. is there a connection?

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**Introduction:** Acute aortic syndromes comprise a group of conditions that can have a catastrophic outcome if not treated urgently. Among these syndromes is acute aortic dissection. On the other hand biomarkers constitute a rapidly growing branch of medicine and science that could offer exciting, possible life-saving opportunities in diagnosis and management. **Objectives:** We aimed to investigate several biomarkers of inflammation and coagulation in acute aortic dissection and their role in short term prognosis. **Methods:** The study included 156 patients with acute aortic dissection in whom urgent surgical treatment was needed and performed in the Institute (58.3±10 years of age, 77% males). Blood was sampled for analyses. Biomarkers of inflammation and coagulation were determined (hsC reactive protein (CRP), white blood cells count, fibrinogen and D-dimmer). Echo study and CT were performed. Patients were followed up during in hospital staying. **Results:** Our data indicates that acute aortic dissection appears more often in males than in females. Youngest patient was 35 years of age and oldest 75. The majority of patients had type I aortic dissection (85%). About 16% died during in hospital staying, 1% had ruptured aorta. In 66% of patients both fibrinogen and white blood cells count exceeded referent range. In 100% of patients C-reactive protein exceeding 1.0mg/dl and D dimmer larger than 250microg/l were found. CRP levels were between 7.8 and 131 mg/dl, fibrinogen between 2 and 8.2 mg/l, while WBC count was 12.01 ±3.38x10G. There was a linear correlation between examined markers ($p<0.001$). Not significant trend in biomarkers levels was noticed to survival compared to persons who died. **Conclusion:** The results of our study suggest that biomarkers levels may be used in diagnosis of acute aortic dissection with proinflammatory and procoagulant activity highly involved. Further studies are needed to confirm the prognostic role of examined markers in acute aortic syndromes.

**P692**

## Body fat related to composite risk factor score for CVD in children

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**Introduction:** Obesity is associated with increased risk of cardiovascular disease (CVD) in adults and less favourable CVD risk factor status in children. These relationships have not been extensively studied in young subjects on a population-base with the use of objective methods. **Objectives:** We assessed if total body fat, abdominal fat and body fat distribution are related to composite risk factor score for CVD in young children on a population-base. **Methods:** Cross-sectional study of 243 (136 boys and 107 girls) children aged 8–11 years, recruited from a population-based cohort. Total body fat (TBF) and abdominal fat mass (AFM) were measured by DXA, TBF was expressed as percentage of body weight (BF%). Body fat distribution was calculates as AFM/TBF. Maximal oxygen uptake ($VO_{2PEAK}$) was measured during maximal exercise test. Systolic and diastolic blood pressure (SBP, DBP), and resting heart rate (RHR) were measured. Mean artery pressure (MAP) and pulse pressure (PP) were calculated. Echocardiography was performed and left atrial diameter (LA) was measured and left ventricular mass (LVM) and relative wall thickness (RWT) were calculated. Z-scores (Value for the individual-mean value for group)/SD were calculated. Sum of z-scores for SBP, DBP, MAP, PP, RHR, LVM, LA, RWT, and -$VO_{2PEAK}$ were calculated in boys and girls, separately, and used as composite risk factor score for CVD. Skewed values were normalised by natural logarithm (ln). **Results:** Pearson correlations between ln BF%, ln AFM and AFM/TBF versus composite risk factor score were for boys ($r=0.56$, $r=0.59$, and $r=0.48$, all $P<0.001$), and for girls ($r=0.42$, $r=0.48$, and $r=0.47$, all $P<0.001$). When all children were divided according to quartiles of BF%, AFM and AFM/TBF, with adjustment for sex, one-way ANOVA analysis indicated higher composite risk factor score with higher quartiles of BF%, AFM and AFM/TBF (all, $P<0.001$). **Conclusion:** Total body fat, abdominal fat and body fat distribution were all associated with higher composite risk factor score for CVD in young children.

**P693**

## Total cholesterol to HDL ratio and non hdl cholesterol: best lipid indicators of increased intimae media thickness

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**Introduction:** There are different lipid markers that predict higher cardiovascular (CV) risk. Triglycerides (TG), LDL and HDL cholesterol are among the most commonly used. However, epidemiological studies have shown that non-HDL cholesterol and total cholesterol (TC) to HDL ratio are better event predictors than the above mentioned. Furthermore these are simpler to determine since they don't require fasting. **Objectives:** To determine which lipid markers are better predictors of subclinical atherosclerosis, measured by carotid intimae media thickness (IMT) in a population of Chilean subjects without definite atherosclerotic disease. **Methods:** 1624 subjects between 25–64 years, examined in the CARMELA study (CArdiovascular Risk factor Multiple Evaluation in Latin America) in Santiago de Chile. In all subjects, we measured BMI, blood pressure and lipid profile. LDL was calculated by Friedewald formula. IMT was performed in both carotids using an automated software. Maximal medium IMT was considered for the analysis. **Results:** 770 men and 854 women were included; mean age was 45 ± 11 years. Mean TC was 202 mg/dl, HDL 50, LDL 121, TG 157 and non-HDL cholesterol 152. Mean TC/HDL ratio was 4.3. Women had significantly lower non-HDL, TG and TC/HDL than men, and significantly higher HDL. Mean IMT was 0.62 mm. Although all the lipid variables correlated significantly with IMT, the magnitude of these correlations was higher for non-HDL ($r=0.24$, $p<0.0001$) and TC/HDL ratio ($r=0.23$, $p<0.0001$). The table shows the OR of each variable for IMT>pc90, adjusted by age and gender. TC/HDL ratio was the best determinant of increased IMT, both in men as in women.

| Lipid marker | Odds Ratio (adjusted) | p |
|---|---|---|
| non-HDL cholesterol | 1.01 | <0.0001 |
| HDL | 0.99 | 0.07 |
| LDL | 1 | 0.05 |
| TG | 1.002 | 0.01 |
| TC/HDL ratio | 1.23 | <0.0001 |

**Conclusion:** TC/HDL ratio and non-HDL cholesterol were the best markers of subclinical atherosclerosis among different lipid variables. Moreover, they do not require fasting and are therefore, simple to determine in the ambulatory setting.

**P694**

## Prevalence of sleep apnea in patients after acute myocardial infarction

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**Introduction:** Sleep represents a state of physiological rest for the cardiovascular system which can be in a great deal disrupted by sleep-disordered breathing (SDB). The most common type of SDB is the obstructive sleep apnea occurring in 9% of middle-aged females and 24% of middle-aged males. The pilot project data indicate a possible close pathophysiological correlation between myocardial infarction and sleep apnea (SA). SA has also been connected by some small studies to a higher morbidity and mortality rate in subjects with a cardiovascluar disease. Early diagnosis and treatment disposes therefore of an ability to greatly improve the life quality and furthermore to decrease morbidity and mortality rate of the latter patients. **Objectives:** To determine the prevalence of SA in patients who have suffered an acute myocardial infarction (AMI). **Methods:** Consecutive patients admitted to our department in 2010 with the diagnosis of AMI were enrolled. All of them underwent complete clinical, biochemical examination and ECG examination at the time of admission. Minimally after 48 hours after the admission and condition stabilisation every patient was examined with the mobile device ApneaLink - a non-invasive examination analyzing air flow in the airways and monitoring the oxygen blood saturation during the night. Sleep apnea or hypopnea occurrence were classified according to standard criteria of the American Academy of Sleep Medicine (AASM). **Results:** 205 patients (74% men), age 65 years, BMI 29 kg/m$^2$, ST elevation AMI 63%, localization of AMI - anterior wall 37%, inferior wall 37%, lateral wall 7%, other 19%, left ventricle ejection fraction 49%. Apnea-hypopnea index (AHI) <5 23%, AHI 5–14 35%, AHI 15–29 22%, AHI ≥ 30 20%. **Conclusion:** Presented project show high prevalence of SA in patients who have suffered an AMI (according to the AASM criteria 77%). If the worse prognosis hypothesis in SA patients are to be confirmed, there is a high benefit in examining all the patiens post AMI, on the potential simultaneous SA occurrence. This way can evaluate a rising opportunity to identify a new risk factor and to eliminate it via a corresponding therapy.

**P695**

## Assessment of dietary, life style pattern and lipid profile of obese cardiovascular disease patients in a rural population in South India

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**Introduction:** In India, mortality rate due to cardiovascular disease (CVD) is increasing and is known to be a multifractional disease and various factors play an important role in etiopathogenesis. **Objectives:** To study the demographic, socioeconomic, dietary, life style, anthropometric, biochemical parameters in selected CVD patients and to impart in-depth nutrition education. **Methods:** The sample size comprised of 300 obese CVD women. Consent and ethical clearance for the study was obtained. The following parameters were included-Selection of samples, sampling and research tool, demographic, socio-economic status, Life style pattern, Dietary pattern, Symptoms analysis, Physical examination, Biochemical tests, Family and medical history and Nutrition education programme. The statistical analysis was done. **Results:** The study showed that 73.3% subjects belonged to 50–60 years age that is, post menopausal women. The height of the subjects was found to be less (154.78±8.24 cms) and their weight was found to be excess (64.89±7.16 kgs) when compared to the normal height and standard weight. The heavy workers were not prone to CVD when compared to the sedentary (70%) and moderate workers (30%). The non-vegetarians (60%) were more prone to CVD when compared to the vegetarians (40%). The subjects had higher BMI (81.6%) when compared to standard value and considered as grade I obesity (27.3± 2.76 kgs). Obesity was

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associated with greater derangements of lipid profile. The triglyceride level was found to be at standard risk <15kg/dl. Biochemical validation showed significant difference in total cholesterol (66.6% subjects), blood sugar level (125.56±40.64) and systolic pressure (159.13+27.89). Statistical analysis showed a significant correlation among total cholesterol and systolic pressure with BMI of hyperlipidemic subjects. The waist to hip ratio ranges between 0.9–1.1 (0.89±0.14) in 83% subjects. The angina was found to be a predominant symptomatic risk factor. The study confirmed drug therapy to be effective. Nutritional education programme was significant at 1 percent level. **Conclusion:** The study provides important information that will be valuable in the development of observing the factors that affects obese CVD patients. Nutritional education programme was effective in rural population.

**P696**

## Predictors and outcomes of delay in recognition of acute myocardial infarction (AMI) in emergency department (ED) patients

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**Introduction:** The early recognition of acute myocardial infarction (AMI) is paramount in improving morbidity and mortality. It is known that a delay in diagnosis may occur if these patients are assigned a low acuity triage. **Objectives:** To investigate the predictors and impact of delayed recognition of AMI in ED on mortality and interventions. **Methods:** We performed a retrospective study of consecutive patients with AMI presenting to a busy hospital ED from July 2005 to June 2010. ED notes were reviewed to establish the initial triage category assigned to the patient. Medical records were reviewed for potential patient-related predictors of low acuity triage. **Results:** Of the 1,935 patients, mean age was 66.4 years and 51% were women. The majority were African American 76%. Chest pain was the chief complaint in 1079 (56%). A total of 651 (34%) patients were initially assigned to low acuity triage. Median time to first electrocardiogram from ED registration was 23 minutes for high acuity and 98 minutes for low acuity patients ($p<0.0001$). 59% of high acuity cases were labeled with an AMI diagnosis prior to leaving the ED as compared with 62% of low acuity cases. Peak troponin level reached an average of 18.5 ng/ml for high acuity and 10.6 ng/ml for low acuity patients ($p<0.0001$). Rates of cardiac catheterization, percutaneous intervention, coronary bypass surgery and death were 53%, 27%, 5% and 6% for high acuity cases respectively and 36%, 14%, 3% and 5% for low acuity cases respectively. The proportion of patients undergoing catheterization and percutaneous intervention were significantly different ($p<.0001$), but rates of bypass surgery and death were not significantly different. Average length of stay was 5.8 days for both groups. Multivariate logistic regression analysis revealed that low acuity triage was independently associated with a chief complaint other than chest pain (OR 1.8), age below 50 or greater than 70 (OR 1.3), diastolic blood pressure between 60 and 80mmHg (OR 1.4), pulse between 50 and 100 b/min (OR 1.3), not arriving via ambulance (OR 1.4) and no history of prior MI (OR 1.3). **Conclusion:** Low acuity triage of AMI is a common occurrence. Some patient-related features make this more likely. Although statistically significant, these factors are weak predictors as evidenced by their relatively low odds ratios. The difference in triaging was also not associated with significantly difference in the hospital stay and mortality.

**P697**

## Impact of cardiovascular risk factors on subclinical carotid atherosclerosis in a general population stratified by framingham risk assessment

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**Introduction:** Framingham risk scores have been widely used to predict the 10-year risk of developing coronary heart disease (CHD). However, the adequacy of Framingham equation for identifying asymptomatic individuals with subclinical atherosclerosis is unknown. The predictive ability of traditional risk factors on subclinical atherosclerosis and whether other underlying risk factors can independently predict subclinical atherosclerosis have not been well established. **Objectives:** To determine the association between subclinical carotid atherosclerosis with conventional risk assessment and underlying risk factors, such as family history of CHD, alcohol intake, lack of physical activity, abdominal obesity, high sensitivity C-reactive protein (hs-CRP), and hyperuricemia in low-, intermediate-, and high-risk individuals. **Methods:** We studied 1176 Chinese aged 50 to 79 years old by conducting a cross-sectional investigation of cardiovascular risk factors, subclinical carotid atherosclerosis, and cardiovascular diseases in 2007. After excluding patients with cardiovascular diseases (CVD), traditional risk assessment was calculated by Framingham scores equation, and participants were divided into 3 groups: low-risk (10-year risk of developing a hard CHD event <10%), intermediate-risk (10%>20%), and high-risk (≥20%). High-resolution carotid ultrasound was performed, and subclinical carotid atherosclerosis was defined as either increased intima-media thickness (IMT) or having plaque. **Results:** Forty-four percent of the subjects were classified into low-risk group, 33% into intermediate-risk group, and 23% into high-risk group. The prevalence of increased IMT and plaque were 51% and 43% in low-risk, 63% and 52% in intermediate-risk, 78% and 70% in high-risk (both $P$ <.001). Multivariate logistic regression showed that independent predictors of increased IMT were age in low-risk individuals, age, physical inactivity, hypertension, and HDL-C in intermediate-risk individuals; that of carotid plaque were age and physical inactivity in low-risk individuals, age, alcohol intake, and hypertension in intermediate-risk individuals. **Conclusion:** Underlying risk factors related to lifestyle are independent predictors of subclinical carotid atherosclerosis in low- and intermediate-risk population.

**P698**

## Quit smoking with champix: parallel, randomised clinical trial of efficacy for the first time in Iran

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**Introduction:** Tobacco consumption like other habit forming substances is difficult to let go. Treatment includes a variety of methods including brief clinical counseling and with medication. Smoking cessation programs were first introduced in Iran in 1997 and up to now, various nicotine replacement therapies have been prescribed. **Objectives:** The aim of this study was to evaluate effectiveness of Varenicline for tobacco cessation. **Methods:** This was a randomized parallel clinical study at tobacco cessation clinics during 2009–2010. Participants were smokers willing to quit visiting the first time a smoking cessation clinic in Tehran divided into three parallel groups randomly. The first group received brief counseling on cessation. The second group received nicotine patches 15 mg/daily for 8 weeks and the third group was prescribed Varenicline one 0.5 mg pill daily for the first 3 days, followed by 0.5 mg twice a day for 4 days and subsequently 1 mg twice daily for 8 weeks. **Results:** The study had 272 participants. 91 individuals were in the first group, 92 in the second and 89 in the third group. At the end of the first month, 128 people from total (47.1%) succeeded in quitting; this included 17 individuals (18.7%) in the first group, 60 (65.2%) in the second group and 51 (57.3%) in the third group (P=0.000). Follow up at one year showed 58 individual (21.3%) remained smoke free which included 6 (6.6%) in the first group, 23 (25%) in the second group and 29(32.6%) in the third group (P=0.000). **Conclusion:** Drug treatment can improve success in quitting several fold. Success with Varenicline is slightly better but not significantly different from nicotine replacement treatment.

**P700**

## Is cardio-metabolic disease a reversible phenomenon? You Bet!

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**Introduction:** Nearly two-thirds of deaths in the world are caused by non-communicable diseases such as heart disease, cancer and diabetes, which are rapidly increasing at a cost to the global economy of trillions of dollars. Cardio-Metabolic disease is the epidemic of the 21st Century. The prevention of CVD is clearly dependent on identification of high risk individuals before symptoms occur. **Objectives:** Consensus guidelines recommends cardiovascular risk assessment as the initial step of primary prevention. The aim of this study was to identify patients at high risk and then treat them for four months to determine if we could halt and reverse their cardio-metabolic disease. **Methods:** We studied a total of 100 patients. At baseline all patients received a cardiovascular risk assessment, physical exam, IMT, EBCT, MCG, Thyroflex and cardio-metabolic markers performed. A Cardio-Metabolic Score (CMS) was given to each patient depending on the severity of their disease. An integrated lifestyle intervention (The Cardio-Metabolic Program-CMP) was implemented during the four month period and their CMS repeated at the end of this time. **Results:** More than 80% of the clients showed improvement in their CMS. Subjective and objective results were collected using a simple software program, The LHAMP (Lifetime Health Assessment and Monitoring Program). **Conclusion:** This study confirms that a simple M.D. office based program (CMP) can identify patients at high risk for Cardio-Metabolic disease and can begin to halt and reverse their disease in a surprisingly short time. This CMP can be easily expanded on a global scale with data from every center collected and trended to assess the success of the intervention strategy for modifying risk factors (Primary Prevention). The ultimate goal is Primordial Prevention, defined as the prevention of development of risk factors before they happen, so as to increase the number of years that people can enjoy quality of life and compress the time that people experience disease and disability.

**P701**

## Knowledge, attitude and practice of students about diet and exercise and their relationship with cardiovascular diseases risk factors

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**Introduction:** Nowadays most countries face high and increasing rates of cardiovascular disease. One of the important factors that can influence on morbidity and mortality of patients with heart diseases is lack of knowledge and attitude about these disorders. **Objectives:** This study was done to evaluate of knowledge, attitude and practice of students on diet and exercise and their relation with cardiovascular diseases risk factors. **Methods:** In this cross-sectional study, life style and risk factors of cardiovascular diseases was evaluated by standard Monica questionnaire in Ahvaz. In this study 2000 students older than 20 years were analyzed. **Results:** The majority of the students had a good knowledge about the effect of exercise (57/1%) and the attitude (15/55%) on cardiovascular disease prevention. But, a few of them had an appropriate practice (18/2%). There was a significant statistical difference in the level of blood cholesterol (P=0/03) fasting blood sugar (P=0/02) and blood pressure (P=0/03) and physical activity and exercise. But there was no significant statistical difference in the level of knowledge about diet with the level of blood cholesterol, sugar, hypertension and their practice. **Conclusion:** Knowledge alone does not guarantee the practice of individuals. An intervention in order to improve the health behaviors is necessary.

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**P702**

## Quality of life in patients with myocardial infraction

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**Introduction:** Myocardial infarction is a common presentation of ischemic heart disease and can affect on quality of life. **Objectives:** The purpose of this study was to determine of quality of life in patients with myocardial infarction referring to Ahvaz hospitals. **Methods:** This study was done as a descriptive research in 1000 patients admitted to cardiac care units of Ahvaz hospitals within 3 months post infarction by random sampling. Data were collected through interview, patients' medical records and patients self report. A SF36 questionnaire was utilized for assessing the quality of life. **Results:** The average of age was 52.1±11.6 and quality of life in
51 of subjects was fairly favorable. Regarding aspects of quality of life, %58 had fairly favorable general status (physical and psychological health) and social function (%67). Also, sleep pattern of majority of subjects (%69) was favorable and most of them (67%) had unfavorable physical activity. There was statistically significant correlation between quality of life and variables such as duration of disease ($P<0.03$), severity of pain ($P<0.04$), decline or loss of job function, and the degree of fatigue ($P<0.04$), but there was no statistically significant relationship between quality of life and other demographics as age, gender, marital status, economic status and occupational status. **Conclusion:** Physicians and nurses can improve the quality of life of patients with myocardial infarction when planning care for these patients.

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**P703**

## Prevalence of heart disease in primary school children in Hwolshe Ward, Jos, Nigeria

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**Introduction:** Heart diseases in children are of public health importance especially in developing countries of the world such as Nigeria. School based prevalence studies are a vital tool in ascertaining the true burden and extent of the disease in the community. **Objectives:** To determine the burden and spectrum of heart disease in primary school children in Hwolshe ward,Jos. **Methods:** A total of four hundred and eighteen (418) primary school pupils selected from two schools in Hwolshe ward of Jos South LGA, Plateau State were studied for the prevalence of heart disease using clinical examination followed by chest radiograph, ECG and echocardiography in those with suspected heart disease. **Results:** Of these 232 (55.5%) were girls and 186 (44.5%) were boys giving a sex ratio of 1.2:1. The subjects ranged from 6 to 12 years of age, with mean age of 9.0±1.95 years which did not differ significantly between males and females, male mean age being 8.9±1.82 years while the female mean age was 9.1±2.05 years. The mean weight and height gradually increased with age for both sexes. The girls were heavier than the boys from the age of 7 years, but these differences were not significant until 12 years of age. The girls were also taller than the boys from the age of 10 years, but these differences were only significant for 11 year olds. 62% of the subjects studied were from the low socioeconomic class. Only three subjects had heart disease giving a prevalence of 0.7%. Ventricular septal defect was seen in 2 subjects and atrial septal defect in one subject. In addition each of these subjects had an associated dysrhythmia: wandering atrial pace maker in one subject with VSD and first degree heart block in the other, while the subject with ASD had associated incomplete right bundle branch block as expected in this heart condition. **Conclusion:** It is suggested that the school health programme be resuscitated and revitalized, with the paediatrician assuming a greater role in the programme. Also, cardiac screening be made part of the school health programme.

**P704**

## Ambulatory monitoring of four physiology parameters to the chronic patients in community by long range wireless transmission technology

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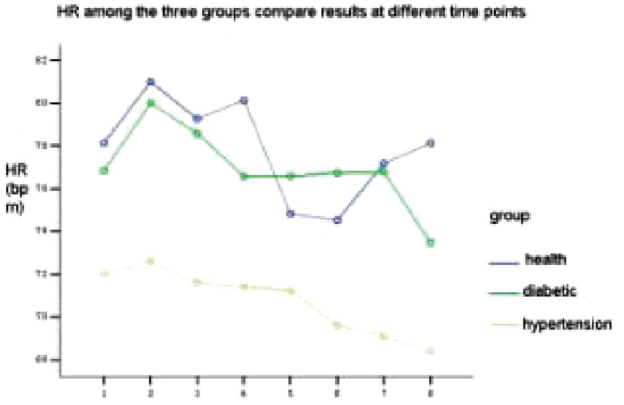
**Introduction:** More and more chinese persons are suffer from chronic disease, the prevalence of hypertension and diabetics are very higher in China, can we apply transmission technology to monitor chronic disease patients? **Objectives:** We carried out real-time monitoring of four physiology parameters by long range wireless transmission technology to discover the concealed patients. **Methods:** 162 subjects (average age 56.31±13.12) with complete healthy filing from communities of Taiyuan city were selected. The four-parameter real-time monitoring including ECG, blood pressure, blood sugar (BG) and oxygen saturation were measured in once 2 hours. The data were wireless transmitted and analyzed by Monitoring Center doctors. **Results:** ECG, blood pressure, blood sugar and oxygen saturation compared in hypertension, diabetics, and controls group. The results showed that systolic and diastolic pressure were highest in hypertension group$F=5.551F=3.870P<0.05$; heart rate was fastest in controls$F=3.657P=0.032$; blood sugar was highest in diabetics group $F=3.741P=0.042$. There was no significant difference oxygen saturation in three groups. Among the three groups comparison of blood glucose levels at different time points.

| | blood glucose □X±S □mmol/L | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | fasting | 2h after breakfast | Before lunch | 2h after lunch | Before dinner | 2h after dinner | Before retiring | Early dawn |
| health | 5.20±1.09 | 5.20±0.34 | 5.35±0.81 | 6.28±1.51 | 5.20±0.67 | 5.60±0.75 | 5.73±0.57 | 5.03±0.09 |
| diabetic | 6.95±1.92 | 10.06±2.84 | 8.27±4.09 | 10.42±3.52 | 7.24±3.02 | 9.58±3.79 | 7.59±2.34 | 6.66±1.85 |
| hypertension | 5.92±0.84 | 9.20±5.65 | 6.56±0.73 | 7.76±0.75 | 5.96±1.09 | 8.32±2.05 | 6.18±0.79 | 6.62±1.80 |

**Image/graph I:**




**Conclusion:** Human physiology parameter real-time and ambulatory monitoring on account of long range wireless transmission technology may supply objective dates, and raise efficiency.

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**P705**

## Heart complications, body mass index and quality of life

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**Introduction:** Diabetes is an organic disease with chronic evolution and living must be appropriately managed, in order to minimize the several biological, psychological and social implications in the patient's life. **Objectives:** The main purpose of the research was to study heart complications, body mass index (BMI), HbA1c, and quality of life in diabetic patients. **Methods:** Participants were 266 adults patients (mean age=51.02; sd=18.710), men (52%) and women (48%). 45% of the diabetic patients were overweighed, and 21% were obese. BMI varied from 16.52 to 4.06 (mean=26.07; sd=4.395). 58% of the patients presented low metabolic control (HbA1c>7.5). 78.94% of the patients mentioned a reasonable quality of life, 10.53% a high quality of life and 10.53% a low quality of life. Participants answered a set of

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self-report instruments to evaluate heart complications, quality of life (*Diabetes Quality of Life Measure, DQOL, Jacobson et al., 1988*); *Treatment Adherence Scale, Matos (1999); IDDM Perceived Control Scale, Bradley (1996); Blood analysis to determine the HbA1c value; Body weight evaluation (kg) and Height (cm) and Body Mass Index calculation.***Results:** Heart complications affects 21, 56%diabetic patients,(t=-2,319; p=0,021), determines worse QOL. *Glycated Hemoglobin* (HbA1c) was significantly related to QOL, being observed that higher HbA1c index values were associated to worse QOL. The Body Mass Index revealed to be a determinant pattern of QOL, suggesting that overweight and obesity predict worse QOL. **Conclusion:** The data obtained showed that high levels of adherence to treatment and beliefs in self-control and medical control are associated with low indexes of HbA1c (good metabolic control). There is also a statistical significant association between heart complications, BMI, HbA1c and quality of life;Suggesting that overweighed and obese patients, and those with low metabolic control, present poor quality of life.The UK Prospective Diabetes Study Group (UKPDS) (1998), demonstrated that a good glucose control reduces the morbidity, and increases quality of life.

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**P706**

## StUdy On the Effect of RaMadan Fasting On LipId ProFilE [SUOM FOR LIFE]

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**Introduction:** Fasting during the month of Ramadan is obligatory for healthy Muslim adults. There are significant changes in the eating schedule during Ramadan. The person has to keep complete NPO (nothing per mouth) from Fajer time (just before sunrise) to Maghreb (sunset) for one lunar month. The changes in the eating schedule are expected to affect the lipid profile and there have been several small studies that showed some effect of Ramadan fasting on lipid profile but there was no consistent result. **Objectives:** To study the effect of fasting during Ramadan on lipid profile. **Methods:** 37 adult volunteers were recruited to the study, willing and fit to fast(no medical contraindication for fasting) during Ramadan, After obtaining informed consent we obtained BMI, blood pressure and lipid profile within two weeks before Ramadan. Then repeat same measurement at the fourth week of Ramadan then third measurement at three weeks post Ramadan. The study was conducted in the United Arab Emirates. **Results:** The pre-Ramadan evaluation showed the average blood pressure to be 120/77, BMI of 26.6, Total Cholesterol 170.5 mg/dl, Triglycerides 191.6 mg/dl, LDL of 103.1 mg/dl, HDL of 37.1 mg/dl, with an LDL: HDL ratio of 4.7, and glucose of 91.8 mg/dl. After 3 weeks of fasting during Ramadan the average blood pressure was 117/77, BMI of 29.97, Total Cholesterol 167.59 mg/dl, Triglycerides 161.89 mg/dl, LDL of 98.40 mg/dl, HDL of 41.19 mg/dl, with an LDL: HDL ratio of 4.19, and glucose of 91.62 mg/dl.The post-Ramadan evaluation showed the average blood pressure to be 117/76, BMI of 30.13, Total Cholesterol of 171.81 mg/dl, Triglycerides 241.26 mg/dl, LDL of 99.15 mg/dl, HDL of 34.15 mg/dl, with an LDL: HDL ratio of 5.44, and glucose of 97.38 mg/dl. **Conclusion:** In this study we found that during fasting the month of Ramadan, the average LDL decreased and the average HDL increased. that resulted in significant improvement of the HDL/LDL ratio, in spite of increased BMI.

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**P707**

## Undiagnosed and uncontrolled cardiovascular risk factors are common among shoppers: the dubai shopping for cardiovascular risk study (DISCOVERY)

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**Introduction:** Cardiovascular disease (CVD) is a major cause of morbidity and mortality in the developing world. Early detection and adequate control of CVD risk factors is essential to combating the global CVD epidemic. Voluntary screening in major shopping malls may be used for this purpose as well as to raise awareness in the community. **Objectives:** To estimate the prevalence of undiagnosed and uncontrolled CVD risk factors among shoppers. **Methods:** Prospective voluntary screening for CVD risk factors was performed among adult shoppers in a major shopping mall in Dubai on 3 separate occasions in 2010 and 2011. **Results:** A total of 974 shoppers were screened (age 40 ± 11 years, 74% female, ethnicity: 16% Arab, 51% South Asian, 33% other, Table). A prior diagnosis of diabetes mellitus (DM), hypertension (HTN), or hypercholesterolemia (HCHOL) was reported by 29% of shoppers, with an additional 13% of shoppers being either obese/overweight or current smokers. Among shoppers not reporting a history of HTN, 18% had a blood pressure of >140/90 mmHg. Among shoppers reporting a history of HTN, 62% had an inadequately controlled blood pressure (i.e. >140/90 mmHg). Nearly one third (28%) of shoppers without a prior history of HCHOL had total serum cholesterol of >200 mg/dl, while 38% of those with prior diagnosis of HCHOL had inadequately controlled total serum cholesterol of higher than 200 mg/dL. While only a minority (1%) of shoppers not reporting a history of DM had random serum glucose of >200 mg/dl, 30% of shoppers reporting a history of DM had a serum glucose of higher than 200 mg/dL. Overall, 35% of shoppers without a prior diagnosis of DM, HTN, or HCHOL had a high blood pressure, serum glucose or cholesterol reading. Only 24% of the entire cohort were free of prior diagnosis of DM, HTN, or HCHOL and had normal serum glucose and total cholesterol levels, normal blood pressure, normal body mass index, and were not currently smoking.

| | |
|---|---|
| **Age** | 40 ± 11 |
| **Sex (% Female)** | 74 |
| **Diabetes Mellitus (%)** | 12 |
| **Hypertension (%)** | 16 |
| **Hypercholesterolemia (%)** | 12 |
| **Current Smoking (%)** | 3 |
| **Obese (%, BMI > 30 kg/m$^2$)** | 17 |
| **Overweight/Obese (%,BMI>25 kg/m$^2$)** | 55 |

**Conclusion:** One third of relatively young and ethnically diverse shoppers have at least one modifiable CVD risk factor of which they are not aware. When a prior diagnosis of a risk factor is reported, it is often inadequately controlled. Shopping malls in a large cosmopolitan setting provide valuable opportunity for effective screening to uncover undiagnosed or inadequately controlled CVD risk factors.

**P708**

## Determination of aspects of health belief model in people at risk of cardiovascular diseases

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**Introduction:** The burden of cardiovascular disease (CVD) has been increasing worldwide. It is the leading cause of mortality in industrialised and developing countries. People at risk of cardiovascular disease need changes in their lifestyle to control their risk factors, as the disease is preventable. The health belief model (HBM) is a conceptual framework to distinguish and modify unhealthy behaviors in order to prevent and control non-communicable diseases (1). **Objectives:** This study aims to einvestigate aspects of health belief model in people at risk of cardiovascular disease. **Methods:** In this observational study, 100 people at the risk of CVD who attended in a CVD clinic in Yazd-Iran were recruited through random sampling. Participants were 30–65 years old with at least one risk factor of cardiovascular disease who able to read and write. Data gathering tool was a questionnaire with 74 items. The questionnaire was completed by participants. Before starting data collection, validity and reliability of the questionnaire were approved by experts in the field. The Cronbach alpha of reliability varied between $\alpha$=0.7 to 0.98. SPSS software was used for data entry and descriptive statistical method was used for data analysis. **Results:** The respondents were 56% female and 44% male. Mean of age of participants was 43.7± 9.4. Most of them (37%) did not complete secondary education, 93% of them were married and 42% of them were housewife. The mean score of HBM aspects were: knowledge 22.7 (75.5%), perceived susceptibility was 15 ±2.6 (74.9%), perceived severity was 23±2.3 (92%), perceived benefits was 27.05±3.4(90.2), perceived barriers 20.7±4.3 (69%), preventive behaviors 18.1±3.7 (72.4%), self efficacy18.21±3 (75.9%) and cues to action was 2.5 (84%). The main source of getting information about CVD was television and radio (67%) and the second source was newspaper, magazine, book and internet (31%). **Conclusion:** Participants in this study had good knowledge about CVD. However, they had not enough healthy practice (e.g. regular physical activity and avoiding tobacco smoking). They perceived some barriers for healthy behaviors, despite good knowledge level and perceived benefits. CVD preventive behaviors should be enhanced by education programs which address the identified aspects.

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**P709**

## VO2max regression model for untrained men 19 to 63 years-old

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**Introduction:** Exercise capacity is a most powerful survival predictor in health people and cardiac patients. **Objectives:** Purpose of study was to develop a regression equation to predict VO2max for 19–63 year-old men. **Methods:** 145 untrained healthy men-volunteers, mean age 57+/-0,3years, BMI 25+/-0,4 were evaluated during progressive maximal treadmill exercise. The ventilatory variables were recorded breath-to-breath (Oxycon Pro, Germany). VO2max was considered valid when one of two criteria was met: 1. respiratory exchange ratio equal to or greather than 1.15, 2. plateau in VO2 despite an increase in work load. Data collected before the maximal cardiopulmonary exercise testing were body mass, height, age. Multiple linear regression was used to create a VO2max regression model based on body mass, height, age. **Results:** All participants achieved a valid VO2max, 37+/-8,1, average RERmax values–1,17+/-0,8. The strongest predictors of VO2max were age (r=-0,7, p<0,001), body mass (r=0,5, p<0,001) and height (r=-0,5, p<0,001). VO2max prediction model is defined in the following way: ***VO2max = 71–0.7–0.1B–0.01H,*** where *A* is the age in years, *B*– body mass, *H* - is the height. **Conclusion:** A new VO2max model is a way to predict VO2max in untrained men 19 to 63 year-old.

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**P710**

## Theoretical-practical training of students of vocational high school to care for cardiac arrest: A prospective study

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**Introduction:** Cardiovascular diseases arethe leading cause of death in Brazil and the world, sudden cardiac arrest is a major contributor to this index. Trainingreduces the ignorance and fear, increasing safety to recognize that the victim is not breathing properly, so as to trigger the help and start CPR as soon as possible. **Objectives:** Objetive of this study: to apply a theoretical-pratical trainning of vocational public high school, to work correctly, quickly and safely before a cardiopulmonary arrest, resuscitation maneuvers running efficiently, in order to save lives. **Methods:** This studywas designed as a prospective investigation in all of 1800 students of vocational public high school, located at Rio de Janeiro. The program of theoretical and practical training lasts 2 hours. Each student attends a lecture with video on the subject for 30 minutes after 30 minutes of classroom practice. Then, using practical training mannequin, which are assessed through a performance checklist. A questionnaire was distributed before the start of training to see if the student had prior knowledge about a rescue in the event of cardiac arrest. **Results:** The project is being implemented with completion scheduled for December this year. Preliminary results showed that over 50% did not have any knowledge about the subject. This preliminary evaluation showed that after 2 hours of training and analyzed the performance checklists: 85% knew how to perform the procedures call for help effectively, 30% were able to recognize the absence of breathing, 35% positioned themselves and began of chest compressions recommended form. **Conclusion:** Initial conclusions are that the students at that school are represented by 90% of adolescents when trained are able to act in the scene of a cardiac arrest, multiply the knowledge to family and community and save lives. However, according to the recommendations of the American Heart Association provides retraining as an ideal that does not exceed two years.

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**P712**

## Daily physical activity pattern related to body fat measurements in younger children

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**Introduction:** Lack of physical activity is generally thought to be associated with obesity in children, this has not been investigated in detail on a population-base. **Objectives:** We assessed if body fat measurements from Dual-energy X-ray absorptiometry (DXA) are related with accelerometer measured activity in children on a population-base. **Methods:** Cross-sectional study of 226 children (boys n=125, girls n=101) aged 8–11 years from a population-based cohort. A DXA total body scan measured total body fat (TBF) and abdominal fat (AFM). Body fat was calculated as a percentage of body weight (BF%) and body fat distribution as AFM/TBF. Daily physical activity was assessed by accelerometers for 4 days. General physical activity (GPA) was assessed as mean counts/minute. Percentage of time spent in sedentary, moderate to vigorous physical activity (MVPA) and vigorous physical activity (VPA) per day were calculated. **Results:** Pearson correlations, with adjustment for sex, between physical activity and versus body fat measurements displayed in table.* indicate $P<0.05$.

| | ln BF% | ln AFM | AFM/TBF |
|---|---|---|---|
| GPA | -0.38* | -0.32* | -0.19* |
| Sedentary | 0.20* | 0.15* | 0.06 |
| MVPA | -0.41* | -0.35* | -0.20* |
| VPA | -0.45* | -0.39* | -0.25* |

**Conclusion:** In this population-based cohort of children a moderately strong, inverse, relationship was found between body fat measurements daily physical activity level, and a weak relationship between time in sedentary and body fat measurements. This indicates that activity patterns may be a contributing factor in the development and/or maintenance of obesity.

**P713**

## A cost effective way to encourage children to unplug and play

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**Introduction:** Less than half of Western Australian (WA) primary school aged children meet the Australian recommendations for physical activity and electronic media use. In 2008, the Heart Foundation developed the Unplug and Play campaign, funded by the Department of Health WA. This low-budget initiative is Western Australia's first campaign in response to the increasing time children spend engaged in sedentary behaviour, especially the use of electronic media for entertainment. **Objectives:** To implement a mass media campaign targeting parents of children aged 6–12 aimed at reducing television and computer use as recreation To evaluate the camapign using computer assisted telephone interviews with parents. **Methods:** The campaign features radio and print advertising, a supporting brochure delivered to parents through schools and public relations activities. The campaign has featured two phases of advertising materials across seven media bursts. Campaign impact evaluation occurred in 2008 and 2011 using cross-sectional telephone surveys of WA parents (n=405). **Results:** Impact evaluation results included: Total awareness of the campaign was 42% in 2008 and 64% in 2009. **The school** brochure was the most commonly recognised source of the campaign message, and was the most effective strategy to communicate the Unplug and Play message to parents. The level of "believability" and "relevance" of the advertised message was high overall with the majority of parents reporting that the campaign made them think about the reasons for limiting children's electronic media use. **Conclusion:** Interventions to limit children's screen-time and encourage active play are warranted. This modest media campaign was able to penetrate the primary "parent" target population and convey a salient message to parents about limiting children's TV, electronic games and Internet use for entertainment to less than 2 hours a day, and encourage active play during daylight hours. Results demonstrate that a well researched and targeted, limited budget campaign can achieve acceptable awareness levels.

**P714**

## Scaling up a successful school based tobacco use prevention program in India: from efficacy to effectiveness

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**Introduction:** CVD is the leading cause of death in India[i], striking Indians particularly early in age[ii]. Tobacco use is an enormous problem with increasing prevalence among adolescents and females. MYTRI proved to be an efficacious school based tobacco use prevention intervention in a randomized control trial[iii]. The results in 2007 informed the National Tobacco Control Program (NTCP) which included school health programs and was launched that year[iv]. Project STEPS is an effectiveness trial for the MYTRI intervention and expected to inform strategies for scale up and effective implementation of NTCP. **Objectives:** To examine the strategies needed to (a) design, implement and evaluate an effectiveness trial of MYTRI (b) ensure sustainability by building capacity of state governments for school based tobacco use prevention programs. **Methods:** STEPS is being implemented in over 1000 schools in two states of India, Andhra Pradesh and Gujarat. MYTRI intervention materials and evaluation tools were updated, translated and piloted to adapt for implementation. In a factorial randomization design, the school intervention is being evaluated for incremental benefit when used in combination with community and health systems interventions versus when used alone, in comparison with control condition. Engaging with government education departments in project processes, sensitizing them, and building capacity to train teachers and peer leaders on tobacco use prevention curriculum, and monitoring are inputs to ensure sustainability. Audiovisual resources for teacher and peer leader trainings have been developed for larger dissemination. **Results:** STEPS brought on board the government education departments at state and district levels and trained 25 officials in a national consultation. The teacher training institutions have been engaged to conduct train teachers for STEPS. Process and outcome evaluation, and routine monitoring for fidelity of implementation will be done. The intervention material - while retaining essential tenets of social cognitive theory - underwent significant modifications due to rural context and updating due to developments in tobacco control scenario. Concrete results are forthcoming and will be presented at the conference. **Conclusion:** STEPS is a crucial endeavor to demonstrate a replicable and sustainable model for implementing school based tobacco use prevention programs in LMIC setting, contributing to CVD control.

**References:**

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[ii]Yusuf S et al, 2004
[iii]Perry CL et al, 2009
[iv]Arora M et al, 2011

**P715**

## A comparison study of point of care testing versus conventional international normalised ratio monitoring at a medical outpatient clinic

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**Introduction:** Patients with compelling indications for long-term anticoagulation,eg atrial fibrillation are treated with oral warfarin. It has a narrow therapeutic index, necessitating regular monitoring of coagulation profile via conventional venous blood sampling. Lately, point-of-care testing (POCT) using fingerprick (International Normalised Ratio) INR meters are increasingly utilized as an alternative. **Objectives:** The primary objective of this study was to assess patient's preference of INR monitoring using either POCT compared to conventional venopuncture. **Methods:** Patients attending medical INR clinic were recruited via consecutive sampling in this prospective single center observational study. They were subjected to either venopuncture and INR testing using conventional laboratory-based method, and fingerprick INR POCT using INRatio meters.After 3 months, switch over between the 2 groups were done.Ten patients dropped out during the study. Statistical analysis was performed using PASW Version 18. **Results:** One hundred patients were recruited and 10% dropped out. Majority of the patients (51.1 %) in the study were female with 95.6% of the study population from Malay race. All of patients preferred POCTbut majoirty were willing to pay only RM 10; half from the POCT test cost. A venopuncture test costs RM17.96 excluding staff time involved. **Conclusion:** Currently, warfarin treatment needs frequent INR monitoring via conventional venopuncture. This method of is time consuming to both the patient and staff during clinics. It is also relatively

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painful to the patient. POCT monitoring of INR saves time as it only take a few seconds to get the reading and is less painful to the patient. All of the study patients preferred the POCT as choice of INR monitoring. However, they were willing to pay only RM 10.00 for the testing; probably because majority of them had monthly income in the lower middle class range. Hospital subsidies would be needed for POCT as choice for anticoagulation monitoring.

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**P716**

## Tackling the food industry: salt reduction programs

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**Introduction:** Pan American Health Organization has launched a region-wide initiative "Cardiovascular Disease Prevention through Dietary Salt Reduction" led by an expert working group. Working closely with countries, the Expert group developed resources to aid policy development through five sub-groups, 1) addressing industry engagement and product reformulation; 2) advocacy and communication; 3) surveillance of salt intake, sources of salt in the diet and knowledge and opinions on salt and health; 4) salt fortification with iodine and; 5) economic studies on salt effectiveness. **Objectives:** To present activities of the PAHO Expert committee for Cardiovascular Disease Prevention through Dietary Salt Reduction in the Americas. **Methods:** The review of products and activites will be given. **Results:** The Expert group has set the policy goal for the Region and produced the Road map for different stakeholders called Policy statement, that was widely endorsed by Policy and decision makers in government, leaders in non-governmental organizations, civil society, and international organizations. The expert group participated in the work of CODEX Alimentarius committee on food labeling and the Committee for nutrition and food for special dietary uses, where its positions has influenced discussions and final recommendations regarding salt or sodium inclusion on food labels and nutrient reference values associated with nutrients with risk for diet related non communicable diseases. The Expert group has collaborated with the World Economic Forum (WEF) to mobilize governments, civil society and industry to engage in salt reduction. Result isRio de Janeiro 2011 Statement, considered as a first and very important consensus position involving governments in the Americas, all sectors of the food industry and civil society regarding our respective roles and responsibilities in dietary salt reduction. The Statement is to be used as a basis for facilitating further dialogues on sodium/salt reduction both at regional and national levels. **Conclusion:** Pan American Health Organization will continue to provide support of experts to the counties in the region as well as catalyze and stimulate NGOs and international organizations in advocacy and communication efforts and jointly with WEF will advance in implementation of the priorities agreed and stated in Statement of Rio de Janeiro 2011.

**P717**

## Census of centenarians' lifestyle in Chongqing, China

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**Introduction:** Centenarians can help teach us how to live healthy and long lives, but in Southwest China, the people's conscience of health is so poor that some local people hold the idea that if you smoke more and dink more alcohol, you can live longer. **Objectives:** To provide suggestions to improve lifestyle and health status of the people, Census of centenarians' lifestyle was conducted. **Methods:** Visitation interview census was conducted for all centenarians' lifestyle and health status in Chongqing, China. **Results:** Totally 878 centenarians were investigated, of which 14.24% have no economic source and 63.63% can not take care of themselves. Most of them are non-smokers(91.63%) and non-drinkers(82.96%). And its urban-rural distribution has no statistically significant differences($\chi^2$=0.9394P=0.6252). 43% of the centenarians have regular meals and 45%of them are not selective on food. In the spiritual life, 33% of the centenarians prefer convalesce, and 85.33% of them have no special hobbies. **Conclusion:** To sum up, the centenarians have bland diet, eat regularly and keep adequate exercise. They have good living habits and behaviors. But most of them have no special hobbies. These results should facilitate establishing more infrastructures on public health, health promotion and welfare policy for the most senior citizens.

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**P718**

## Building tobacco control capacity in india through short-term and long-term E-learning distance education programmes

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**Introduction:** Tobacco use poses imminent burden of cardiovascular diseases among current tobacco users. To combat this, unprecedented large scale capacity building pertaining to tobacco control (TC) is needed. Health professionals, including cardiologists play important role in curbing rise of tobacco use by counseling patients, being role models & by promoting policy changes. Online distance learning programmes by Public Health Foundation of India (PHFI) intend to train health professionals in TC. **Objectives:** 1) Utilize short & long term programmes on TC for capacity building of health professionals working with government & other sectors. 2) To train health professionals on tobacco cessation. 3) Evaluate effectiveness & ease of use of an online learning platform across multiple stakeholders related to TC initiatives in India. **Methods:** TC course curriculum of short–term (3 months) & long–term (12 months) online programmes includes information adapted from material provided by Johns Hopkins Bloomberg School of Public Health & University of Southern California Keck School of Medicine, USA with funding support from Bloomberg Initiative to Reduce Tobacco Use. PHFI has launched short-term courses on TC (STC 2011) focused at building capacity of health professionals (SCHP), law enforcers (SCLE), administrators (SCAD), legal professionals (SCLP) & journalists (SCJR). Learning management system (LMS) was developed for online delivery of courses including lectures, quizzes, assignments etc. Lectures covering different TC issues along with roles of stakeholders in TC were peer reviewed & recorded by international & national experts. This paper aims to evaluate profile and performance of participants accessing first ever online capacity building courses launched in a developing country context. **Results:** Total of 71 students are enrolled in first batch of STC 2011. Of them, 75% are Government nominated & 25% are self-sponsored. About 62%, 30% & 8% of total students have joined SCHP, SCLE & SCAD respectively. Curriculum was well received by students. Online discussion forum & Q & A board were used to clarify doubts. Some faced difficulty in downloading files. **Conclusion:** Online courses on TC provide opportunity for professionals to learn TC from national & international experts. LMS was used for sharing ideas, opinions & clearing doubts on TC issues.

**P719**

## Effect of regular aerobic exercise on endothelium-dependent vasodilation in pregnant women. A randomized controlled trial

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**Introduction:** Aerobic exercise in non-pregnant women affects endothelium-dependent vasodilation positively as a consequence of the increased blood flow that stimulates the release of nitric oxide, inducing vasodilation; however, it is not known if exercise produces the same effect during pregnancy. **Objectives:** To evaluate the effect of regular aerobic exercise on the endothelium-dependent vasodilation in pregnant women. **Methods:** This was a randomized, double-blinded, controlled clinical trial of 64 healthy primigravid women between 16 and 20 weeks' gestation. The experimental group took part in aerobic exercise at an intensity of 50–65% of their maximum heart rate for 60 min, three times a week for 16 weeks. The control group undertook their usual physical activity. The endothelium-dependent vasodilation was evaluated by flow-mediated dilatation (FMD). One-way ancova models were used following the intention-to-treat principle to evaluate differences between the intervention groups. **Results:** From the 64 pregnant women who were accepted to participate in the project, 14 did not attend the second set of measurements; therefore, they were excluded from the analysis. We present the results of the 50 pregnant women for whom we have a complete set of measurements. The mean age of the women included was 19.5 $\pm$ 2.3 years and the gestational age at entry was 18.6 $\pm$ 3.4 weeks. The degree of adherence of the exercise group was 75% (18 of the 24 women who started the training participated in 24 or more sessions of the 36 scheduled). The ancova analysis revealed that the exercise group had a greater FMD at the end of the intervention, (P = 0.003) in relation to the control group. The time of training did not show a significant statistical association in any of the ancova models used. **Conclusion:** Regular aerobic exercise improves endothelium-dependent vasodilation in pregnancy. This intervention may be an early and effective alternative to strengthen the prevention of disorders associated to endothelial dysfunction. **Trial registration.** NCT00741312.

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**P721**

## Partnering in program development and training to improve door-to-balloon times in international, emerging, health care systems

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**Introduction:** Cardiovascular diseases have the highest mortality rates in the world. Delays in reperfusion times for acute myocardial infarction (AMI) & acute ischemic stroke (AIS) are

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associated with worse outcomes in resourceful health systems lacking in structured process development & infrastructure due to deficiencies in public awareness, institutional commitment, lack of training & educational opportunities for health providers. Existing models of international medicine deliver brand name health care in international markets without elevating local health care standards. Bridging this gap to improve outcomes is an essential medical mission which can be achieved effectively by partnering with hospitals for specific training & program development. **Objectives:** Improve reperfusion times for AMI and stroke by implementing evidence based strategies driven by established guidelines & best practices. Training emergency response systems, provide on-site, hands-on training of specific interventional skills, & implement institutional protocols to improve outcomes. **Methods:** *CognisMD: Partners in Health*, is an independent organization conceptualized & created by practicing US medical professionals from successful, academic & private institutions sharing an altruistic vision of partnering with hospitals in emerging markets. Through Ministries of Health & privately funded hospitals, implentation of early reperfusion therapies for AMI & stroke will be addressed with didactic curricula, physician hands-on training, non-physician staff education & training, & development of programs & processes organized on-site & in the US. **Results:** Guidelines recommend door-to-balloon times (D2B) of $<$90 minutes for AMI & door-to-needle (D2N) times of $<$60 minutes for AIS. Mean D2B & D2N times in developing countries is well over 150 mins with higher morbidity & mortality rates compared to US hospitals. Analysis of existing systems from symptom onset to reperfusion will be made, followed by implementation of practical, best practices solutions tailored to local systems. **Conclusion:** Partnering with hospitals & health-care systems motivated to improve outcomes but lacking in specific training and infrastructural development, has potential to make large scale, system-wide changes through education, training & program development in cardiovascular medicine. An independent organization of practicing physicians driven by this mission can effectively deliver a comprehensive, collaborative effort to improve program standards and patient outcomes.

**P722**

## That'S news to me: building the evidence base for the Australian Go Red for Women campaign

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**Introduction:** In Australia cardiovascular disease (CVD) is a leading cause of death in women, yet public awareness is low. To address this, the Heart Foundation recently undertook significant research into Australian women's experience of CVD. **Objectives:** To collate available data on CVD in Australian women and explore women's knowledge attitudes and behaviors in order to tailor public health strategies to lower women's heart disease risk. **Methods:** Data collection included commissioning: a national report on available information on heart disease risk factors;diagnostic and therapeutic procedures;and health care expenditure;a literature review;market research into women's attitudes and beliefs;and implementation of a national population survey to track women's awareness of key Go Red for Women(GRFW) messages over time.
**Results:** Collectively this evidence has provided important insights. Notable amongst these is that:
- CVD causes more deaths than any other disease group in women (1)
- It is responsible for more than 25% of female premature deaths, with Coronary heart disease and stroke being the two leading causes(1)
- More than 90% of Australian women have at least one modifiable CVD risk factor and half of all women have 2 or 3 (1)
- On average health care expenditure on females for CVD is 20% less per person than for males, at $261 and $322 respectively (1)
- Some evidence exists that heart disease is managed differently in hospital between men and women, although the reasons for this are not clear (1)
- Self reports indicate that women are well versed in the lifestyle risk factors associated with heart disease but only one in 10 women mention hypertension or cholesterol as risk factors (2,3)
- Awareness of Go Red messages have been tracking upwards since our comprehensive campaign began in 2009 (3).

**Conclusion:** Significant public health opportunities to improve women's heart health in Australia. This presentation will expand on our key findings and demonstrate how we have used this knowledge as an advocacy tool to gain support for our Australian GRFW campaign.
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**P723**

## Global charter on cardiovascular rehabilitation: a call for action

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**Introduction:** Cardiovascular disease remains the leading killer of women and men globally, and is a growing epidemic in low-income countries. Without systematic access to cardiovascular rehabilitation (CR), these individuals may suffer multiple recurrent acute care events and unnecessarily premature death. **Objectives:** To ratify an international charter regarding the definition, benefits, access to, and core components of CR. Given that fully-comprehensive CR services may not be feasible in many countries due to shortages of healthcare professionals and other resource constraints, the aim is to build a global understanding of systematic access and utilization of CR through collaboration between high and low-to-middle income countries (LMIC). **Methods:** We solicited participation from an international group of experts to form the Global Advocacy Panel–Cardiovascular Rehabilitation (GAP-CR). A review of peer-reviewed and grey literature on CR in LMIC was undertaken. A global charter on CR has been drafted. It will be displayed at national CR meetings leading up to the WCC to solicit input and endorsement from CR administrators, organizations, and associations. **Results:** Eight peer-reviewed articles were identified. Non-equipment-based, modified CR models tailored to the local context are shown to be effective in LMICs. The Global Charter on CR ultimately calls to action those responsible for administering patient care to: (a) establish CR as an obligatory, not optional service, and (b) to support countries to establish and augment programs of CR to ensure broad access to these proven services. Additionally, the charter calls for CR organizations and associations in high-income countries to collaborate with those in LMICs, to support capacity-building and provide tangible toolkits for program development and maintenance. **Conclusion:** We aim to maintain and grow this global consortium through partnership with international organizations, and to consider and communicate on-going consensus of evidence-based standards for CR world-wide. **T Briffa (AUS), L Carlyle (CA), C Chessex (CA), A Clark (CA), A Contractor (India), P Doherty (UK), G Melo-Ghisi (Brazil), J Harris (CA), S Hinton (UK), AC Kentner (CA), R Munoz-Sandoval (Mexico), B O'Neill (CA), J Redfern (AUS), & B Sanderson (US).*

**P724**

## The effect of coq10 supplementation on serum lipoproteins, IL-6, ICAM-1 and plasma fibrinogen in hyperlipidemic patients with myocard infarction

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**Introduction:** Epidemiological studies showed atherosclerosis and myocardial infarction is considered leading cause of death and disability in developed and developing countries. **Objectives:** The effect of CoQ10 supplementation on serum lipoproteins,IL-6 ,ICAM-1 and plasma fibrinogen in Hyperlipidemic paitients with myocard infarction. **Methods:** The study as a randomized double blind clinical trial, was conducted in 52 hyperlipidemic patients (TG 150mg/dl, TC 200mg/dl) in the 70–30 year age range who have suffered acute myocardial infarction.In this study, patients randomly assigned to CoQ10[($n = 26$) 200 mg daily supplement CoQ10] and control groups[($n = 26$) were taking the placebo] for 3 months. Blood samplesof both groups at baseline and after intervention were collected .Anthropometric indices ,serum lipoproteins (TG, TC, LDL-C HDL, TC/HDL-C, LDL-C/HDL-C), IL-6, ICAM and plasma fibrinogen were measured. **Results:** There were no significant difference in baseline lipid parameters, serum inflammatory, (ICAM-1, IL-6) and plasma fibrinogen between the two groups.After 12 weeks supplementation, the following results were obtained:
1- Serum levels of TC, TG, LDL-C after three months of intervention both in CoQ10 groupand placebo group compared with baseline ($P < 0/05$) was significantly reduced.
2- Serum HDL-C levels after three months of intervention, only in CoQ10 group compared with baseline ($P < 0/05$) was significantly increased.There was significant differences between the two groups at the end of intervention($p<0.001$).
3- Serum levels of TC/HDL-C and LDL-C/HDL-C after three months of supplementation, only decreased significantly in CoQ10 group compared with baseline values and also significant differencewas observed between the two groups at the end of the intervention($p<0.05$).
4- In the CoQ10 group, there was significant decrease in serum levels of IL-6 and ICAM-1 after three months of supplementation compared with baseline($p<0.001$).There was significant difference between two groups at the end of study($p<0.001$).
5- Plasma fibrinogen levels after three months of supplementation, had no significant differencee between two groups. **Conclusion:** 200mg daily CoQ10 for 3 months had benefical effects on serum lipoproteins,ICAM,IL-6 and may be useful in treatment and prevention of myocard infarction.

**P725**

## Visceral adiposity in young patients with coronary artery disease: a hospital based case control study

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**Introduction:** Central obesity is associated with an increase in the cardio-metabolic risk. BMI is a very crude indicator of adiposity. Although waist hip ratio is a simple tool, it does not distinguish between accumulations of visceral and subcutaneous abdominal fat. CT scan accurately estimates visceral and subcutaneous fat areas **Objectives:** To assess the importance of visceral fat and its correlation with anthropometric and metabolic parameters in young CAD patients **Methods:** The younger age for coronary artery disease was defined as less than 55 years for males and 65 years for females. Cases were enrolled from patients admitted in cardiology department with AMI. CAD was established by coronary angiogram in all cases. Age and sex matched subjects were enrolled as controls who had a negative Tread Mill Test and normal coronary angiogram .Height, Weight, BMI,Waist,Waist to hip ratio were calculated and abdominal subcutaneous fat area and visceral fat area were measured by CT scan. Fasting Blood Sugar (FBS), Lipid profile and C-Reactive Protein (CRP) were also measured **Results:** A total of 50 patients (20 cases and 30 controls) were studied. Cases and controls were similar with respect to age, gender, prevalence of co-morbidities like diabetes mellitus, hypetension, dyslipidemia, smoking, mean height, weight and the Body Mass Index (BMI). Waist circumference ($94.90\pm6.68$ Vs $88.17 \pm 8.17$cm ;$p=0.004$),Waist Hip Ratio ($1.00\pm0.05$ Vs

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0.92±0.05p<0.005)and visceral Fat Area (122.6± 37.59 Vs 88.40± 36.95cm2, p <0.005)were significantly higher in cases compared with controls whereas subcutaneous Fat Area were similar between cases and controls. Fasting blood sugar (145.25±57.08 Vs 97.77±13.04 p<0.001),Triglycerides(193.75±45.38 Vs 128.60±50.86 p=0.009) and CRP(0.58±0.37 Vs 0.28±0.26, p=0.002) were significantly higher in cases compared to controls. ROC curve analysis showed visceral fat area as measured by CT scan was an excellent predictor of cardiovascular events (Area under ROC curve 0.915cm2). Visceral fat area (VFA) was found to correlate with BMI(r = 0. 484 ,p=0.01), WHR (r = 0. 612,P<0.001), FBS(r=0.465,p=0.001), triglycerides (r =0.384 p= 0.006) and CRP (r = 0. 450, p=0.001). **Conclusion:** Visceral adiposity is associated with an increased risk of coronary artery disease and it also correlated with BMI, waist, waist hip ratio and increased levels of fasting blood sugar, serum triglycerides and C-reactive protein

**P726**

## Obesity: Left Ventricular Systo-Diastolic Dysfunction Assessed by Speckle Tracking Imaging

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**Introduction:** Obesity is a very prevalent disease, reaching epidemic proportions in Western countries. Several studies suggest that obesity causes left ventricular dysfunction, even in the absence of structural heart disease. The role of the new echocardiographic techniques in the evaluation of these patients is not known. **Objectives:** Our aim is to compare indexes of left ventricular (LV) systo-diastolic function between an obese population and a control group, by speckle-tracking imaging. **Methods:** We performed a case-control echocardiographic study between obese patients (BMI≥30) with preserved systolic function and a group of healthy, non-obese controls. We aquired cineloops in apical and parasternal short axis views. In post-processing we have measured the global systolic strain (GS), global strain rate (GSR) and segmental strain, by speckle-tracking imaging. In strain rate analyses we looked at the systolic (s'), proto-diastolic (e') and late-diastolic (a') components. The demographic and clinical data were collected through a questionnaire. **Results:** We studied 30 subjects (22 obese and 8 healthy non-obese controls). In the group of obese patients, 77% were male and had a mean age of 47±12 years. The body mass index was 39±4 kg/m2 and the percentage of fat mass was 46±7%. GS values of the LV showed a trend to be lower in the obese group (-18±3 vs -21±2.9, p=0.07). The late-diastolic component (a') of GSR was significantly lower in the obese group (1.0±0.2 vs 0.80±0.2, p=0.04), with no statistically significant relationship with respect to the systolic and proto-diastolic components. In the analysis of segmental deformation we found that the deformation of the apical segment of the lateral wall showed the greater dysfunction compared to the control group (p=0.01). **Conclusion:** Obesity is associated with subtle changes in contractility and relaxation of the LV that may be missed if not assessed by myocardial deformation techniques. Our findings suggest that decreased systolic strain in LV lateral apical segment may be a marker of early myocardial involvement in obesity.

**P727**

## Obesity, glucose metabolic control and left ventricular deformation by speckle tracking

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**Introduction:** Obesity is often associated with multiple co-morbidities such as diabetes mellitus, hypertension and dyslipidaemia. Many of these diseases are the result of a common pathogenic mechanism: the insulin-resistance. Previous studies suggest that obesity may cause left ventricular dysfunction, even in the absence of structural heart disease. **Objectives:** We aim to evaluate metabolic predictors of initial stages of systolic dysfunction in patients with preserved ejection fraction by speckle tracking echocardiography. **Methods:** We studied obese patients (BMI≥30) with preserved ejection fraction and no structural heart disease, followed at an obesity clinic of a university hospital. The demographic and clinical data were collected through a questionnaire. Patients underwent analytic (including HbA1c, fructosamine, insulin and C-peptide levels) and echocardiographic evaluation. Recorded echocardiographic apical 4-chamber view images were analysed using a dedicated post-processing speckle-tracking software and global s-wave strain and strain rate (GS, GSR) of the left ventricle were derived. The association between these variables was determined by Pearson's correlation coefficient. **Results:** We studied 22 obese patients, 77% male, mean age 47±12 years. The body mass index was 39±4 kg/m2, the percentage of body fat mass was 46±7% and the waist circumference was 119±10 cm. Mean blood glucose level was 105±37 mg/dL, HbA1c was 8.8±3.7%, fructosamine was 209±34 mmol/L, insulin was 20±12 mIU/L and C-peptide was 2.3±0.7ng/mL. The lipid profile revealed mean total cholesterol of 205±48 mg/dL, LDL-cholesterol of 125±45 mg/dL, triglycerides of 139±80 mg/dL, HDL cholesterol 50±10 mg/dL. Blood glucose showed linear correlation to fructosamine levels (R = 0.76, p <0.01). All patients had normal LV ejection fraction (>50%). Increased fructosamine levels were associated with lower values of LV GS (R =- 0.58; p = 0.04) and GSR (R = -0.58, p = 0.04). We found no significant association of HbA1c, insulin and C-peptide with GS and GSR. **Conclusion:** In obesity, fructosamine values predict impaired left ventricular systolic function assessed by strain and strain rate. In our study this metabolic variable was the only predictor of initial systolic dysfunction. Future trials should explore this association and the effect of glucose metabolism control.

**P728**

## Waist circumference cutoff values for definition of abdominal obesity in men and women of Kyrgyz ethnicity

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**Introduction:** According to the new criteria of metabolic syndrome (MS) (IDF/NHBLI/AHA, 2009 y) the threshold of the waist circumference (WC) for diagnosis of the abdominal obesity should be used according to ethnical origin. In Kyrgyz population such criteria has not determined yet. **Objectives:** To determine the optimal WC cutoff values for definition of abdominal obesity in ethnic Kyrgyzs. **Methods:** 323 particularly healthy persons (183 women and 140 men), mean age 51,8±9,5 years old were included in the study. Measurement of blood pressure (BP), anthropometric data (including body mass index calculation and WC measurement), fasting blood glucose, serum lipid parameters and insulin was performed in all examined persons. Insulin resistance (IR) was considered as elevation of HOMA index (insulin x fasting glucose/22,5) ≥ 2,77. Criteria of the MS were considered as BP ≥ 130/85 mm Hg, plasma glucose ≥ 5,6 mmol/l, triglyceride level ≥ 1,7 mmol/l and high density lipoprotein cholesterol level <1,03 mmol/l in men and <1,29 in women. For statistical analysis the WC data were stratified in units of 4–5 cm for both sexes starting with WC <75 cm in women and <80 cm in men as the reference. Odds ratio (OR) and 95% confidence interval (CI) were calculated for each strata. Sensitivity and specificity for presence of IR or two other criteria of MS were calculated by using receiver operator characteristic (ROC) curves. The optimal WC cutoff values were extrapolated from the curves for men and women separately. **Results:** Number of patients with IR (as was expected), insulin level and HOMA index were increasing with rising of WC in both sexes. OR for association of IR and WC also was rising with WC and was statistically significant between all strata (in men and women) compare with the referral point. The optimum sensitivity and specificity obtained from the ROC curves for IR were 88 cm in women (sensitivity 0,85 95CI (0,72–0,93), specificity 0,58(0,49–0,66)) and 94 cm for men (sensitivity 0,8 (0,65–0,91), specificity 0,61 (0,51–0,71). The data from the ROC curve for two other criteria of MS confirmed the results and the WC 88 cm in women (sensitivity 0,82 (0,72–0,9), specificity 0,72 (0,62–0,8)) and 94 cm in men (sensitivity 0,74 (0,62–0,84), specificity 0,73 (0,61–0,83)) were corresponded to the optimal sensitivity and specificity. **Conclusion:** It may be appropriate to use the WC cutoff values ≥88 cm in women and ≥ 94 cm in men of Kyrgyz ethnicity for definition of abdominal obesity. A bigger study to confirm this result is needed.

**P729**

## Association of body mass index and presence of coronary artery atherosclerosis as detected by coronary computed tomography angiography: an observational cohort analysis

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**Introduction:** Coronary computed tomography angiography (CTA) is a useful modality for the diagnosis of obstructive coronary artery disease (CAD) and evaluating the presence of coronary atherosclerosis. Data on the effect of body mass index (BMI) on CTA results is limited. **Objectives:** We sought to evaluate the association of body mass index and presence of coronary atherosclerosis and severity of CAD in patients (pts) who underwent CTA. **Methods:** We performed an observational cohort study of 182 pts referred for 64-slice CTA from December 2005 to May 2008 in the New York City/Long Island region. Pts were referred primarily for evaluation of chest pain syndrome, screening for CAD and abnormal/equivocal stress test. BMI was categorized as follows: <18.5 as underweight, 18.5–24.9 as normal, 25–29.9 as overweight and >30 as obese. CTA results were further divided into three groups: Obstructive CAD (defined as at least one lesion with stenosis >50%), non-obstructive CAD and normal. **Results:** The mean age of the cohort was 63 years. Males comprised 60% of the total group. Average BMI was 28. The distribution of pts in the four BMI categories was as follows: underweight (n=3; 1.6%), normal (n=39; 21.4%), overweight (n=87; 47.8%) and obese (n=53; 29.1%). None of the underweight pt had obstructive CAD. In pts with normal BMI, 28% had obstructive CAD, 28% had non-obstructive CAD and 38% had normal scans respectively. While in overweight pts 31% had obstructive CAD, 46% had non-obstructive CAD and 16% had normal coronary arteries respectively. In obese pts 34% had obstructive CAD, 28% had non-obstructive CAD and 28% had normal scans respectively. Pts with abnormal BMI were more likely to have any CAD (P<0.05) but not obstructive CAD (P=NS) while pts with normal BMI were more likely have normal scans (P<0.05). **Conclusion:** In this cohort analysis, most pts were either overweight or obese. We also observed that overweight and obese pts were more likely to have evidence of coronary atherosclerosis on CTA when compared to pts with normal BMI. However, in our analysis, we did not observe an increase incidence of obstructive CAD in pts with abnormal BMI.

**P730**

## Waist circumference is more important than insulin resistance in the evaluation of the cardiometabolic risk index in adolescents

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**Introduction:** Overweight is a serious public health concern. Its development during adolescence generates an impact on health in the adulthood, which is mainly related to

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metabolic complications. **Objectives:** The main objective was to investigate the impact of waist circumference (WC) and insulin resistance (HOMA) on the cardiometabolic risk index (CRI) of adolescents. **Methods:** Body mass index (BMI) was calculated and WC was measured in adolescents (n=242; 10–18 y) of both sexes. Glucose, insulin, triglycerides (TG), cholesterol (C), total cholesterol (TC), Apolipoprotein A-I (ApoA-I) and B (ApoB), non-esterified fatty acids (NEFA), and electronegative LDL [LDL(−)] concentrations and paraoxonase 1 (PON1) and cholesteryl ester transfer protein (CETP) activities were determined in plasma. Adolescents were distributed by low or high WC ($WC_{LOW}$, $WC_{HIGH}$) and HOMA values (insulin sensitivity - HOMA-IS and insulin resistance - HOMA-IR). Furthermore, cluster analysis was performed using the cardiometabolic risk index (CRI) for following variables: BMI, BFM%, SBP/DBP, lipid profile, ApoA-I, ApoB, PON1, NEFA, CETP, and LDL(-). The cut-off value was chosento each variables to separateadolescents into high and low risk. Regarding these parameters, CRI was obtained for the adolescents by summing the values for each variable; then, differences between mean values for the groups ($WC_{LOW}$-IS, $WC_{LOW}$-IR, $WC_{HIGH}$-IS, and $WC_{HIGH}$-IR) were compared. **Results:** Group $WC_{HIGH}$ showed high values for BMI ($P<0.001$), body fat mass percentage (BFM%) ($P<0.001$), bloodpressure (BP) ($P<0.001$), insulin ($P<0.001$), HOMA ($P<0.001$), TG ($P<0.029$), NEFA ($P<0.039$), CETP ($P<0.001$), LDL(-) ($P<0.020$), and TG/HDL-C ($P<0.001$), TC/HDL-C ($P<0.002$), LDL-C/HDL-C ($P<0.012$), ApoB/ApoA-I ($P<0.017$), and LDL(-)/TC ($P<0.022$) ratios in comparison to $WC_{LOW}$. Inverse profile to HDL-C ($P<0.001$), ApoA-I ($P=0.028$), HDL-C/APOA-I ($P=0.005$), and PON1 activity ($P<0.001$).Adolescents classified as IR showed negative impact on BMI ($P<0.001$), WC ($P<0.001$), BFM% ($P<0.001$), BP ($P=0.008$), TG ($P<0.001$), TG/HDL-C ratio ($P=0.020$), and low results for PON1 ($P<0.001$) than IS group. CRI showed that $WC_{HIGH}$-IR = $WC_{HIGH}$-IS > $WC_{LOW}$-IR = $WC_{LOW}$-IS ($P<0.001$). **Conclusion:** In conclusion, WC and IR can identify many cardiometabolic parameters associated with risk of adolescents to develop early cardiovascular disease. However, adolescents with $WC_{HIGH}$ have a more negative cardiometabolic profile as compared with IR.

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**P731**

## Can CETP activity and LDL(-) change the impact of obesity on lipid risk factors in adolescents?

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**Introduction:** Obesity has been associated with increased cholesterol ester transfer protein (CETP) and possibly with electronegative LDL [LDL(-)]. However, the impact of these particles on the other lipid risk factors in adolescents is not clear. **Objectives:** Therefore, we investigated whether CETP and LDL(-) are able to change the existing association between obesity and lipid risk factors in adolescents. **Methods:** From adolescents with both genders, anthropometria (body mass index, waist circumference, body fat mass), and sexual maturation were monitored in 242 adolescents. The glucose, lipid profile, apolipoproteins, and LDL(-) levels and CETP activity were analyzed. **Results:** CETP in normal weight-NW ($P<0.001$) and overweight-OW ($P<0.001$) was lower than in obese-OB adolescents. LDL(-) in NW was lower than in OW ($P=0.017$) and OB ($P=0.049$). BMI exhibited positive and linear association with TC/HDL-C ($P=0.026$), TG/HDL-C ($P=0.007$), ApoB/ApoA-I ($P=0.035$), LDL(-) ($P=0.019$), and LDL(-)/TC ($P=0.027$). An inverse profile was observed between HDL-C ($P=0.040$) and ApoA-I ($P<0.001$) with BMI. Waist circumference showed positive association with TG ($P=0.031$), TC/HDL-C ($P=0.011$), LDL-C/HDL-C ($P=0.031$), TG/HDL-C ($P=0.002$), ApoB/ApoA-I ($P=0.001$), LDL(-) ($P=0.033$), LDL(-)/TC ($P=0.044$) and CETP ($P=0.007$). Negative association was observed between WC and HDL-C ($P=0.013$) and ApoA-I ($P=0.004$). After adjustment for CETP, associations between the HDL-C, LDL-C/HDL-C, TC/HDL-C and LDL(-)/LDL-C with BMI or WC were modified. Adjustment for LDL(-) content was not able to change these associations, suggesting an independent mechanism for regulation of the levels of this particle during obesity. Concordance analysis between BMI and WC were tested. It was showed that 88% of the NW were in the 1st tertile, 27% of the OW were in 2nd tertile, and 95% of the OB group were in the 3rd tertile of WC. This fact shows that adolescents distributed according to BMI tertiles may be in the 1st, 2nd, or 3rd tertile of WC. **Conclusion:** In conclusion, obesity, mainly central obesity shows important relation with lipid risk factors, and it is considered the most sensitive and specific parameter for predictor of cardiovascular disease. In addition, CETP activity, but not LDL(-) was able to change associations of BMI and WC on lipid biomarkers in adolescents.

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**P732**

## Evaluating cardiovascular risk using the tone-entropy algorithm

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**Introduction:** Currently the Framingham equation is the most often used cardiovascular risk calculator in health care. The equation requires data for age, gender, cholesterol status, blood pressure, diabetes status and smoking. A large proportion of the morbidity and mortality associated with cardiovascular disease is due to arrhythmic events that are multifactorial including dysregulation by the autonomic nervous system. **Objectives:** This study investigates the association of the tone-entropy (T-E) algorithm for analysis of heart rate variability obtained from20 minute ECG recordings with the Framingham risk stratification. **Methods:** Data for the study was obtained from 170 diabetic patients of the Diabetes Screening Complications Initiative (DiScRi) clinic at Charles Sturt University.The variables used for determination of the cardiac risk score were age, sex, blood pressure, cholesterol (total and HDL), and smoking with diabetes status being a categorical variable. Cardiac risk over a five year period was divided into very high (>20%), high (15–20%), moderate (10–15%) and mild (less than 10%) in accordance with the Australian and New Zealand Guidelines. The tone, balance between accelerations and inhibitions of the heart, represents the sympatho-vagal balance. The entropy evaluates total acceleration–inhibition activities, or total heart period variations, in a familiar unit of bit. **Results:** No significant difference was found for total cholesterol to high density lipoprotein ratio, one of the determinants of cardiac risk, between the four cardiac risk groups. Entropy was the only variable with a significant difference for the ANOVA ($F_{172,\ 3} = 9.51$; $<0.0001$). Bonferroni post hoc analysis indicated a significant difference between mild, high and very high as well as between high and mild cardiac risk groups. Tone was also not significantly different between the four groups, although the expected trend of an increase with increased risk of a cardiac event was observed. **Conclusion:** T-E has two major advantages over the conventional methods of HRV analysis in that it is robust against non-stationarity and not sensitive to differences in length of recordings. This latter point makes it especially useful for clinical investigation where short time recordings are more likely to be used. T-E analysis therefore corresponds to the cardiovascular risk classification and suggests a non-invasive, possibly more sensitive, method of stratifying 5 year cardiovascular risk.

**P733**

## Functional capacity after cardiac rehabilitation in diabetic vs non diabetic cardiac patients

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**Introduction:** The diabetes mellitus (DM) represent an additional metabolic handicap in cardiac patients (pts). **Objectives:** The aim of this study was to determine in a cohort of cardiac pts whether training-induced improvements in aerobic capacity and work performance are related and independent from the presence of DM. **Methods:** From September 2007 to September 2010, three hundred thirteen male cardiac pts, referred for outpatient cardiac rehabilitation (CR), were divided in two groups : 114 (36.4%) pts with diabetes mellitus (DM), mean age 65.4 +/- 6.6 years (Group A), and 199 (63.5%) pts without DM (Group B), mean age 65.7 +/- 10.1 years. All pts performed a cardiopulmonary exercise testing (CPET) before and after a 12 weeks CR program consisting in thrice weekly training sessions. The peak work load (PWL) in watt, the peak oxygen uptake (peak VO2) in ml/Kg/min and the peak oxygen pulse (peak O2 pulse) in ml O2/beat measured during CPET, and the work performance resulting from the ratio between the PWL sustained and the body weight (PWL/BW) in watt/Kg, were compared at baseline and after CR program using the Primer software. **Results:** From the analysis of the data collected, before and after cardiac rehabilitation the results expressed as mean plus/minus standard deviation (SD), and P value were showed in table.

| Group | Measure | before-after CR | P value |
|---|---|---|---|
| A | peak VO2 | 18.5+/-5.6 vs 21+/-4.8 | 0.000* |
| B | peak VO2 | 19.9+/-5.8 vs 21.19+/-6.01 | 0.030* |
| A | peak O2pulse | 11.3+/-3.4 vs 12.8+/-3.05 | 0.000* |
| B | peak O2pulse | 12.3+/-3.3 vs 12.9+/-3.7 | 0.089° |
| A | PWL | 102.9+/-20.6 vs 115.1+/-26.3 | 0.000* |
| B | PWL | 107.3+/-31.7 vs 118.6+/-35.4 | 0.000* |
| A | PWL/BW | 1.3+/-0.3 vs 1.48+/-0.3 | 0.000* |
| B | PWL/BW | 1.37+/-0.3 vs 1.53+/-0.4 | 0.000* |

P value=degree of dissimilarity between the two sets of measurements ; *=result statistically significant ; °=result statically non significant ; for others abbreviations see the text. **Conclusion:** On the basis of the above results we can conclude that, after cardiac rehabilitation, the aerobic capacity (peak VO2), the peak work load sustained (PWL) and work efficiency (PWL/BW) improved significantly in both groups, but the peak oxygen pulse(peak O2pulse) improved significantly only in diabetic patients.

**P734**

## Heart-rate profile changes during exercise after cardiac rehabilitation in diabetic vs non diabetic cardiac patients

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**Introduction:** The basal heart rate (HR) and HR profile during exercise is an important cardiovascular risk factor. **Objectives:** The aim of this study was to assess the changes of the HR at rest, at peak of exercise and in the first 3 minutes of recovery from exercise-induced by cardiac rehabilitation (CR) in patients (pts) with and without diabetes mellitus (DM). **Methods:** From May 2008 to May 2010, three hundred five pts, without history of pacemaker implantation or atrial fibrillation, mean age 65.3 +/- 8.9 years, referred to physician-supervised outpatient CR, were enrolled for this study and divided in two groups: 111 pts, with DM (group A), and 194 pts without DM (group B). All pts underwent exercise testing (ET) previous and after the CR. The resting HR (HR rest), the HR at the peak of exercise (HR peak), the increase in rate from the resting level to the peak of exercise (HR peak–HR rest), and the heart rate recovery rate (HRR), resulting from the difference between the peak HR and the HR throughout the first 3 minutes of recovery from exercise (HRR 1'R, HRR 2'R, HRR 3'R) were measured during the initial and final ET. **Results:** The results expressed as mean values plus/minus standard deviation (SD), and P value were shown in the table.

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| Group | Measure | before-after CR | P value |
|---|---|---|---|
| A | HR rest | 74.3+/-11.06 vs 69.5+/-9.7 | 0.000 |
| B | HR rest | 70.5+/-10.7 vs 67.1+/-11.6 | 0.003 |
| A | peak HR-HR rest | 55.05+/-16.9 vs 59.57+/-17.14 | 0.049 |
| B | peak HR-HR rest | 55.2+/-17.3 vs 59.25+/-19.17 | 0.031 |
| A | HRR 1'R | 16.6+/-8.3 vs 20.45+/-13.5 | 0.013 |
| B | HRR 1'R | 18.1+/-10.3 vs 21.15+/-10.13 | 0.005 |
| A | HRR 3'R | 38.6+/-14.4 vs 43.14+/-14.55 | 0.021 |
| B | HRR 3'R | 39.7+/-14.9 vs 44.36+/-16.13 | 0.004 |

**Conclusion:** We can conclude that after CR were detected significant favourable changes in the resting HR, the HR increase from the resting level to the peak exercise level and the HRR in both groups, regardless of diabetes mellitus.

**P735**

## Mineral metabolism disturbances and inflammation are related with left ventricular hypertrophy in type 2 diabetic patients with CKD

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**Introduction:** Cardiovascular disease remains the major cause of death in patients with chronic kidney disease and diabetes, accounting for approximately 3/4 of the mortality in type 2 diabetes with kidney disease. **Objectives:** The aim of this study was to evaluate the factors related with the left ventricular hypertrophy (LVH) in a population of type 2 diabetics with kidney disease. **Methods:** We included 119 type 2 diabetic patients (f = 54, m = 65), with a mean age of 60.35 years and a mean estimated glomerular filtration rate (MDRD) of 45.3 ml/min, followed in our outpatient nephrology clinic. We analyzed several laboratory parameters, the insulin resistance (HOMA), inflammation - interleukin 6 (IL6), tumor necrosis factor alpha (TNF$\alpha$) and high sensitivity C-reactive protein (hs CRP)–the mineral metabolism, the urine albumin/creatinine ratio, as well as the left ventricular mass index (LVMI) in our patients. **Results:** In a simple linear regression model, the LVMI was positively correlated with insulin resistance (r=0,682 p=0,001), IL6 (r=0,649 p=0,001), TNF$\alpha$(r=0,619 p=0,001), hsCRP (r=0,564 p=0,001), PTH (r=0,638 p=0,001), phosphorus (r=0,588 p=0,001) and inversely with the eGFR (r= - 0,360 p=0,001), albumin (r=-0,265 p=0,004) and hemoglobin (r= -0,208 p=0,023). Using a multiple regression model, we found that the PTH (r=0,264 p=0,005), the phosphorus (r= 0,192 p=0,027) and the TNF$\alpha$(r=0,238 p=0,022) independently influenced the LVMI. **Conclusion:** In our study the disorders of the mineral metabolism and inflammation contributed to the development of left ventricular hypertrophy in type 2 diabetic patients with renal disease.

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**P736**

## New insights into the role of fibroblast growth factor 23 in cardiovascular disease in type 2 diabetics

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**Introduction:** Fibroblast growth factor 23 (FGF23) is a recently discovered regulator of phosphate and mineral metabolism, and have been implicated in the pathogenesis of myocardial hypertrophy and atherosclerosis. **Objectives:** The aim of this study was to evaluate the relationship between the left ventricular hypertrophy (LVH) and the new factors of cardiovascular disease in type 2 diabetics. **Methods:** This was a cross-sectional study with diabetes mellitus patients in stages 3 and 4 of diabetic nephropathy, followed in our outpatient nephrology clinic. We analyzed several laboratory parameters, the insulin resistance (HOMA), inflammation -tumor necrosis factor alpha (TNF$\alpha$)–the mineral metabolism (FGF23, vitamin D, PTH), oxidative stress (malonaldehyde), the urine albumina/creatinine ratio as well as the left ventricular mass index (LVMI) in our patients. **Results:** Fifty type 2 diabetics were included (62,7 %male) with a mean age 66,9 years, and a mean glomerular filtration (MDRD) of 50 mL/min/1.73 m$^2$. In a simple linear regression model the LVMI was positively correlated with Log HOMA (r=0.539 p=0.0001), Log TNF$\alpha$(r=0.607 p=0.0001), Log FGF23 (r=0.616 p=0.0001),Log PTH (r=0.636 p=0.0001), Log malonaldehyde (r=0.621 p=0.0001), Log urine albumina/creatinine ratio (r=0.677 p=0.0001) and inversely with Log OH25D (r= -0.646 p=0.0001). However, in the multiple regression model evaluation, we found that the FGF23 (r=0.351 p=0.012) and the PTH (r=0.306 p=0.033) independently influenced the LVMI. **Conclusion:** In our study the FGF23 is independently associated with left ventricular hypertrophy in type 2 diabetic patients with moderate renal disease. The prospective human studies and laboratory experiments are needed to further explore the effects of FGF-23 on the cardiovascular system in diabetic nephropathy.

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**P737**

## Oxidative stress and inflammation are associated with risk cardiovascular in moderate nephropathy diabetic

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**Introduction:** Excessive oxidative stress and low-grade chronic inflammmation are major pathophysiological factors contributing to the development of cardiovascular disease. Oxidative stress and inflammation are Known to contribute to the pathogenesis of atherosclerosis, and markers of these processes are predictive of cardiovascular events and mortality rates in the general population and patients with advanced nephropathy diabetic. **Objectives:** The aim of this study was to evaluate the relationship between the left ventricular hypertrophy (LVH) and the novel factors of cardiovascular disease in a patients with type 2 diabetes mellitus. **Methods:** This was a cross-sectional study with diabetes mellitus patients in stages 3 and 4 of diabetic nephropathy, followed in our outpatient nephrology clinic. We analyzed several laboratory parameters, the inflammation - high sensitivity C-reactive protein (hs CRP)–the mineral metabolism (PTH, phosphorus), the natriuretic peptide B (BNP-B), and oxidative stress (malonaldehyde)as well as the left ventricular mass index (LVMI) in our patients. **Results:** Forty-one type 2 diabetics were included (68% male) with a mean age of 68.7 $\pm$ 9.3 years, and a mean glomerular filtration (MDRD) of 49.4$\pm$23.5 mL/min/1,73 m$^2$. In a simple linear regression model, the LVMI was positively correlated with Log hs CRP (r=0,737 p=0,001), log malonaldehyde(r=0,713 p=0,001), BNP-B (r=0,385 p=0,015), Log PTH (r=0,384 p=0,015), phosphorus (r=0,348 p=0,026) and inversely with the Log eGFR (r= - 0,495 p=0,003). However, in the multiple regression model evaluation, we found that the oxidative stress (r=0,375 p=0,012), the inflammation (r= 0,446 p=0,002) independently influenced the LVMI. **Conclusion:** In our study shows that factors such as oxidative stress and inflammation contributed to the development of left ventricular hypertrophy in type 2 diabetic patients with moderate renal disease.

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**P738**

## Mineral metabolism and inflammation as predictors of cardiovascular morbidity in type 2 diabetics with nephropathy

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**Introduction:** According to the Framingham study, type 2 diabetic patients have a 3 to 4 times increased chance of suffering a cardiovascular event and twice the mortality, when compared to the general population. **Objectives:** The aim of this study was to evaluate the factors related with the cardiovascular morbility in a population of type 2 diabetics with kidney disease. The morbility was defined as all hospital admissions caused by cardiovascular (CVD) events. **Methods:** Our population was divided into two groups according to CVD hospitalization: G 1 (n = 39) = with CVD hospitalization and G 2 (n = 80) without CVD hospitalization. We analyzed several laboratory parameters, the insulin resistance (HOMA), inflammation - interleukin 6 (IL6), tumor necrosis factor alpha (TNF$\alpha$) and high sensitivity C-reactive protein (hsCRP)–the mineral metabolism, as well as the left ventricular mass index (LVMI) in our patients. **Results:** We included 119 type 2 diabetic patients (f = 54, m = 65), with a mean age of 60.35 years and mean estimated glomerular filtration rate (MDRD) of 45.3 ml/min, followed in our outpatient clinic. The mean follow-up was 50 months. We found that the G1 group was older (66.8 vs 56.6 years, p = 0.001), and showed higher levels of phosphate (4.8 vs 4.0 mg/dl, p = 0.001), PTH (196.7 vs. 111.24 ug/ml, p = 0.001 ), calcium X phosphate (45.9 vs 38.3 mg$^2$/dl$^2$, p = 0.001), LVMI (157 vs $\pm$ 112.8 g/m$^2$ p = 0.001), HOMA –IR (3. 6 *vs* 1.1 p = 0.001), uric acid (7.6 vs 6.1 mg/dl, p = 0.001), hsCRP (2.8 vs 0.7mg/L p = 0.001),TNF (9.3 vs 4.03 pg/mL p = 0.001), homocysteine (24.5 vs 14.4,$\mu$moL/L p = 0.001) and lower levels of albumin (4.06 vs 4.27 mg/dl, p = 0.042), hemoglobin (12.2 vs 12.9 g/dl p = 0.003) and eGFR (34.6 vs 56.6 ml/min, p = 0.001). Using the multivariate logistic analysis we found that hsCRP ($\beta$= 2.71 p = 0.0003) and PTH ($\beta$= 0.0141 p = 0.0315) were independent risk factors of cardiovascular hospitalization. An increase in one unit and PTH at 0.01 units in the amount of hsCRP increased odds ratio of hospitalization for cardiac causes by 1.4% (OR= IC 95%: 0.3–3.3%) and 15% (OR= IC 95%: 3–92%) respectively. **Conclusion:** In our study, we found the mineral metabolism disturbances and the inflammation were independent risk factors of morbility cardiovascular in type 2 diabetic, with moderate renal disease. These findings call for further validation in large prospective studies in type 2 diabetic with diabetic nephropathy.

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**P739**

## Low diabetes treatment and control despite high awareness in urban asian indian subjects

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**Introduction:** Type-2 diabetes is an important public health problem in India. **Objectives:** To determine its prevalence, awareness, treatment and control we performed a nationwide study. **Methods:** Population based studies among men and women ≥20 years were performed at eleven medium sized cities in India using cluster sampling in middle class locations. 6198 subjects (men 3426, women 2772) were evaluated for demographic, biophysical and biochemical risk factors using uniform protocol. Descriptive statistics are presented. Logistic regression was performed to determine association of diabetes and its awareness, treatment and control with socioeconomic factors. **Results:** Age-adjusted prevalence of diabetes (known or fasting blood glucose ≥126 mg/dl) was in 973 subjects (15.7%) (men 16.7%, women 14.4%). Significant determinants of diabetes were male sex, high dietary fat, obesity and truncal obesity ($p<0.01$). Diabetes awareness was in 71.5%, more in men (73.9%) as compared to women (67.7%). Of these, 75.9% were on treatment, and of those treated controlled fasting glucose (<126 mg/dl) was in 44.4%. Among diabetic subjects, treatment was in 54.3% (men 56.9, women 50.3%) and control in 34.2% (men 35.5, women 32.2%). On multivariate analysis significant determinants of awareness, treatment and control was better educational status ($p<0.01$). **Conclusion:** Despite high awareness of diabetes in Asian Indian urban subjects, there is low treatment and control status. Education status is significant determinant of awareness, treatment and control.

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## Prevalence and impact on prognosis of glucometabolic states in middle eastern patients with acute coronary syndrome (the GLORY study)

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**Introduction:** Western studies have shown that diabetes mellitus and other glucometabolic states are highly prevalent among patients with ACS, and are associated with worse adverse cardiovascular outcome. **Objectives:** To study prevalence of glucometabolic states amondg Middle Eastern patients and thier inpmact on prognosis. **Methods:** We evaluated the prevalence of glucometabolic states (known diabetes, newly diagnosed diabetes, impaired fasting glucose (IFG), and no diabetes) in 656 ACS patients, who were followed up prospectively for total mortality, and composite events of death, readmission for myocardial infarction, or urgent coronary revascularization, for one year after admission. **Results:** Of the whole group, 291 (44.6%) were known diabetics, 69 (10.6%) had newly diagnosed diabetes, 86 (13.2%) had impaired fasting glucose, and 206 (31.6%) were nondiabetics. The overall in-hospital mortality rate was 2.6%, and was not significantly different between the four groups. At 1 year; overall mortality was 7.2%, and was significantly higher among diabetics (newly diagnosed; 17.1%, and known diabetics; 7.8%) compared with patients who had IFG (3.4%) and nondiabetics (4.4%), $p=0.002$. Composite events at 6 months was significantly higher in known diabetics (14.7%), compared with newly diagnosed diabetics (7.1%), IFG (9.2%) and nondiabetics (6.3%), $p=0.016$. At 1 year, composite events occurred in 15.9% of the whole group, and was significantly higher in known diabetics (20.1%), compared with newly diagnosed diabetics (10%), IFG (11.5%) and nondiabetics (13.6%), $p=0.049$. **Conclusion:** In Middle Eastern ACS patients, 70% have abnormal glucometabolic states. Newly diagnosed diabetics and known diabetics have higher risk of cardiovascular events than patients with impaired fasting glucose and nondiabetics after 1 year of admission.

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## The effect of telmisartan on Rho/ROCK signal pathway in insulin resistance rat's coronary artery

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**Introduction:** Rho/Rock signal passway system is invovaled in vascular tone regulation partly through NO systemSome investigation show that Telmisartan a RAAS system antiblocker also can adjust vascular tone through NO signal systembut the relationship between them in insulin resistance rat is still unknown **Objectives:** To observe the express level change of RhoA and ROCK signal pathway in insulin resistence Rat and To identify the role of telmisartan on the expression of RhoA and ROCK signal pathway in insulin resistence Rat small cornary artery tissue. **Methods:** There were 30 male Sprague-Dawley (SD) Rats was randomly divided into 3 groups,10 in each group.The control group was feed with normal diet ,10 in Insulin resistance group (make model by high fructose diet plus Streptozotocin injection ),10 in telmisatan group (insulin resistance plus telmisartan). Blood samples were assaied at the 8 weeks. Coronary arteries were isolated for the RT-PCR and Westen Blot assay to identify RhoA,ROCK1,ROCK2 mRNA and proten expression level of the rat coronary tissue. **Results:** Compared with control group, the blood pressure, body weight, serum TC,TG,FBG,FSI value were obversly higher and ISI value was obversly lower $P<0.01$ RhoA proten express level down regulated but ROCK1mRNA express level was up regulated in IR group. After interfere by telmisartan, blood pressure, body weight, serum TG, FBG, FSI value of IR group were significantly lower $P<0.05$, and ISI level was significantly rise $P<0.05$. The RhoA proten expression was remarkably higher than IR group ($P=0.043$) .there were no statistical significance of RhoA, ROCK1mRNA and ROCK1, ROCK2 proten expression between Tel and IR group. **Conclusion:** Telmisartan can obviously lower insulin resistance rat's blood pressure and body weight, FBG and TG level,elevate ISI level,improve insuline resistance state. Telmisartan can reverse the RhoA protein down regulation in IR rat's coronary artery ,but only have a limited affect on RhoA mRNA ,ROCK1 and ROCK2mRNA and protein expression level in insulin resistance rat's coronary artery.

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## Underestimated epidemic of diabetes in China

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**Introduction:** Diabetes is one of the major non-communicable diseases worldwide, with dramatically increasing trends in China. To rational assign the health recourse and properly guide the prevention, it is important to investigate its prevalence, to estimate and project the number of people with diabetes. There were several national surveys for diabetes in China with published data and also published papers with predicted the burden of diabetes in different time points. But few study examined the predicted trend with the observed numbers in recent years. **Objectives:** To compare the predicted prevalence rates of diabetes and predicted number of people with diabetes for China with observed rate and numbers by searching and analyzing published papers from 1990 to 2011. **Methods:** To search published papers which presented the results of national diabetes survey in China and also the papers aimed to project the burden of diabetes, we selected articles published in the English/Chinese languages through MEDLINE and the China Wanfang Digital Databaseusing keywords "China," "diabetes," "prevalence," "estimated" and "projection" et al. from 1990 to 2011. **Results:** There are four published papers predicted the future prevalence rates and numbers of people with diabetes in China in different time points. The observed prevalence and the total number of people with diabetes in 2002 were 50% and 45 % higher than that projected for the nearby time points 2000. The observed prevalence and the total number of people with diabetes in 2008 were overwhelming over all predictions did by different authors, that was not only 150% higher in prevalence and 39.4 million more people with diabetes compared with the highest projected numbers for 2009 by Pan and also 50% higher in prevalence and 29.8 million more people with diabetes than the highest projected numbers for 2030 by Shaw. **Conclusion:** It can bring to light that the epidemic of diabetes in China is increasing in an eruptive way based on both observed and projected numbers. Furthermore, the epidemic of diabetes in China is increasing in a speed much more faster than current knowledge and method of prediction has caught.

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## Cardiovascular risk profile of diabetic patients followed in primary and tertiary care in Abu Dhabi, United Arab Emirates

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**Introduction:** Diabetic patients followed in tertiary care may have more advanced disease compared with those followed in primary care and hence may require more aggressive cardiovascular risk reduction. **Objectives:** To compare the cardiovascular risk profile including markers of endothelial dysfunction and inflammation in diabetic patients followed in primary and tertiary care. **Methods:** Adult Emirati diabetic patients attending two primary care clinics and the diabetes center at a tertiary hospital in Abu Dhabi, United Arab Emirates were studied as detailed in the reference below. High sensitivity CRP (hs-CRP), IL-6, IL-1ra, NT-ProBNP, sICAM, and sVCAM levels were measured, and the results were log transformed (natural log, $_{ln}$) if the distribution was skewed. **Results:** Diabetic patients followed in tertiary care were older (54.2±10.2 vs. 51.9±11.9 years, $P=0.09$), had longer duration of diabetes (11.7±7.1 vs. 6.3±7.0 years; $P<0.001$) and were more likely to be males (47.8 vs. 23.7%; $P<0.001$), to be on statins (78.4% vs. 67.2%; $P=0.03$) and to have micro- (25.5 vs. 13.6%; $P=0.01$) and macro-vascular (33.1 vs. 22.0%; $P=0.06$) diabetic complications compared with those followed in primary care. Their NT-ProBNP and IL-1ra levels were also significantly higher (**Table**). Both hypertension (53.8 vs. 51.7%; $P=0.8$), and dyslipidemia (78.2 vs. 68.6%; $P=0.09$) were commonly reported but differences were not significant. Diastolic blood pressure and total cholesterol, LDL-c, and hs-CRP levels were significantly lower in tertiary care (Table). Large artery stiffness index (8.6±2.2 vs. 8.5±2.1 meter/second; $P=0.8$), systolic blood pressure (127±18 vs. 124±17 mmHg), body mass index (32.9±7.2 vs. 32.8±6.5 kg/m$^2$; $P=1.0$) and sVCAM, sICAM, and IL-6 levels were not statistically significantly different.

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**Table**

| Variable | Primary Care (n=118) | Tertiary Care (n=157) | P value |
|---|---|---|---|
| Diastolic BP (mmHg) | 76±12 | 72±10 | <0.001 |
| Total cholesterol (mmol/L) | 4.3±1.1 | 3.9±0.9 | <0.001 |
| LDL-c (mmol/L) | 2.6±0.9 | 2.2±0.8 | 0.001 |
| NT-ProBNP$_{ln}$ (pg/ml) | 3.6±1.0 | 3.9±1.0 | 0.008 |
| IL-1ra$_{ln}$ (pg/ml) | 5.9±0.7 | 6.1±0.6 | 0.02 |
| IL-6$_{ln}$ (pg/ml) | -0.3±1.4 | -0.6±1.3 | 0.08 |
| hs-CRP$_{ln}$ (mg/L) | 1.4±1.3 | 0.8±1.4 | <0.001 |
| sICAM$_{ln}$ (ng/ml) | 5.4±0.5 | 5.5±0.3 | 0.3 |
| sVCAM$_{ln}$ (ng/ml) | 5.9±2.2 | 5.4±3.3 | 0.1 |

**Conclusion:** Diabetic patients followed in tertiary care have more advanced disease compared with those followed in primary care. However, they have better lipid profile and blood pressure, and lower hs-CRP levels which suggest more aggressive cardiovascular risk reduction, especially with the use of statins.

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## Diabetes mellitus and its influence in cardiac rehabilitation program for coronary patients

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**Introduction:** Modifiable coronary risk factors are a main focus of secondary prevention/ cardiac rehabilitation programs (CRP) after an acute coronary syndrome. Cumulatively they exert a negative impact on functional capacity, psychossocial status and overall prognosis. *Diabetes Mellitus* is associated with a myriad of cardiovascular and metabolic dysfunctions resulting in worse prognosis and functional recovery. **Objectives:** We wanted to study in our population the relevance in out come of our diabetic patients when submitted to a cardiac rehabilitation program. **Methods:** We evaluated 186 patients referred to a cardiac rehabilitation program after an acute coronary event, recruited between September 2008 and August 2010. Information on clinical, anthropometrical, functional and laboratorial parameters was collected. Baseline and after CRP evaluations included functional capacity, assessed using metabolic equivalents (METS) achieved during exercise stress testing; and quality of life evaluated through the physical and mental summary components of the Medical Outcomes Study Short Form 36 (MOS-36 SF-36) questionnaire. We used standard paired-sample t test for program response and independent sample t-test for intergroup comparisons. **Results:** One-hundred eighty six patients were evaluated, mean age [mean(SD): ] was 54±9 years and 116 (85%) were men. Nineteen (14.5%) were diabetics of which were 6 (19.4%) women. Diabetics showed a higher proportion of women (p=0.019), smokers (p=0.048) and obese patients (p=0.015). Regarding other coronary risk factors no differences were found, namely hypertension (p=0.42), dyslipidemia (p=0.54) and family history of coronary disease (p=0.32). Diabetic and non-diabetic patients both showed significant improvements in functional capacity (2.96±1.7 p≫.001 vs 3.85±1.6 p≫0.001). Improvement in functional capacity was lower for the diabetic patients (2.9±1.7 vs 3.8±1.7 p=0.042). Both groups showed similar improvements in physical [+3,09(4,86); p<0,001 versus +3,71(7,68); p<0,001] and mental [+3,56(10,38); p=0,05 versus +2,05(10,87); p=0,02]. **Conclusion:** Albeit diabetics show significant improvement in their functional capacity and quality of life, the magnitude of improvement is lower than for non-diabetics. CPR is of major relevance in improving functional capacity and quality of life independently of the presence of diabetes.

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## Risk assessment of pre-diabetic patients without previous coronary artery disease

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**Introduction:** Pre-diabetic state, mainly impaired glucose tolerance (IGT), is a risk factor for coronary artery sisease (CAD) and sudden death. Many subjects with IGT will develop CAD before progressing to diabetes. **Objectives:** The purpose of this study was to investigate the predictors of the abnormal ECG stress test and cardiac events in pre-diabetic pts without previous CAD. **Methods:** We enrolled 291 consecutive pre-diabetic (IGT) pts without previous CAD (according to ESC and EASD). All pts were evaluated by ECG stress test for non-cardiac or atypical chest symptom, rest ECG and/or cardiac echo abnormalities, presence of major cardiovascular (CV) risk factors. We analyzed the association between abnormal exercise ECG and cardiac events and several clinical parameters during a mean follow-up period of 3.1 ± 0.5 years. **Results:** Abnormal stress ECG showing inducible ischemia was noticed in 14% patients, mentioning that 8.1% of patients were unable to exercise or had equivocal results. Univariate analysis has shown the following parameters significant associated with abnormal exercise testing: age (p<0.01), family history of premature CV events (p<0.02), arterial hypertension (p<0.01), dyslipidaemia (p<0.02), plasma glucose (p<0.04). Multivariate logistic regression analysis, after adjusting for other potential confounders, has shown that cardiac echo abnormality (p<0.01), LDL cholesterol (p<0.01), and Hb A1c (p<0.04) were significant independent predictors of abnormal ECG exercise test. Multivariate Cox proportional analysis revealed that abnormal stress ECG (HR=2.4, 95%CI: 1.1–6.4, p=0.036) and post-load glucose (2-hPG) (HR=2.7, 95%CI: 0.8–7.2, p=0.042) were good predictors of the cardiac events. **Conclusion:** Abnormal ECG exercise test is a good predictor of cardiac events, and is present in a significant percent of pre-diabetic (IGT) patients without known previous CAD. Independent predictors of abnormal stress ECG were: cardiac echo abnormality, LDL-cholesterol, and glycated Hb. A simple, inexpensive and effective test, exercise ECG can be extremely useful in every day clinical practice in initial risk assessment of these patients.

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## Impact of diabetes on frequency of ventricular arrhythmias in patients after myocardial infarction

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**Introduction:** Coronary patients with diabetes are at high risk of cardiovascular events. Coronary disease in diabetic patients has speed up, progressive course because of the synergic work of hyperglycemia and other risk factors of the coronary disease, as well as dyslipidemia, hypertension and obesity. **Objectives:** The aim of this study was to establish the influence of diabetes mellitus on frequency of ventricular arrhythmias in patients after myocardial infarction (MI). **Methods:** The study involved 293 patients after MI, in the sinus rhythm without AV blocks or branch blocks. Ninety-five patients were with diabetes mellitus (average age 60.1 years), and 198 were without diabetes (average age 59.5 years). There was no significant difference in age or sex between two groups of patients. In all subjects 24-hour ECG recording and echocardiographic examination were performed and from standard ECG corrected QT dispersion (QTdc) was calculated. From the Holter record, the analysis of the heart rate variability was performed by software. Four parameters of the time domain heart rate variability were assessed: SDNN, SDANN, RMS-SD and NN50 ms. **Results:** The study demonstrated that patients after MI with diabetes had significantly higher prevalence of frequent premature ventricular complexes (PVCs ≥ 10/hour): 56 (58.9 %) vs 46 (23.2 %), p<0.001, in comparison to those without diabetes. Ventricular tachycardia was present in 8 (8.4 %) vs 4 (2.0 %) patients in the group without diabetes, p<0.05. Patients with diabetes also had significantly lower values of followed parameters of the heart rate variability (p<0.001 for all parameters), and significantly higher values of QTdc (p<0.001) in comparison to those without diabetes. Patients with diabetes also had significantly lower values of LVEF (p<0.001), and significantly higher values of LVESd (p<0.001), LVEDd (p<0.001), and La (p<0.001), in comparison to those without diabetes. **Conclusion:** The study showed that in patients after MI, diabetes mellitus have a significant impact on ventricular arrhythmias, which in part may explain the higher risk of sudden death in patients with diabetes mellitus. Significantly higher frequency of ventricular arrhythmias in patients with diabetes is the result of the presence of higher number of pathological states which induced significant electrophysiological changes as well as provided conditions for the appearance of frequent and complex ventricular arrhythmias.

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## The prevalence of metabolic syndrome components in non-diabetic patients admitted with acute coronary syndrome: a prospective study in males versus females

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**Introduction:** Metabolic syndrome (MS) is a silent epidemic which consists of a cluster of metabolic disorders that promote cardiovascular morbidity and mortality. While Diabetes (DM) and Acute Coronary Syndrome (ACS) is well studied, much of the prevalence of MS in Non-Diabetic patients (NDM) admitted with ACS is unknown. **Objectives:** This Prospective study was conducted to ascertain the prevalence of the MS and the frequency of its various components, individually and in combinations, in patients presenting with ACS, without a previous diagnosis of Diabetes Mellitus (DM). **Methods:** Two groups of 467 males and 116 females, without a previous diagnosis of DM, were hospitalized with diagnosis of ACS. Clinical measurements of weight, height, waist circumference (WC) and Blood Pressure (BP), as well blood samples for Fasting Plasma Glucose (FPG) and Lipid profile were taken. Accordingly, patients were categorized according to the latest international criteria for the global definition of the MS. **Results:** Total 583 patients (mean age of 51.5±11.9 years), 467 men (mean age of 49.7±10.7 years) and 116 women (mean age of 58.6±13.5years). All patients had no diagnosis of DM before. 396 (67.92%) fulfilled the criteria for MS. Of the components of MS, reduced HDL-Cholesterol and elevated FBG were the most common components (83.5% and 76%, respectively), followed by increased WC, high triglyceride and elevated BP (63.6%; 45.8% and 27.4%, respectively). Majority had three or more components (68.3%). A single metabolic component of the MS was found in only 11% of patients and two in 19.34%. In males, reduced HDL-C was the most common metabolic abnormality (87.2%), (69% in females; $p$ <0.001). Elevated BP was significantly higher among males (32.1 vs. 8.6%; $p$ <0.001). In females however, elevated FBG was the commonest component (72.4%). Overall, males were more likely to display more components of MS than female, ($p$ <0.001). **Conclusion:** Despite relatively young age, the prevalence of MS in ACS patients without previous diagnosis of DM was high (67.92%) and most had three or more metabolic components. Females were nearly 10 years older. Reduced HDL-C was the commonest component in males and elevated FBG in females.

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## Does cardiac rehabilitation improve functional capacity and cardiovascular risk profile in patients with coronary artery disease and metabolic syndrome?

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**Introduction:** Cardiac rehabilitation (CR) has multiple beneficial effects and improves the prognosis of patients with coronary artery disease (CAD). Metabolic syndrome (MS) is an increasing clinical entity in the western countries and it is associated with a significant increase in cardiovascular morbidity. Limited data are available regarding the effects of CR in patients with MS and CAD. **Objectives:** In this study we aim to evaluate the effectiveness of CR on functional capacity, metabolic parameters and coronary risk factors (CRF) in patients with MS and CAD. **Methods:** This study involved patients (pts) with CAD who completed a phase 2 CR program, between September 2008 and August 2010, on a tertiary care center. Sociodemographic, clinical, laboratorial and functional parameters were collected before and after CR program. Pts were divided according to the presence of MS at the beginning of the program, defined by ATP III criteria. The two groups were compared for functional improvement [evaluated in metabolic equivalents (METs) achieved on exercise stress test] and for analytic and clinical response to CRF. Standard tests (Qui-Square and Student's t-test) were used to compare to compare intra and intergroup differences with CR. **Results:** We enrolled 144 pts, 91,7% were men, and mean age was 53±9 years. Of them, 26 (18,1%) fulfilled criteria for MS. Previous diagnosis of hypertension, dyslipidemia, diabetes, and a higher waist circumference were significantly more prevalent in pts with MS ($p<0,05$ for all analysis). At CR program end, functional capacity improved in both groups [76,5% in pts with MS ($p<0,0001$) and 65,8% in those without ($p<0,0001$)]; however, there were no significant differences in functional improvement between groups ($p=0,207$). Significant improvements in waist circumference, blood pressure and analytic profile were observed in both groups (except for high-density lipoprotein cholesterol levels in MS group). Waist circumference, fasting glucose and triglycerides improvements during follow-up were higher in pts with MS ($p<0,05$ for all analysis). At the end of follow-up, of the 26 pts with MS at the beggining of the program, only 9 (34,6%) maintained MS criteria. **Conclusion:** In our population, a CR program improved functional capacity and CRF in pts with CAD and MS, therefore reducing their cardiovascular risk profile and enhancing their physiological status. CR program should be part of a comprehensive therapeutic regimen of these pts.

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## Metabolic syndrome associated with higher CVD risk for women

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**Introduction:** Metabolic syndrome (MetS) is significant risk factor of cardiovascular disease (CVD) and characterised by atherogenic dyslipidemia. **Objectives:** To evaluate association between MetS and lipids, C reactive protein (CRP), glucose metabolism, coronary artery calcium (CAC) score, and cytokines changes depending on patients' sex. **Methods:** In 200 outpatients (mean age 52.3±11.7; 35.5% - men) incidence of MetS was evaluated. MetS was defined by International Diabetes Federation criteria. Patients of both sexes were subdivided into these with and without MetS and levels of total cholesterol (TC), high and low density lipoprotein cholesterol (HDL-C and LDL-C), triglycerides (TG), glucose and insulin levels, CRP, interleukin-6 (IL6), tumor necrosis factor-$\alpha$ (TNF-$\alpha$), adiponectin (A), leptin (L) in serum and CAC score by using computer tomography were detected. **Results:** MetS was detected in 85 (42.5%) patients (39 (45.9%) were men). Similar lipids and glucose metabolism changes were established in patients of both sexes: lower HDL-C level and higher TG, glucose and insulin levels. Both men and women with MetS have higher CRP level ($p=0.016$ and $p=0.004$, respectively), but level of IL6 remained practically unchanged. Elevated levels of TC ($p=0.012$), LDL-C ($p<0.001$), L ($p=0.002$), TNF-$\alpha$ ($p=0.011$), and elevated CAC score ($p=0.004$) and decreased A ($p<0.001$) level were detected only in women with MetS. **Conclusion:** The findings confirm that MetS affects CVD development in women more unfavourably as indicated by adverse changes in cytokines and increased amount of calcium in their coronary arteries.

**P750**

## Anti-inflammatory properties of HDL after short-term exercise training without any specific diet in patients with metabolic syndrome

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**Introduction:** Recent study showed that short-term exercise, associated with diet and weight loss, improves the anti-inflammatory properties of HDL in metabolic syndrome (MetS). However, diet and weight loss, per se, can alter the functionality of HDL and, in real life many patients do not follow the medical counseling of diet and exercise simultaneously. We showed previously that the antioxidative characteristics and the capacity to accept lipids of HDL are early improved by short-term exercise training (Tr) with no diet associated. (1). **Objectives:** We sought to verify whether the anti-inflammatory properties of HDL are affected by Tr, without any diet associated, in patients with MetS. **Methods:** Forty sedentary persons (30 withMetS,10 controls) were evaluated. Twenty of those with MetS were subjected to a 3 times/week training load(45 min/day) for 3 months on a bicycle ergometer. Plasma high-sensitivity C-reactive protein (hs-CRP) was analyzed and HDL subfractions were obtained by plasma ultracentrifugation. (2). Endothelial cells were cultured, stimulated with TNF-$\alpha$ and lipopolysacharide, and coincubated with HDL sub fractions obtained before and after Tr. Sequentially, those cultures of endothelial cells were coincubated with THP-1 cells labeled with a fluorescent marker. The labeled THP-1 cells that adhered on endothelial cells were counted under fluoroscopic microscope. **Results:** Baseline plasma levels of HDL-C were lower in the MetS group compared to controls and Tr did not change neither HDL-C nor weight in MetS group. Hs-CRP plasma levels from patients with MetS were higher than controls (3.0 ± 1.5 vs1.5 ± 1.5 mg/L respectively, $p<0.05$) and did not change after Tr (3.0 ± 1.5 vs2.8 ± 1.8 mg/L, before and after Tr respectively, $p>0.05$). The number of adhered labeled THP-1 cells coincubated with endothelial cells did not change significantly when mixed with HDL2a or HDL3b from patients with MetS after Tr, compared with HDL2a or HDL3b obtained before Tr. **Conclusion:** Our results showed that Tr did not change an inflammatory serum marker (hs-CRP) and the adherence of THP-1 cells on endothelium cells, suggesting that the anti-inflammatory properties of HDL are not early improved by short-term exercise, when there is no diet associated.

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**P751**

## Influence of the concentration and molecular composition on the LDL and HDL functional characteristics in patients with the metabolic syndrome

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**Introduction:** Long-term exercise associated with diet changes lipoproteins plasma levels. **Objectives:** We sought to analize the effects of short-term exercise training without any specific diet (T) on the concentration,composition and functional characteristics of LDL and HDL in patients with metabolic syndrome (MS). **Methods:** Forty sedentary persons were studied,30 with MS and 10 controls.Twenty of those with MS were subjected to a 3 times/week controlled training load (45 min/day) for 3 months on a bicycle ergometer.LDL and HDL subfractions were obtained by plasma ultracentrifugation[1] and their compositions were analyzed. LDL from control subjects was incubated with HDL2a,HDL3b from the MS patients (before and after T) and the in vitro resistance to oxidation was verified. An artificial lipoprotein emulsion (LDE) labeled with[14]C-phospholipid, [3]H-triglycerides, [14]C-cholesterol and[3]H-cholesteryl ester was incubated with plasma from the participants. After precipitation of VLDL, LDL and LDE the HDL-containing supernatant was counted for radioactivity to verify the HDL ability to accept lipids.[2]**Results:** T decreased triglycerides (TG) but did not change apoB,apoA-I,LDL-C and HDL-C plasma levels. LDL resistance to oxidation increased (+91%) after T,associated with a decrease in the LDL content of apoB (-16%) and TG (-14%) and in the concentration of the small and dense LDL particles. Oxidizability of control LDL decreased when mixed with HDL2a or 3b from patients with MS, before vs. after T (-23% for HDL2a and -18% for HDL3b),associated with an increase in PON1 activity in the MS group (58.3±36.2 before vs.70.7±38.4ng/ml/min after T,$p<0.05$) and with a significant decrease in the content of total cholesterol (TC) and TG in HDL3b and HDL3c but with an increase in cholesterol ester (CE) in HDL3b. T did not significantly modify concentrations of TC and TG in HDL2a, 2b and 3a. Phospholipids and total protein content did not change in all HDL subfractions.T significantly increased free cholesterol and CE transfer from LDE to HDL in MS group to levels similar to those observed in controls. **Conclusion:** In patients with the MS, T influences the LDL and HDL functionality by earlier changes in molecular composition rather than their concentration, emphasizing the early benefits of exercise and highlighting the importance of evaluating the functional aspects of the lipoproteins besides their plasma levels

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**P752**

## Interaction between inflammation, physical activity and metabolic syndrome among a geriatric remote community in Southern Taiwan

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**Introduction:** Metabolic syndrome (MetS) can increase the risk of cardiovascular disease and diabetes mellitus. Obesity, physical activity and inflammation may play the major roles in the pathophysiology of MetS. It remains unclear among aged subjects. **Objectives:** Our study aimed to study the assocaition between the clinical common risk factors and inflammatory biomarkers for MetS among an aging Asain suburban community. **Methods:** We enrolled totally 404 residents over 65 years of age (average age: 74.64±6.14 years) in a remote aging community in Southern Taiwan. Each subject underwent a structured questionnaire interviews to measure the amount of physical activities. We defined the high inflammatory status based on their hsCRP level higher than 0.9mg/L, the best cutoff value for MetS in this cohort. **Results:** The total prevalence rate of MetS was 24.6%, which was obviously lower than the previous reported Caucasian data. The average level of hsCRP was significantly higher in the MetS group (2.50±0.52 vs. 0.70±0.18 mg/L, $p<0.01$). The frequency of higher hsCRP level was significantly higher among MetS population (39.3 vs. 18.8%, $p=0.03$). The risk of elevated hsCRP increased with escalating MetS components (p for trend$<0.001$). Interestingly, an increased average weekly physical activity was observed more frequently in the non-MetS population ($p=0.02$), which also happened among those with lower hsCRP levels ($p=0.03$). We found that instead of "central obesity" in Caucasian MetS population, only "the lower HDL level" and "lower weekly physical activity" remained predictors for higher inflammatory status

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among this geriatric MetS population. **Conclusion:** Our study indicates that, instead of obesity in Caucasian population, HDL abnormality, reduced physical activity and inflammation are the major roles for the pathophysiology of MetS in this aging population.

**P753**

## Role of peri-renal fat in association with risk factors for atherosclerosis

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**Introduction:** The peri-renal fat(PRF) has been associated with hypertension but its measurement and association with risk factors is not well described. **Objectives:** To correlate the thickness of the PRF with risk markers for atherosclerosis. **Methods:** A total of 48 volunteers of both sexes, 24 women (F), 15 controls and 9 with MS, and 24 men (M), 12 in each group, selected with basis in their clinical history and physical examination underwent clinical evaluation and ultrasound (US). We did not include those who were using drugs that could interfere with metabolic and hemodynamic profile, and those who drank more than 15 g/day of ethanol. The thickness of the PRF was measured by the distance between the inner face of the transverse muscle of the abdomen and the posterior face of the right kidney. **Results:** The correlation was positive ($p < 0.05$) with risk factors in men starting with the TGP (0.24 cm), LDL-C (0.34 cm), total cholesterol (0.36 cm), triglycerides (0.65 cm), waist circumference (0.66 cm), SBP (0.65 cm), Glucose (0.67 cm), DBP (0.68 cm) and Gamma-GT (1.23 cm), and in women with the Gamma-GT (0.14 cm), triglycerides (0.24 cm), SBP (0.60 cm) and the waist circumference (0, 79cm). **Conclusion:** The thickness is correlated with PRF crhonology risk factors for atherosclerosis.

**P754**

## Thickness of visceral fat and risk markers of atherosclerosis

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**Introduction:** Increased body fat has been linked to a higher risk for cardiovascular disease. Previous studies showed that visceral fat (VF) is associated with metabolic syndrome (MS), but the association ascending order of visceral fat thickness with atherosclerosis risk factors(RF) still is not well determined. **Objectives:** Analyze the relationship between the thickness of VF with atherosclerosis risk factors in patients with RF and MS. **Methods:** Eighty nine persons, 45 women (7 controls, 25 RF and 13 MS) and 44 men (6 controls, 19 RF and 19 MS) were analized and selected with basis in their clinical history and physical examination underwent clinical evaluation and ultrasound (US). We did not include those who were using drugs that could interfere with metabolic and hemodynamic profile, and those who drank more than 15 g/day of ethanol.The thickness of VF in centimeters (cm), determined by ultrasound, was measured by the distance between the inner face of the abdominal muscle and the posterior face of abdominal aorta. Ultrasound examination was performed with convex transducer 3–9 MHz, positioned transversely 1 cm above the umbilicus, without compression of the transducer. **Results:** The correlation was positive ($p < 0.05$) with risk factors in men starting with the HDL-c(5,98cm), triglycerides(6,52cm), waist circumference(6,55cm), DBP(7,33cm), glucose(8,12cm), Gamma-GT(8,87cm), SBP(9,21) and TGP (9,92 cm), and in women with the waist circumference(3,62cm), total cholesterol (5,71 cm), DBP (6 cm), triglycerides (6,41cm), LDL-C (6,64 cm), SBP (7cm), and glucose (9,58cm). **Conclusion:** The thickness of visceral fat is associated with risk factors for atherosclerosis in this population.

**P755**

## Can the peri-renal fat be considered as diagnostic criterion for metabolic syndrome?

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**Introduction:** The peri-renal fat (PRF) is related to hypertension but the potential of its determination by abdominal ultrasound as a diagnostic criterion of metabolic syndrome(MS) is not yet well established. **Objectives:** To correlate the thickness of the PRF with the diagnosis of metabolic syndrome. **Methods:** A total of 48 volunteers of both sexes, 24 women (F), 15 controls and 9 with MS, and 24 men (M), 12 in each group, selected with basis in their clinical history and physical examination underwent clinical evaluation and ultrasound (US). We did not include those who were using drugs that could interfere with metabolic and hemodynamic profile, and those who drank more than 15 g/day of ethanol. The thickness of the GPR was measured by the distance between the inner face of the transverse muscle of the abdomen and the posterior face of the right kidney. **Results:** The occurrence of three risk factors for cardiovascular disease was associated with the PRF thicknesses of 0.56 (M) and 0.46 cm (F). These cut-off points were tentatively used as a criterion for diagnosis of MS in the considered population. For a prevalence of 58.3 (H) and 37.5% (F) of SM, the sensitivity was 64.3 (M) and 66,7% (F), with confidence intervals (CI) of 35.1–87.2% (M) and 29.9–92.5% (F) and specificity was 80.0 (M) and 73.3% (F), with CI of 44.4–97.5% (M) and 44.9–92.2% (F); the positive predictive value was 81.8 (M) and 60.0% (F), and the predictive negative value was 61.5 (M) and 78,6% (F); the likelihood ratio (LR) was 3.2 (M) and 2.5 (F) for a positive result, and 0.45 of both sexes for a negative result; the odds ratio was 58.0 (M) and 38.0 (F); and area under the ROC curve was 0.76 (M) and 0.82 (F). **Conclusion:** The increased thickness of the peri-renal fat showed a strong association with the metabolic syndrome. Therefore, this criterion was shown to be valid for the diagnosis of MS.

**P756**

## C677T polymorphism of methylentetrahydrofolate reductase gene association with insulin resistance and metabolic syndrome in Kyrgyzs

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**Introduction:** The association between C677T methylentetrahydrofolat reductase (MTHFR) gene polymorphism, high homocystein blood level and increased cardiovascular risk has been reported. **Objectives:** To study an association of the C677T methylentetrahydrofolat reductase (MTHFR) gene polymorphism with insulin resistance (IR) and metabolic syndrome (MS) among Kyrgyzs. **Methods:** 132 Kyrgyz patients with IR according to HOMA index (≥2,77) and 132 sex and age matched patients without IR, diabetes mellitus (DM) type 2 and MS according to ATP III criteria were included into the study. Measurement of arterial blood pressure (BP), body mass index, waist and hip circumference, fasting blood sugar, serum lipids and insulin were performed in all patients. DNA was extracted from blood cells and C677T of MTHFR gene polymorphism was determined by PCR method. **Results:** TT genotype was revealed in 18 (7%), CT genotype in 97 (37%) and CC genotype in 149 (56%) examined persons. Frequency of T allele was 25%. There was a strong association between carrying of T allele and IR ($\chi^2$ genotype = 7,22, p=0,027; $\chi^2$ allele = 7,33, p=0,007, OR –1,68, 95% CI (1,13–2,5)), MS ($\chi^2$ genotype = 7,53, p=0,023; $\chi^2$ allele = 7,32, p=0,007, OR–1,74, 95% CI (1,16–2,60)) and such components of MS as abdominal obesity ($\chi^2$ genotype = 6,78, p=0,033; $\chi^2$ allele = 6,94, p=0,0084, OR–1,74, 95%CI (1,15–2,65)), hypertriglyceridemia ($\chi^2$ genotype = 6,64, p=0,036; $\chi^2$ allele = 5,36, p=0,02, OR–1,60, 95%CI (1,07–2,39) and low level of high density lipoprotein cholesterol (HDL-C) ($\chi^2$ genotype = 5,91, p=0,05; $\chi^2$ allele = 5,64, p=0,02, OR–1,66, 95%CI (1,09–2,53)). **Conclusion:** In Kyrgyzs carrying of T677 allele of MTHFR gene is associated with IR, MS, abdominal obesity, hypertriglyceridemia and low HDL-C level.

**P757**

## Social support, coping strategies in relation with acute coronary syndrome

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**Introduction:** Psychological factors have been recently proposed as cardiovascular risk factor. Association of psychological stratus with ACS and its metabolic risk factors has been suggested in many studies. This study designed to evaluate the association of lifelong coping strategies and social supports with progression of chronic stable angina (CSA) to acute coronary syndrome (ACS). **Objectives:** Psychological factors have been recently proposed as cardiovascular risk factor. Association of psychological stratus with ACS and its metabolic risk factors has been suggested in many studies. This study designed to evaluate the association of lifelong coping strategies and social supports with progression of chronic stable angina (CSA) to acute coronary syndrome (ACS). **Methods:** coping strategies and social support of patients based on stress management questionnaire and Norback social support questionnaire were evaluates in a case control study. Seventy eight hospitalized patient with ACS and 146 patients with CSA were included as the case and control groups respectively. Positive angiographic findings were defined as the criteria for CSA. Logistic regression analysis was used to examine the aforementioned association. **Results:** The mean age of 224 participants was 55±10.4 years and 69.6% of them were male. After adjusting for age, sex and traditional coronary artery disease risk factors, acute life event (OR: 1.09, 1.05–1.13 95%CI), maladaptive coping strategies (OR: 5.81, 1.93–17.49 95%CI), adaptive coping strategies (OR: 0.21, 0.05–0.94 95%CI), total functional support (OR: 0.49, 0.26–0.97 95%CI) and total network support (OR: 0.27, 0.15–0.53 95%CI) were significantly associated with ACS. **Conclusion:** Improvement in social support and adaptive coping strategies should be considered in patients with chronic ischemic heart disease to reduce the risk of ACS.

**P758**

## Cardiotrophin-1 (CT-1) levels in metabolic syndrome: effects of angiotensin receptor blocker and statin treatments on CT-1 levels

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**Introduction:** Cardiotrophin-1 (CT-1) is an inflammatory cytokine which is known to participate in the pathophysiology of underlying several cardiovascular (CV) disorders. Patients with metabolic syndrome (MS) have a well recognized increase in their overall cardiovascular risks. **Objectives:** We aimed to investigate basal plasma CT-1 levels in patients with MS, and change in plasma CT-1 levels with therapy utilizing an angiotensin receptor blocker (ARB) and/or a statin. **Methods:** A total of 59 patients with MS and 20 healthy controls were enrolled. Among MS patients, 20 had hypertension (HT) and hyperlipidemia (HPL) (group 1), 19 had only HPL (group 2) and the remaining 20 (group 3) had only HT. Hypertensive patients received either 80 or 160 mg valsartan and hyperlipidemic patients were given 80 mg of extended release

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fluvastatin. Plasma CT-1 levels were evaluated at baseline and after 6 months of active treatment using an ELISA test for human CT-1. **Results:** Baseline CT-1 was significantly higher in MS patients in all groups compared with the control group ($p<0.001$). Baseline CT-1 levels were not different among MS patients in different groups. Significant decrease was present in CT-1 after treatment, and this was true for all 3 groups (p values for groups 1, 2 and 3 respectively: $p<0.001$, $p<0.0005$, $p<0.001$). **Conclusion:** CT-1 levels are higher in MS patients compared to healthy people regardless of the syndrome components they have. Therapies utilizing ARBs and/or statins aiming to decrease overall cardiovascular risk, seem to have beneficial effects on CT-1 levels in patients with MS. The correlation between CT-1 levels and CV prognosis in MS patients remains to be determined.

**P759**

## Cardiotrophin-1 (CT-1) levels in metabolic syndrome: relationship between the change in cardiovascular risk factors and ct-1 levels with treatment

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**Introduction:** Cardiotrophin-1 (CT-1) is an inflammatory cytokine which is known to participate in the pathophysiology of several cardiovascular (CV) disorders. Patients with metabolic syndrome (MS) have a well recognized increase in their overall cardiovascular risks. **Objectives:** We aimed to investigate basal plasma CT-1 levels along with several CV risk parameters in patients with MS, and the relationship between the change in plasma CT-1 levels and CV risk parameters after therapy utilizing an angiotensin receptor blocker (ARB) and/or a statin. **Methods:** A total of 59 patients with MS and 20 healthy controls were enrolled. Among MS patients, 20 had hypertension (HT) and hyperlipidemia (HPL) (group 1), 19 had only HPL (group 2) and the remaining 20 (group 3) had only HT. Hypertensive patients received either 80 or 160 mg valsartan and hyperlipidemic patients were given 80 mg of extended release fluvastatin. All patients received advice on life style changes. **Results:** Significant decrease was present in CT-1 ($\Delta$CT-1) after treatment, and this was true for all 3 groups (respectively, HT+HPL, HPL, HT ($P<0.001$,$P<0.0005$,$P<0.001$)). Similar decrease was present for fasting plasma glucose (FPG)($P<0.001$,$P<0.001$,$P<0.001$), fasting insulin($P<0.001$,$P<0.001$,$P<0.001$), HsCRP ($P<0.001$,$P<0.001$,$P<0.001$), fibrinogen($P<0.001$,$P<0.001$,$P<0.001$), weight (W)($P<0.001$,$P<0.001$,$P<0.001$), left ventricle mass index(LVMI)($P<0.05$,$P<0.05$,$P<0.05$), systolic($P<0.001$,$P=NS$,$P<0.001$) and diastolic($P<0.001$,$P=NS$,$P<0.001$) blood pressure, Framingham risk score($P<0.001$,$P<0.001$,$P<0.001$), and HOMA-IR ($P<0.001$, $P<0.001$,$P<0.001$). Significant correlation was found between $\Delta$CT-1 and $\Delta$W in all groups ($r=0.910$;$P<0.001$, $r=0.871$;$P<0.001$; $r=0.795$;$P<0.001$). In HPL group, $\Delta$CT-1 level was found to be significantly correlated with LVMI decrease ($\Delta$LVMI) ($r=0.665$; $P<0.001$) and BMI difference ($\Delta$BMI) ($r=0.623$, $P<0.05$). **Conclusion:** After treatment of MS components, plasma CT-1 showed significant decrease in relation with decreasing CV risk level. There was significant decrease in LVMI in hyperlipidemic patients after statins and $\Delta$LVMI was significantly related with $\Delta$CT-1. In all groups, $\Delta$W was related with $\Delta$CT-1.

**P760**

## Relationship between socioeconomic status and metabolic syndrome among iranian Smokers Isfahan healthy heart program

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**Introduction:** Metabolic syndrome (MetS) is a clustering of risk factors for cardiovascular disease (CVD), which includes obesity, hypertension, diabetes, dyslipidemia, and unhealthy lifestyle. A combination of these risk factors has been shown to predict type 2 diabetes and CVD. To examine the association between socioeconomic determinants and smoking behavior in a population-based sample of Iranians with MetS. **Objectives:** The purpose of this study was to determine the relationship between SES and metabolic syndrome among iranian smokers. **Methods:** This cross-sectional survey comprised 12,600 randomly selected men and women aged $\geq$ 19 years. These subjects had participated in the baseline survey of a communitybased program for CVD prevention, entitled "Isfahan Healthy Heart Program," conducted in 2000–2001. Subjects with MetS were selected on the basis of the National Centers for Environmental Prediction–Adult Treatment Panel III (NCEP–ATPIII) criteria. Data for demographic factors, medical history, medication use, and lifestyle behaviors were obtained using questionnaires, and physical examination and fasting blood sampling were performed to measure blood pressure, obesity indices, and serum lipid levels. Logistic regression analysis was performed to assess the association between socioeconomic determinants and smoking habits and other health-related behaviors. **Results:** Our data showed that marital status, age category, and residency were not significantly different in smokers and non-smokers with MetS. Smoking was morecommon (12.4 %) in the group with intermediate educational level (6–12 years of education), the same as the high percentage of smokers (12.3%) in the middle economic group by the income category (Quartile 1–3). MetS is significantly related to age, sex, and education. On the basis of the results of logistic regression analysis, middle-aged and elderly smokers were at approximately 4–5 times higher risk of developing MetS than nonsmoker. **Conclusion:** This study showed that the 3 dimensions of socioeconomic status, i.e., education, occupation, and income were associated with MetS in smokers. It is assumed that .Awareness of the effect of smoking on health is increased with a higher level of education.more educated people also have better practice, control and treatment related to their wealth. Therefore, we recommend prevention efforts against smoking in the lower social strata of the Iranian population.

**P761**

## Relationship between serum uric acid level in metabolic syndrome and its components

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**Introduction:** Elevated serum uric acid level have been associated with metabolic syndrome and its components. **Objectives:** The study was aimed to estimate serum uric acid level in cases of metabolic syndrome and those with less than three components of metabolic syndrome.These levels were matched with identical and healthy controls ,to identify difference, if any,in serum uric acid levels with each component and number of components of metabolic syndrome. **Methods:** An observational cross sectional study was performed.150 subjects were included in the study.50 cases were of metabolic syndrome based on modified national cholesterol education program adult treatment panel III( NCEP ATP-III) criteria (the cut off for waist circumference was taken as per international diabetes federation for southeast asians ), 50 had less than three components of metabolic syndrome and 50 were age and sex matched healthy controls.Serum uric acid level was measured by uricase method;the reagent is based on trinder's reaction enzymatic and colorimetric method.Hyperuricemia was defined as $\geq$7 mg/dl for males and $\geq$6 mg/dl for females.Patients on drugs producing hyperuricemia and hypouricemia,pregnant women,those with known disorders of purine metabolism,acute and chronic inflammatory diseases, chronic kidney diseases, chronic liver diseases,cancer,bone marrow and organ transplant were excluded from study. **Results:** Total serum uric acid level of cases in metabolic syndrome group ($6.9778\pm1.1052$) was statistically significantly higher than cases with less than three components group ($5.689\pm1.0225$) which was significantly higher than control group ($2.7966\pm0.5843$) ($p<0.000$).The serum uric acid level increased significantly with increase in number of components of metabolic syndrome. Mean serum uric acid level for 1 component was ($4.6653\pm1.2469$),for 2 components was ($6.1365\pm1.0270$),for 3 components was ($6.658\pm1.0342$), for 4 components was ($7.91\pm0.0584$), for 5 components was ($8.76\pm0.3925$) ($p<0.000$).It was found that serum uric acid levels were statistically significantly and positively correlated with hypertension ($r=0.446$,$p<0.001$),obesity ($r=0.355$,$p<0.011$),hypertriglyceridemia ($r=0.213$.$p<0.138$) and hyperglycemia ($r=0.016$,$p<0.912$).It was negatively correlated with decreased HDL cholesterol levels ($r=-0.086$,$p<0.552$). **Conclusion:** We conclude that higher serum uric acid levels positively correlate with number of components of metabolic syndrome. Hypertension and obesity weare the major determinants of hyperuricemia in this study.

**P763**

## Serum lipid profile in newly presenting Nigerians with systemic hypertension

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**Introduction:** Systemic hypertension and dyslipidemia are modifiable cardiovascular risk factors. The synergistic effect of these risk factors may worsen the artherogenic index of an individual. **Objectives:** To determine the pattern and prevalence of dyslipidaemia in newly presenting Nigerians with systemic hypertension. **Methods:** One-hundred and fifteen newly presenting individuals with systemic hypertensionattending the Cardiology clinic of Federal Medical Centre, Bida were matched for age and sex with 115 normotensive controls. The history of hypertension, demographic characteristics and other risk factors were taken. Thesystolic and diastolic blood pressures and weight and height were measured. The body mass index (BMI) was calculated by dividing the weight (kg) by the square of the height (m2). The laboratory estimation of fasting lipids;total cholesterol (TC), triglycerides (TG), high-density lipoprotein cholesterol (HDL-C), and low-density lipoprotein cholesterol (LDL-C) and fasting blood sugar (FBS)was also carried out. **Results:** Patients with systemic hypertension had higher BMI ($t=7.06$; $p<0.001$), TC ($t=3.01$; $p<0.05$), and HDL-C ($t=-4.69$; $p<0.001$).The commonest dyslipidaemia was the HDL-C in both the hypertensive patients(44.3%) and normotensive controls(20.9%). Low-density lipoprotein cholesterol was high in 11 (9.6%)and 7 (6.1%) of the hypertensive patients and normotensive controls respectively ($p$ 0.05). In hypertensive patients,TC correlated positively to diastolic blood pressure ($r = 0.22$; $p<0.05$). A positive correlation was also noted between LDL-C and age ($r = 0.22$; $p<0.05$) and FBS ($r = 0.20$; $P<0.05$) and BMI ($r = 0.20$; $p<0.05$). Among normotensive controls, TC was positively correlated to LDL-C ($r = 0.63$; $p<0.001$) but correlated negatively toTG ($r = -0.30$; $P<0.001$).In newly presenting Nigerians with systemic hypertension, lipid abnormalities are common.Screening of these patients in addition to other risk factors is desirable and the institution of therapy will help reduce the synergistic effects of these risk factors. **Conclusion:** In newly presenting Nigerians with systemic hypertension, lipid abnormalities are common-.Screening of these patients in addition to other risk factors is desirable and the institution of therapy will help reduce the synergistic effects of these risk factors.

**P764**

## The condition of vasoregulating function and antithrombogenic activity of the vascular wall in women with different menopausal status

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**Introduction:** Though the important role of endothelial dysfunction in cardiovascular continuum development has been recognized recently, the role of aging estrogen deficiency in the

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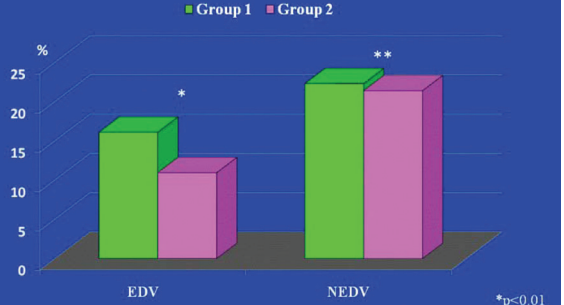
abnormality development in vasoregulatory function and antithrombogenic activity of the vascular wall has not been defined yet. **Objectives:** To investigate the condition of vasoregulatory function and antithrombogenic of the vascular wall in women with different menopausal status, to specify correlations of revealed abnormalities with major CVD risk factors. **Methods:** The study included 51 women, divided into two groups: group 1 included 23 premenopausal women with average age was 49.22.6, group 2 included 28 early postmenopausal women, average age was 53.35.1($p<0.001$). The average age of menopause was 50.69.6, mediana length of menopause was 4,0(2,0;5,0)years. All women underwent clinical examination, 24-hour blood pressure monitoring, cuff test, determination of antiplatelet, anticoagulant and fibrinolytic activity (Tabl.1), endothelium-dependent vasodilatation (EDV) in reactive hyperemia test using high resolution ultrasound and with nitroglycerin test. **Results:** Resting EDV was significantly higher in group 1: 16.1±5.9%, than in group 2: 10.9±7.2% ($p<0.01$) (Fig1). There were no significant differences in blood flow velocity during reactive hyperemia test in both groups. Thrombocyte aggregation was initially higher in group 2 than in group 1: 64.3±23.7% and 41.4±12.3% respectively ($p<0.001$)(Tabl.1) In reply to vessel occlusion in both groups there was marked significant increase of the progressive activity AT III: to 7.2% in group 1 and to 6.6 % in group 2. There were determined positive correlations between fibrinogen level and thrombocyte aggregation ($R=0.30;p<0.05$), age of menopause ($R=0.40;p<0.05$), BMI ($R= 0.41;p<0.001$), waist circumference ($R=0.40;p<0.001$). There were determined negative correlations of EDV with age ($R=-0.36;p<0.01$), length of hypertension ($R=-0.39;p<0.01$), BMI ($R=-0.62;p<0.0001$) and waist circumference ($R=-0.50;p<0.0001$). There were determined negative correlations of fibrinolyticactivity index with length of hypertension ($R=-0.41;p<0.05$), BMI ($R=-0.38;p<0.01$), waist circumference ($R=-0.31;p<0.05$).

**Image/graph I:**

**Fig.1. Endothelium-dependent Vasodilatation (EDV) and Endothelium-independent Vasodilatation (NEDV) in Premenopausal (Group 1) and Early Postmenopausal (Group 2) Women**




**Image/graph II:**

**Tabl.1. Indicators of Antithrombogenic Activity in Women in Groups 1 and 2.**

| | Group 1, n=23 | Group 2, n=28 | P |
|---|---|---|---|
| Thrombocyte aggregation, % (before cuff test) | 56.0±15.5 | 65.0±26.6 | NS |
| Thrombocyte aggregation, % (after cuff test) | 41.4±12.3*** | 64.3±23.7 | <0.001 |
| Antiaggregatory activity index (u.c.) | 1.46±0.69 | 1.05±0.35 | <0.01 |
| Antithrombin III activity ,% (before cuff test) | 93.2±7.0 | 96.0±9.6 | NS |
| Antithrombin III activity (AT III),% (after cuff test) | 99.9±7.6*** | 102.3±10.3** | NS |
| Anticoagulant potency index (u.c.) | 1.07±0.08 | 1.06±0.13 | NS |
| Fibrinolysis, min (before cuff test) | 6.7±1.8 | 5.6±2.4 | NS |
| Fibrinolysis, min (after cuff test) | 6.6±1.8 | 6.4±2.5 | NS |
| Fibrinolytic activity index (c.u.) | 1.01±0.04 | 0.97±0.14 | NS |
| Fibrinogen, g/L | 3.0±0.4 | 3.4±0.6 | NS |

**p<0.01; ***p<0.001 before and after cuff test

**Conclusion:** Decrease of anticoagulant property of vascular endothelium, changes in functional endothelium activity were determined in early postmenopausal women. There were determined correlations in indicators of vasoregulatory and antithrombotic activity of endothelium with components of metabolic syndrome.

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**P765**

## The effect of hormonal therapy on cardiovascular system in women considering the hormonal profile

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**Introduction:** At present hormonal therapy (HT) in peri- and postmenopausal period is considered to be pathogenetically proved as it provides women's adaptation to a new metabolic balance after ovarian failure. **Objectives:** To investigate the impact of HT on the cardiovascular system and metabolic indicators in peri- and postmenopausal women. **Methods:** The study included 178 women, divided into four groups including pre- and postmenopausal women. Group I included 64 premenopausal women aged 43.0±5.9years, group II included 43 postmenopausal women aged 52.0±5.0years. In control group Ia were 46 premenopausal women aged 45.0±4.9years, who weren't prescribed HT. In control group IIa were 25 postmenopausal women aged 52.6±6.0years, who had contraindications to HT. Average menopause length was 5.0±4.4years. Women in group I were prescribed a combined oral contraceptive pill of 3mg drospirenone and 20mcg ethinylestradiol per tablet. Women in group II were prescribed 2mg of drospirenone and 1mg of estradiol per tablet. Initially and after 12 months all women underwent clinical examination, ambulatory blood pressure (ABP) measurement, gynecological examination(Tab.1). **Results:** After 12 months according to ABP measurement normal indicators of SBP and DBP were marked in 67.2% in group I and in 64.4% in group II. Percentage of women in group Ia with arterial hypertension (AH) stage II increased by 1.2%. BP in group IIa tended to increase: percentage of women with AH stage I increased by 1.6% and with AH stage II by 1% (Fig.1). Waist circumference in group I decreased by 3.7sm, in group Ia increased by 2.8sm and in group II decreased by 4.5sm; in group IIa increased by 7.8sm ($p<0.005$). In group I and II body mass decreased: in group I by 3.0kg, in group II by 3.3kg and in control groups increased by 4.9kg in group Ia and by 3.2kg in group IIa ($p<0.005$). 12 month-HT showed BMI decrease: in group I it was 24.8±1.0kg/m$^2$ and in group II was 25.6±1.2kg/m$^2$ ($p<0.005$). In group Ia and IIa BMI increased to 26.8±1.2kg/m$^2$ and 28.0±1.5kg/m$^2$ respectively ($p<0.005$). In lipid profile TC decreased by 15.0% in group I and by 8.6% in group II ($p<0.005$). In groups Ia and IIa TC increased by 0.17% and 3.2% respectively ($p<0.005$). LDL significantly decreased by 10.8% in group I and by 9.1% in group II ($p<0.005$). The level of TG, HDL, glucose didn't change significantly.

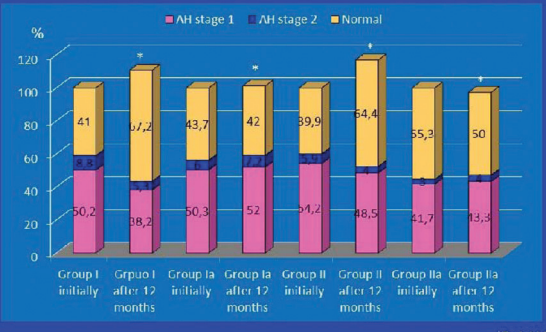
**Image/graph I:**

**Tab.1. Initial Indicators in the Research Groups**

| | Group I, n=64 | Group Ia, n=46 | Group II, n=43 | Group IIa, n=25 | P |
|---|---|---|---|---|---|
| Systolic blood pressure (SBP), mm.Hg | 125.3±12.9 | 122.4±5.4 | 140.8±5.0 | 138.3±5.1 | P<0.05 |
| Diastolic blood pressure (DBP), mm.Hg | 73.1±5.9 | 78.4±3.4 | 77.8±5.0 | 83.0±2.1 | P<0.05 |
| Body mass, kg | 66.0±10.7 | 72.7±16.2; | 73.5±14.1 | 76.3±15.3 | P<0.01 |
| Waist circumference, sm | 81.9±10.4 | 85.7±12.9 | 84.4±13.4 | 97.0±9.5 | P<0.001 |
| Body mass index (BMI), kg/m$^2$ | 25.2±1.7 | 26.0±1.0 | 27.3±1.4 | 26.6±1.5 | NS |
| Total cholesterol (TC), mmol/L | 5.9±1.0 | 5.8±1.4 | 6.1±1.0 | 6.2±0.7 | P<0.02 |
| Triglycerides (TG), mmol/L | 1.1±0.4 | 1.3±1.1 | 1.2±0.6 | 1.4±0.2 | NS |
| Low density lipoproteins (LDL), mmol/L | 3.7±0.8 | 3.3±1.0 | 3.9±0.9 | 4.0±0.93 | P<0.02 |
| High density lipoproteins (HDL), mmol/L | 1.6±0.3 | 1.5±0.3 | 1.6±0.5 | 1.5±0.2 | NS |
| Glucose, mmol/L | 5.2±0.6 | 5.3±0.6 | 5.2±0.7 | 5.4±0.5 | NS |

**Image/graph II:**

**Fig. 1. Percentage Ratio of BP Indicators Initially and After 12 Months in Research Groups**



**Conclusion:** 12 month-hormonal therapy with drospirenon resulted in significant decrease of SBP and DBP along with significant improvement of metabolic status and lipid profile.

**P767**

## Effects of extended-release niacin on fasting lipoproteins, glucose and insulin levels in chinese patients with dyslipidaemia

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**Introduction:** Niacin has broad spectrum lipid modifying and anti-atherosclerotic properties and is the most effective agent currently available for increasing levels of high-density lipoprotein cholesterol (HDL-C). However, chronic treatment with niacin has often been associated with increases in free fatty acids (FFA), fasting glucose levels and insulin resistance and the underlying mechanisms are unclear. **Objectives:** This study examined the effect of extended-release (ER) niacin on lipoprotein, glucose and insulin profiles in Chinese patients with dyslipidaemia. **Methods:** Forty-six Chinese patients with dyslipidaemia entered the study and 7 withdrew because of flushing (n=5) or other personal reasons. The 39 patients completing the study (mean age = 55.1±9.1 years, 27 males, 8 with diabetes, 22 receiving statin treatment, baseline HDL-C = 1.03±0.21 mmol/L, baseline TG = 3.30±1.67 mmol/L) were treated with ER niacin once-daily at bedtime in increasing doses of 375, 500, 750 (each for one week), 1000, and 1500 mg for 4 weeks, then 2000 mg for 12 weeks. Fasting lipid, lipoprotein, glucose and insulin levels were measured before and during the study. **Results:** After 23 weeks treatment with ER niacin, there were significant increases in HDL-C (mean±SD: 29.7±27.1%, $p<0.001$) and reductions in triglycerides (-34.9±37.6%, $p<0.001$). Significant reductions in serum phospholipids, apolipoprotein (apo) AII, apoB, apoCII, apoCIII and apoE levels were observed in the study. However, the effects of niacin on LDL-C and lipoprotein(a) [Lp(a)] levels were not significant. The LDL-C and Lp(a) responses appeared to be related to baseline triglyceride levels in this group of patients ($r=0.439$, $p<0.01$ and $r=0.35$, $p<0.05$, respectively). There were significant increases in FFA (48.2±73.3%, $p<0.005$), insulin (31.8±55.0%, $p<0.05$), plasma glucose and HbA1c levels during the study and some patients needed increases in oral hypoglycaemic therapy. The change in insulin levels during niacin treatment was correlated to the change in FFA ($r=0.332$, $p<0.05$). **Conclusion:** This study shows that treatment with ER niacin significantly improves multiple atherogenic lipid profiles in Chinese patients with dyslipideamia, but in some patients increases in FFA and insulin levels occur during long-term treatment which may offset some of the beneficial effects on cardiovascular risk.

**P768**

## Impact of plant sterol supplementation on sterols metabolism in patients under different lipid-lowering therapies

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**Introduction:** Dietary ingestion of phytosterols is considered a healthy choice, for it promotes reduction in cholesterol absorption. However, phytosterol intake can augment its plasma levels, and phytosterolemia is a marker of cardiovascular disease. There are controversial data on phytosterol supplementation either as functional foods or encapsulated. **Objectives:** We hypothesized that phytosterol supplementation could affect the balance between cholesterol absorption and synthesis, in subjects taking lipid-lowering strategies with different mechanisms of action. **Methods:** In a prospective, randomized, open label study, patients of both genders, 30 to 75 years, in primary or secondary prevention of coronary heart disease, with an indication for lipid-lowering therapy were selected. After a 4-wk run-in period with atorvastatin 10 mg, they were randomized to atorvastatin 40 mg (GI), ezetimibe 10 mg (GII) or combination of atorvastatin 40 mg plus ezetimibe 10 mg (GIII) *per day* for another 4-wk period (phase I). On phase II, in addition to the previous lipid-lowering therapies, the patients received 2.0 mg of encapsulated $\beta$-sitosterol. Lipids, markers of cholesterol absorption ($\beta$-sitosterol and campesterol) and synthesis (desmosterol) were measured at each time point. **Results:** Baseline characteristics were similar among groups. Atorvastatin and the combined therapy decreased total and LDL-C, triglycerides and Apo B ($p<0.001$ vs. baseline, GLM-repeated measures), whereas ezetimibe did not change these parameters after run-in period with atorvastatin. Campesterol and $\beta$-sitosterol were reduced in ezetimibe or combined therapy groups, whereas atorvastatin increased these absorption markers ($p<0.01$ vs baseline, GLM-repeated measures). On the other hand, ezetimibe alone doubled cholesterol synthesis. and associated with phytosterol supplementation supplementation, tripled desmosterol ($p=0.017$ vs. other groups). Campesterol/desmosterol and $\beta$-sitosterol/desmosterol ratios increased in atorvastatin group and decreased in other groups. **Conclusion:** Phytosterol supplementation in patients under different lipid-lowering agents can affect cholesterol synthesis and absorption in a different way. Combining a statin with long half life and a cholesterol absorption inhibitor seems the most appropriate strategy to prevent the imbalance between synthesis/absorption.

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**P769**

## Prevalence of dyslipidemias and associated risk factors in a rural population in south-western uganda: a community based survey

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**Introduction:** The burden of cardiovascular diseases (CVD) is rising in Uganda with an estimated 31,700 deaths reported in 2001[1]. Lipid abnormalities are a major risk factor for premature CVD, yet no large scale studies have been conducted in Uganda to assess their magnitude and risk factors. **Objectives:** To estimate the prevalence of high total cholesterol and triglycerides and associated risk factors in a rural population in Uganda. **Methods:** From Jan-Aug 2011, a total of 5933 individuals (Men = 2559, Women=3374), aged 13+years who are part of a rural general population cohort being surveyed annually were recruited. Lifestyle, blood pressure and anthropometric measurements were recorded in addition to blood collected for lipid analysis. Dyslipidemia was defined as high cholesterol >5.2mmol/L or high triglycerides >2.3mmol/L. Associated factors were explored using Chi2 tests. **Results:** We report preliminary results to be updated by end of survey in November 2011.

Table: **The distribution of cholesterol and triglycerides by age and sex in a rural Ugandan population**

| | Total chosterol mean (Sd) | | Triglycerides Mean (sd) | |
|---|---|---|---|---|
| Age | Men | Women | Men | Women |
| 13-24 | 3.02 (0.7) | 3.40 (0.8) | 1.04 (0.4) | 1.16 (0.6) |
| 25-40 | 3.45 (0.9) | 3.69 (0.9) | 1.22 (0.7) | 1.12 (0.6) |
| >40 | 3.63 (1.1) | 4.08 (1.1) | 1.26 (0.7) | 1.40 (0.7) |

The age and sex adjusted mean values show higher lipid levels in females and higher age groups (table). The prevalences of high total cholesterol and high triglycerides as defined above were 6.1% (364/5933) and 5.0% (298/5933) respectively. On crude analysis, both high cholesterol and high triglycerides prevalences were higher in women than men (8.2% vs. 3.4%; 6.0% vs. 3.8%: $p<0.01$ respectively) and increased by age (Cholesterol 1.6%, 6.3%, 11.3%; Triglycerides 3.1%, 4.2%, 8.1%: $p<0.01$ for age groups 13–24, 25–40, >40 years respectively). Dyslipidemia prevalence varied between obese (BMI30kg/m$^2$) and non obese (BMI<30kg/m$^2$) participants (22.8% vs. 5.5% for cholesterol, 17.5% vs. 4.4% for Triglycerides) **Conclusion:** Though these are comparatively lower dyslipidemia prevalences than in the developed countries, in view that this is a relatively younger population and in rural Africa it is a potential public health problem which may require early preventive interventions.

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**P771**

## Body fat distribution, and serum lipids in patients with and without coronary heart disease

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**Introduction:** To investigate the association between obesity indices, abdominal fat distribution and lipid profile in patients with coronary heart disease (CHD). **Objectives:** To investigate the association between obesity indices, abdominal fat distribution and lipid profile in patients with coronary heart disease (CHD). **Methods:** Body weight, height, waist circumference (WC), body mass index (BMI), and waist/height ratio (WHtR) of 123 patients with stable angina who were candidate for coronary angiography were measured. Fasting blood samples were taken to measure the levels of fasting blood sugar (FBS), total cholesterol (TC), low- and high-density lipoprotein cholesterol (LDL-C, HDL-C), apolipoproteins A and B (apo A and apo B), and triglycerides (TG). According to angiography reports, participants were divided into patients with or without CHD. All patients underwent an abdominal computerized tomography (CT) scan to measure the visceral, superficial, and deep subcutaneous fat. **Results:** Mean ages of patients with CHD (n=73) and without CHD (n=50) were 50.5±7.6 and 53.7±7.6 years, respectively ($p=0.03$) Patients with CHD had significantly higher levels of TC, TG, and superficial subcutaneous fat, while patients without CHD had higher levels of apo A ($p\leq0.05$). Multivariate analyses showed significant association of visceral fat with TC, LDL-C, TG and apo B, in patients without CHD, while significant inverse associations were found between WC and HDL-C, WHtR and apo A as well as visceral fat and LDL-C in patients with CHD. **Conclusion:** Among anthropometrics and imaging indices of obesity, WC and WHtR have shown better association of central obesity with dyslipidemia in patient with CHD, while CT-measured visceral adipose tissue area was the best correlate of dyslipidemia in patients without CHD.

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## Association of apolipoprotein B, apolipoprotein a, and the apolipoprotein B/apolipoprotein A ratio with body fat indicators

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**Introduction:** To evaluate the association of apolipoprotein B (apoB), apolipoprotein A (apoA) and apoB/apoA ratio with the body fat indicators in patients with stable angina pectoris (SA). **Objectives:** To evaluate the association of apolipoprotein B (apoB), apolipoprotein A (apoA) and apoB/apoA ratio with the body fat indicators in patients with stable angina pectoris (SA). **Methods:** One hundred and twenty two participants with a mean age of 52.1±7.2 and SA were recruited for the present study. Body weight, height, and waist circumference (WC) were measured and WHtR was calculated. After 12 hours of fasting, a blood sample was obtained and serum levels of apoB, and apoA were measured and the apoB/apoA ratio was calculated. These patients underwent an abdominal computerized tomography scan (CTS) to assess the amount of visceral (VAT) and subcutaneous adipose tissue (SAT). Linear regressions were computed to assess the relation of apoB, apoA and their ratio with various measurements of adiposity (VAT, SAT, WC, and WHtR), with adjustment for age, sex and BMI≥25, WC≥80 in women and WC≥90 in men and WHtR. ≥0.59.(sse comments in the methods about these adjustments). **Results:** Significant positive associations were found between visceral fat area and the apoB/apoA ratio (P= 0.02, $\beta$=0.2) ratio and significant negative correlations were observed between visceral fat area and apoA concentrations (P=0.04, $\beta$=-0.2). **Conclusion:** Since VAT is associated with the apoA and apoB/apoA ratio in patients with SA, intra-abdominal fat could be considered at the time of these patients evaluation.

P773

## Common mutations of familial hypercholesterolemia patients in Taiwan: characteristics and implications of migrations from Southeast China

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**Introduction:** Familial hypercholesterolemia (FH, OMIM #143890) is one of the most common inherited disorders of plasma lipoprotein metabolism, characterizedclinically by an increased level of circulating low-density lipoprotein (LDL)-cholesterolthat leads to lipid accumulation in tendons and arteries, premature atherosclerosis and increased risk of coronary heart diseaseWith the exception of a small number of founder populations where one or two mutations predominate, most geographically based-surveys of FH patients show a large number of mutations in a given population. Haplotype analysis of FH Caucasians improved the knowledge and understanding of the origin, spread by migrations and estimation of the ages of pathogenic mutation, but no data has been reported concerning the Asian population. **Objectives:** To gain more insight into FH patients in Taiwan, we analyzed probands and haplotype patterns of Taiwanese carrying common mutations and compared them to FH southern Asians. **Methods:** Two hundred and eight Taiwanese with clinically diagnosed FH underwent high-throughput DNA resequencing array—*LDLR*, *APOB*, and *PCSK9* with/without multiple ligation-dependent probe amplification. Haplotype analyses among probands and family members were undertaken using TaqMan® Assays. **Results:** *LDLR* mutations were found in 118 probands, consisting of 60 different loci, and *APOB* 10579C>T mutations in 12 probands Three mutations (64delG, 1661C>A, and 2099A>G) were novel. *LDLR* 986G>A (13.1%), 1747C>T (10.8%), and *APOB* 10579C>T (9.2%) were common mutations with no differences in phenotypes. *LDLR* 1747C>T associated with one haplotype (CAAGCCCCATGG/(dTA)n-112nt); *LDLR* 986G>A with two. *APOB* 10579C>T associated with the same *LDLR* binding-domain pattern in Taiwanese and southern Asians. **Conclusion:** *LDLR* 986G>A, 986G>A and *APOB* 10579C>T are common mutations, with combined frequency of approximately 33%. The presence of different haplotypes associated with these common mutations indicates multiple historical migrations, probably multiple recurrent origins and presence of common ancestors from southern China.

P774

## Lipid control success rate before and after percutaneous coronary intervention

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**Introduction:** Controlling risk factors such as dyslipidemia in patients with coronary artery disease is necessary. **Objectives:** The aim of this study was to evaluate the success rate of lipid control, including total cholesterol (TC), triglyceride (TG), low-density lipoprotein cholesterol (LDL-C), high-density lipoprotein cholesterol (HDL-C), and non-HDL-C, before percutaneous coronary intervention (PCI) and after a 9-month follow-up. **Methods:** This retrospective study was conducted on 195 patients (67.7% men and 32.3% women, mean age= 57.8 ± 9.4 years) who referred to Tehran Heart Center and underwent PCI. Serum lipid profiles were determined in all the patients before PCI and at 9-months' follow-up, and the lipid control success rates were evaluated. Dyslipidemia was defined as serum levels of LDL-C≥100 mg/dl or TG ≥ 150 mg/dl or TC≥200 mg/dl or HDL-C≤40 mg/dl in the men and≤50 mg/dl or less in the women, or non-HDL-C ≥130 mg/dl with or without the consumption of lipid-lowering agents. Controlled lipids were defined as serum lipids lower than the above-mentioned values. During follow up, all patients was given atorvastatin 20–40 mg per day. **Results:** Amongst the 195 patients, 26.2% had diabetes mellitus, 42.6% had hypertension, and 34.9% were smokers. Dyslipidemia was more common in the women. At 9-months' follow-up, there was no significant difference in terms of the prevalence of patients with high HDL-C or low TG; however, a significant increase was seen in the prevalence of patients who had low TC (63.6% vs. 80.5%; p value <0.001), LDL-C (47.2% vs. 65.6%; p value <0.001), and non-HDL-C (40.0% vs. 63.1%; p value <0.001). **Conclusion:** Although by current treatments, the prevalence of patients with low TC, LDL-C, and non-HDL-C significantly increased in our study, dyslipidemia persisted in a considerable proportion of our patients. Thus, the results of this study necessitate further investigations into the relationship between high serum lipids and the long-term outcome of patients after PCI as well as further evaluations of the dyslipidemia treatment strategies in our center.

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P775

## Prevalence of abnormal lipid values among adolescents in Al Ain, United Arab Emirates

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**Introduction:** Dyslipidemia is associated with an increased risk for cardiovascular disease. There are few population-based data regarding abnormal lipid values among adolescents in United Arab Emirates (UAE). **Objectives:** To estimate the prevalence of abnormal lipid levels among adolescents aged 12 to 18 years in Al Ain, UAE. **Methods:** We conducted a school-based cross-sectional study. A random sample (n=1630) adolescents aged 12 to 18 years was selected from 8 school out of 73 public and 41 privates schools in Al Ain during months of March and April in 2010. The final sample (n=1,018) included participants who had fasted for at least 8 hours and agreed to draw blood. Anthropometric measurements were made by trained nurses. BMI less than 85th, greater than 85th but less than 95th, and greater than the 95th percentiles for age and gender were used to define normal, overweight and obese according to the 2000 CDC growth charts. The presence of abnormal total cholesterol, high-density lipoprotein cholesterol, and low-density lipoprotein cholesterol were calculated. **Results:** Out of 1,018 participants, 345 (34%) were overweight and obese. A total of 25.1% had borderline (170–200 mg/dL) total cholesterol, 7.3% had high (>200 mg/dL) total cholesterol, 24.4% had borderline (110–129 mg/dL) low-density lipoprotein cholesterol and 13.7% had had high (>129 mg/dL) low-density lipoprotein cholesterol, and 35.6% had low (<35 mg/dL) high-density lipoprotein cholesterol. **Conclusion:** Dyslipidemia, particularly low levels of high-density lipoprotein cholesterol is substantial public health problem among adolescents in Al Ain, UAE.

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## Nut consumption and serum lipids among iranian population: Isfahan healthy heart program

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**Introduction:** Nuts are nutrient-dense plant foods and the richest source of fat mostly unsaturated fatty acids, after vegetable oils. It also contains considerable amounts of plant sterols, with antioxidant. Despite being high in fat and relatively energy dense, large epidemiologic studies have consistently demonstrated a cardioprotective effect associated with higher intake of nuts. **Objectives:** This study was performed to examine the association of nut consumption and serum lipid levels in central part of Iran. **Methods:** This cross-sectional study was conducted in the structure of Isfahan Healthy Heart Program (IHHP) a community trail for cardiovascular disease prevention and healthy lifestyle promotion. In the present study 9660 men and women were included from three counties of Isfahan, Najafabad and Arak by multistage cluster random sampling method. Dietary intake was assessed with a 48 items food frequency questionnaire. Laboratory assessment including serum lipids and apolipoprotein (Apo)s were done at a standardized central Lab. **Results:** There were significant reduction in Apo B [97.9±0.8, 97.1±0.8 & 96.1±0.8, respectively (p<0.01)] and ApoB/ApoA [0.8±0.007, 0.78±0.008 & 0.77±0.009, respectively (p<0.001)] and increase in Apo A [125.8±0.7, 127.2±0.8 & 127.4±1, respectively (p<0.05)] based on nut consumption tertiles. But TC, TG and LDL-C reductions and HDL-C enhancement were not significant. **Conclusion:** These results suggest that nut play an effective role in lipid profile modifications.

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## Lifestyle in wine drinkers and abstemious: the relationship of coronary lesions, calcium score and risk factors

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**Introduction:** Red wine (RW) protects the cardiovascular system but objective evidence based on coronary status is lacking. **Objectives:** To assess the effects of chronic RW consumption upon coronary lesion burden. **Methods:** We performed Coronary Computed Tomographic Angiography in 204 male subjects whose mean age was 58.95±7.3 years and related lesions to risk factors (RF). One hundred were chronic RW drinkers who consumed at least one glass of RW wine/day, 4–5 times/week, in the last 5 years and 104 were abstemious. **Results:** RW drinkers consumed 25.78 gr alcohol/day vs 0 among abstemious; they also ingested more calories (2118.50kcal vs 1776.21kcal daily; $p<0.01$) mainly from saturated fats (22.98 g vs 16.51g; $p<0.05$) than abstemious. Abstemious, however, ingested more fibers (22.73 gr vs 17.49 gr; $p<0.05$). There were no significant differences regarding age, smoking, BMI, arterial hypertension, diabetes, LDL and triglycerides. Psychological factors including anxiety, depression and stress also were similar. However, plasma glucose was lower (97.5±18.3 mg% vs 105.9±32.0 mg %; $p<0.06$) and HDL was higher (46.9 ±10.9 mg% vs 39.5 ±9.0 mg%; $p<0.01$) in RW drinkers compared to abstemious. Calcium score was higher on RW drinkers than in abstemious(144.43±362.2 vs 122.05±370.26; $p<0.004$). Lesions were classified as absent or ≥50%. Considering LM, ADA, RCA and Cx in proximal, median and distal portions, plus 3 marginal, 3 diagonal and 2 terminal RCA branches, 3672 segments were included in the analysis. There were no significant differences regarding lesions severity between groups, except for more frequent zero lesions in proximal Cx (86.3 x 71.4 %; $p<0.016$). **Conclusion:** Despite higher caloric intake and saturated fats, RW drinkers have similar coronary lesion burden; calcium score, however, was higher compared to abstemious. Higher HDL cholesterol ascribed to RW drinking and lower plasma glucose may have protective roles.

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## Dyslipidaemia amongst coronary angioplasty patients: a Malaysian tertiary referral centre experience

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**Introduction:** In Hospital Universiti Sains Malaysia, a tertiary referral centre in Malaysia; percutaneous coronary angioplasty (PCI) have been performed in high risk acute coronary syndrome(ACS). Dyslipidaemia is a known independent risk factor for the development of major adverse cardiovascular events (MACEs) post coronary angioplasty. Both international and local cardiology guidelines have stressed the importance of aggresive lipid management. **Objectives:** The primary objective of this study was to determine incidence of MACEs amongst patients undergoing elective coronary angioplasty with ad hoc PCI. The secondary objectives of this study were to determine the prevalence and association of dyslipidaemia with MACEs post PCI and also to audit control of lipids during 6 months clinic follow-up. **Methods:** A total of 240 patients who underwent elective coronary angioplasty were recruited into this prospective cohort study. **Results:** 240 patients were recruited and 5 dropped out during study. 21(8.9%) patients had MACEs post PTCA. The prevalence of dyslipidaemic patients was 74.9% with mean LDL-C 3.18 ± 0.95 mmol/l,TG 1.71 ± 0.79 mmol and HDL-C 1.15 ± 0.34 mmol/l pre-angioplasty. Dyslipidaemia was not significantly associated with MACEs ($p=0.084$). During 6 months clinic follow up, mean values for LDL-C was 2.33 ± 0.80 mmol/l and TG was 1.55 ± 0.62 mmol with significant reduction from baseline (both $p<0.001$respectively). Mean HDL-C was 1.19 ± 0.28 mmol/l and did not achieve significant reduction ($p=0.06$). 55.7% of patients manage to achieve targeted LDL-C of <2.6mmol/l. All of the study patients were on statins. **Conclusion:** The incidence of MACEs post PCI in our centre is low. Dyslipidaemia has high prevalence amongst patients with ACS undergoing elective PCI. However, it was not significantly associated with MACEs post PCI which could possibly be due to pleotrophic effects of statins. There were significant reductions in LDL-C and TG levels during 6 months clinic follow-up and over half of the study patients achieved desired levels.

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## Impact of plant sterols, fish oil omega-3s and their combination on HDL-C in Indian adults

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**Introduction:** Observational studies suggest lower risk of coronary heart disease in those with higher HDL-C levels. Whereas many studies have examined the impact of various dietary supplements on lipid profile, few have described the effect of plant sterols (PS) and/or omega-3s (w-3s) supplementation on HDL-C. **Objectives:** Independent and combined effects of a yoghurt drink providing 2 g/d PS and fish-oil capsules providing 2 g/d w-3s on HDL-C were compared in adult Indian industrial workers. **Methods:** Following a 2-week run-in period, 200 mildly hypercholesterolemic adults aged 35–55 years, were randomized into one of four groups of a 2x2 factorial, double-blind, placebo-controlled trial. Subjects (n=178) provided blood samples before and after the 4-week intervention. HDL-C levels were analyzed (quasi Intention-to-treat) using ANCOVA models with relevant baseline measurements as covariates; adjusted means were compared across groups. **Results:** Two g/d w-3s resulted in an overall 5.4% increase in HDL-C (adjusted mean 0.93 mmol/L in control vs 0.98 mmol/L in w-3 active; $P=0.0004$). There was no impact of PS on HDL-C; however, the combination resulted in a 7.6 % statistically significant increase in teh HDL-C levels. **Conclusion:** The findings suggest that w-3s may have particularly beneficial effects on HDL-C in the Indian population, which is known for its high prevalence of low HDL-C concentrations. The significant improvement in plasma HDL-C concentrations by w-3s and the combination of w-3s and PS was not paralleled by PS alone supplements. However, this could be due to the study being under powered for the examining this parameter and warrants additional investigations.

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## Investigation of the lipid-lowering effects of chlorella vulgaris extract as an adjunct to low dose atorvastatin and gemfibrozil

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**Introduction:** Dyslipidemia is among the major and most prevalent risk factors of cardiovascular disease, and has been categorized among the features of metabolic syndrome. Chlorella vulgaris is a unicellular green microalgae rich in micronutrients which has diverse biological activities. In spite of its ant-hyperlipidemic and anti-hyperglycemic activities, no study has to date investigated the therapeutic efficacy of this microorganism in a clinical setting. **Objectives:** The present study set out to investigate the lipid-lowering effects of supplementation with C. vulgaris extract as an adjunctive therapy for metabolic syndrome in a randomized clinical trial. Inclusion criteria included serum triglycerides > 200 mg/dL, LDL > 160 mg/dL, HDL-C <35 mg/dL and BMI > 25 kg/m$^2$. **Methods:** Seventy-eight dyslipidemic patients were randomly assigned to atorvastatin (80 mg/day) + gemfibrozil (600 mg/day) (atorvastatin group; n = 39), or atorvastatin (40 mg/day) + gemfibrozil (300 mg/day) + C. vulgaris extract (1800 mg/day) (Chlorella group; n = 39). The patients were followed up for 8 weeks. A fasted lipid profile comprising serum total cholesterol, triglycerides, LDL-C and HDL-C was determined for each patient at baseline as well as at the end of trial. **Results:** Both groups experienced reductions in BMI but these reductions did not reach statistical significance. There were significant reductions in serum triglycerides and LDL-C concentrations in both groups by the end of trial ($p<0.01$). In spite of elevation, serum HDL-C levels remained statistically unaltered in both groups ($p > 0.05$). Post-trial values for all lipid profile parameters were comparable between Chlorella and atorvasttatin groups ($p > 0.05$). The magnitude of change in lipid profile parameters during the course of trial did not significantly differ between the groups. **Conclusion:** Based on the findings, adjunctive therapy with C. vulgaris extract is associated with favorable lipid-lowering effects and could obviate the need for high-dose atorvastatin and gemfibrozil therapy.

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## Antioxidant activity of essential oils from cupressus species against oxidation of LDL

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**Introduction:** Oxidative stress has been suggested to play a pivotal role in the pathophysiology of atherosclerosis. Antioxidants, in particular of natural origin, are therefore potential candidates for the prevention and treatment of atherosclerosis and its subsequent cardiovascular outcomes. Essential oils are volatile constituents of plants and possess several medicinal effects including antioxidant activity. **Objectives:** To investigate the antioxidant activity of the essential oils obtained from branchlets and fruits of three Iranian Cupressus species namely C. horizentalis, C. sempervirens and C. sempervirens cv. Cereiformis against oxidation of LDL. **Methods:** The essential oils were obtained by steam distillation. The antioxidant capacity of volatile oils was assessed using three different concentrations of each oil (low, medium and high). LDL was oxidized using the classical copper-induced LDL auto-oxidation. Incubations were carried out at 37 °C for measuring the conjugated diene formation during different times up to 210 minutes. The duration of lag phase of the oxidation reaction was used as a sensitive index of the antioxidant effects. Vitamin C was used as a positive control. **Results:** While varying degrees of inhibition against LDL oxidation was observed from the tested oils, these effects were far less than that of vitamin C which caused a marked prolongation of reaction lag phase. As for the C. horizentalis oils, antioxidant effects were observed at low concentration while at high concentration the pro-oxidant effects were predominant. In contrast, antioxidant effects of essential oils from branchlets and fruits of C. sempervirens and C. sempervirens cv. Cereiformis increased at higher concentrations. The highest observed antioxidant effect was for C. sempervirens cv. Cereiformis at the high concentration, amounting to about 80%.

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**Conclusion:** Taken together, the evidence from this study suggests that essential oils obtained from branchlets and fruits of Iranian Cupressus species have weak antioxidant activity against LDL-oxidation in vitro. Further research is warranted to clarify other types of antioxidant activities from the same plants as well as the clinical importance of these effects.

**P784**

## The athletes heart in holter monitoring: comparison with echocardiographic study

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**Introduction:** Decreased heart rate and minor conduction abnormalities are known symptoms of the athletes' heart. The impact of structural adaptation to intensive training on 24-hour ECG monitoring findings in professional athletes is not well studied. **Objectives:** We compared results of echo and Holter examination in a cohort of highly trained athletes participating in sports with high mixed exertion load (group IIIC sport) which have the greatest impact on heart morphologic and functional adaptation. **Methods:** 30 rowers from the Polish National Team (aged 24,5; 27% women) comprised the study group. None of the examined had any known cardiovascular disorder. The Holter monitoring was performed in all cases using standard 7 lead (3 channel) system. Monitoring included at least one intensive training and a night time. A profound echocardiographic examination was performed in all cases the same day (after Holter termnation) using portable ultrasound system. The study was performed in the period of intensive training (during a camp). **Results:** Average heart rate during monitoring was 67/min and well correlated with indexed left atrium area (LAA; R=-0,57; P=0,002) and TAPSE (R=-0,55; P=0,003). Minimal heart rate correlated with most of left sided diameters (LVd; IVSd; PWd; LAd not indexed) and LV mass index (R=-0,44; P=0,007) LAA, RAA (absolute and indexed) and TAPSE. Maximum HR correlated weakly only with fractional area change of the RV (FAC; R=0,40; p=0,04) and pulmonary flow maximal velocity (R=0,55, P=0,003) but not with age. Conduction abnormalities was present in 23% of examined. In all cases it was 2:1 atrio-ventricular block, interestingly typical Mobitz I block was not observed. In one case conduction abnormalities led to a >2,5s pause. Athletes with present AV block had thicker IVSd (0,63 vs 0,56cm/m$^2$;P=0,01**)** and higher E/E' (7,2vs 5,7; P=0,007). There were also differences in right heart parameters: grater right ventricle inflow track (1,81vs 1,41cm/m$^2$ P=0,03) and higher tricuspid regurgitation gradient was observed in this subset. **Conclusion:**

1. Lowest heart rate is observed in individuals with the highest extend of morphologic adaption of left ventricle.
2. Left atrium size (diameter and area) influence the heart rate (average and minimum) the most.
3. The presence of left ventricle hypertrophy and RV dilatation may lead to conduction abnormalities.

**P785**

## The effects of melatonin on morphology of cardiovascular system in experimental metabolic syndrome

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**Introduction:** Melatonin, a hormone secreted mainly by the pineal gland in the brain, has been shown to be involved in a variety of physiological and pathophysiological processes via receptor-mediated or receptor-independent mechanisms. **Objectives:** The aim of this study was to find out whether melatonin can modify morphological parameters of myocardium and aorta in rats with metabolic syndrome - obese spontaneously hypertensive rats [SHR/ND mcr-cp (cp/cp)]. **Methods:** Rats were divided into four groups: the first three groups represented male 6-week-old Wistar Kyoto (WKY), spontaneously hypertensive (SHR), and rats with metabolic syndrome (SHR-cp). The fourth group consisted of 6-week-old SHR-cp treated with melatonin (10 mg/kg/day) for 3 weeks. Blood pressure was measured by tail-cuff plethysmography every week. Formaline fixed tissues were embedded by standart paraffin technique, cut to 5 um sections and stained by hematoxyline–eosin and picro–sirius red stain. Myocardial and aortal total collagen, cross section area and wall thickness of the aorta were analyzed. Melatonin MT(1) receptors were determined at the protein level by Western blot analysis. **Results:** In the SHR-cp blood pressure was decreased by 10% after the second week of melatonin treatment and this decrease persisted till the end of the treatment in comparison with age-matched untreated SHR-cp. Both myocardial and aortal total collagen contents in SHR-cp were increased significantly comparing to SHR. Melatonin treatment failed to affect fibrosis enlargement in the myocardium. On the other hand, it was able to reduce significantly fibrosis enlargement in the aorta, where the expression of MT(1) receptors was shown to be higher comparing the heart. **Conclusion:** In conclusion, it seems that decrease of fibrosis enlargement in the aorta may contribute to the blood pressure reduction after melatonin treatment in SHR-cp. Moreover, the contribution of MT(1) receptor–mediated effect of melatonin is suggested.
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## Effect of N-3 fatty acids on acute hemodynamic reaction following pulmonary air embolism

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**Introduction:** Vasoconstrictive lipid mediators are considered to be involved in the pulmonary vascular reaction following embolism respectively air embolism. In this context, the administration of n-3 fatty acids, which are known to influence the generation and pattern of eicosanoids, are of therapeutical interest in pulmonary embolism. **Objectives:** Aim of this study was to investigate whether or not the presence of n-3 fatty acids shifts the spectrum of generated vasoconstrictive eicosanoids to the more vasodilating metabolites and reduces the increase of pulmonary vascular resistance in pulmonary air embolism. **Methods:** Isolated rabbit lungs were ventilated and perfused with 200ml Krebs-Henseleit-2%>albumin buffer solution in a recirculating manner. In 10 experiments each, alternatively 1.5ml of a 10% lipid solution rich in n-6 fatty acids or a 10% lipid solution rich in n-3 fatty acids were added to the perfusate. Embolism was induced by bolus injection of 1ml air into the pulmonary artery. **Results:** Air embolism resulted in an acute increase of pulmonary artery pressure (PAP) from 12.2± 2.7 to 40.5± 14.4 mmHg, and an increase of the TXB2 concentration in the perfusion fluid to 1023± 659pg/ml in the presence of n-6 fatty acids. This reaction was significantly reduced in the presence of n-3 fatty acids, whereas PAP only rose from 12.1± 2.7 to 27.6±5.5 mmHg and TXB2 concentration only reached a peak level of 588.6±401pg/ml. In further 20 experiments, the cyclooxygenase inhibitor diclofenac significantly blocked thromboxane generation and reduced the increase in pulmonary artery pressure respectively pulmonary vascular resistance. **Conclusion:** The study reveals a major role of thromboxane in the acute hemodynamic reaction following pulmonary embolism, which can be diminished by the application of n-3 fatty acids and by cyclooxygenase inhibition.

**P788**

## Nitric oxid-independent effect of red wine extract on blood pressure in rats with metabolic syndrome

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**Introduction:** Recently, red wine has attracted considerable interest also as a potential source of bioactive compounds such as polyphenols and minerals, which could be beneficial in the prevention and treatment of hypertension. **Objectives:** The goal of this study was to perform a chemical analysis of an alcohol free Alibernet red wine extract and to investigate the effects of this extract on blood pressure and nitric oxide synthase (NOS) activity in normotensive Wistar Kyoto rats (WKY), spontaneously hypertensive rats (SHR), and rats with metabolic syndrome [SHR/ND mcr-cp (cp/cp)]. **Methods:** In red wine extract total antioxidant capacity was measured by Randox kit simultaneously with total phenolic content and selected minerals. The total phenolic content was evaluated according to the Folin-Ciocalteau colorimetric assay. Young 6-week-old male WKY, SHR and SHR-cp rats were treated with red wine extract (24,2 mg/kg/day) for 3 weeks. Blood pressure was measured by tail-cuff plethysmography once a week. NOS activity was determined by measuring the formation of L-[3H] citrulline from L-[3H] arginine in the aorta, heart, kidney, cerebellum, brain cortex and brain steam. **Results:** Both antioxidant capacity and phenolic content were significantly higher in the Alibernet extract compared to Alibernet red wines. Among the 9 minerals analyzed potassium, zinc and magnesium were the most abundant elements. Blood pressure was decreased by 15% already after the second week of Alibernet red wine extract treatment in SHR-cp rats and this decrease persisted till the end of the treatment. In contrast, Alibernet red wine extract failed to decrease blood pressure in both WKY and SHR. On the other hand, Alibernet red wine extract increased NOS activity in the aorta, heart, and kidney of SHR while it had no effect on tissues NOS activity of SHR-cp rats. **Conclusion:** In conclusion, NO-independent mechanisms are responsible for blood pressure decrease in SHR-cp rats after Alibernet red wine extract treatment. The increase in antioxidant enzyme activity (e.g. SOD that requires magnesium and zinc as co-factors) is suggested. Supported by grants APVV-0538–07, APVV-0742–10 and VEGA: 2/0190/11, 2/0178/09.

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## Sex proportion of offspring in mothers with cardiac disease

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**Introduction:** Sex ratio adjustment has become a hot and interesting topic in ecology and production biology, as documentations of sex ratio changes are numerous, and include examples in human and animal species. An increasing number of researches support the idea that exposure to stressful conditions can influence the sexes of offspring produced by humans; a majority of which document significantly fewer males after exposure to adverse conditions such as severe life events or economic disruption. **Objectives:** According to the background many studies were performed about sex proportion in stressful conditions but sex ratio in natural disasters such as cardiovascular disease was not assessed, so we planned this study for assessment of sex proportion of offspring in mothers with cardiac disease. **Methods:** We reviewed 200 pregnant women with cardiac disease and mean age 29.4±4.28 years who referred for delivery to our heart center. **Results:** The incidence of various cardiac disease in 200 pregnant women were as follow: valvular heart disease 138 cases (64%), dilated cardiomyopathy 19%, hypertrophic cardiomyopathy 2 patients (1%), not corrected or significant residual congenital heart disease in 28 women (14%) and aneurysm of aorta were found in 4

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cases (2%). Also our result showed that 55 women (27.5%) had left ventricular ejection fraction <25% and 72 cases (36%) had pulmonary hypertension (pulmonary artery pressure ≥40 mmHg).These patientsdelivered (24% with normal vaginal delivery and **76%** with cesarean section) a total of 216 offspring; 164/216 (75.9%) of them were female [the calculated sex ratio (male/female) was 52/164 (**0.32**)] and 16 neonates (8%) were twins. **Conclusion:** Our study showed that cardiac disease in mothers was associated with a significantly higher proportion of female offspring. We believe this is the first report of the relation between offspring gender and mother's cardiac disease. This finding should thus be considered hypothesis-generating and future studies that examine this idea may be warranted.

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**P791**

## Adaptive reactions in response to acute heart failure and their importance for therapy

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**Introduction:** Heart failure guidelines don't take into consideration the adaptive reactions which are caused by an acute heart failure (AHF) - reactions of compensation, protection and homeostasis. **Objectives:** To investigate the protective response of an organism to an acute left heart failure (ALHF) and manage heart failure according to it. **Methods:** 14820 patients were observed during and after heart operations. Standard monitoring was carried out: ECG, cardiac output, pulmonary venous pressure (PVP), etc. The monitor-computer system (MCS) calculated with the delay of 3 min (or by indications) the system of estimations corresponding to 8-compartment model of cardiovascular system: pump coefficients of the left (LVPC) and right (RVPC) heart ventricles (corresponding to Starling coefficients), systemic and pulmonary vascular resistances (SVR, PVR), elasticities of vascular reservoirs (EVR, etc.), EF,etc. On the average 13 ± 4 measurements were performed for each patient. Time control was 14 ± 6 hours (from 4 hours to 7 days). Using these estimations, the MCS supervised by a physician picked out, differentiated and quantitatively estimated pathological (ALHF, ARHF, total, etc.) and adaptive (homeostatic, protective and compensatory reactions) conditions and processes. **Results:** In 8300 (56%) patients with ALHF, LVPC was lowered in 2 to 4 times in comparison with nosologic norm (EF, PVP, contractility indexes have been accordingly changed) during procedure. In 5632 (68%) patients of this group, LVPC got back to normal values in 6±3 h. 2668 (32.1%) patients required prolonged treatment (up to 7 days). In patients with uncomplicated ALHF in-hospital mortality was 0.09% (13). In 3436 (61%) patients with ALHF in early postoperative period the more LVPC lowered the more RVPC decreased (correlation coefficient 0.8). Detailed analysis revealed that RVPC decrease protects LV from critical overload and pulmonary edema. RVPC change has reflex character. A similar analysis was conducted for other characteristics and their combinations. A clinical case will be presented in order to acquaint with the developed technology. **Conclusion:** Interactions of pathological and adaptive processes (their form and manifestation) have combinatory character. Developed technology offers the possibility to coordinate treatment and the adaptation of an organism to AHF. Experience of the technology use demonstrates that during AHF treatment the interaction of pathological and compensatory processes should be taken into account.

**P792**

## Impairment of cell-to-cell coupling protein, connexin-43, due to ventricular fibrillation and during sinus rhythm restoration demonstrated in male and female rat hearts

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**Introduction:** Despite of current therapy based on ICD the sudden cardiac death due to ventricular fibrillation (VF) is still a major health problem. It is of interest to search the possible factors that might affect defibrillation threshold and/or termination of VF. Our previous and other studies suggest that impairment of cell-to-cell coupling protein, connexin-43 (Cx43), facilitates occurrence of malignant arrhythmias. We hypothesize that VF itself deteriorates Cx43 alterations and it may hamper cardioversion into sinus rhythm (SR). **Objectives:** The purpose of this study was to examine whether myocardial expression of Cx43 is altered due to VF and during sinus rhythm restoration. **Methods:** Experiments were performed using aged male and female rats. Isolated Langendorff-mode perfused heart was subjected to following events: (1) basal condition, (2) electrically-induced VF lasting two minutes, (3) electrically-induced VF lasting ten minutes, 4) sustained VF followed by spontaneous SR restoration due to transient stop perfusion. The hearts were frozen at each event and ventricular tissue was taken for Cx43 analysis using rabbit antiCx43 antibody to detect both phosphorylated (P-Cx43) and un-phosphorylated forms of Cx43 (noP-Cx43) and mouse antiCx43 to detect noP-Cx43 only. **Results:** Compared to basal conditions total Cx43 expression did not change during experiment either in male or female rat hearts. However, P-Cx43 as well as ratio of P-Cx43 to total Cx43 decreased significantly due to 10-min VF and 2-min VF in males only. In parallel, there was a significant increase of noP-Cx43 due to 10-min VF and 2-min VF in males only. Surprisingly, an enhancement of noP-Cx43 linked with suppression of P-Cx43 was detected at the moment of stop perfusion-induced termination of 2-min lasting VF followed by sinus rhythm restoration in both male and female rat hearts. Sinus rhythm was not restored after 10-min VF, which caused much pronounced dephosphorylation of Cx43. **Conclusion:** In conclusion, there is a down-regulation of Cx43 due to sustaining of VF and it occurs earlier in male compared to female rat hearts. It appears that transient no-flow-related inhibition of cell-to-cell coupling, as indicated by an increase of nonP-Cx43, can terminate VF followed by sinus rhythm restoration depending on the degree of prior Cx43 down-regulation.

**P793**

## Effect of a high-fructose diet on glucose tolerance, plasma lipid and hemorheological parameters during oral contraceptive administration in female rats

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**Introduction:** Oral contraceptives (OCs) are the most commonly used medication for contraception all over the world by over 100 million womenand are also used in the treatment of menstrual disturbances and hyperandrogenism in women for a prolonged period of time. OC use may have negative effects on cardiometabolic parameters, promoting the risk cardiovascular complications[1,2]. It may be important to evaluate the influence of increased dietary fructose on cardiometabolic parameters during OC use considering the substantial contribution of fructose in human daily diet. **Objectives:** The present study therefore aimed at testing the hypothesis that increased consumption of fructose during OC use would deteriorate OC-associated altered glucose tolerance, lipid and hemorheological parameters. **Methods:** Female rats were given (p.o.) vehicle, high-dose NEE (10.0$\mu$g norgestrel/1.0$\mu$g ethinyl estradiol) or low-dose NEE (1.0$\mu$g norgestrel/0.1$\mu$g ethinyl estradiol) with or without high dietary fructose daily for 6 weeks. **Results:** Results demonstrated that high-dose NEE but not low-dose NEE treatment led to significant increases in hematocrit, blood viscosity, and decreases in body weight gain, glucose tolerance, and plasma HDL-cholesterol level. Both NEE treatments resulted in significant increases in plasma viscosity and triglyceride. Increased dietary fructose without NEE treatment produced significant increases in fasting blood glucose, hematocrit, blood and plasma viscosities, while increased dietary fructose significantly potentiated the effects on blood and plasma viscosities observed during NEE treatment. Conversely, the effects of NEE treatment on body weight gain, glucose tolerance, plasma triglyceride and HDL-cholesterol were significantly attenuated. **Conclusion:** The results indicate that increase in dietary fructose may worsen abnormal blood rheology. These results also demonstrate that increased dietary fructose may not impact negatively on glucose and lipid metabolisms during OC use. The findings imply that fructose-enriched diet might be an important consideration during OC use regarding blood rheological properties.

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**P794**

## Detection of novel FBN1 and TGFBR2 mutations and genotype-phenotype correlations in 60 probands with marfan syndrome or Marfan-like phenotypes

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**Introduction:** Mutations in the fibrillin-1 gene (*FBN1*) and transforming growth factor beta receptors II gene (*TGFBR2*) have been proved to associate with Marfan syndrome (MFS). The correlation between genotype and phenotype in MFS and MFS-like patients is poorly understood. **Objectives:** The purpose of this study is to identify the mutation spectrum in 60 Chinese probands with MFS or MFS-like phenotypes, and to establish genotype-phenotype correlations. **Methods:** A totalof 60 unrelated probands with a MFS or Marfan-like features and 100 unrelated individuals were enrolled. The skeletal, cardiovascular, ophthalmic and other clinical data of these probands were evaluated and collected. All of the coding exons (8 in *TGFBR2* and 65 in *FBN1*) were amplified and sequenced directly in all the enrolled subjects. Genotype-phenotype correlation analysis was performed in the probands after sequencing. **Results:** A total of 30 *FBN1* mutations and 5 *TGFBR2* mutations were identified in 35 of our 60 (58.33%) probands (34 were previously unreported). All these mutations were confirmed to be absent in the unrelated controls. Among these 30 *FBN1* mutations, 14 mutations (12 nonsense mutation and 2 frameshift mutations) led to a premature termination codon (PTC); and 5 of the remaining 16 missense mutations were substitutions of a cysteine implicated in a disulfide bond. The *TGFBR2* mutations were all missense mutations except for 1 frameshift mutation. Patients fulfilled the Ghent criteria (n= 37) for MFS had a higher (P= 0.017) detection rate (62.16%) of *FBN1* mutations than that of 30.43% in probands only with Marfan-like features (n=23). Patients had mutations leading to a PTC had a higher probability of developing aortic aneurysm and dissections (71.43% vs. 25%; p= 0.026) when compared to the missense mutations. All of the *TGF$\beta$R2* mutation carriers got major cardiovascular lesion phenotypes, including aortic dissections and aneurysms at sites distant from the aortic root, and 2 of them got sudden death due to a thoracic aortic dissection. Patients carrying a *TGF$\beta$R2* mutation are more likely to develop major cardiovascular involvements when compared to patients with *FBN1* mutations (100% vs. 46.67%; p= 0.049).

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**Image/graph I:**

TABLE Mutation Spectrum Of 35 Unrelated Probands With *FBN1* And *TGFBR2* Mutations

| Number | Gene | Nucleotide Change | Protein Change | Type | Exon | Module | Reference |
|---|---|---|---|---|---|---|---|
| 1 | FBN1 | c.357C>A | pC119X | Nonsense | 4 | EGF 2 | Novel |
| 2 | FBN1 | c.493C>T | pR165X | Nonsense | 6 | Hybrid 1 | Novel |
| 3 | FBN1 | c.751G>T | pQ251X | Nonsense | 7 | cb EGF 1 | Novel |
| 4 | FBN1 | c.842A>T | pE281V | Missense | 7 | cb EGF 1 | Novel |
| 5 | FBN1 | c.1057G>A | pW366X | Nonsense | 9 | LTBP 1 | Novel |
| 6 | FBN1 | c.1374T>A | pY458X | Nonsense | 11 | EGF 4 | Novel |
| 7 | FBN1 | c.1693C>T | pR565X | Nonsense | 13 | cb EGF 4 | Novel |
| 8 | FBN1 | c.3217G>A | pE1073K | Missense | 26 | cb EGF 12 | Novel |
| 9 | FBN1 | c.3347A>C | pE1116A | Missense | 27 | cb EGF 13 | Novel |
| 10 | FBN1 | c.3461A>C | pH1154P | Missense | 28 | cb EGF 14 | Novel |
| 11 | FBN1 | c.4004A>C | pT1342P | Missense | 32 | cb EGF 18 | Novel |
| 12 | FBN1 | c.4143delG | p.K1381fsX23 | Frameshift | 33 | cb EGF 19 | Novel |
| 13 | FBN1 | c.4471T>C | pC1491R | Missense | 36 | cb EGF 22 | Novel |
| 14 | FBN1 | c.4567C>T | pR1523X | Nonsense | 36 | cb EGF 22 | Novel |
| 15 | FBN1 | c.4616C>T | pR1539X | Nonsense | 37 | LTBP 4 | Novel |
| 16 | FBN1 | c.4786C>T | pR1596X | Nonsense | 38 | LTBP 4 | Novel |
| 17 | FBN1 | c.5698T>C | pC1900R | Missense | 46 | cb EGF 28 | Novel |
| 18 | FBN1 | c.5798G>C | pD1933H | Missense | 47 | cb EGF 29 | Novel |
| 19 | FBN1 | c.5971A>G | pN1991S | Missense | 48 | cb EGF 31 | Novel |
| 20 | FBN1 | c.6100G>A | pG2034S | Missense | 49 | cb EGF 31 | Novel |
| 21 | FBN1 | c.6105T>A | pK2037X | Nonsense | 49 | cb EGF 31 | Novel |
| 22 | FBN1 | c.6987C>G | pD2329E | Missense | 56 | cb EGF 36 | Novel |
| 23 | FBN1 | c.7125delTG | p.C2376fsX27 | Frameshift | 57 | LTBP 7 | Novel |
| 24 | FBN1 | c.7238G>A | pC2413Y | Missense | 58 | cb EGF 37 | Novel |
| 25 | FBN1 | c.7240C>T | pR2414X | Nonsense | 58 | cb EGF 37 | Novel |
| 26 | FBN1 | c.7559C>T | pT2520M | Missense | 60 | cb EGF 39 | Novel |
| 27 | FBN1 | c.7765A>G | pR2589G | Missense | 62 | cb EGF 41 | Novel |
| 28 | FBN1 | c.8200A>G | pN2734D | Missense | 64 | COOHcmg | Novel |
| 29 | FBN1 | c.8481G>A | pG2811R | Missense | 65 | COOHcmg | Novel |
| 30 | FBN1 | c.8547T>G | pY2849X | Nonsense | 65 | COOHcmg | [1] |
| 31 | TGFBR2 | c.139C>A | p.S46R | Missense | 2 | Nil | Novel |
| 32 | TGFBR2 | c.186T>A | pI62K | Missense | 3 | Nil | Novel |
| 33 | TGFBR2 | c.1425T>A | pY478E | Missense | 6 | Nil | Novel |
| 34 | TGFBR2 | c.1831insT | p.V509fsX24 | Frameshift | 7 | Nil | Novel |
| 35 | TGFBR2 | c.1676C>T | pR562C | Missense | 8 | Nil | Novel |

Numbering is based on the nucleotide reference cDNA sequence (*FBN1* NM_000138.2; *TGFBR2* NM_003242.4) with the A of the ATG translation start site at nucleotide position +1. Protein sequence numbering is based on protein sequence (*FBN1* NP_000129.2; *TGFBR2* NP_003233.4).

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**Conclusion:** These results extend the *FBN1 and TGFβR2* mutation spectrum and revealed genotype-phenotype correlations in MFS and MFS-like probands.

## P795

## Role of peroxisome proliferator-activated receptor $\beta$ agonist on myocardial capillary density and angiogenesis in hindlimb ischemic diabetic rats

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**Introduction:** Peroxisome proliferator-activating receptors (PPARs) are a nuclear receptor/ligand-activated transcription factors. Three PPAR isotypes have been identified: PPAR$\alpha$, PPAR$\beta/\delta$ and PPAR$\gamma$. **Objectives:** In this study, we evaluated the effect of specific PPAR$\beta$ agonist, GW0742, on angiogenesis and serum Vascular Endothelial Growth Factor (VEGF), VEGF Receptor-2 (VEGFR-2) and nitrite concentrations in hindlimb ischemia in normal and diabetic rats. **Methods:** Hindlimb ischemic rats were divided into four groups: control, diabetic, control and diabetic treated with GW0742 (n=7 each). Diabetes was induced by injection of streptozotocin (55 mg/kg; ip). GW0742 was injected one day after surgery (1mg/kg; sc). After 21 days, blood samples were taken and left ventricular and gastrocnemius muscles were harvested for immunohistochemistry. **Results:** GW0742 significantly increased serum nitrite and VEGFR-2 concentrations and VEGF to VEGFR-2 ratio in control and diabetic rats. Capillary density in heart and hindlimb muscles was lower in diabetic animals compare to control. GW0742 administration significantly increased myocardial capillary density in diabetic rats ($p<0.05$). In addition, GW0742 significantly restored the capillary density in control and diabetic hindlimb ischemic rats. **Conclusion:** PPAR$\beta$ agonists restore heart and skeletal muscles angiogenesis through angiogenic factors and can be considered for prevention and/or treatment of vascular complications in diabetic subjects.

## P796

## Effect of diclofenac, a non-steroidal anti-inflammatory drug, on the rabbit heart

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**Introduction:** Diclofenac is a commonly prescribed non-steroidal anti-inflammatory drug (NSAID) used in the treatment of pain and inflammatory conditions. Its long term use is associated with the highest cardiovascular risk of the non-selective NSAIDs. Previous electrophysiological investigations show that Diclofenac inhibits voltage-dependent $Na^+$ channels in cardiac myoblasts and neurons and activates neuronal $K^+$ channels. It also reversibly inhibits Sodium ($Na^+$) channels and irreversibly inhibits long-lasting calcium channels (LCC). It is therefore important to assess the physiological changes in the cardiovascular system that would be associated with use of Diclofenac. **Objectives:** To investigate the physiological effects of Diclofenac on the rabbit heart. **Methods:** The design was an animal model experimental study. The animals used were eighteen (18), 8 -18 month old male New Zealand white rabbits. Of the eighteen, twelve were used for *in vivo* Electrocardiography (ECG) experiments while six were used for isolated organ experiments. For the ECG experiments, Twelve (12) male rabbits weighing approximately 2 kg were divided into two equal groups (n=6)–control and experimental. Electrocardiogram tracings were recorded using PowerLab Data acquisition apparatus (Model ML865, AD Instruments, Sydney, Australia). The control group was administered with normal saline (0.2 ml/kg) while the experimental group received Diclofenac injection (5 mg/kg). The ECG tracings were analyzed for rhythm and rate disturbances as well as standard wave intervals and durations. For the isolated organ experiments, six rabbit heart were mounted on standard Langendorff apparatus Bioscience Oscillograph, (model 400 MD 2C, Washington, USA) baseline recordings taken before Diclofenac (2 $\mu$g/ml) infusion. Contractility and heart rate were measured from the length and frequency of the spikes respectively. **Results:** Despite a tendency towards prolongation of the PR, QT and QTc intervals, there were no significant changes in all ECG measurements after Diclofenac administration. However, in the isolated heart studies, after administration of Diclofenac, heart rate decreased significantly from 87 $\pm$ 12 to 66 $\pm$ 10 bpm, P=0.02. The contractility also decreased significantly from 19.4 $\pm$ 3.1 to 14.4 $\pm$ 2.3 mm, $P<0.01$. **Conclusion:** In therapeutic doses, Diclofenac causes a reduction in the rate and contractility of the rabbit heart. It also causes a tendency towards prolongation of the PR, QT and QTc intervals on the surface electrocardiogram.

## P797

## Myocardial cell-to-cell coupling protein, connexin-43, is implicated in antiarrhythmic mechanisms of atorvastatin and omega-3 fatty acids

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**Introduction:** Statins and omega-3 fatty acids (omega-3) exhibit besides lipid-lowering effects the antiarrhythmic ability in clinic, while definite mechanisms are not elucidated yet. Our previous and other studies suggest that disturbances in myocardial cell-to-cell coupling protein, connexin-43 (Cx43), are involved in the development of malignant arrhythmias. **Objectives:** Goal of this study was to examine whether atorvastatin and omega-3 can affect propensity of diseased rat heart to ventricular fibrillation (VF) and modulate expression and/or distribution of Cx43. **Methods:** Experiments were conducted using animal models mimicking human hypertriglyceridemia and essential hypertension, i.e. hereditary hypertriglyceridemic (HTG) rats and spontaneously hypertensive rats (SHR). Diseased rats as well as age-matched healthy rats were fed for two month with omega-3 (EPA+DHA, 30mg/day) and compared with untreated. Besides, HTG rats were treated for two month with atorvastatin (0.5mg/100g/day). Susceptibility of the heart to electrically-inducible VF was monitored using Langendorff-perfused isolated heart. Ventricular tissues from treated and untreated rat hearts were processed for ultrastructure examination and analysis of myocardial Cx43 expression and distribution. **Results:** Results showed that omega-3 and atorvastatin reduced heart rate, systolic blood pressure and triglycerides in HTG and SHR. Diseased rat hearts exhibited an abnormal distribution of Cx43 with predominant localization on lateral sides of the cardiomyocytes. In addition, there was a down-regulation (in SHR) and hyperphosphorylation (in HTG) of myocardial Cx43. These changes were associated with increased susceptibility to VF. However, these alterations were significantly attenuated due to atorvastatin and omega-3. Moreover, treatment resulted in improving of cardiomyocyte and cell-to-cell junction integrity and particularly decreased susceptibility of the heart of VF. **Conclusion:** Results indicate that antiarrhythmic effects of omega-3 FA and atorvastatin are linked with modulation of expression and/or phosphorylation of Cx43 and protection of cardiomyocyte and cell-to-cell junction integrity. As both compounds are ligands for transcription factor, PPAR, it seems clinically relevant to examine a possible regulation of Cx43 gene expression. Support by VEGA 2/0049/09 and 0046/12 grants.

## P798

## In vitro nitric oxide (NO) scavenging screening of kelussia odoratissima Mozaffarian extract

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**Introduction:** Nitric oxide is a vital chemical mediator involved in the regulation of various physiological processes and produced by endothelial cells and macrophages. Excess concentration of NO is associated with immunopathology of a vast variety of inflammatory diseases, cancer, diabetes mellitus and atherosclerosis. Antioxidants are the best way to scavenge free radicals as well as NO. To this purpose, natural antioxidants originated from plant are the best candidate. **Objectives:** This study performed to investigate the ability of *Kelussia odoratissima Mozaffarian*(locally called ''Karafskoohi") to scavenge NO produced in vitro by using sodium nitroprusside. **Methods:** After extracting herb in methanol (soaked method), Phytochemical screening such as total poly phenol and flavonoid was performed. Nitric oxide scavenging was assessed by method of Sreejayan and Rao based on the spontaneous generation of NO from the sodium nitroprusside and quercitin was used as a reference. **Results:** the amounts of total phenol and flavonoid components in the plant methanolic extract (60.87$\pm$4.5 mg/g of extract) and (43.49$\pm$ 0.2 mg/g of extract) were determined. Extract scavenged nitric oxide in a concentration-dependent manner special in low dose ($p<0.05$). Different doses (125, 250 and 500 $\mu$g/ml) of extract exhibited 15.09$\pm$ 4.5, 32.93$\pm$2.4 and 39.52$\pm$2.9 percent inhibitory effects respectively which is closely comparable to the references (quercitin). Moreover, Positive correlation ($r = 0.92$) between antioxidant activity and flavonid content was found. **Conclusion:** According to the results, *Kelussia odoratissima* extract is a potent scavenging agent which can be of great value as an alternative for protection against free radical-mediated damages. Positive correlation between antioxidant activity and flavonid content is suggesting the fact that antioxidant capacity of the aqueous plant extracts is due to a great extent of its flavonid.

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**P799**

## The association between serum LDL-cholesterol and genetic variation in chromosomal locus 1p13.3 among coronary artery disease patients in Qatar

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**Introduction:** Increased serum concentration of LDL cholesterol is a risk factor for developing coronary artery disease (CAD). Recently, wide genome studies identified several polymorphisms with significant impact on coronary artery disease. **Objectives:** To investigate the association between serum LDL-cholesterol, lipids and significant coronary artery stenosis with well-known genetic variants in chromosomal locus 1p13.3 among coronary artery disease patients with significant coronary artery stenosis [case group] and without significant stenosis [control group]. **Methods:** Blood was drawn from a total of 178 patients for the detection of the variants rs599839, rs646776 and rs4970834 genotype of DNA that was performed by the 5' nuclease assay. **Results:** The Odds ratio and the frequency distribution of the genotype (rs599839, AG) revealed that (45.5%) ,(25.9%), had AA and (48.5%), (59.3%) had AG, and (6.0%), (14.8%) had GG among control and case group patients, respectively with P value=0.108. The frequency distribution of the genotype (rs646776, A>G) revealed that (18.2%), (35.3.1%), had AA and (18.2%), [11.8%] had AG, and (63.6.0%), (52.9%) had GG among control and case groups, respectively with P value=0.345. The frequency distribution of the genotype (rs4970834, C>T) revealed that (51.5%), (31.4%), had CC and (48.5%), (66.7%) had CT, and (0.0%), [1.9%] had GG among control and case groups, respectively with P value=0.312. The HDL-C level for the rare allele (G) of rs599839 [12.01± 3.9 mM vs. 3.46± 1.45 mM] for GG vs. AA+AG using the recessive genetic model with p value=0.006. No significant difference was observed for LDL-C and cholesterol among genotypes of all variants using different genetic models. The rs599839 variant had significant association with the severity of coronary stenosis using additive genetic models. The OR was 2.7 times among patients with significant stenosis with p value =0.04. Regression analysis revealed that the following independent variables have a statistically significant effect on LDL-C level; BMI, diabetes, TC, TG, and HDL-C in presence of rs59839 and rs646776 and rs4970834. **Conclusion:** Polymorphism rs646776 and of rs599839 were significantly associated with HDL-C and triglycerides levels. In addition the variant rs599839 had a significant association with atherosclerotic lesion in coronary vessels.

**P800**

## A single nucleotide polymorphism on the beta chain of fibrinogen exerts controversial effects on thrombotic and inflammatory mechanisms in patients with stable angina pectoris

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**Introduction:** Patients with coronary artery disease (CAD) exhibit increased levels of thrombotic and inflammatory biomarkers including fibrinogen, interleukin 6 (IL-6) and sCD40L. However, it remains obscure, whether the genetic variability on fibrinogen beta chain modifies thrombosis and inflammation in those patients. **Objectives:** In the present study we investigated the impact of the G455A genetic polymorphism on the aforementioned biomarkers. **Methods:** We genotyped 393 patients with documented CAD and 236 controls. The G455A polymorphism was determined by polymerase chain reaction (PCR) and the specific HaeIII restriction enzyme. Serum levels of fibrinogen were measured by the von Clauss method. Moreover, IL-6 and sCD40L levels were assessed by enzyme-linked immunosorbent assay (ELISA). **Results:** Genotype distribution was GG: 54.6%, GA: 36.8%, AA: 8.6% for controls and GG: 50.1%, GA: 42.0%, AA: 7.9% for CAD. Interleukin 6 levels (pg/ml) were enhanced in patients with CAD compared to controls (4.40±3.13 vs 3.41±2.76, p<0.01). However, the G455A polymorphism failed to affect IL-6 levels between GG+GA vs AA both in CAD and controls (p=NS). Similarly, sCD40L levels (ng/ml) were significantly higher in CAD compared to controls (2.07±1.47 vs 1.82±1.68, p<0.001). Although no difference was observed in sCD40L across the study genotypes both in controls and in CAD (p=NS), the G455A polymorphism defined sCD40L levels (GG+GA vs AA) in the total population (1.91±1.41 vs 2.77±2.23, p<0.05). Finally, fibrinogen levels (mg/dl) were significantly higher in CAD compared to controls (436.0±126.8 vs 373.2±91.7, p<0.001). Importantly, the present polymorphism affected significantly fibrinogen levels (GG+GA vs AA) not only in controls (366.6±85.8 vs439.1±122.3, p<0.05), but also in CAD (426.0±122.7 vs 521.8±113.1, p<0.001). **Conclusion:** The G455A genetic polymorphism has a striking effect on fibrinogen levels both in controls and in patients with coronary artery disease. In addition, it affects partly sCD40L in the total population. Our findings suggest that the G455A polymorphism affects the thrombotic process and consequently promotes atherosclerosis, especially via its significant impact on fibrinogen.

**P801**

## Cardiovascular condition in chagasic and not chagasic pre and post-menopausal women associated with risk factors and genetic polymorphisms

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**Introduction:** Chagas disease is a complex illness caused by *Trypanosoma cruzi* (*T. cruzi*) infection. The course of the disease indicated that the majority of patients remain asymptomatic for years and 30% of them evolve towards the dilated cardiomyopathy. The variability of the clinical manifestations and prognosis of these patients led to postulate that, molecular mechanisms that respond to different genetic background would be activated during the progression of the disease. **Objectives:** To determine the relationship between symptoms of heart damage with frequencies of single nucleotide polymorphisms in chagasic women under and over 55 years of age. **Methods:** In 85 women we determined: infection by *T.cruzi*, lipid profile, kidney and liver function, Chest Rx, ECG and bi-dimensional EcoCG. By PCR-RFLP of genomic DNA isolated from leukocytes, we analyzed the following polymorphisms: Ala-9Val and Ile58Thr encoded in the SOD-Mn gene, 138-EX1-INS/A in the endothelin-1 and the H323H (T/C) in the endothelin A receptor gene. According to the serology, the participants were classified in Chagasic Group (CG) and Non-Chagasic Group (NCG). **Results:** Biochemical profile showed no significant difference between chagasic and not chagasic patients. Young chagasic women have higher frequency of alterations in Rx, ECG and EcoCG corresponding to level II and III of cardiomyopathy (p<0.048). The RR coefficient indicated that the possibility of having a normal EcoCG was approximately 5.87 times higher in non-chagasic young than in young chagasic patients (OR=5.87, 95% CI 1.47–23.4) We observed a significant difference (p<0.0495) in the distribution of the Thr allele of the Mn-SOD polymorphism among NCG and CG. **Conclusion:** The genetic variant Ile58ThrMnSOD alters the structure of the enzyme causing a lower activity and a concomitant increase in the superoxide anions causing oxidative damage. The presence of these polymorphisms in heterozygosis would lead to a deterioration of the cardiac function. Biochemical variables that indicate risk of cardiomyopathy were not substantially different as to explain such cardiovascular disorders in young women, so the differences observed in Rx, ECG and EcoCG should be caused by the infection with *T.cruzi*. In pre-menopausal chagasic women affected by the parasite, the presence of the Ile58ThrMnSOD polymorphism will increase the deterioration of cardiac function, regardless of the factors of cardiovascular risk and protective of estrogen action.

**P802**

## Effects of endurance training on expression endothelial nitric oxide synthase and nitric oxide production in human placenta

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**Introduction:** Many studies have documented that placental development is altered by a variety of environmental factors such as aerobic exercise training which alter placental bed blood flow and/or oxygen delivery. The placenta lacks of innervation, thus vascular tone regulation depends on endothelial release of vasoactive molecules such as nitric oxide (NO). Although exercise-induced increases blood flow and expression of eNOS has been reported; it is not known if exercise produces the same effect in human placenta. **Objectives:** To determine the effects of aerobic exercise training in the second half of pregnancy on expression endothelial nitric oxide synthase and nitric oxide production in human placenta. **Methods:** This was a randomized, double-blinded, controlled clinical trial of 20 healthy primigravid women between 16 and 20 weeks' gestation. The training group (n=10) took part in aerobic exercise at an intensity of 50–65% of their maximum heart rate for 60 min, three times a week for 16 weeks. The control group (n=10) undertook their usual physical activity. Functional analysisby spectrophotometric method was used to detect the NO and nitric oxide synthase (NOS) in placental tissue and western blot quantitation was used to measure the expression of NOS. **Results:** Training significantly (p <.05) increased eNOS expression. Functional analysis of eNOS indicated that exercise induced significant increases in NO (+40%) production. **Conclusion:** Greater eNOS expression may also underlie the effects of exercise in the protection on disorders associated to endothelial dysfunction such as gestational hypertension, preeclampsia and gestational diabetes mellitus. *Trial registration. NCT00741312.*

**P803**

## Propofol increases Ca2+ sensitivity of large conductance Ca2+-sensitive K+ channels (BKCa) in mouse cerebral arterial smooth muscle cells

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**Introduction:** Propofol, an intravenous anaesthetic, has been widely used for sedation in general anaesthesia and ICU through increasing agonist efficacy at the $GABA_A$ receptor. However, propofol has potential side effectsincluding hypotension, especially in elderly or hypertensive patients. The great variability in sensitivity to propofol may lead to circulatory instability among patients and rats. The underlying mechanisms are complicated. **Objectives:** Propofol is widely used for intravenous anesthesia. But it has side effects including hypotension, especially in the elder or patients with hypertension. However, the underlying mechanisms are complicated and some aspects remain unknown. Previous studies suggest that the activation of large conductance $Ca^{2+}$-sensitive $K^+$ channels ($BK_{Ca}$) is involved in propofol-mediated hypotension. Here, we aim to investigate the effect of propofol on the $Ca^{2+}$ sensitivity of $BK_{Ca}$ and their participation in propofol-medicated hypotension. **Methods:** Smooth muscle cells were isolated from mouse cerebral arteries. Whole-cell $BK_{Ca}$ current and spontaneous transient outward $K^+$ currents (STOCs) were recorded in perforated whole-cell configuration. In inside-out single channel configuration, single channel current, $Ca^{2+}$ and voltage dependence of $BK_{Ca}$ were studied. The drug orcalcium ion was added to the bath solution to obtain the desired concentration. **Results:** Propofol increased the $BK_{Ca}$ macroscopic currents and STOCs. Itincreased the total open probability(*N*Po)of single $BK_{Ca}$ with the half maximal effective concentration($EC_{50}$) of 76 $\mu$M. Propofol increased the calcium sensitivity with theequilibrium dissociationconstant ($K_d$) of $Ca^{2+}$ from 0.887 $\mu$M (control) to 0.694 $\mu$M (28 $\mu$M propofol), 0.599 $\mu$M (56 $\mu$M propofol) and 0.177 $\mu$M (112 $\mu$M propofol). Analysis of the channel kinetics revealedthat propofol increased the open dwell time and decreased the closed dwell time significantly, which sustained $BK_{Ca}$ in open state. **Conclusion:** Propofol activates

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$BK_{Ca}$ through increasing the calcium sensitivity. The results revealed one of the mechanisms of propofol-induced hypotension that propofol lowersthe $Ca^{2+}$ threshold of the channel activationby increasing its $Ca^{2+}$ sensitivity and thereby vasodilating effectbecomes stronger under the $Ca^{2+}$ overloaded cell conditions.

**P804**

## Mesenchymal stem cells as a gene delivery system by LentiV to create pacemaker cells

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**Introduction:** This paper will focus on hyperpolarization-activated cyclic nucleotide-gated channel HCN4 gene lentiviral transfection to create biological-pacemaker cells in vitro. **Objectives:** The study was to test proof-of-principle if genetically engineered mesenchymal stem cells (MSCs) transfected with HCN4 genes can be modified to be cardiac pacemaker cells. **Methods:** 1.. The self-inactivating HIV1-based lentiviral vector (LentiV) was used as transgene delivery, which was constructed with plasmid hHCN4/pcDNA3. 2. Total RNA was extracted from control MSCs and those transfected with hHCN4, and RT-PCR was performed. 3. Membrane proteins were extracted from control MSCs and those transfected with hHCN4. Western blot analysis was performed. 4. Whole-cell patch clamp was used to study membrane currents. After the $I_f$ was recorded, cells were superfused with extracellular solution containing 4 mM cesium chloride and the currents were measured accordingly. 5. MSCs transfected with either GFP alone or GFP-hHCN4 were cocultured with neonatal rabbit ventricular myocytes. The coculture beating rate of cardiac myocytes was measured after 3 days of coculture. **Results:** 1. In addition to expressing characteristic hHCN4 protein, mHCN4-transfected hMSCs also express an anticipated high level of hHCN4 gene by RT-PCR and Western blot analysis. 2. $I_f$ was elicited using hyperpolarizing steps in 10-mV increments from -40 mV to -140 mV, and it was significantly inhibited by 4 mM cesium chloride. 3. The coculture beating rate of cardiac myocytes was $87 \pm 11$ bpm when MSCs were transfected with control plasmid (expressing only GFP) and $149 \pm 14$bpm when MSCs were expressing both GFPhHCN4 ($P < 0.05$). **Conclusion:** The MSC expressing hHCN4 is a demonstration of feasibility of preparing MSC-based biological pacemaker cells. The study provides a platform for further investigating the possibility of modifying cardiac excitability with genetically engineered MSCs transfected with HCN4 gene by LentiV.

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**P805**

## The character of pacemaker current in mesenchymal stem cells transfected with HCN4 genes by LentiV

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**Introduction:** This paper will focus on hyperpolarization-activated cyclic nucleotide-gated channel HCN4 gene lentiviral transfection to create biological-pacemaker cells in vitro. **Objectives:** To test if the pacemaker current can be elicited from mesenchymal stem cells (MSCs) transfected with HCN4 genes by LentiV. **Methods:** 1.MSCs of rabbit from the posterior iliac crest of rabbit were cultured at 37°C in a humidified atmosphere of 5% CO2. 2. The self-inactivating HIV1-based lentiviral vector (LentiV) was used as transgene delivery, which was constructed with plasmid hHCN4/pcDNA3. 3. Total RNA was extracted from control MSCs and those transfected with hHCN4, and RT-PCR was performed. 4. Whole-cell patch clamp was used to study membrane currents. $I_f$ were elicited in the whole cell configuration by holding cells at -40 mV for 50 ms followed by 10 -mV steps (2 s) to -130 mV and returned to -40 mV (50 ms) after each step. After the $I_f$ was recorded, cells were superfused with extracellular solution containing 4 mM cesium chloride and the currents were measured accordingly. **Results:** 1. In addition to expressing characteristic hHCN4 protein, mHCN4-transfected hMSCs also express an anticipated high level of hHCN4 gene by RT-PCR and Western blot analysis. And immunofluorescence image is shown for GFP. Control MSCs were negative. 2. With the use of the whole cell configuration of the patch-clamp technique, $I_f$ was elicited using hyperpolarizing steps in 10-mV increments from -40 mV to -140 mV from a holding potential of -40 mV and was voltage-dependent. The threshold of voltage for activation of $I_f$ is around -80 mV. Remarkably, all hHCN4 positive cells exhibit a large cesium-sensitive $I_f$ and it was significantly inhibited by 4 mM cesium chloride. **Conclusion:** The pacemaker current of $I_f$ can be elicited from the mesenchymal stem cells transfected with HCN4 genes by LentiV. The genetically engineered MSC expressing hHCN4 is a demonstration of feasibility of preparing MSC-based biological pacemaker cells.

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1. Ya-Feng Zhou, Xiang-Jun Yang, Hong-Xia Li. Hyperpolarization-activated cyclic nucleotide-gated channel gene: the most possible therapeutic applications in the field of cardiac biological pacemakers. Med Hypotheses 2007, 69(3): 541–4.
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**P806**

## Novel role of anti-aging hormone klotho in cardioprotection

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**Introduction:** Previous studies have demonstrated that transient receptor potential vanilloid 1 (TRPV1) acts as a cardioprotectant in ischemia-reperfusion (IR) injury. Klotho is a circulating protein with $\beta$-glucuronidase activity that hydrolyzes the extracellular sugar residues of TRPV in channel activation. Moreover, klotho deficiency plays a role in the development of age-related cardiovascular disorders. **Objectives:** The present study therefore aimed to test whether exogenous supplementation with klotho would activate TRPV1 and protect the heart against IR **Methods:** Rat hearts were isolated and mounted on the Langendorff apparatus to avoid non-cardiac effects of klotho from circulation. After 20-min basal period, acute IR injury was induced by a 30-min stop of perfusion and 2-h reflow. The recombinant klotho protein (KL, 0.05 $\mu$g/ml), the selective TRPV1 antagonist capsazepine (Capz, 0.1 $\mu$M), or the $\beta$-glucuronidase inhibitor D-saccharic acid 1,4-lactone (DSL, 0.5 $\mu$M) was given alone or in combination 5 min before reperfusion. Myocardial protection was assessed by measuring left ventricular developed pressure (LVDP), lactate dehydrogenase (LDH) release, and infarction. TRPV1 expression was examined. **Results:** The IR hearts treated with klotho had a better postischemic LVDP recovery as compared to its basal period and untreated controls at the end of reperfusion (Table 1). Klotho significantly decreased the release of LDH and limited infarction caused by IR. Blockade of either $\beta$-glucuronidase activity or TRPV1 abolished contractile recovery, and decreased LDH and mitigated infarction mediated by klotho. The expression of TRPV1 however was not affected in groups.

**Table 1. Changes in LVDP, LDH release, and infarction before or after IR in groups.**

| Groups/Parameters | | IR | IR+KL | IR+KL+DSL | IR+KL+Capz |
|---|---|---|---|---|---|
| LVDP (mmHg) | Basal | 92±6 | 91±5 | 90±3 | 93±4 |
| | Rec | 46±3* | 68±4*† | 49±2*# | 41±3*# |
| LDH (U/L) | Basal | 18±3 | 17±3 | 17±3 | 89±3 |
| | Rec | 70±6* | 29±3*† | 65±5*# | 69±7*# |
| IS (%) | Rec | 72±9 | 49±6† | 51±7# | 47±8# |

N = 6 for each group. Values are expressed as mean ± SEM. IS, infarct size as percentage of area in risk; Rec, recovery period after ischemia; *P<0.05 compared to basal period. †P<0.05 compared with IR group. #P<0.05 compared with IR+KL group

**Conclusion:** Our data demonstrate that klotho attenuates myocardial IR injury. Inhibition of either the klotho (as the $\beta$-glucuronidase activity) or TRPV1 abolished the cardioprotective effects, suggesting that TRPV1 acts as a downstream effector of klotho to ameliorate recovery from IR injury.

**P807**

## Reduced ventricular and vascular dysfunction induced by novel N-acylhydrazone derivative in monocrotaline-induced pulmonary hypertension in rats

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**Introduction:** Pulmonary arterial hypertension (PAH) is an uncommon but serious disease which is characterized by enhanced pulmonary vascular resistance and subsequent vascular remodeling, right ventricular hypertrophy, increased right ventricular pressure and endothelial injury of pulmonary arteries. **Objectives:** The present work investigated vascular reactivity and ventricular function in rats with PAH treated with LASSBio-1359, a new N-acylhydrazone derivative. **Methods:** Protocols were approved by Animal Care and Use Committee at Universidade Federal do Rio de Janeiro. Male Wistar rats received a single intraperitoneal injection of monocrotaline (MCT) (60 mg/kg) for PAH induction. Animals were randomly divided in the following groups in which were treated with: 1. saline (control), 2. MCT + vehicle (DMSO), 3. MCT + LASSBio-1359 (50 mg/kg p.o.). At the end of treatment period (14 days), some parameters were evaluated: 1. pulmonary acceleration time (PAT) measured using transthoracic echocardiography; 2. right ventricular systolic pressure (RVSP), through the puncture in the right ventricle using a venous catheter connected to a calibrated pressure transducer; 3. vascular reactivity to acetylcholine in pulmonary artery; 4. expression of the nitric oxide synthase (NOS) through the western blot. **Results:** PAT (ms) was increased from $26.2 \pm 2.8$ (control) to $41.3 \pm 3.9$ in PAH group treated with vehicle ($n=8$, $p<0.05$). In contrast, PAT was $24.2 \pm 1.7$ when treated with LASSBio-1359.RVSP (mmHg) increased from $26.0 \pm 2.0$ (control) to $55.2 \pm 2.3$ in MCT group ($n=8$, $p<0.05$) but was similar to control after treatment with LASSBio-1359 ($31.8 \pm 2.3$ mm Hg). Ratio of right ventricle and body weight (mg/g) was $0.66 \pm 0.02$, $1.63 \pm 0.16$ and $0.87 \pm 0.10$ for control, vehicle and LASSBio-1359 groups, respectively. These results indicate that PAH promoted ventricular dysfunction which was reduced by LASSBio-1359. The pulmonary artery maximum relaxation (%) was $57.3 \pm 5.5$, $43.6 \pm 1.2$ and $61.4 \pm 8.4$ for control, vehicle and LASSBio-1359-treated groups indicating that PAH decreased the contractile response to acetylcholine in pulmonary artery which was recovered by LASSBio-1359. iNOS but not eNOS expression was increased by PAH and normal after treatment with LASSBio-1359. **Conclusion:** LASSBio-1359 reduced ventricular and vascular dysfunction in monocrotaline-induced PAH rats indicating a possible new alternative to treat PAH.

**P808**

## New thienylhidrazone reduces cardiac and vascular alterations promoted by myocardial infarction in spontaneously hypertensive rats

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**Introduction:** Severe ventricular dysfunction is observed in arterial hypertension associated to myocardial infarction (MI). **Objectives:** New thienylhidrazone, LASSBio-294, which has demonstrated positive inotropic effect was tested in spontaneously hypertensive rats (SHR) submitted to experimental MI. **Methods:** Protocols were approved by Animal Care and Use Committee in which male SHR (12–14 wks old) were randomly divided in sham-operated (Sham) and infarcted groups (MI) which were treated or not with LASSBio-294 (20 mg/kg, p.o.) during 28 days. Under sevoflurane anesthesia, the animals were submitted to a ligature of the anterior descending coronary artery. After treatment period, the following hemodynamic parameters were analyzed: left ventricular end diastolic pressure (LVEDP), end-systolic pressure (LVESP) and dP/dt. All groups were submitted to the treadmill test which consisted in 3 cycles (3 min each) with a velocity of 8, 12 and 18 m/min until rats reached exaustion. Hypertrophy was detected using the ratio of heart/body weight. Aorta were dissected and prepared for isometric tension recording and vascular reactivity to acetylcholine was observed. **Results:** LASSBio-294 significantly reduced the mean arterial pressure from 162.7 ± 7.5 to 136.7 ± 27.3 mmHg ($p<0.05$) in SHR-MI group. Cardiac hypertrophy was observed in SHR-MI group because the ratio heart/body weight increased from 5.32 ± 0.22 mg/g (SHR) to 7.54 ± 0.58 mg/g ($P<0.05$) which returned to 5.23 ± 0.21 mg/g in the SHR-MI group treated with LASSBio-294. Ventricular dysfunction was observed in SHR-MI since LVEDP increased from 11.0± 1.6 mmHg (SHR) to 26.5 ± 4.2 mmHg ($P<0.05$). In contrast, when SHR-MI group was treated with LASSBio-294, LVEDP reduced to 14.6 ± 2.7 mmHg. MI reduced the running distance and exercise capacity when compared to the SHR-sham group but both parameters were partially recovered after treatment with LASSBio-294. Running distance (m) and exercise capacity (kg.m) were 232.7 ± 58.2 and 235.4 ± 74.1, 23.3 ± 2.3 and 36.0 ± 3.5, 100.4 ± 16.7 and 144.4 ± 16.9for SHR-sham, SHR-MI and SHR-MI treated with derivative, respectively. Maximum acetylcholine-induced relaxation (%) was 56.1 ± 4.5 and 46.0 ± 5.8 for SHR-Sham and SHR-MI groups indicating that MI decreased the contractile response to acetylcholine in aorta which recovered to 67.8 ± 3.3 % after treatment with LASSBio-294. **Conclusion:** LASSBio-294 is a promising candidate for preventing MI-induced cardiac and endothelium dysfunction in SHR, which could potentially avoid heart failure.

**P809**

## Rhynchophylline vasodilation of human mesenteric artery involves L-Type Calcium Channel Inhibition

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**Introduction:** Uncaria species (Gouteng in Chinese) have been used as ethnopharmacological medicines to treat ailments of the cardiovascular systems. As one of the main alkaloid constituent, rhynchophylline (Rhy) exhibits a similar pharmacological activity when compared with Gouteng andhas drawn extensive attention in recent years.However, the underline mechanism remains to be understood.Physiological activation of vascular $Ca^{2+}$ channel or $BK_{Ca}$ is an important bufferingmechanism to counteract vessel depolarization and constriction. Agents that alter the activity of $Ca^{2+}$ channel or $BK_{Ca}$affect the vascular tone in both physiological and pathological conditions. **Objectives:** We therefore studied the actions of Rhy on endothelium-denuded human mesenteric artery and its effect on the $I_{Ca,L}$and $BK_{Ca}$ currents in human mesenteric artery smooth muscle cells (HMASMCs). **Methods:** Tension measurement was measured via Powerlab Electrophysiolograph, the effect of Rhy on the precontracted artery was analysed. Single smooth muscle cells were enzymatically isolated from the same arterioles.By use of the whole–cell perforated patch clamp technique, the effects of Rhy were examined on $BK_{Ca}$ channels as well as on $Ba^{2+}$ (10 mM) currents through L-type $Ca^{2+}$ channels. Fura-2 loaded cells were used to check the effect of Rhy on intracellular $Ca^{2+}$changes. **Results:** □Different concentrations of Rhy(1–100$\mu$M) dose-dependently relaxed both KCl (60 mM) and Bay k8644 (1 $\mu$M)-evoked arterial contraction completely, the IC50 of Rhy obtained from KCl and Bay k8644 contracted arteries was (38.26±1.12) $\mu$M and (32.69±1.20) $\mu$M, respectively. Different potassium channel inhibitors: tetraethylammonium (TEA; 1mM), glibenclamide (10 $\mu$M), and 4-aminopyridine (4-AP; 1 mM) failed to block Rhy-induced vasodilation ($n=3$–10, $P>0.05$). □Application of Rhy (100 $\mu$M) significantly (48.17±0.13%, $n=3$, $P<0.05$) inhibited both $I_{Ca,L}$ and the Bay k8644 stimulated $I_{Ca,L}$(66.31%) below the basal levels($n=4$, $P<0.05$). Macroscopic $BK_{Ca}$currents were not remarkably activated by Rhy (100 $\mu$M) ($n=6$, $P>0.05$).□Rhy (100$\mu$M) significantly inhibited KCl (60 mM) induced intracellular $Ca^{2+}$ elevation ($n=3$, $P<0.05$). **Conclusion:** Our results suggest that, in human mesenteric artery, the vasodilatory effects of Rhy may be mainly mediated by the inhibition of L-type $Ca^{2+}$ channels, rather than the activation of potassium channel.

**P810**

## Role of aerobic exercise in hyperhomocysteinemia and hyperhomocysteinemia-accelerated atherosclerosis

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**Introduction:** Hyperhomocysteinemia (HHcy) has been recognized as an independent risk factor of atherosclerosis. Recently, the critical roles of inflammation and reactive oxygen species (ROS) in hyperhomocysteinemia-accelerated atherosclerosis have been confirmed. However, there wasn't an effective intervention to be found to reduce the development of atherosclerosis induced by hyperhomocysteinemia. **Objectives:** The purpose of the study was to investigate whether aerobic exercise could decrease Hcy level and reduce development of atherosclerosis induced by HHcy. **Methods:** Six-week-old female apoE−/− mice (N=24were assigned to three groups: Control group, HHcy group and HHcy + exercise group. HHcy animal model was made by feeding a high Hcy chow (1.8 g/L in water). After 1 week of acclimatization, the HHcy + exercise group was trained in a motorized rodent treadmill for 8 weeks (speed: 15 m/min, slope: 0°, 60 min/d, 5 d/wk). Plasma total cholesterol, LDL cholesterol, triglyceride and Hcy levels were determined enzymatically by auto-biochemistry analysis system. Plasm superoxide dismutase (SOD) activities were determined by hydroxylamine assay kit. Aortic roots of all apoE−/− mice were isolated for comparing the plaques area by immunohistochemistry. **Results:** There were not significant changes in body weight and daily drinking amount among the three groups. Plasm Hcy levels in HHcy group were higher than control group ($\mu$mol/L, 20.88 ± 5.79 vs 7.8 ±1.1, p=0.001), furthermore, aerobic exercise decreased the Hcy levels significantly ($\mu$mol/L, 14.01 ± 2.30 vs 20.88 ± 5.79, p=0.016). Compared with control group, Plasm SOD activities were lower in HHcy group (U/L, 43.05 ± 21.65 vs 73.12 ± 10.09, p=0.014). However, it was increased in HHcy + Exercise group than HHcy group (U/L 70.58 ± 10.92 vs 43.05 ± 21.65, p=0.035). Total cholesterol, LDL cholesterol and triglyceride concentrations were similar in the three groups (Table 1). Atherosclerotic lesions were apparent of Hcy supplementation in apoE−/− mice particularly where aortic roots and the major arteries branch off from the aortic arch. 8 weeks of aerobic exercise could reduce the atherosclerotic lesions in HHcy + Exercise group.

**Image/graph I:**

A. Control group B. HHcy group C. HHcy+Exercise group

**Fig 1 Aerobic exercise reduced atherosclerotic lesions induced by HHcy in apoE−/− mice.**
**Control apoE−/− mice (A), HHcy apoE−/− mice (B) and HHcy+Exercise apoE−/− mice (C). Mice were sacrificed, and the aortic tree was dissected. Serial sections of the aortic roots were stained with oil red O which could show atherosclerotic lesions obviously (magnification ×50). Atherosclerotic lesions were more apparent in HHcy apoE−/− mice than Control apoE−/− mice in the corresponding section. Compared with HHcy apoE−/− mice, 8 weeks of aerobic exercise could reduce the atherosclerotic lesions in HHcy + Exercise apoE−/− mice.**

**Image/graph II:**

**Table 1 Plasm levels of lipid**

| | Control group | HHcy group | HHcy + Exercise group | *p* value |
|---|---|---|---|---|
| T-CHO (mmol/L) | 9.34 ± 1.40 | 10.62 ± 0.91 | 10.23 ±0.68 | 0.113 |
| LDL-C (mmol/L) | 1.40 ± 0.21 | 1.70 ± 0.34 | 1.77 ± 0.21 | 0.146 |
| T-G (mmol/L) | 1.01 ± 0.28 | 1.03 ± 0.33 | 1.01 ± 0.18 | 0.99 |

**Conclusion:** Aerobic exercise decreases plasm Hcy levels in hyperhomocysteinemia mice and retards the development of hyperhomocysteinemia-accelerated atherosclerosis which does not depend on the decrease of cholesterol levels. It may be realized by upregulating the expression of anti-oxidant agent.

**P811**

## Common ECG changes in Takotsubo cardiomyopathy

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**Introduction:** Takotsubo Cardiomyopathy (TC) is a transient non-ischemic cardiomyopathy which has an acute presentation that may mimic acute myocardial infarction (AMI). **Objectives:** We aim to elucidate common electrocardiogram (ECG) abnormalities seen during the acute presentation of TC. **Methods:** Thirteen patients were retrospectively identified through a coronary angiogram database. All had underwent an urgent angiogram in view of possible STEMI on ECG. A left ventriculogram (demonstrating basal hyperkinesia with apical akinesia) was done in all patients. All patients fulfilled the Mayo clinic diagnostic criteria for TC. The 12-lead ECG which prompted the angiogram was analysed. **Results:** Eleven (84.6%) patients had a sharp downsloping QRS in the antero-septal or lateral leads. The nadir of the S wave was below the isoelectric line in 8 patients (61.5%), while it was above the isoelectric line in 2 (15.4%) patients. The J point was found elevated in 11 (84.6%) patients, with varying degree of elevation from 1mm to 6mm from the isoelectric line. Ten (76.9%) patients had a upsloping ST segment elevation, predominantly concave upwards. A single patient had horizontal ST elevation. The ST segment was not elevated in 1 patient, and was depressed in another patient. The peak of the T waves is taller than the R wave in 8 (61.5%) patients. In these patients, the T wave was broad (base >160ms) and tall (mean peak 9.8 mm above isoelectric line). The peak of the T wave was smaller than the R in 3 (23.1%) patients, but the base was broad and tall in 2 (15.4%) of them. Two (15.4%) patients had T wave inversion at the time of presentation. Seven (53.8%) patients demonstrated widespread ST and T wave changes involving V2-V6 and the inferior leads. ECG changes were seen only in the septal or lateral leads in 6 (46.2%) patients. In all patients, there were no reciprocal ST depressions to mirror the presumed territory of infarct.

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**Image/graph I:**

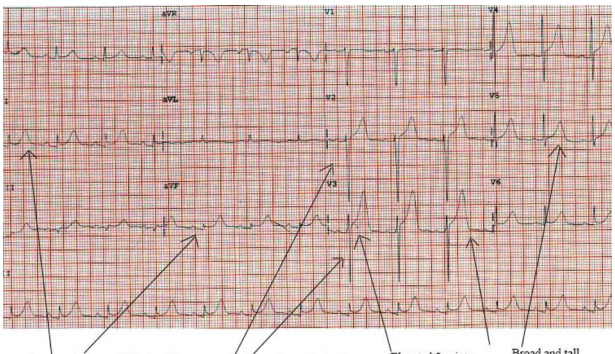


Figure 1

**Image/graph II:**

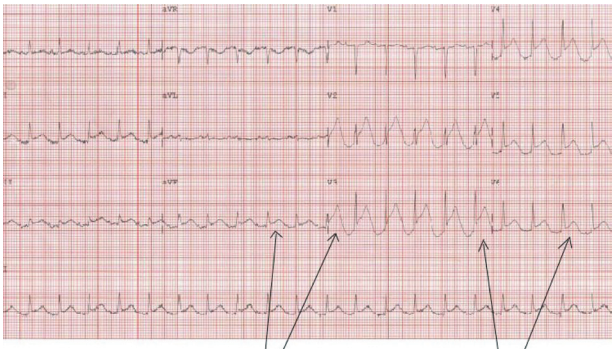


Figure 2

**Conclusion:** The acute ECG changes in TC causes a significant diagnostic challenge. Our study suggests that several clues may be present in the ECG to point to TC as a possible diagnosis. Common ECG features in TC include a sharp downsloping QRS with the nadir below the isoelectric line, J point elevation, a concave downward ST segment elevation with a tall and broad T wave as well as the absence of reciprocal changes in isolated anterior-septal or lateral ST elevation. These features are not commonly seen in the ECG of patients with STEMI and may be possible diagnostic criteria of TC on ECG.

**P812**

## Cathepsin S deficiency results in abnormal accumulation of autophagosome in macrophages and enhances angiotensin II–induced cardiac inflammation and fibrosis

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**Introduction:** Hypertensive heart disease is an inflammatory disease characterized by extensive fibrosis and remodeling of the heart. Proinflammatory cells, such as macrophage, stimulate myofibroblast formation and extracellular matrix accumulation, leading to cardiac fibrosis. Cathepsin S (Cat S) is expressed in human atherosclerotic and aneurysmal tissues and may contribute to inflammatory diseases. Cat S has strong elastinolytic and collagenolytic activity, but whether this protease contributes to cardiac inflammation and fibrosis in hypertension is unknown. **Objectives:** We aimed to define the role of Cat S in the development of cardiac inflammation and fibrosis induced by angiotensin II (Ang II). **Methods:** Cat S-knockout (Cat $S^{-/-}$) and age-matched wild-type (WT) C57BL/6J mice were infused continuously with Ang II (750 ng/kg/min) or saline for 7 days. Immunohistochemical staining and real-time PCR were performed for cardiac fibrosis and inflammation detection. LC3 level either in Ang II-infused hearts or in cultured macrophages were determined by western blot and transmission electron microscopy. Amino acids levels in medium of starved bone marrow–derived macrophages from WT and Cat $S^{-/-}$ mice were analyzed by liquid chromatography-mass spectrometry/mass spectrometry. **Results:** Cat $S^{-/-}$ mice showed severe cardiac fibrosis, including elevated expression of collagen I and $\alpha$-SMA as compared with WT mice. Moreover, macrophage infiltration and expression of inflammatory cytokines (tumor necrosis factor $\alpha$, transforming growth factor $\beta$1 and interleukin 1$\beta$) were significantly higher in Cat $S^{-/-}$ than WT hearts. The mechanism underlying these effects involved abnormal accumulation of autophagosomes and reduced amino acids production, leading to starvation-induced cell death and inflammation in Cat $S^{-/-}$ heart. **Conclusion:** Deficiency in Cat S results in abnormal accumulation autophagosome in macrophage and its apoptosis in mice infused with Ang II, which induces further macrophage activation and elevated expression of inflammatory cytokines, thus contributing to cardiac fibrosis.

**P813**

## Oxytocin protects cardiomyocytes from apoptosis induced by ischemia-reperfusion in rat heart

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**Introduction:** In previous studies, we demonstrated the protective effects of oxytocin (OT) on myocardial injury in ischemic reperfused heart**. Objectives:** The current study examines the protective effect of OT on apoptosis of cardiomyocytes in the preconditioned myocardium of anaesthetized rats. **Methods:** Thirty rats were equally divided into five groups (n=6): (I) a sham group, (II) an ischemia-reperfusion (IR) group with hearts subjected to 25 min of ischemia and 120 min of reperfusion, (III) an OT group with OT administered 25 min prior to ischemia, (IV) a 5HD+OT group with 5-hydroxydeconoate (5HD; a specific inhibitor of the mitochondrial ATP-dependent potassium channel, mitoKATP) administered 10 min prior to OT administration and (V) an ATRC+OT group with atractyloside (ATRC; a compound with the ability to open the mitochondrial permeability transition pore, mPTP) administered 10 min prior to OT administration. Evaluations were made by light microscopy (LM), transmission electron microscopy (TEM) and immunohistochemistry using TUNEL and Bcl-2 staining. Treatment with OT before IR induction normalizes cardiomyocytes both in LM and TEM observations. **Results:** OT significantly reduces the numbers of TUNEL- and Bcl-2-labeled positive cells relative to the IR group ($p<0.05$). Administration of 5HD and atractyloside was found to significantly increase the numbers of TUNEL- and Bcl-2-labeled positive cells in comparison with the OT group ($p<0.05$). **Conclusion:** Ultrastructural changes including extensive loss of myofibrils, disruption of sarcolemma, swelled mitochondria with amorphous dens bodies indicates induction of necrosis in the 5HD+OT and ATRC+OT groups as well as in the IR group. The significant restoration of altered immunohistochemistry parameters and prevention of an IR-induced rise in ultrastructural changes confirm that oxytocin provides a cardioprotective effects through mitoKATP and mPTP signaling pathway.

**P814**

## Lumican protein and cardiac fibrosis

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**Introduction:** Aging, mechanical factors and neurohormonal factors that are capable of modifying the cardiocyte phenotype due to cardiac remodeling, which often causes cell death and triggers the fibrosis resulting from extracellular matrix remodeling. Fibrosis is a major factor contributing to cardiac failure and a crucial determinant of myocardial function, increasing diastolic stiffness, and the propensity for reentry arrhythmias. **Objectives:** The small leucine-rich proteoglycan family, which binds collagen fibrils and regulates interfibrillar spacing, may have a role in cardiac remodeling. Lumican can regulate collagen fibril organization, corneal transparency, and epithelial cell migration and tissue repair. To determine the role of lumican in the cardiac remodeling, we assessed the effects of natural aging and stress-inducing isoproterenol in the *Lum*$^{-/-}$null mouse model. **Methods:** We analyzed the basic cardiac phenotypes of *lumican*-null (*Lum*$^{-/-}$) mice in both youth and elder, and then used the isoproterenol-induced cardiac fibrosis model to study the roles of extra-cellular matrix and apoptosis in cardiac remodeling. **Results:** Higher mortality resulted from significantly impaired systolic function, and an increase of atrial natriuretic peptide secreted by the ventricles in response to excessive stretching of myocytes of *Lum*$^{-/-}$ mice in comparison to wild type littermates. In addition, *Lum*$^{-/-}$ mice exhibited higher level of TGF-$\beta$, collagen I/III, and membrane-type matrix metalloproteinase-1 (MT1-MMP, or MMP-14) during cardiac remodeling. **Conclusion:** In conclusion, lumican was relating to up-regulation of the TFG-$\beta$ and MT1-MMP pathway to regulate the cardiac fibrosis by increasing collagen I and III. Our results suggest that lumican is essential for accommodating stress (i.e., aging or isoproterenol)-induced cardicyte fibrosis, thus amelioration of cardiac failure and cardiac death.

**P815**

## Receptor for activated protein kinase C1 inhibits hypertrophic responses by suppressing p300/GATA4-dependent pathway in cardiomyocytes

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**Introduction:** A zinc finger protein GATA4 is one of the factors involved in transcriptional regulation during myocardial cell hypertrophy and forms a functional complex with an intrinsic

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histone acetyltransferase (HAT), p300. HAT activity of p300 is required for acetylation and the transcriptional activation of GATA4 as well as for cardiomyocyte hypertrophy and the development of heart failure *in vivo*. By tandem affinity purification and mass spectrometric analyses, we identified a Receptor for Activated Protein Kinase C1 (RACK1), a multi-functional scaffold protein, as a novel GATA4-binding partner. Recently, it has been reported that RACK1 regulates the activity of various transcription factors such as hypoxia-inducible factor-1$\alpha$ (HIF-1$\alpha$) and p63$\alpha$. However, the precise functional relationships among p300, GATA4 and RACK1 remain unknown. **Objectives:** The goal of this study was to clarify whether RACK1 is involved in p300/GATA4 transcription pathway and cardiomyocyte hypertrophy. **Methods:** The binding of RACK1 with GATA4 was determined by glutathione S-transferase (GST) pull-down assays and immunoprecipitation followed by Western-blot analysis (IP-WB) in HEK293 cells. Moreover, the binding domains of these proteins were examined by using multiple mutants of RACK1 and GATA4. HEK293 cells and primary cardiomyocytes from neonatal rats in culture were transfected with reporter plasmids encoding atrial natriuretic factor (ANF) and endothelin-1(ET-1) promoters. These cells were harvested for luciferase assays. Cardiomyocytes transducted with RACK1 by lentivirus were stained with $\beta$-myosin heavy chain ($\beta$-MHC) antibody and measured the myocardial cell surface area. **Results:** GST pull-down assay showed that the fourth and fifth repeat WD40 domains of RACK1 physically bound to the N-terminal zinc finger domain of GATA4. IP-WB demonstrated that RACK1 was associated with GATA4 in HEK293T cells. Overexpression of RACK1 inhibited p300/GATA4-induced ANF and ET-1 promoter activities in HEK293T cells. In cardiomyocytes, overexpression of RACK1 significantly inhibited phenylephrine-induced hypertrophic responses such as myofibrillar organization, an increase in the cell size, and the activation of ANF and ET-1 promoters. **Conclusion:** RACK1 forms a functional complex with p300/GATA4 and regulates hypertrophic response including cell hypertrophy and gene transcription in cardiomyocytes. Further examinations are needed to clarify the mechanisms of inhibitory effects of RACK1 on cardiac hypertrophy.

**P816**

## TBL1 increases the binding of HDAC3 with GATA4 and suppresses p300/GATA4-induced hypertrophic gene transcription in rat cardiomyocytes

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**Introduction:** Hypertrophic stimuli activate cardiac transcription factors such as SRF, MEF-2 and a zinc finger protein GATA4 and modulate gene expression in cardiomyocytes. These changes finally lead to the development of heart failure *in vivo*. An intrinsic histone acetyltransferase (HAT), p300, serves as a coactivator of GATA4 and is involved in its acetylation and DNA binding activity. By tandem affinity purification and mass spectrometric analyses, we identified transducin beta-like protein 1 (TBL1), as a novel GATA4-binding protein. TBL1 is a component of nuclear receptor corepressor/histon deacetylase 3 (HDAC3) complex, which regulates the transcriptional activities such as NF-kB, thyroid hormone receptorand b-cathenin. However, the precise functional relationships between p300/GATA4 and TBL1 remain unknown. **Objectives:** The purpose of this study wasto examine the role of TBL1 inp300/GATA4-dependent hypertrophic gene transcription. **Methods:** The binding of TBL1 with GATA4 was examined by GST-pulldown assay. To investigate the hypertrophic gene promoter activity, HEK293T cells and primary culture of cardiomyocytes isolated from neonatal ratswere transfected with atrial natriuretic factor (ANF) and endothelin-1 (ET-1) promoter constructs. These cells were lysed and the luciferase activities were measured. Acetylated form of GATA4 and binding between HDAC3 and GATA4 were determined by immunoprecipitation, followed by western blotting (IP-WB). **Results:** First, GST-pull down assay demonstrated that TBL1 physically interacted with GATA4. TBL1 bound to GATA4 in HEK293T cells. Next, to investigate whether TBL1 affects p300/GATA4-induced activation of hypertrophic gene promoter, we performed reporter assays in HEK293T cells. Overexpression of TBL1 inhibited p300/GATA4-induced ANF and ET-1 promoter activities. Conversely, knockdown of TBL1 by RNAi enhanced these promoter activities. IP-WB analyses showed that overexpression of TBL1 repressed p300-induced acetylation of GATA4 and enhanced the binding between HDAC3 and GATA4. Finally, TBL1 repressed phenylephrine-induced promoter activation of ANF and ET-1 in cardiomyocytes. **Conclusion:** These findings demonstrate that TBL1 forms a functional protein complex with p300/GATA4 and suppresses hypertrophic gene transcription in cardiomyocytes.

**P818**

## A new 72 gene panel for the diagnosis of heart disease patients using next generation sequencing

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**Introduction:** Cardiovascular disease is the leading cause of death worldwide. Most cardiomyopathies and channelopathies are genetic in origin and are characterized by their risk of premature death and chronic morbidity, affecting both the patient and his/her family. The detection of mutations in patients allows for therapeutic or preventive measures to be established as part of the genetic counseling. However, the large number of genes involved, makes it difficult to analyze using conventional techniques. We present an NGS platform, which includes 72 genes associated with different pathologies, that permits a quick and thorough analysis of those genes. **Objectives:** Genetic characterization of heart disease patients in a fast, comprehensive, and cost-effective manner using a 72 gene NGS approach. **Methods:** We developed a methodology for resequencing 72 genes (44 genes associated with cardiomyopathy, arrhythmogenic right ventricular dysplasia, Marfan syndrome, aortic aneurysm, and 28 genes associated with Brugada syndrome, long QT and short QT syndromes, familial atrial fibrillation and catecholaminergic polymorphic ventricular tachycardia). The design was done in our Bioinformatics Unit and includes 1.4 Mb of exons, splicing regions and 5' and 3' unstranslated regions of the 72 selected genes. Exonic regions were thus captured (SureSelect, Agilent), and sequenced in the SOLiD v4 platform. The results were confirmed by Sanger sequencing. Bioinformatic analysis was performed according to our pipeline, which consists of mapping and comparing reads against the reference sequence of the human genome, aligning reads, classification and identification of point variations (SNPs and mutations), structural variations, and small indels, as well as their involvement at the transcriptional level. A set of 12 cases with a known mutation was used for validation studies. 21 patients (10 cases with aortic aneurism/Marfan syndrome, 2 cases with arrhythmogenic right ventricular dysplasia, 3 cases with Hypertrophic cardiomyopathy, 2 cases with long QT syndrome, 1 case with Brugada syndrome and 3 cases with family history of sudden death). **Results:** We found 35 nucleotide changes: 4 pathogenic mutations; 30 unclassified variations, of which 24 are novel changes, and using in silico predictions, 2 are likely pathogenic and 2 are unlikely pathogenic. **Conclusion:** Targeted resequencing enables efficient high throughput analysis of genes associated with heterogeneous diseases, and explains their phenotypic variability.

**P819**

## The effect of Akt1 gene on rats cardiomyocytes by ultrasound/ microbubbles destruction

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**Introduction:** Akt is a Ser/Thr protein kinase, which has powerful effects in promote cells survival. Ultrasound targeted microbubble destruction (US/MB) was regarded as a potential valuable tool to deliver therapeutic genes to cells or tissues with noninvasive, tissue-specific characteristics. **Objectives:** we observed the protective effects on cultured cardiomyocytes suffering from ischemia/reperfusion(I/R) injury of by using US with MB method transfected Akt1 gene. **Methods:** 293FT cells and cardiomyocytes were divided into 4 groups respectively: group A, only pEGFPC1-Akt1; group B, MB+pEGFPC1-Akt1; group C, US+pEGFPC1-Akt1; group D, US+MB+ pEGFPC1-Akt1. Cells in each group underwent I/R injury 48 hours later after transfection. The cell apoptosis rate and the expression level of Akt1 protein were detected after I/R injury. **Results:** Exogenous genes in the group of MB alone could not be delivered to target cells without the help of US, but the latter could do it without MB, the transfection efficiency significantly could be enhanced in US with MB group. In order to increase the transfection efficiency further, we tried several different experimental conditions, finally such combination was determined:ultrasound frequency 1.7MHz, mechanical index(MI) 1.5, irradiation time 2min, MB volume concentration 15%. According to these ultrasound parameters. Akt1 gene was transfected to cultured cardiomyocytesand then suffered from I/R injury, the results showed that the Akt1 gene was expressed and the number of apoptotic cells decreased significantly. **Conclusion:** Our data showed that US with MB is a promising gene delivery method to deliver therapeutic genes to cardiomyocytes cells and has cardiac protective effects.

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**P820**

## Identification of protein that interact BRAP, encoded by a gene associated with myocardial infarction susceptibility

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**Introduction:** Development and progression of coronary artery diseases including myocardial infarction (MI) depend on complex interactions multiple genetic and environmental factors. The pathogenesis includes chronic formation of plaque inside the vessel wall of the coronary artery and acute rupture of the artery, implicating a number of inflammatory molecules. We previously showed that a functional variation in *BRAP*, encoding a galectin-2 binding protein, strongly associated with susceptibility to MI in East Asian populations. We also found that the BRAP protein regulates the activity of NF kappa B, a central transcription factor of inflammation. **Objectives:** To clarify detailed function of BRAP in the pathogenesis of MI. **Methods:** We searched BRAP binding partners by using an S-protein tag pull down method and MALDI/TOF mass analysis, followed by co-immunoprecipitation experiment for confirmation of BRAP interaction. **Results:** We identified several molecules, that bind BRAP, related to cell proliferation and inflammation. TNF receptor-associated factor 5 (TRAF5) was one of them, which plays an important role in the TNF receptor mediated inflammatory systems. Interestingly, we also identified the two major components of I kappa kinase (IKK) signalosome, IKK$\beta$ and IkB$\beta$, as a novel binding partner of BRAP. **Conclusion:** Combined with previous

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results that galectin-2 protein binds with lymphotoxin-$\alpha$ (LTA; also known as TNF-$\beta$), known as one of the cytokines produced at earliest phase of vascular inflammatory processes, and regulates its extracellular secretion, we hypothesized LTA-galectin-2-BRAP cascade plays a pivotal role in an inflammatory signal pathway,specifically TNF receptor and IKK-signalosome mediated inflammation and thereby altered expression and/or function of the cascade influence the MI susceptibility.

**P821**

## FHL2 and endothelial progenitor cells

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**Introduction:** The four-and-a-half LIM domain protein 2 (FHL2) has been shown to play an important role in inhibiting inflammatory angiogenesis, but the relation between FHL2 and endothelial progenitor cell (EPC) in response to tissue ischemia remains unclear. **Objectives:** Here, we tested the hypothesis thatimpaired ischemia-induced neovascularization in mice lacking FHL2 is related to a defect in EPC mobilization and functions in vasculogenesis. **Methods:** Unilateral hindlimb ischemia surgery was conductedin *FHL2*-knockout ($FHL2^{-/-}$) mice and wild-typemice. Blood flow recovery, histological analysis, flow cytometry, Western blot analysis, and *n vitro*assays were used to eluciate the detailed mechanisms. **Results:** After hindlimb ischemia surgery, 100% of FHL2-null mice experienced autoamputation of the operated limbs, whereas only 20% of the age-matched wild-type mice exhibited hindlimb necrosis (n=8 per group).Blood flow recovery was significantly impaired in $FHL2^{-/-}$ mice when compared with that in wild-typemice as determined by laser Doppler imaging. Histological analysis revealed that the capillary density in the ischemic limb was increased in wild-typemice, whereas no such increase was noted in FHL2-null mice. Flow cytometry demonstrated that the number of EPC-like cells ($Sca\text{-}1^+/Flk\text{-}1^+$) in peripheral blood increased in wild-type mice after hindlimb ischemia surgery, but not in $FHL2^{-/-}$ mice. FHL2 deficiency impaired *ex vivo* angiogenesis in mouse aortic-ring culture assay which revealed that the mean density of the microvessels was significantly higher in the wild-type aorta than in the $FHL2^{-/-}$ aorta. Western blot analysis showed that vascular endothelial growth factor (VEGF) and matrix metalloproteinase 9 (MMP-9) protein levels were significantly downregulated in ischemic muscles in *FHL2*-knockout mice compared to wild-type mice. Using *in vitro* assays, deletion of FHL2 protein by FHL2 siRNA suppressed the migration and tube formation capacities of EPC. **Conclusion:** These findings indicate that deficiency of FHL2 impairs ischemia-induced neovascularization, and these effects may occur through a reduction in EPC mobilization, migration and vasculogenesis functions.

**P822**

## Cytokinesis-block micronucleus cytome assay in the peripheral blood lymphocytes of dilated cardiomyopathy patients

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**Introduction:** The Cytokinesis-Block Micronucleus Cytome (CBMN Cyt) Assay is commonly used for studying the frequency of micronuclei (MNi), nucleoplasmic bridges (NPBs) and nuclear buds (NBUDS) in peripheral blood lymphocytes and to evaluate the extent of DNA damage in humans. The role and extent of DNA damage using the CBMN Cyt assay, has been ascertained in some disorders. However, such data is not available for cardiovascular diseases. **Objectives:** In this study, it was aimed to ascertain the presence of DNA damage in the peripheral blood lymphocytes of Dilated Cardiomyopathy patients using the CBMN Cyt assay. **Methods:** Blood samples were collected from 48 individuals suffering from dilated cardiomyopathy from Vellore, South India with equal number (48) of age and sex related controls and were immediately processed for the CBMN assessment, which involved addition of Cytochalasin B at the $44^{th}$ hour of leucocyte culture. Standard harvesting procedure was followed. The fixed cells were dropped on microscopic slides, stained with Giemsa and scored under the optical microscope (final magnification 100X) following the scoring criteria listed by Fenech et al. (2003). **Results:** A significantly increased frequency of Micronuclei (MNi) was observed in the patient group (2.92±0.42) as compared to the controls (0.6±0.08) ($p<0.001$). Nuclear buds (NBUDS) which are a biomarker for gene amplification were also observed in increased number for the patients (1.65±0.23), in comparison to the controls (0.84±0.122) ($p<0.001$). Nucleoplasmic bridges (NPBs) are a biomarker for dicentric chromosomes, were found to be in increased number for the patients (1.9±0.27), in comparison to the controls (0.84±0.122) ($p<0.001$). Multinucleated cells (MULT) (i.e. cells having > 2 nuclei) were also observed to be increased in patients (15.3±2.2) than the controls (6.6±0.97) and significant ($p<0.001$). **Conclusion:** This is the first report on the CBMN Cyt assay in the peripheral blood lymphocytes of Dilated Cardiomyopathy patients. This study showed an increased frequency of DNA damage in the patients when compared with the controls.

**P824**

## Inadequate capillary growth in pressure-overload hypertrophy induced by dysregulation of angiogenesis factors

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**Introduction:** Myocardial hypertrophy is characterized by a decrased capillary density, which is affected by angiogenesis factors like vascular endothelial growth factors (VEGF), its receptors (VEGFR1 and VEGFR2), the stroma cell-derived factor-1 (SDF1) and hypoxia-inducible transcription factors (HIFs). **Objectives:** To determine the effect of the hypertrophic myocardium to alteration of gene expressions, which are involved in angiogenesis, we explanted (n=5 at each time point) mice hearts 24 hours (h), 1, 2 and 3 weeks (w) after transverse aortic constriction (TAC). We then analyzed changes in gene expression levels of HIF1 and HIF2, VEGF, VEGFR1, VEGFR2 and SDF1 compared to a non-banded control group. **Methods:** Eight-week-old adult mice, were anesthesized and TAC was performed. Gene expressions with relevance for angiogenesis were assessed by q PCR. Capillary densities of the myocardium were determined by immunohistochemistry. **Results:** LV weight-to-body ratios in TAC - and sham animals were 5.2 g/kg vs. 2.8 g/kg ($p<0.01$). The capillary density was significantly decreased in the TAC group 1253 ± 71 vs. 1735 ± 58 per field of vision ($p<0.05$). Expression of VEGF (2.07 fold, $p<0.005$) and SDF1 (3.10 fold, $p<0.01$) were significantly increased 24 h after TAC as compared to sham animals. 1w (VEGF: 0.88 fold, SDF1: 1.40 fold) and 2w (VEGF:0.96 fold, SDF1: 0.70 fold) the expression of VEGF and SDF1 was significantly decreased as compared to 24h after TAC. Remarkably, expressions of VEGF (1.51 fold) and SDF1 (1.70 fold) were increased again 3w after TAC. Expression of VEGFR1 (1.29 fold) and VEGFR2 after 24h (1.17 fold) were slightly increased followed by a decreased expression at 1 and 2 weeks after TAC. Surprisingly, the expression of VEGFR2 was significantly increased 3 weeks (1.46 fold) as compared to 2 weeks after TAC, whereas the expression of VEGFR1 remained low.The expression of HIF2 showed a significant decrease at week 1 to 3 after TAC (1w: 0.26 fold; 2w: 0.52 fold; 3w :0.45 fold; compared to sham animals). Surprisingly the expression of HIF1 only showed a slightly increased expression 24h and no significant changes within 3 weeks after TAC. **Conclusion:** The decrease in capillary density in hypertrophied myocardium appears to be linked to the dysregulation in the expression of pro-angiogenic factors. Our results suggest that this dysregulation must be overcome in order to reconstitute capillary density in the hypertrophic heart, which may improve the myocardial susceptibility to an ischemia-reperfusion injury.

**P825**

## Lipoprotein (a) affects in vitro lysis assays

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**Introduction:** Thrombosis plays a major role in cardiovascular disease.Eleveted plasma concentrations of lipoprotein a (LPa) was identified as a risk factor for myocardial infarction, stroke and venous thromboembolism. The apolipoprotein a present in LPa are homologous with kringle IV and V in plasminogen molecule. LPa competes with plasminogen for fibrin binding sites, resulting in a diminished fibrinolysis. Moreover, it could modify fibrin characteristics. **Objectives:** The aim of this study was to evaluate the effects of LPa on fibrin formation, lysis and Plg activation. **Methods:** Kinetic studies were performed and optical density ($OD_{405nm}$) *vs* time was recorded in the following assays. **(A)** Fibrinformation (purified system): fibrinogen (0.6 mg/ml) was clotted with thrombin (5 NIH/ml) and $CaCl_2$ (20 mM). **(B)** Fibrinolysis (purified system): fibrinogen (0.6 mg/ml), Plg (0.3 mM), t-PA (6 U/ml), thrombin (5 NIH/ml) and $CaCl_2$ (20 mM) were mixed. **(C)**Fibrinolysis (plasmatic system): idem (B) but normal plasma was used as fibrinogen and plasminogen source. **(D)** Plg activation (purified system): Plg, activators (u-PA and streptokinase) and chromogenic substrate were employed in amidolytic methods. LPa 68 mg/dl that was disolved in citrated buffer was used in all the experiments and citrate buffer was the control. The assays were performed in triplicate. **Results: (A)**The rate of fibrinoformation in the presence of LPa was higher than the control (0,5010±0,0002 $min^{-1}$ vs 0,0014±0,0001 $min^{-1}$)and final OD was lower (0,151±0,009 *vs* 0,252±0,002), suggesting that fibrin related to LPa was made by thin fibers. **(B)** Lysis with LPa was slower than control (9,7±0,4 $x10^{-5}$ $min^{-1}$ vs 61±8 $x10^{-5}$ $min^{-1}$)and complete lysis time was significantly higher (>1.000 min *vs* 805±26 min). **(C)**LPa - fibrin was only partially lysated, whereas complete lysis time of control fibrin was 610±12 min. **(D)** LPa delayed activation of Plg with both activators used. The largest interference was observed with streptokinase (half time activation 32±2 min *vs* 18±1 min) All differences were statistically significant ($p<0.05$). **Conclusion:** LPa accelerates the fibrinoformation and modifies the structure of the network, resulting in thinner fibers, more difficult to lyse than control. In addition, LPa affects Plg activation, which would impair the generation of plasmin. As a whole, the results suggest another insight by which high plasma LPa levels could contribute to a prothrombotic state and to vascular diseases.

**P826**

## Associations of UGT1A1 and SLCO1B1 polymorphisms with serum bilirubin level before and after treatment with rosuvastatin in chinese patients with hyperlipidaemia

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**Introduction:** Serum bilirubin level is inversely related to cardiovascular disease (CVD) risk in both retrospective and prospective studies. The organic anion transporting polypeptide (OATP) 1B1 (gene SLCO1B1) and uridine-diphosphate glucuronosyl transferase (UGT) 1A1 appear to play a role in the disposition of bilirubin by controlling the uptake of bilirubin into liver and by governing the conjugation and clearance of bilirubin, respectively. Polymorphisms in UGT1A1 contribute to the variability in serum bilirubin in different populations, whereas the association between bilirubin levels and SLCO1B1 polymorphisms was inconsistent. **Objectives:** This study examined whether the serum bilirubin level and the effect of rosuvastatin treatment was influenced by polymorphisms in SLCO1B1 and UGT1A1 in Chinese patients with hyperlipidaemia. **Methods:** The serum total bilirubin level was examined in 379 patients with hypercholesterolaemia, including 164 with familial hypercholesterolaemia (FH) before and after at least 4 weeks of treatment of rosuvastatin 10 mg daily therapy.All participants were genotyped for the SLCO1B1 388A>G and 521T>C and UGT1A1 *6, * 28 and *60 polymorphisms. **Results:** Male subjects had higher values of total bilirubin than females at baseline (mean ± SD: 12.6 ± 4.5 μmol/L vs. 10.5 ± 3.8 μmol/L, $p<0.001$) and on

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treatment. There was no difference in bilirubin levels in patients with hypertension, diabetes, or FH compared to those without these conditions. After rosuvastatin treatment, there was a small but significant increase in total bilirubin levels from baseline in male subjects (median [interquartile ranges]: 5.9% [-13.6%, 25.0%], $p<0.05$) but not in females. The UGT1A1*6 ($p<0.001$), *28 ($p^{-5}$) and *60 ($p=0.001$) variant alleles were significantly associated with increased baseline or on-treatment bilirubin levels, whereas the SLCO1B1 388A>G and 521T>C polymorphisms were not related to bilirubin concentrations in this group of patients. The UGT1A1 polymorphisms had no effect on the bilirubin response to rosuvastatin. **Conclusion:** This study demonstrates a strong relationship between UGT1A1, but not SLCO1B1 polymorphisms, and serum total bilirubin levels in Chinese patients with hyperlipidaemia. Rosuvastatin treatment increased bilirubin levels in males but not in females and this effect was independent of UGT1A1 polymorphisms.

**P827**

## Steroidogenic off-target effects of the CETP inhibitor torcetrapib involves the cytoplasmic mitochondrial permeability transition pore

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**Introduction:** High levels of HDL-C are associated with reduced atherosclerosis[1] and cardiovascular events.[2] Cholesteryl ester transfer protein (CETP) inhibitor, torcetrapib, increased HDL-C, but was associated with increased mortality.[3] Possible causes were compound-specific off-target effects[4] including increased steroidogenesis involving voltage-gated L-type $Ca^{2+}$ channels[5]. Opening of the mitochondrial permeability transition pore (mPTP) exchanges $Ca^{2+}$ and cholesterol between mitochondria and cytosol, coupled to mitochondrial membrane potential. mPTP comprises a multisubunit permeability pore including the voltage-dependent anion-selective channel (VDAC) and the peripheral benzodiazepine receptor/translocator protein (PBR/TSPO). **Objectives:** To evaluate the role of mPTP in torcetrapib-induced aldosterone production in H295R adrenocarcinoma cells. **Methods:** Aldosterone production, expression of aldosterone synthase (CYP11B2) and L-type $Ca^{2+}$ channel $\alpha$1C subunit, cellular impedance and intracellular $Ca^{2+}$ were assessed in 300nM torcetrapib treated H295R cells. Aldosterone production was quantified in the presence of an inhibitor of mitochondrial $Ca^{2+}$ uniporter and VDAC (ruthenium red, RuR), modulators of PBR/TSPO (PK11195, RO-054684) and an inhibitor of mPTP (RO-683400). **Results:** Torcetrapib induced aldosterone production, expression of CYP11B2 and L-type $Ca^{2+}$ channel $\alpha$1C subunit mRNA in H295R cells. This induction was dose dependently abolished by 0.1–10$\mu$M RuR (1$\mu$M RuR reduced aldosterone [mean $\pm$ SD] -30$\pm$10%, CYP11B2 0.6$\pm$0.05 fold, n=3) and aldosterone was blocked by 3nM–30$\mu$M PK11195 and RO-054864 (at 30$\mu$M -77$\pm$3%, 86%$\pm$2% respectively, n=3) but increased by RO-683400 (2 fold at 300nM). Impedance, an indicator of intracellular $Ca^{2+}$ changes[6] showed oscillations with 10$\mu$M PK11195 and 10nM-10$\mu$M torcetrapib similar to an L-type $Ca^{2+}$ channel agonist, suggesting torcetrapib increases intracellular $Ca^{2+}$ activity most likely through mPTP. mPTP is now being targeted by RNAi to confirm its role in torcetrapib-dependent aldosterone production. **Conclusion:** Unique off-target effects of torcetrapib on steroidogenesis mirror a novel parallel cellular signal pathway, chemically tractable, acting by a mechanism involving the mPTP and L-type $Ca^{2+}$ channels. As RuR prevents VDAC-induced apoptosis the antiapoptotic potential of torcetrapib requires investigation.

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**P828**

## Effect of angiotensin-converting enzyme inhibitor on DNA damage and inflammatory molecules expression in rabbit aortic endothelial cells cultured in vitro in hypercholesterolemic and hyperglycemic conditions

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**Introduction:** Diabetes mellitus is a major risk factor for vascular diseases such asatherosclerosis. The inhibitionof the renin-angiotensin system may exert a protective effect on the development of atherosclerosis. **Objectives:** The current study aimed to verify the action of an ACEI in endothelial cells that were cultured *in vitro* under hypercholesterolemic and hyperglycemic conditions. **Methods:** Rabbit aortic endothelial cellswere cultured in medium with ox-LDL (30 $\mu$g) and22.2 mMor 5.5 mMof glucose in the presence or absence of an ACEI (1 mM quinapril). The expression profiles of the inflammatory markers ICAM-1 and MCP-1 were analyzed using immunocytochemistry and quantified using image analysis software. In addition, DNA damage was analyzed using the comet assay. **Results:** We observed a reduction in ICAM-1expression in endothelial cells that were treated with ACEI and cultured in medium containing a low concentration of glucose. The expression of MCP-1 was reduced in cells that were cultured with a low concentration of glucose in an ACEI-independent manner. No differences were observed in the percentage of DNA damage among the groups. **Conclusion:** Using an *in vitro* model, we observed that ACEI reduced the expression of inflammatory proteins in endothelial cells, and this protective effect depended onthe glycemic control.

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**P829**

## Impact of sex and physical exercise on endostatin release in patients With type 2 diabetes mellitus

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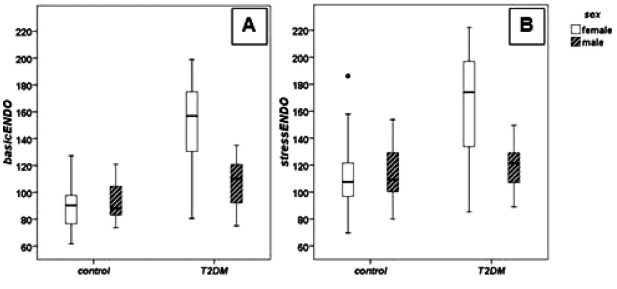
**Introduction:** Type 2 diabetes mellitus (T2DM) is an important cardiovascular risk factor in both sexes. However, females have been shown to have a more pronounced risk suffering from cardiovascular diseases (CVD) compared to males (1). Endostatin (Endo) inhibits VEGF-induced migration and proliferation of endothelial cells. It leads to a reduced vascularisation in tissue and atherosclerotic plaques and therefore might contribute to plaque stabilisation (2). **Objectives:** The aim of the present study was to investigate the influence of sex and physical exercise on Endo levels in postmenopausal female and male patients suffering from T2DM compared to healthy controls. **Methods:** A total of 74 individuals were investigated. The Endo levels of 35 T2DM patients (female: n=15, mean age: 60,13 +/- 10,8; male: n=20, mean age: 58,1 +/- 7,32) were compared to the levels of 39 young healthy non-smoking controls (female: n=20, mean age: 23,05 +/- 3,73; male: n=19, mean age: 23,16 +/- 4,13). Blood samples of Endo were taken at rest (basicENDO), after a graded bicycle stress test (stressENDO) and 90 minutes after the stress test (relaxENDO). **Results:** T2DM was associated with significantly higher endostatin levels at all points of measurement, moreover female diabetics showed by far the highest levels (Tabel1). Physical exercise was associated with a significant increase (p-values: <0,001–0,005) in all groups. However, the increase in T2DM patients (female: 9,2%; male: 9,7%) was distinctly reduced compared to the increase in the controls (female: 25,5%; male: 22,9%). 90 minutes after the bicycle stress test, all individuals approximately reached their basal Endo levels.

**Image/graph I:**

| | basicENDO (ng/ml) | stressENDO (ng/ml) | relaxENDO (ng/ml) | increase from basicENDO to stressENDO | | |
|---|---|---|---|---|---|---|
| | | | | ng/ml | % | p-value |
| fem.T2DM | 148,6 +/- 39,2 | 162,3 +/- 46,6 | 147,2 +/- 41,8 | 13,7 | 9,2 | =0,005 |
| maleT2DM | 107,7 +/- 17,5 | 118,1 +/- 16,7 | 109,4 +/- 19,9 | 10,4 | 9,7 | =0,002 |
| fem. control | 88,3 +/- 15,3 | 112,1 +/- 26,1 | 91,6 +/- 20,6 | 22,7 | 25,5 | <0,001 |
| male control | 93,4 +/- 15,0 | 114,8 +/- 20,7 | 96,2 +/- 11,8 | 21,4 | 22,9 | <0,001 |

**Image/graph II:**




**Conclusion:**

1. Graded physical exercise is associated with a significant increase in Endo levels in all groups and both sexes.
2. T2DM is associated with higher Endo levels at rest as well as after graded bicycle stress test. However, stress-related Endo release has been shown to be distinctly reduced compared to healthy controls.
3. Female diabetics however, show the highest Endo levels at any times of measurement.
4. Stress-related endostatin release could therefore represent a protective mechanism of physical activity preventing from inflammation and subsequent atherosclerosis.

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P830

## Variability on fibrinogen beta chain gene modifies the coagulation process independently of fibrinogen levels in patients with advanced atherosclerosis

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**Introduction:** Studies have shown that fibrinogen levels are strongly associated with coronary artery disease (CAD), while gene polymorphisms are implicated in its' regulation and the risk of CAD. **Objectives:** In the present study we examined whether a specific genetic polymorphism on the beta chain of fibrinogen could affect atherogenesis independently of fibrinogen. **Methods:** We genotyped 412 patients with CAD and 272 healthy individuals (controls) evaluated by coronary angiography or exercise test. The G455A polymorphism was estimated by polymerase chain reaction (PCR) and the use of the HaeIII restriction enzyme. Serum levels of D-dimers ($\mu$g/l), factor (f) V (%), factor (f) X (%) were measured by standard coagulometry techniques. **Results:** The genotype distribution in CAD patients was GG: 50.7%, GA: 41.5%, AA: 7.8% and GG: 54.5%, GA: 37.8%, AA: 7.7% in controls. We have shown that CAD patients had significantly higher levels of fV (119.5$\pm$26.2 vs 113.0$\pm$23.7, $p<0.05$), fX (109.8$\pm$23.8 vs 100.3$\pm$26.4, $p<0.001$) and D-dimers (467.0$\pm$289.7 vs 341.8$\pm$191.2, $p<0.001$) compared to controls. However, we have found no significant difference in the studied parameters across the genotypes in the control group (p=NS for all). On the contrary, the G455A polymorphism affected significantly D-dimers, fX and fV levels in CAD patients. More specifically, the AA homozygosity was associated with significant increased levels of D-dimers (669.3$\pm$443.8 vs 532.7$\pm$504.2, $p<0.05$), fV (132.9$\pm$28.5 vs 118.4$\pm$24.8, $p<0.05$), while it increased (not significantly) fX (109.0$\pm$21.1 vs 99.8$\pm$27.1, p=NS) compared to the carriers of the G allele. **Conclusion:** Coagulation process is increased in patients with coronary artery disease. Importantly, we have shown that a single nucleotide polymorphism on beta chain fibrinogen gene regulates D-dimers and factor V levels in patients with advanced atherosclerosis. Our findings indicate that the G455A polymorphism may affect further coagulation, independently of fibrinogen.

P831

## Apo lipoprotein A1 Gene polymorphisms predict cardio-metabolic risk in South Asian immigrants

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**Introduction:** Coronary artery disease **(CAD)** is a leading cause of death globally with increasing burden in South Asians in the US. Specific genetic variants that influence CAD have not been fully assessed in South Asian Immigrants. **Objectives:** The goal is to identify Apo lipoprotein A1 (*APOA1)* gene polymorphisms and their association with CAD risk factors, metabolic syndrome and dysfunctional HDL (Dys-HDL). **Methods:** Acommunity-based study on South Asians aged 35–65 years without CAD was conducted. *APOA1* gene sequencing was performed and genotypes compared with cardiovascular findings. **Results:** The prevalence of metabolic syndrome and dysfunctional-HDL was 29.7% and 26%, respectively. Six novel *APOA1* gene single nucleotide peptides (**SNPs**) were analyzed. Three of the six SNPs (G2, G3, and G5) were found to be associated with metabolic syndrome; G2 (T655C) (p= 0.044), G3 (T756C) (p=0.037) and G5 (T1001C) (p= 0.037). *APOA1* gene SNP G1 (T319C)was highly correlated with low HDL levels (p=0.001). In our study, both associations of *APOA1* SNPs with metabolic syndrome and low HDL remained after age-adjustment. **Conclusion:** Discovery of novel gene polymorphisms will help to understand further the causes of excess CAD risk in South Asians so that preventative strategies targeted to high-risk group can be developed.

P833

## ABCB1 Gene: a potential candidate for the efficacy of atorvastatin lowering lipids in chinese patients with high-risk of cardiovascular disease

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**Introduction:** Low-density lipoprotein cholesterol (LDL-C) reduction response to statin has great interindividual variability, however the reasons remain unclear. **Objectives:** Our study was aimed to assess the ATP-binding cassette, subfamily B, member1 (ABCB1) genetic variations and its potential influence on atorvastatin efficacy in Chinese patients with high-risk of cardiovascular disease (CVD). **Methods:** We recruited 294 patients aged 20–70 years under the standards of statin administration based on the Chinese Adult Dyslipidemia Control Guidelines in 2007. All patients were assigned to atorvastatin treatment at a dosage of 20 mg daily for 4 weeks. Fasting blood samples were collected before and after treatment for circulating lipid profiles. A reduction of 40% in LDL-C was defined as LDL-C response. Total 27 polymorphisms in ABCB1 gene were genotyped by the Illumina gene microarray method. The effect of polymorphisms on the LDL-C response was tested in various models of inheritance. **Results:** Among 27 polymorphisms in ABCB1 gene, rs2235013 G>A, rs1128503 T>C, rs10276036 G>A, were individually and significantly associated with the percentage reduction in LDL-C before and after adjustment for age, sex, body mass index and baseline LDL-C. Moreover, the strength of association between rs1128053 polymorphism with LDL-C reduction preserved even after adjustment for other CVD risk factors. Under the recessive model, carriers of rs1128053 CC genotype had 60% lower LDL-C response (odds ratio = 0.40; 95% confidence interval = 0.17–0.95; P = 0.037) with respect to those with the rs1128053 T allele, and this association remained significant after multivariate adjustment. Furthermore, multivariate regression analysis showed that rs1128503 explained 11% of the variance in percentage change of LDL-C in response to atorvastatin. **Conclusion:** Our results collectively lend some credence to the position that ABCB1 gene might be a potential candidate for the efficacy of atorvastatin lowering lipids in Chinese patients with high CVD risk, which provides an anchoring point for better understanding the genetic profiles of atorvastatin efficacy, and establishes the background data for further investigation on the interaction of ABCB1 gene and environmental factors in Chinese.

P834

## Polydatin reduced blood lipid level and inhibited the mRNA expression of NF-$\kappa$B and MMP-9 in aorta of apolipoprotein E gene knocked-out mice

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**Introduction:** Polygonum cuspidatum is a traditional Chinese herb that has the effect of eliminating dampness and relieving jaundice, clearing heat and detoxicating, and promoting blood circulation and removing blood stasis, and so on. As one of the main effective constituent active ingredients of polygonum cuspidatum, polydatin has many cardiovascular pharmacologic activities. **Objectives:** To study the effect of polydatin on blood lipid level, mRNA expression of NF-$\kappa$B and MMP-9 in aorta of apolipoprotein E gene knocked-out [ApoE(-/-)] mice. **Methods:** 36 six-week old ApoE(-/-) mice were fed with hyperlipidemic diet for 19 weeks, and then assigned randomly into model group (administrated with saline, 0.4ml/d), polydatin group(administrated with polydatin, 25mg/kg.d), Lovastatin group (administrated with Lovastatin, 3.3mg/kg.d). After 17 weeks of intervention, the blood serum was separated to assay the level of blood TC, TG, LDL-C and HDL-C; and then aortas were fixed with 2.5% Glutaraldehyde, to observe the mRNA expression of NF-$\kappa$B and MMP-9 in aorta with hybridization in situ. **Results:** Compared with model group, blood TC, TG, HDL-C and LDL-C in both treatment groups reduced significantly(*P*0.05 or *P*0.01), and there was no significant difference between them. It manifested with hybridization in situ, mRNA expression rates of NF-$\kappa$B and MMP-9 in polydatin group and Lovastatin group were lower than that of model group, *P*0.01. Observation with optical microscope showed, in model group there were excessive positive cells and the pigmentation of brown granules was deep; in polydatin group and Lovastatin group, positive cells could also be seen but much fewer than that of model group and the pigmentation of brown granules was even. **Conclusion:** Polydatin has the exact effects of reducing blood lipid level, inhibiting mRNA expression of NF-$\kappa$B and MMP-9 in aorta of ApoE(-/-) mice, and this might be one of its mechanisms in anti-atherosclerosis and promotinging plaque stability.

P835

## Rosuvastatin attenuated myocardial dysfunction in experimental model of acute myocardial infarction

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**Introduction:** Dyslipidemia is related to the progression of atherosclerosis. Although treatment of dyslipidemia is beneficial in decreasing the number of coronary events its effect on infarct size is still to be assessed. **Objectives:** Determine the role of rosuvastatin on myocardial necrosis in an experimental model of acute myocardial infarction (AMI). **Methods:** 54 rats underwent a surgical procedure with definitive occlusion of left anterior descending (LAD) coronary artery to cause AMI and were divided in 6 groups: G1-normocholesterolemic diet; G2-normocholesterolemic diet and rosuvastatin (1 mg/kg/day) 30 days after AMI; G3-normocholesterolemic diet and rosuvastatin (1 mg/kg/day) 30 days before after AMI; G4-hypercholesterolemic diet; G5-hypercholesterolemic diet and rosuvastatin (1 mg/kg/day) 30 days after AMI; G6-hypercholesterolemic diet and rosuvastatin (1 mg/kg/day) 30 days before after AMI. Echocardiography was performed to determine left ventricular function and % of infarct area was determined by histology. **Results:** Fractional shortening was normal at baseline and decreased significantly after AMI ($p<0.05$ in all groups). After AMI, fractional shortening was lower in groups 4 and 5 than other groups. No significant difference was observed in fractional shortening between group 6 and groups with normocholesterolemic diet. Percentage of infarct area was significantly higher in group 4 than in group 3. No significant differences were observed in infarct area among other groups. **Conclusion:** Hypercholesterolemic diet resulted in decreasing of cardiac function after AMI and this was attenuated with rosuvastatin when started before AMI.

P836

## Inverse relationship between clopidogrel serum levels and endothelial and platelet microparticles in subjects with coronary heart disease

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**Introduction:** Increased number of endothelial and platelet microparticles have been related to cardiovascular risk factors and coronary heart disease. Little is known regarding the early effects of statins and clopidogrel, drugs commonly prescribed for these patients. **Objectives:**

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Our study aimed at evaluating the effects of atorvastatin and clopidogrel, alone or combined on endothelial and platelet microparticles, and endothelial progenitor cells. **Methods:** A prospective open-label study enrolled subjects with stable coronary disease (n=26). Atorvastatin 80 mg was given daily for 3-wk (visits 1–3), and clopidogrel 75 mg daily for 3-wk (visits 2–4). Counts of endothelial progenitor cells (CD34+/CD133+/KDR+, %), endothelial microparticles (CD51+) and platelet microparticles (CD42+/CD31+) were assayed by flow cytometry. Pharmacokinetic parameters were estimated over 24h on each visit by HPLC and mass spectrometry. Correlations were tested by Spearman test. **Results:** For platelet microparticles, we found negative correlation with clopidogrel CMax on visit 3 (rho=-0.57, p=0.006), and visit 4 (rho=-0.54, p=0.01), as well as for the clopidogrel AUC on visit 2 (rho=-0.43, p=0.049), visit 3 (rho=-0.44, p=0.04), and visit 4 (rho=-0.57, p=0.005). For endothelial microparticles, a negative correlation with clopidogrel AUC was found on visit 2 (rho=-0.43, p=0.04). In addition, clopidogrel CMax was correlated with endothelial progenitor cell (CD133+/KDR+) on visit 4 (rho=0.48, p=0.02). No correlations for microparticles or endothelial progenitor cells were found with atorvastatin. **Conclusion:** The balance between microparticles release and endothelial progenitor cells mobilization seems importantly affected by the clopidogrel serum levels, suggesting a new protective mechanism on coronary heart disease.

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**P837**

## Association between high-sensitivity c-reactive protein levels and the progression of carotid plaque over 5 years

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**Introduction:** Many studies suggest inflammation plays an important role in the process of atherosclerosis. High-sensitivity C-reactive protein (hsCRP) has been recommended by American Heart Association and Centers for Disease Control and Prevention in US as the best marker of inflammation in the clinical settings. Accumulated evidence has indicated that hsCRP is associated with the occurrence of cardiovascular disease event. However, the association between hsCRP and subclinical atherosclerosis was still limited and controversial. **Objectives:** The purpose of the present study was to explore the relationship between hsCRP and subclinical atherosclerosis among apparently healthy population. **Methods:** Participants were from the cohort of Peking University residential community in the Chinese Multi-provincial Cohort Study (CMCS). Two surveys on cardiovascular risk factors and the measurements of hsCRP and carotid B-mode ultrasound were carried out in 2002 and 2007, respectively. Individuals with cardiovascular disease, acute infections and potential infections (hsCRP>10 mg/L) were excluded. A total of 864 subjects with complete information in both baseline and re-examination were included in the analysis. Serum hsCRP was measured using a particle-enhanced immunoturbidimetric method (DiaSys, Holzheim, Germany). **Results:** The age-standardized progression rate of carotid plaque was 42.3%, and the rate was higher in males than females (48.2% versus 39.2%). The progression rate of carotid plaque elevated according to the increase of hsCRP levels both in males and females. After adjustment for age, hypertension, diabetes, obesity, low-density lipoprotein cholesterol, high-density lipoprotein cholesterol, triglycerides and smoking, people with hsCRP≥1 mg/L had a 1.70 times (95% confidence interval: 1.11–2.61) higher risk of having progression of carotid plaque in men when compared to those with hsCRP1 mg/L. However, the relationship between hsCRP and the progression of carotid atherosclerosis was not present in multivariate analysis in female. **Conclusion:** The present study showed that baseline hsCRP was a useful predictor of the progression of carotid plaque in males. The results indicated that hsCRP played an important part in the process of atherosclerosis and had potential values in the screening and intervention of high-risk individuals.

**P839**

## Relaxation of arterial graft induced by nicorandil

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**Introduction:** Spasm of arterial and venous graft conduits is a serious problem that may occur during harvesting or after coronary artery bypass surgery. Spasm of the human internal mammary artery (HIMA) occurs occasionally, but can cause serious ischemic problems. The exact mechanism of graft spasm is not yet fully known. Although the use of different pharmacological agents to prevent and treat spasm has been described, there is currently no clear agreement as to the optimal agent. **Objectives:** The aim of this study was to investigate the effects of nicorandil, $K^+$ channel opener, on the isolated human internal mammary artery (HIMA) and to define the contribution of different $K^+$ channel subtypes in nicorandil action on this blood vessel. **Methods:** The HIMA segments were collected from male patients suffering from coronary artery disease who were undergoing coronary artery bypass surgery and studied in organ bath. HIMA rings were pre-contracted with phenylephrine (10 $\mu$M). Endothelium was removed mechanically. **Results:** Our results show that nicorandil (0.001 $\mu$M–300 $\mu$M) induced a concentration-dependent relaxation of HIMA rings pre-contracted by phenylephrine. Glibenclamide (10 $\mu$M), a selective $K_{ATP}$ channels inhibitor, almost completely antagonized the nicorandil-induced relaxation of HIMA. Iberiotoxin (100 nM), a most selective blocker of large-conductance $K_{Ca}$ ($BK_{Ca}$) channels, partly antagonized relaxation of HIMA induced by nicorandil. In contrast, a non-selective blocker of voltage-gated $K^+$ ($K_V$) channels, 4-aminopyridine (4 AP, 0.5 mM), as well as margatoxin (10 nM), a potent inhibitor of $K_V1.3$ channels, did not abolish the nicorandil-induced relaxation of HIMA. **Conclusion:** Our results showed that nicorandil induced strong endothelium-independent relaxation of HIMA. It seems that $K_{ATP}$and $BK_{Ca}$ channels located in the smooth muscle of HIMA mediated relaxation induced by nicorandil.

**P840**

## Euterpe oleracea (açai) modifies sterol metabolism and attenuates experimentally-induced atherosclerosis

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**Introduction:** Euterpe oleracea (açai) is a fruit from the Amazon region, largely consumed in Brazil and exported to many countries, whose chemical composition may be beneficial for individuals with atherosclerosis. Euterpe oleracea is rich in anthocyanic compounds and several polyphenols; the oil from Euterpe oleracea is composed of monounsaturated fatty acids (60%), 13% polyunsaturated, fibers, vitamin E. There are reports of lipid-lowering effets in hypercholesterolemic rats. However, properties on atherosclerosis are poorly understood. **Objectives:** We hypothesized that consumption of Euterpe oleracea would reduce atherosclerosis development by a decrease in cholesterol absorption and synthesis. **Methods:** Male New Zealand rabbits were fed a cholesterol-enriched diet (0.5%) for 12 weeks, when they were randomized to receive Euterpe oleracea extract or water plus a 0.05% cholesterol-enriched diet for additional 12 weeks. Plasma phytosterols and desmosterol were determined by ultra performance liquid chromatography and mass spectrometry. Atherosclerotic lesions were estimated by computerized planimetry. I/M ratios and plaque composition were also assessed. **Results:** At sacrifice, animals treated with Euterpe oleracea had lower levels of total cholesterol (p=0.03) and non-HDL-cholesterol (p=0.03) as compared to controls. These animals had smaller atherosclerotic plaque area in their aortas (p=0.001) and a smaller intima/media ratio (p=0.002) in comparison with controls. At the end of the study, campesterol, $\beta$-sitosterol, and desmosterol plasma levels did not differ between groups. However, animals treated with Euterpe oleracea showed lower values for the desmosterol/campesterol (p=0.026) and desmosterol/$\beta$- sitosterol (p=0.006) ratios as compared to controls. **Conclusion:** Consumption of Euterpe oleracea extract markedly improved the lipid profile and attenuated atherosclerosis. These effects were related in part to a better balance in the synthesis and absorption of sterols.

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**P841**

## Antioxidation effect of simvastatin in rabbit hippocampus: role of superoxide dismutase, glutathione peroxidase, malondialdehyde and haem oxygenase-1

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**Introduction:** The hippocampus is a vulnerable and plastic brain structure that is damaged by a variety of stimuli, e.g.Hypercholesterolemia contributesto coronary artery disease progression but little is known about its effect on hippocampus. **Objectives:** The present study was designed to elucidate the role of superoxide dismutase(SOD), glutathione peroxidase(GSH-Px), Malondialdehyde (MDA) and haem oxygenase-1(HO-1) in the antioxidation effect of Simvastatin. **Methods:** The study was carried out on adult male Japanese white (JW) rabbits weighing approximately 2.0 kg. The animals were randomized into 3 groups of eight animals each: one control group and other two groups which were maintained on high-cholesterol diet (HCD) for 6 month. After 2 month on this diet, the animals were devided into two groups:non-treated group and simvastatin group; The animals were euthanized with an overdose of sodium pentobarbital.The hippocampus were excised, placed in ice-cold sterile saline, and cleaned of connective tissue. Blood was taken through cardiac puncture and plasma was used for biochemical assay of lipid peroxides. Levels of SOD,GSH-Px and MDA were measured by use of Enzyme-linked immunosorbent assay (ELISA) kits. HO-1mRNA in hippocampus were analysed by using Real Time Quantitative PCR methods and expression of HO-1 protein, plasma malondialdehyde (MDA), superoxide dismutase(SOD) and glutathione peroxidase (GSH-Px) were also measured. **Results:** Hypercholesterolaemia decreased SOD(6.43±1.29vs.10.10±1.08$\mu$g/ml control)and GSH-Px(36.95±5.53vs.48.85±8.59 U/L control group)and increased cytotoxic MDA (16.69±1.42vs.9.17±2.44 ng/ml control group) in hippocampus,and it has same trend in plasmaSOD,GSH-Px and MDA.HO-1mRNA expression of non-treated group decreased

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respectively(about4.9-foldvs.control group), but increased (about 5.5-fold vs.non-treated group)after treatment with Simvastatin.SOD and GSH-Px were as well as increased significantly than the non-treated group($P<0.01$ or$P<0.05$) after treatment with Simvastatin. Simvastatin partially restored the HO-1, SOD and GSH-Px,decreased MDA levels. **Conclusion:** Atherosclerosis induced an oxidative damage in hippocampus. Simvastatin showed antioxidation effects mediated by HO-1, restoring the SOD and GSH-Px levels and reducing cytotoxic MDA levels.

**P842**

## Subclinical atherosclerosis is interrelated with convectional cardiovascular risk factors and arthritis activity in psoriatic arthritis patients

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**Introduction:** High cardiovascular morbidity and mortality in patients with psoriatic arthritis (PsA) can't be explained only by convectional cardiovascular risk factors. The inflammation considered to be one of the factors that lead to atherosclerosis development. **Objectives:** The aim of the study was to reveal the relationships of intima-media thickness (IMT) of the carotids (CA) and inflammation in PsA patients. **Methods:** 65 patients with PsA and 20 ages - and sex–matched controls were involved. Mean age in cases was 41,62±10,2 (M±SD), in controls- 41,33±13,8 years. Convectional cardiovascular risk factors (hypertension, dyslipidaemia, BMI, smoking, individual cardiac history) in cases and controls were the same. The subclinical atherosclerosis was studied by using color-enhanced Doppler ultrasound of the carotids (CA). IMT was measured in the 3 points (bifurcation of the common CA and equidistant points (1 cm from the bifurcation) of common and internal CA). The mean IMT was calculated. PsA activity was evaluated by standard procedures. Erythrocyte sedimentation rate (ESR), fibrinogen were measured. The 18,5 % of the PsA patients had the systemic features of the disease (e.g. uveitis, aortitis et al.). **Results:** An atherosclerotic plaques of CA were revealed in 33% of cases and in 0% of controls ($p<0,001$). Increase of IMT was also found in PsA patients. Was shown the correlation between IMT of CA and age (Spearmen's r=0,56), IMT - BMI (r=0,37), IMT–blood pressure (r=0,3), IMT–ESR (r=0,34), IMT–fibrinogen (r=0,66), $p<0,01$ to al. IMT of right CA in patients with uveitis exceeded IMT patients without uveitis (0,6 [0,5;0,7] vs. 0,4 [0,4; 0,6] mm, Me [Q25; Q75], respectively). Mean IMT in patients with uveitis was 0, 68 [0,53; 0,85] mm, n =11, without uveitis–0,43 [0,4; 0,53] mm, n=54, p = 0,03.

Table 1

| | IMT, mm PsA patients, n = 65 | IMT, mm, Controls, n = 20 |
|---|---|---|
| Bifurcation of the left common carotid artery | 0,6 [0,5; 0,7]** | 0,4 [0,3; 0,55] |
| Internal left carotid artery# | 0,6 [0,5; 1,1]** | 0,55 [0,5; 0,7] |
| Left common carotid artery# | 0,6 [0,5; 0,7]*** | 0,5 [0,6; 0,9] |
| Mean IML | 0,62 [0,5; 0,9]* | 0,51 [0,5; 0,7] |

*p<0,05; ** p<0,01; ***p<0,001

**Conclusion:** The subclinical atherosclerosis of CA was found in PsA patients compared with healthy persons. IMT in PsA patients interrelated with convectional cardiovascular risk factors and with acute-phase reactants. We suppose that IMT's increase in PsA is not only the feature of subclinical atherosclerosis, but the evidence of cardiovascular system's involvement in the systemic inflammation.

**P843**

## Effect of extraction of polygonum cuspidatum and hawthorn on carotid artery atherosclerotic plaque and its stability

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**Introduction:** Abundant clinical and epidemiologic studies confirmed atherosclerosis and its unstable plaque had close correlation with emergency cerebrovascular diseases such as acut coronary syndrome, acut cerebral infarction, and so on. Intervention on atherosclerosis and its plaque stability with traditional Chinese herbs has become a hot spot currently. Polygonum cuspidatum and hawthorn are both traditional Chinese herbs. In TCM theory, Polygonum cuspidatum has the effect of detoxifying, and hawthorn has the effect of activating blood circulation to dissipate blood stasis. Pharmacological studies also showed that both Polygonum cuspidatum and hawthorn could regulate blood lipid in vitro. **Objectives:** To observe the effect of extraction of polygonum cuspidatum combined with hawthorn on carotid intima-media thickness (IMT), plaque integral, and plaque stability related serum indexes of patients with carotid atherosclersis. **Methods:** 62 cases of carotid artery atherosclerosis patients were assigned randomly to 2 groups: detoxifying and blood circulation activating treatment group(treatment group, 31 cases) and control group(31 cases). Patients in treatment group were treated with capsules of Extraction of polygonum cuspidatum and hawthorn, 1 pill *po*, bid; and patients in control group were treated with Lovastatin 20mg *po*, qd. The course of treatment was six months. To observe changes of IMT, plaque integral, and detect the level of plaque stability related serum indexes such as hs-CRP, MMP-9 and TIMP-1. **Results:** After 6 months of treatment, in control group one patient quit the trial because of mild liver dysfunction and one patient was rejected because of having not followed the therapeutic regimen. 31 cases in treatment group and 29 cases in control group were analyzed. The results showed that IMT and plaque integral of treatment group decreased significantly after the treatment □*P*□0.05□, but there was no change of IMT and plaque integral in control group, and the treatment group was superior to control group in decreasing plaque integral □*P*□0.05□. Serum Hs-CRP, MMP-1 and MMP-1/TIMP-1 decreased after the treatment □*P*□0.05□, □*P*□0.01□, and the treatment group was superior to control group in decreasing Hs-CRP □*P*□0.05□. **Conclusion:** Chinese herb extraction of polygonum cuspidatum and hawthorn has good effect of anti-atherosclerosis and promoting plaque stability. Its mechanism might be related with anti-inflammation and inhibiting degradation of extracellular matrix, and deserves further studies.

**P845**

## Device closure of ruptured sinus of valsalva: immediate results and short-term follow up

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**Introduction:** Rupture of aneurysm of the sinus of Valsalva (RSOV) is an uncommon condition with a wide spectrum of presentation and surgical correction has been the treatment of choice. However, lately isolated RSOVs have been successfully closed percutaneously using transcatheter devices. **Objectives:** To evaluate the immediate and short term outcome after transcatheter closure of RSOV at a single tertiary care center. **Methods:** Percutaneous transcatheter closure of ruptured sinus of valsalva aneurysm was attempted in three patients between January 2009 and December 2010. The ages were 26, 28 and 40 years. All were females. All were symptomatic in class II. Two-dimensional and colour Doppler echocardiography revealed rupture of an aneurysm of right coronary sinus into right ventricle in two and noncoronary sinus into right atrium in another and none had associated ventricular septal defect. The echo estimated size of the defect was 7–12 mm. In all patients the defect was crossed retrogradely from the aortic side and over an arterio-venous wire loop after balloon sizing, devices were successfully deployed by antegrade venous approach (Amplatzer duct occluder in all three). **Results:** The mean procedural time was 42.3 ± 5.4 minutes, while the fluoroscopic time was 24.5 ± 6.9 minutes. All had complete closure of the shunt on echocardiography and angiography. The average hospital stay was 2.9 ± 1.1 days. There were no major complications. The patients were followed up for a mean of 11.3 ± 4.1 months. At the time of the last follow up all the patients were in NYHA class I. Trivial to mild AR present in 2 patients was unchanged. **Conclusion:** Transcatheter closure of RSOV is feasible and effective, especially safe with the available Amplatzer devices. We conclude that in the short term, transcatheter closure of isolated RSOV is a viable alternative to surgical repair.

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