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High prevalence of novel gain-of-function mutations in KCNA5 in patients with early-onset lone atrial fibrillation

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Introduction: Atrial fibrillation (AF) is a common arrhythmia, affecting approximately 2.3 million Americans. The prevalence is increasing and the disease confers increased mortality. Several studies have shown that genetic variants contribute to the development of the disease. KCNA5 encodes the alpha subunit of the Kv1.5 channel, which is responsible for the ultrarapid outward potassium current IKr. This current is specific for the atrium and, together with two other subunits, has been identified as a loss-of-function mutation in KCNA5 in families with AF. We hypothesized that early-onset lone AF is associated with a high prevalence of mutations in KCNA5. Objectives: We aimed to resequence KCNA5 in patients with onset of lone AF before the age of forty, and to further characterize identified mutations functionally. Methods: The entire coding sequence of KCNA5 was bidirectionally sequenced using Sanger sequencing, in 213 patients with onset of lone AF before the age of 40 and in 200 healthy controls. Trafficking analyses were performed using immunostaining of transfected HEK293 cells. Subsequently, we performed electrophysiological characterization using whole-cell patch-clamp techniques, also on transfected HEK293 cells.

Results: We identified 6 variants in KCNA5 in 8 patients with early-onset lone AF. Three were novel non-synonymous mutations (E48G, A305T, D322H) and 3 previously reported rare variants (R61Q, A251T, R578K). The mutations are located at highly conserved residues in regions that are highly conserved through evolution, and they are likely to be disease-causing. Trafficking analyses with immunostaining showed that mutants behaved similarly to wild-type, and all were localized at both the ER and the cell membrane. All mutants resulted in gain-of-function for Kv1.5, with increased currents and a leftward shift in the activation curves. In addition, all mutants displayed a rightward shift in the inactivation curves, but this effect was only significant for D322H. Two of the patients carrying novel mutations had >1 first degree relative with AF. One of the probands carrying A305T has a son with early-onset AF, who carries an identical mutation. Remaining familial workup is in progress.

Image/graph:

Conclusion: We identified 3 novel gain-of-function mutations in KCNA5 in 4 patients with early-onset lone AF. We are the first to present gain-of-function mutations in this gene in patients with AF, indicating that a shortening of the atrial action potential, due to a gain-of-function effect on IKr, can contribute to the development of AF.

Effects of amiodarone on small conductance calcium-activated potassium channels in human atrial myocytes

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Introduction: In 2003, Xu et al first reported the presence of small conductance calcium-activated potassium channels (SK) in cardiac myocytes that plays a crucial role in cardiac repolarization. Interestingly, the SK channels is expressed more abundant in the atria compared with the ventricles. Previous studies showed that Amiodarone possesses the pharmacological effects of class I, II, III, and IV antiarrhythmic agents meting an atrial-selective drug effect. Consequently, we hypothesized that amiodarone might also be a potent target for SK channels.

Objectives: The aim of this study was to examine whether antiarrhythmic agent amiodarone affected SK channels in human atrial myocytes.

Methods: The preparations of right atrial appendage were obtained from 15 patients with sinus rate. Single myocytes were isolated by enzymatic dissociation with two-step method. Immunofluorescence was used to observe SK channel protein distribution. The ionic currents were recorded using whole-cell conventional patch clamp techniques to detect the changes of SK channel current density. Results: SK channels protein were evidenced in single isolated human atrial myocytes with Immunofluorescence method. Using the patch-clamp recording techniques, an inward rectifier K+ mix current could be obtained from human atrial myocytes. 

Conclusion: Three SNPs: rs2200733 (4q25), rs3807989 (7p31) and rs11047543 (12p12) were associated with early-onset lone AF before the age of 40 years. All three SNPs are positioned close to genes that in previous studies have been demonstrated to be important for cardiac morphology/development, thereby suggesting a link between these SNPs and structural heart disease. Our results however, indicate that variants in these three loci are associated with AF through mechanisms that do not involve major structural abnormalities in the heart.

Table 1

<table>
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<th>Nearest Gene</th>
<th>SNP id</th>
<th>Chr</th>
<th>Basepair location</th>
<th>MAP control (base)</th>
<th>OR (95% CI)</th>
<th>P-value</th>
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<td>1.70</td>
<td>95% CI: 1.18 – 2.44</td>
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</tbody>
</table>

Significantly levels (p < 0.05) and (p < 0.01).
High prevalence of mutations previously associated with LQTS syndrome identified in patients with lone atrial fibrillation before the age of 40 years

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Introduction: Atrial Fibrillation (AF) is the most common sustained arrhythmia. Lone AF is suspected primarily to be a channelopathy that involves many of the same genes as Long QT syndrome (LQTS). LQTS is a monogenic inherited cardiac repolarisation disorder characterised by a prolonged QT interval on the ECG. It has been estimated that the prevalence of LQTS is 1/2000–1/5000 and 13 different genes have been associated with the syndrome. Objectives: We tested the hypothesis that early-onset lone AF is associated with a high prevalence of mutations, which have previously been associated with LQTS. Methods: The coding regions and splice-sites of the nine long QT genes SCN5A, KCNQ1, KCNH2, KCNQ2, KCNE2, KCNO1, KCNJ2, CAV3, SCN4B and KCNQ5 were bidirectionally sequenced in 182 lone AF patients, with onset of the disease before the age of forty (Olesen et al 2011). These genes account for 97% of all previously described LQTS mutations. Results: In the 192 probands with early-onset lone AF, nine non-synonymous mutations previously associated with LQTS were found in ten probands: A46T and A302V in KCNQ1; P347Y in KCNH2; T1104M, D1816N, R1897W and F2004L in SCN5A; 15ST in KCNE2 and T78M in CAV3 (in two patients). In total 5% (10/192) of the patients had a mutation in one of the genes previously associated with LQTS. This is a high prevalence compared to the prevalence of LQT mutations in the general population (0.002–0.005%). The results suggest that many mutation-carrying early-onset lone AF patients, could also be predisposed to LQTS. Furthermore, this indicates that a decrease in the repolarisation reserve could also be involved in the development of AF. In line with this, Johnson et al. have documented early-onset lone AF in 1.7% of LQTS-patients. Only two of our patients had ECGs with prolonged QTc. The patients carrying mutations in KCNQ1 (A302V) and SCN5A (D1819N) had a QTc = 457ms and QTc = 467ms, respectively. The rest of the patients had a normal QTc. One possible explanation for this is that the patients have an intermittent phenotype of LQTS. Another possible explanation is that some of these variants have reduced penetrance. Conclusion: Ten out of 192 patients with early-onset lone AF had a mutation previously found in LQTS, indicating that there is considerable genetic overlap between these diseases. Furthermore, some lone AF patients may have undiagnosed LQTS. Treatment with Class Ic antiarrhythmic agents in such patients could potentially be harmful.

Left ventricular hyper-trabeculations in elite athletes: pathological feature of cardiomyopathy or physiological adaptation to exercise?

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Introduction: Regular athletic training results in physiological adaptation of cardiac architecture and function. Left ventricular hyper-trabeculation (LVHT) is not a recognised feature of ‘athlete’s heart’, but is a feature of certain cardiomyopathies, most notably left ventricular non-compaction. This is of particular relevance given that cardiomyopathy remains the commonest cause of exercise-related sudden cardiac death in athletes. Objectives: The aim of this study was to systematically evaluate the prevalence and significance of LVHT in an elite athlete population. Methods: Between 2006 and 2011, 692 athletes (mean age 22.4±4.3 years, 74.4% male, 64.4% Caucasian and 455 (65%) were professional sportsmen. Only two of our patients had ECGs with prominent QTc. The patients carrying mutations in KCNQ1 (A302V) and SCN5A (D1819N) had a QTc = 457ms and QTc = 467ms, respectively. The rest of the patients had a normal QTc. One possible explanation for this is that the patients have an intermittent phenotype of LQTS. Another possible explanation is that some of these variants have reduced penetrance. Conclusion: Ten out of 192 patients with early-onset lone AF had a mutation previously found in LQTS, indicating that there is considerable genetic overlap between these diseases. Furthermore, some lone AF patients may have undiagnosed LQTS. Treatment with Class Ic antiarrhythmic agents in such patients could potentially be harmful.

ECG phenotype in SCN5J5 mutation carriers with type-13 long QT Syndrome

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Introduction: KCNJ5 mutation Gly387Arg is linked to atrial fibrillation (AF), prolonged QT interval and sudden death in a large Chinese family. Objectives: This study aimed to elucidate ECG phenotype characteristics among gene mutation carriers. Methods: Resting 12-lead ECGs of both Gly387Arg carriers (n=9, age 14–64 yrs) and non-carriers (n=15, age 10–66 yrs) were studied. Heart rate (HR) & rhythm, PR interval, QRS duration & axis, QT interval, T and U wave morphology were compared between carriers and age- and sex-matched non-carriers. In patients with AF, the earliest ECG evidence was traced. To determine whether gene-specific ECG patterns were present, ECGs (n=24, randomly mixed with mutation carriers and non-carriers) were read blindly from genotype by an experienced LQTS ECG investigator. Results: No significant differences were found between Gly387Arg carriers and non-carriers in HR, PR, QRS duration and axis. Three Gly387Arg carriers developed AF were all at age 60’s. Although there was a considerable overlap (Fig 1), QTc was significantly longer in Gly387Arg carriers (448±21 ms vs. 428±15 ms, p<0.05). Other than individuals with a history of hypertension (in both carriers and non-carriers), T wave morphology was normal among mutation carriers and there was no difference in terms of the U wave morphology between two groups. By QT, T and U wave morphology, 5/6 gene carriers could not be distinguished from non-carriers.

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E006

Novel copy number genetic variants in patients with Brugada syndrome but without SCN5A mutations

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Introduction: Brugada syndrome (BrS) is a genetic disease that is characterized by abnormal electrocardiogram findings and an increased risk of sudden cardiac death, especially in Asian young male. SCN5A gene mutation has been shown to be associated with it. However, only about 20–25% of BrS patients in the world have this mutation. Copy number variants may be one of the causes. Objectives: We conducted a genome-wide association study in BrS patients without SCN5A mutations. Methods: We enrolled 16 BrS patients without SCN5A mutation and 16 healthy controls, and used Illumina 1 million Omni1-Quad chip to conduct copy number variation (CNV) analysis. CNV was analyzed using Partek (version 6.4). Results: All BrS patients and healthy controls are male with mean age 45±9 vs. 69±7 year-old, respectively. Total 438 genes showing CNVs in at least 25% (416) of subjects were detected and the copy numbers of NALCN (Na leakage channel) in chromosomal 13 in BrS patients were significantly lower than that in the controls (Kruskal-wallis test: CN=0.77, P<0.0018). NALCN permeable to Na+ , K+ and Ca2+ is responsible for the background sodium leak conductance. The PCR test showed significant deletion of NALCN in BrS patients group than in the control group. Deletions of this genes may interfere the stability of the resting membranous action potential
or activation of sodium channel that cause life-threatening arrhythmias. Conclusion: We disclosed this novel deletion in NALCN gene in BrS patients without SCN5A mutation. This genetic structural variants deserve further functional assays.

Spectrum of mutations in twenty one Saudi families with long QT syndrome

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Introduction: Long QT syndrome (LQTS) is an inherited potentially fatal arrhythmogenic disorder that is characterized by prolonged corrected QT (QTc) interval. The syndrome can be inherited either as an autosomal dominant disorder known as Romano-Ward syndrome (RWS) or as an autosomal recessive disorder, associated with congenital deafness, known as Jervell and Lange-Nielsen syndrome (JLNS). To date, 13 genes have been implicated in LQTS. However, mutations in 5 genes (KCNN3, KCNH2, SCNSA, KCNE1, KCNE2) account for the majority of the cases. Objectives: Molecular characterization of LQTS in our population. Methods: 21 Saudi families with LQTS, 17 with RWS and 4 with JLNS were recruited through the Cardiovascular Genetics Program at King Faisal Specialist Hospital & Research Center. Direct sequencing of the entire coding regions of the commonly mutated genes (KCNN3, KCNH2, SCNSA, KCNE1, KCNE2) known to be implicated in LQTS was conducted. Results: Causative mutations were identified in 10 families (48%). Heterozygous KCNN3 mutations were detected in 5 families with RWS whereas homozygous KCNN1 mutations were detected in 5 other families. 4 with JLNS and 1 with RWS. None of the 21 families had mutations identified in the other 4 genes (KCNE1, SCNSA, KCNE2, KCNE2). Conclusion: Our work represents the largest cohort of Arab patients with LQTS. Our molecular data illustrates further the genetic heterogeneity of LQTS, a finding that has important therapeutic and preventive implications.

Characterization of early repolarization in patients at increased risk of sudden cardiac death

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Introduction: Early repolarization (ER) particularly in the inferior leads, is associated with idiopathic ventricular fibrillation, but the majority of subjects appear to have a benign prognosis. At present there are no risk stratifiers for asymptomatic ER. Objectives: We aimed to identify potentially high-risk subjects with ER but without a definitive cardiac diagnosis and examine response to ajmaline provocation and exercise. Methods: Patients at increased risk of arrhythmic events were identified and following exclusion of those with cardiac diagnoses, electrocardiographic data were obtained from 2 consecutive leads and stratified according to type, territory and J-point height. Results: The final cohort comprised 173 patients (mean age 37.7 ± 14.8 years, 56.1% male). Baseline ER was present in 20 patients (11.6%). (4) (a) During ajmaline provocation and exercise there were no new ER changes. ER with ST-segment elevation and LST consistently diminished. There were 5 patients with persistent ER during ajmaline and exercise, all male with notched/slurred ER in the inferior or inferolateral leads (see figures 1 and 2). Those with persistent ER during exercise were more likely to be symptomatic than those in whom ER changes diminished (p = 0.01). Subtle structural abnormalities were determined in 3/5 of these patients.

Image/graph 1:

The role of the sodium current complex in a non-referred nationwide cohort of sudden infant death syndrome

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Introduction: Sudden Infant Death Syndrome (SIDS) is the most common cause of death in infants between age one month and one year. The etiology is largely unknown, but a proportion of SIDS can stem from cardiac channelopathies like Long QT Syndrome and Brugada Syndrome. Objectives: Analyze the role of the sodium current in SIDS by investigating Nav1.5 and its interacting proteins on 66 unbiased non-referred SIDS cases retrieved from a nationwide neonatal screening biobank. Methods: DNA was obtained from dried blood spot samples from the Danish Neonatal Screening Biobank. In total, 66 verified SIDS cases from entire Denmark in the period 2000-2006 were selected for genetic analysis in the 7 major current genes involved in the Nav1.5 channel complex, SCN5A, SCN1-4B, GPD1L and CAV3. Exons and flanking intronic sequences were investigated by PCR, high resolution melting curve analysis and direct sequencing. Functional analysis using patch clamp technique was applied on novel SCN5A variants found in a non-referred population of rare variants in the sodium current genes equaling 11% of all SIDS cases, SCN5A harbored 5 rare variants (R458C, R535*, S1103Y and R1193Q and S1190L). CAV3 had rare variant (T78M), GPD1L rare variant (R220H) and SCN3B one rare variant (L10P). Interestingly, SCN5A R1193Q and GPD1L R220H was present in the same infant, depicting a possible combined effect on the sodium current. Four of the rare variants have previously been described in SIDS, Brugada or Long QT Syndrome cohorts (S1103Y and R1193Q and S1190L). CAV3 candidate (T78M), GPD1L rare variant (R220H) and SCN3B rare variant (L10P). Functional data on novel variants confirmed a likely pathogenic role. The sodium current plays a significant role in SIDS, and mutations in the channel complex appear to have a high prevalence in a non-referred nationwide cohort of SIDS cases.

The in hospital mortality of patient hospitalized with acute heart failure: Acute HEart failure database (AHEAD) Main

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1Internal Cardiology dept, University Hospital Brno, 2Internal Cardiology dept, University Hospital, Brno, 3Internal Cardiology dept, University Hospital, Prague, 4IBA, Masaryk University, Brno, Czech Republic

Introduction: The objectives of the Acute Heart Failure Database (AHEAD) registry are to assess patient characteristics, etiology, treatment and outcome of acute heart failure (AHF) in districts...
Profile of the acute decompensated heart failure in children and adolescents in a developing country

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Introduction: Heart failure (HF) is the major cause of hospitalization in our country. However, few studies have evaluated HF in children and adolescents. Objectives: This study tries to establish the profile of HF patients (PTS) in the age range 0 to 19 years hospitalized with acute decompensated HF, describe the clinical and sonographic characteristics, clinical management and estimating the re-hospitalizations and the survival curve.

Methods: 4,757 patients in the age range 0 to 19 years, admitted in five hospitals from 2008 to 2009, were prospectively screened, trying to identify those with cardiopathy diagnostic. 131 patients were finally enrolled in our study. 75% of these patients were admitted with cardiopathy diagnostic. The remaining 25% were already being treated for this disease. The PTS were followed up by phone after their hospital discharge for endpoints evaluation. Results: Seventy-five patients were admitted with HF, 62.7% males, 66.8% in the age range 0 to 6 years and 44% white. At the admission, 68.7% were in an advanced HF status and 75.7% were in the functional class IV (NYHA/ROSS) and 35.7% in class III. The length of stay in the hospital was 13.3 days on average, with a re-admission rate of 22.7%. The hospital mortality was 6.7% and the overall mortality 14.7% during the 19 months follow-up, with the survival curve showing that 89% of the patients were alive after 131 days observation and 86% after 416 days. The HF diagnostic increased 6.3 times the risk of death in the cardiopathy group. Cardiac murmur was detected on 78.7% of the PTS, hepatomegaly (62.7%) and pulmonary rales (18.4%) were frequent. The left ventricular ejection fraction (LVEF) was normal for 61.5% of these PTS. Furosemide was the most used medication (72%), with diuretics, ACE inhibitors and spironolactone appearing in less than 40% of the prescriptions. Dobutamine was prescribed for 30% of the PTS, prostaglandine for 10%, beta-blockers for 5.3%, sildenafil for 4% and indometicine for 1.3%. Conclusion: The majority of the PTS with HF had congenital cardiopathy with preserved LVEF and was admitted in the stages C or D and HF classes III or IV, cardiac murmur was the most frequent signal, functioning as a warning for requesting cardiology evaluation and early treatment largely different from those used for adults.

0017 Sonographic B-Line, NT-proBNP and pressure of end-tidal CO2 (petCO2) in diagnosis of acute heart failure in prehospital emergency setting

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Introduction: The aim of this study was to evaluate the diagnostic accuracy of bedside lung ultrasound (sonographic B-line), NT-proBNP and pressure of end-tidal CO2 (petCO2) in diagnosis of acute heart failure (HF) in patients with acute dyspnea in the emergency prehospital setting. Objectives: The differential diagnosis of acute dyspnea in prehospital setting is challenging. The problem is differentiation between COPD/asthma and HF in patients with respiratory distress. The application of bedside portable ultrasound and rapid portable biomarkers in prehospital setting could help in diagnostic decision. Methods: This prospective study with performed in Center for Emergency Medicine, Maribor, Slovenia, June 1st to June 30th, 2011. PTS with acute dyspnea were enrolled. PTS with acute dyspnea were compared: HF related acute dyspnea group (n=145) vs pulmonary-related acute dyspnea (asthma/Copd) group (n=112). All patients underwent lung ultrasound examinations, rapid NT-proBNP testing and petCO2. Results: The sonographic B-line has 100% sensitivity, 94% specificity, 100% NPV and 95% PPV for the diagnosis of HF. NT-proBNP cut-off from 1000 pg/ml has 91% sensitivity, 87% specificity, 86 NPV and 89 PPV. In comparing the four methods, we found significant difference between ultrasound sign and 1) NT-proBNP (p<0.005), 2) petCO2 (p<0.005) and (3) modified Boston criteria (p<0.05). The combination of sonographic B-line and NT-proBNP has 100% sensitivity, 100% specificity, 100%NPV and 100%PPV. With the use of ultrasound, we can exclude HF in patients with pulmonary-related dyspnea who have positive NT-proBNP (>1000 pg/ml) and history of HF. In the group of acute HF-dyspneic patients, subgroup of patients diagnosed previous COPD/asthma had significantly higher petCO2 (0.6±1.2 vs. 1.2 ± 5.9 ± 1.8 kPa; p<0.01). Conclusion: The sonographic B-line alone or in combination with NT-proBNP has high diagnostic accuracy in differentiating acute HF-related from COPD/asthma related causes of acute dyspnea in prehospital emergency setting. PetCO2 could help in differentiating of acute dyspnea in prehospital setting.

0018 Clinical correlations and prognostic value of abnormal liver function tests in acutely decompensated heart failure patients

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Introduction: Abnormal liver function tests (LFTs) are commonly found in patients with heart failure (HF). However, while it has long been recognized that abnormal LFTs accompany congestive, right-sided heart failure, whether left-sided heart failure may also lead to impairment of hepatic function due to a low-flow state is less characterized. Objectives: To...
investigate the relationship between LFTs, venous congestion, and decreased cardiac output in acutely decompensated heart failure (ADHF) patients, and their impact on long term survival.

Methods: We investigated LFTs and cardiac function in 253 ADHF patients (87.4% male, 12.6% female; mean 61.6±12.8 years old) by measuring serum concentrations of glutamic oxalacetic transaminase (SGOT), glutamic pyruvic transaminase (SGPT), and γ-glutamyl transpeptidase (γGT). Mean LVEF was 29.3±8.6%, mean RV systolic pressure was 48.3±14.0 mmHg, mean RV diastolic dimension was 32.8±7.2 mm. The etiology was ischemic (46.2%) or dilated (53.8%). Results: By Spearman's correlation γGT (r = 0.263, p < 0.001) was negatively associated with LVEF, while RVSP and RV had positive relationship with γGT (r = 0.381, p < 0.001, and r = 0.412, p < 0.001, respectively). Similarly, SGOT was negatively associated with LVEF (r = -0.146, p = 0.039), and had positive relationship with RV (r = 0.254, p = 0.002). SGPT did not correlate with any of the analyzed variables. Patients were followed for an average of 24±17 months; 75% of all causes deaths were recorded, of which 41 cardiac deaths. By Cox regression analysis, after adjustment for covariates, γGT was a significant independent predictor of all-cause mortality (R 1.006 per mg/dl increase, 95% CI: 1.001-1.010, p = 0.01). Other independent predictors were also LVEF (HR per 1% increase: 0.892, 95% CI: 0.828-0.963, p = 0.003) and serum creatinine levels (HR: 2.471 per 1 mg/dl increase, 95% CI: 1.998-3.066, p < 0.001). Conclusion: In a population of ADHF subjects, abnormal LFT values indicate venous congestion as well as both venous congestion (as indexed by increased RV systolic pressure and RV dimensions) and reduced output (indicated by reduced LVEF), increased serum concentrations of γGT are also an independent predictor of all cause mortality in this population.

Effects of autologous stem cell transplantation on cell proliferation and apoptosis in chronic non-ischemic heart failure

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Introduction: Bone marrow mononuclear cells (BMCs) have been shown to improve function in animal models of chronic ischemic heart disease, but their clinical benefit in human non-ischemic cardiomyopathy is still unknown. Objectives: This study evaluates the hypothesis that epimyocardial application of BMCs in doxorubicin-induced cardiomyopathy induces cell proliferation and decrease apoptosis. Methods: Heart failure was induced in White New Zealand rabbits by injection of doxorubicin (3mg/kg, weekly for 6 weeks). They were divided into 4 groups: transplant group (BMC, n = 15), medium group (medium injection, n = 9), control group (healthy, n = 9) and diseased group (DOX, without therapy, n = 7). All cells were isolated by bone marrow aspiration and labeled with fluorescent dye Vybrant/DiI prior to transplantation. Cell proliferation (Ki67 and apoptosis (TUNEL-assay) were analyzed by immunohistochemical studies four weeks after therapy (Figure 1). Cell proliferation was calculated as cell nuclei/nuclei ratio in noted cell type. The proliferation was almost the same like the proliferation in the healthy group. Also the cell proliferation in the medium group was higher but it was less than in the transplanted group. In the untreated group proliferation was much less compared to the other groups. Also the cardiomyocytes proliferation was higher in the BMC group, but not significantly. There were no differences between right and left ventricle and septum. Apoptosis was minimal reduced in cell-treated group, but not significantly compared to the untreated group and the transplantations influence was negligible. Only in the healthy group there was significantly less necrosis and less cell death. There were almost no differences in apoptosis between the other groups. Conclusion: Autologous BMC transplantation induces cell proliferation and reduces cell apoptosis. This regulation could be a possible mechanism in myocardial regeneration.

Functional and cellular heterogeneity in a porcine model of paced induced heart failure

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Introduction: Large animal models of heart failure (HF) are of great importance in elucidating HF specific protein alterations with direct relevance for the human pathology. In previous studies, we performed experiments in the hearts of control and paced New Zealand rabbits. In the present study we investigated protein phosphorylation patterns in the pacing model of PIHF the P-TnI level is lower and more inhomogeneous in the vicinity of the pacing electrode than at the identical region of un-paced controls. This heterogeneous remodeling of the failing hearts affects p-cIbad of individual cardiomyocytes, and is relevant to the in vivo found regional contractile dysfunction.

Refined multiscale entropy analysis of heart rate variability forecasting lethal cardiac endpoints in heart failure patients

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Introduction: Although previous studies proposed a great variety of nonlinear algorithms to strictly arrhythmic risk in heart failure patients, the results are not so excellent. Furthermore, the common use of the various classes in different methods in different type and size card patients showed different results. Objectives: To determine the risk of mortality predicting by the Refined Multiscale Entropy (RMSE) analysis of heart rate variability (HRV) in heart failure patients with ejection fraction less than 0.35. Methods: Refined Multiscale Entropy (RMSE) is based on three steps: 1) progressive elimination of the fast time scales; 2) coarse graining procedure necessary to assess entropy rate; 3) calculation of the entropy rate. 188 patients (aged 65.7±1.2 years, mVs: 78/92 89.9%) were enrolled in this study. Patients were followed for 36 months, a 24-hour Holter registration were performed in every 2 weeks. The high risk group (HRG) contains 72 patients, who had either sudden cardiac death, or died to progressive heart failure, and 141 alive patients belong to the low risk group (LRG). A multivariate discriminant model was developed, where the change of the individual entropy/ scale of time was the independent variables (pacer Holter measurement for each patient), and the outputs were death (HRG) or alive (LRG). Results: All the RMSE curves exhibited a minimum at short time scale followed by an exponential increment with t. Risk groups showed significant differences over a large interval of scales (f = 4–15). These results indicate a reduction of the HRV complexity in patients with a high degree of disease. The stepwise statistical differentiation was obtained at the time scale 1–8 with a p-value of 0.0024 (LRG: SE = 1.312±0.015 and HRG: SE = 1.107±0.022; discriminant Wils’k lambda was 0.002, p<0.0001).The risk of death increased continuously with each quartile of DS of HRV with an adjusted relative risk of 4.2, A 3.5-fold increase in mortality in p2/a (the upper compared to the lower quartile of DS, HRV (r = 0.31–2.2, p<0.001) was observed. Conclusion: The lethal cardiac endpoints in heart failure patient with low ejection fraction could be predicted by this non-linear HRV method and would be used for the frequent telemedicine ECG monitoring of these patients to prevent cardiac death.

Role of the DNA replication protein, Ciz1, in the mammalian cardiomyocyte

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Introduction: Adult mammalian cardiomyocytes lose the ability to self renew as they withdraw from the cell cycle after birth. Consequently, the heart has limited capacity for repair following injury. Therefore developing therapeutic strategies to generate de novo cardiomyocytes is one key factor in the ongoing battle against heart failure. The interaction of Ciz1 with histone deacetylase (HDAC1) is a novel protein that has been shown to play a key role in mammalian DNA replication in vitro. Ciz1 localises to dynamic sub-nuclear foci (replication factories) where it interacts with other key cell cycle proteins including cyclins E and A. Expression of Ciz1 has been detected in all mammalian cells and is elevated in the presence of DNA damage. Furthermore Ciz1 is up-regulated during the cell cycle and differentiation and proliferation have been indicated. Furthermore Ciz1 and its splice variants have been linked to proliferative disorders, including cancer. However, Ciz1 is also expressed at low levels in terminally differentiated cells such as adult cardiomyocytes, suggesting the protein may have different other functions in addition to its role in DNA replication.

Objectives: This study aims to investigate whether Ciz1 is a suitable candidate molecule for stimulating cardiomyocyte regeneration to aid restoration of normal heart function through re-establishment of cardiomyocyte self-renewal capacity. Methods: The approach has been carried out through development of a conditional transgenic Ciz1 over-expression mouse model, in which Ciz1 is over-expressed specifically in cardiomyocytes. Results: Transgenic hearts are enlarged due to cardiomyocyte hyperplasia, with no evidence of cardiac dysfunction. Isolated cardiomyocytes exhibited altered nuclear dynamics with evidence for altered cell cycle regulation, which is currently under further investigation. Conclusion: The results suggest that Ciz1 may represent a suitable novel candidate for therapeutic application in cardiovascular disease.

A citrus flavonoid, auraptene, prevents left ventricular systolic functional deterioration following myocardial infarction in rats

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Introduction: Heart failure is associated with pathological growth of constituent cardiomyocytes. To achieve effective oral pharmacological therapy for heart failure, we screened
Introduction: TAVI procedure is currently considered the alternative option in elderly patients (pts) with AS deemed unsuitable for conventional surgery. However, its effect on clinical and echocardiographic improvement has not been systematically evaluated in octogenarians. Objectives: of the present study was to assess the clinical outcome in octogenarians following TAVI, with a special emphasis on symptoms and echocardiographic functional improvement at 12-month follow up. Methods: All octogenarians with a risk profile considered by the Heart Team to be unacceptable for conventional aortic surgery entered in this prospective registry. Pre- and post-procedural echocardiographic evaluation also included assessments of LV systolic function and sPAP. Results: One hundred and forty-nine octogenarians (mean age: 84.7 ± 3.4 years; male: 48.3%) underwent TAVI procedure for severe AS (144 pts, 96.6%); A0:0.76 ± 0.21 cm²; mean gradient: 55.2 ± 14.4 mmHg; peak gradient: 67.1 ± 21.5 mmHg in isolated grade 4 AS (pts 3.8%). All patients were symptomatic (NYHA class II-IV) at baseline. Advanced age and other risk factors made conventional surgery at high risk (ESLQ: 26.1 ± 16.9; TO score:2.9 ± 2.7). Pre-procedural echocardiographic evaluation included assessments of LV systolic function (24 pts, 16.1% = EF<40%) and sPAP (43.1 ± 11.5 mmHg); All patients underwent successful TAVI procedure using Edwards-SAPIEN valve (ESV) (63.8%) and Medtronic CoreValve (MCV) (36.2%) delivered by different approaches: transapical (33.9%), transfemoral (8%), transeptal (7%) and transaortic (0.7%). Mortality at 30 days, 6 months and 1 year were respectively 4% (16/414 pts), 12.9% (13/101 pts) and 18% (14/77 pts). Clinical and echocardiographic follow up was conducted at 12 months and attended the following: Acute procedural success rate was 99.5%. Device implantation resulted in a significant and sustained reduction of PPG (20.6 ± 6 mmHg one year, 18.7 ± 7 mmHg two years, 16.8 ± 6 mmHg three years, and 16.5 ± 5 mmHg four years after TAVI) and MCV (11.3 ± 3 mmHg one year, 9.2 ± 4 mmHg two years, 10.5 ± 3 mmHg three years, and 10.3 ± 4 mmHg four years after TAVI) as well as a significant and sustained increase of calculated AVA (1.4 ± 0.2 cm² one year, 1.5 ± 0.6 cm² two years, 1.6 ± 0.2 cm² three years, and 1.8 ± 0.2 cm² four years after TAVI). An interim life-table analysis after 162 patients revealed a cumulative 30-day, 1-year, 2-year, and 3-year survival rate of 93.2% (patients at risk = 162), 94.6% (patients at risk = 109), 74.3% (patients at risk = 50), and 70.4% (patients at risk = 36), respectively. Conclusion: Durability of hemodynamic results after TAVI seems to be encouraging. Cumulative survival after TAVI shows a clear benefit for patients with symptomatic severe AS, who would otherwise be left untreated due to their expected high surgical risk.

Optimized tissue engineering: magnetically guided recellularization of stented decellularized pericardium derived arterial valves

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Introduction: Application of progenitor cells for construction for three-dimensional tissue is an important issue in tissue engineering. Here we report on the development of a bioreactor for cell culture experiments, which allow the application of a novel magnetic device enhancing the concentration of the circulating cells in a certain part of the bioreactor used for the recellularization of inoculated pericardial tissue. Objectives: Stented pericardial arterial valves were subsequently decellularized by using SDS/DCA 0.5%. Human cord-blood-derived unrestricted somatic stem cells (USSCs) were labelled with ferromagnetic beads and cultured in circulating medium for up to 130 hours (n=8). Methods: A magnetic field (0.5 Tesla) was created around the mounted valve within the bioreactor for specific delivery of circulating cells to their desired targets. In the control group the magnetic field was absent. Morphological characterization of matrix and cells was assessed by immuno histochemical staining and electronic microscopy. The bioreactor enabled the retention of physiologic culture conditions with high pulsatile flow, aerobic cell metabolism oxygen tension (pO2 = 130 ±20 mmHg) and physiological pH values (7.4 ±0.5) during the whole experimental procedure. Results: Macroscopic and histological analysis showed a homogeneous growth of cell layer on the valves surfaces as well as in the decellularized matrix of the valve.
Zwolle Myocardial Infarction Study Group

Introduction:
Limited data are available concerning the real world outcome in all comers with an acute coronary syndrome (ACS). Guidelines indicate performing coronary angiography (CAG) in high risk patients and to aim for reperfusion in patients with ST elevation. However, also patients with non-ST elevation ACS might benefit from early CAG and reperfusion, especially when an occluded CX artery is involved. Objectives: We aimed to analyse the use of CAG and reperfusion therapy in all comers ACS population including both STEMI and non-STEMI patients.

Methods: Individual patient data of all patients with the diagnosis ACS between January 2006 and December 2009 were evaluated. An ACS was defined as symptoms suggestive of ischemia (chest pain, shortness of breath, syncope or palpitations) combined with ECG changes and/or a rise in troponin T. Reperfusion therapy was defined as the performance of CAG within 3 hours of admission. Baseline characteristics, treatment and outcome of all the patients and differences in the rate of CAG and reperfusion therapy between STEMI and non-STEMI patients were analysed.

Results: During the study period, 4909 patients presented with an ACS. A total of 3216 patients (66%) were diagnosed as having a STEMI and 1202 patients (34%) as a non-STEMI. During admission, CAG was performed in 4565 patients (92%) (STEMI 98%, non-STEMI: 85%, p < 0.001). The small group of patients who did not undergo angiography were old and had a high co-morbidity index. Reperfusion therapy was performed in 2609 patients (57%), (STEMI: 93%, non-STEMI: 21%, p < 0.001). Overall Mortality at one year was 9%. Mortality was very high in patients not undergoing CAG (42%), compared to 6% in patients undergoing CAG. Mortality was significantly higher in non-STEMI compared to STEMI patients (11% vs. 8%, p < 0.001).

Conclusion: In an all comer ACS population, angiography guided therapy was performed in 57% of patients, with a very high rate of reperfusion therapy in STEMI but also in a considerable percentage of non-STEMI patients. This approach was associated with good outcome, leaving a small group of patients with a poor prognosis associated with a very high age and many co-morbidities.

The utility rate of percutaneous coronary intervention in patients with ST elevation acute myocardial infarction in Beijing, China

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Introduction: Despite percutaneous coronary intervention (PCI) for the patients with ST elevation acute myocardial infarction (STEMI) has been recommended by guidelines, few studies assess the utility of PCI among STEMI patient in China. Objectives: To examine the current utility of PCI among hospitalised STEMI patients in the most economics advanced area of China. Methods: The study was based on the “Beijing Acute Myocardial Infarction (AMI) Surveillance Platform” data system, which contains the electronic records of all AMI cases admitted to tertiary hospitals or secondary hospitals in Beijing area during the year 2007 to 2009. The patients with STEMI aged 25 or over were included in this study. Results: Totally 32 936 patients (mean age 62.9 ± 13.2 yr, 32.3% female and 18.9% ± 7.5y) were recruited and 65.1% patients were admitted to tertiary hospitals. Totally 40.6% of STEMI patients received PCI during hospitalization in acute period. And 24.8% of STEMI patients received early PCI, and the tertiary hospitals had 2.5 times higher early PCI rate than that in secondary hospitals (31.3% vs. 12.8%, p < 0.001). Mean 16% STEMI patients received elective PCI among them, 61.7% received the elective PCI within seven days of onset of AMI. The mean elective PCI rate in tertiary hospitals was also higher than that in secondary hospitals (20.1% vs. 7.5%, p < 0.001). PCI with stents accounted 93.7% of total PCI operations. Among the patients received stents, 62.0% received drug-eluting stents. Hospitalized mortality was 12.7% for patients without PCI, while 1.8% for those who received PCI. Conclusion: The utility rate of PCI in STEMI patients is still low Beijing, the most economic advanced area of China, comparing with other countries. There is a huge gap on the quality of acute care for STEMI patients, especially in secondary hospitals in this area.

The long-term results of the organized interventional STEMI care in the central-Hungarian region

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Introduction: In the Central-Hungarian region the well-organized intervention attendance of the ST-segment elevation myocardial infarction has begun on the 1st of January, in 2003. The long-term results of the organized interventional STEMI care in the central-Hungarian region shows that our results are prominently good in the aspect of international relations as well. The accretion of the mortality is the highest in the first year and in the subsequent years it is approximate the mortality of a stable coronary disease. Our data support the successful operation of the system and furthermore draws attention of the importance of the attendance.
Acute coronary heart disease morbidity and mortality in Russian population (RESONANCE study)
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Introduction: Acute coronary heart disease (CHD) represents the most common cause of morbidity and mortality in the world. Relative epidemiologic data for Russia are sparse. Objectives: To investigate age-related differences in Acute Coronary Heart Diseases (CHD) prevalence and patients survivability in average Russian population. Methods: In study authors analysed all forms of Acute CHD as well as myocardial infarction and unstable angina and Sudden Coronary Death were actively revealed among 285 736 population of three Russian regions. Analysis was performed in age groups separately for males and females. The sources of data were the acts of civil status, autopsy reports, hospital medical histories, out-patient medical records and also information about prominent symptoms from district doctors and patient relatives. Results: Acute CHD prevalence amounted 402.2 and 192.20 per 100 000 in males and females respectively, mortality - 93.18 and 48.65 per 100 000, lethality - 23.17% and 25.31%. In males, age-related mortality was increasing from 14.6 per 100 000 in 30–39-year-old males to 128.43 per 100 000 in 50–59-year-old males with plateau in 60–69 years and decreasing since 70 years. Despite the peak of Acute CHD mortality (38.46 per 100 000) was also in 50–59-year-old males, there was the better survivability in this group (22.94% lethality vs 45.32% lethality for 30–39 years and 33.33% lethality for 60–79 years). In females, mortality was increasing from 11.07 per 100 000 in 40–49-year-old females to submaximal value (60.20 per 100 000) in 60–69-year-old females and to peak value (64.35 per 100 000) - in 70–79-year-old group. Despite the peak female mortality (19.45 per 100 000) was reported also in 70–79 years, the worse survivability was in 80–89 and 90–99-year-old females (43.61% and 66.67% lethality). Conclusion: Study results demonstrated high level of Acute CHD morbidity in all ages groups of Russian males and females. In males, despite the highest Acute CHD onset probability in 50–59 years, this age group demonstrated the better survivability versus as well as younger and senile male groups. In females, despite mortality peak in 70–79 years the worse survivability was in senile (>80 years) groups.

Characteristics, treatments and outcomes in young as compared with elderly acute coronary syndrome patients in India (CREATE registry)
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Introduction: Acute coronary syndromes (ACS) in India occur at a younger age compared to other countries. There are no published countrywide data comparing young with older ACS patients from India. Objectives: To compare the characteristics, treatments and outcomes of ACS in young with the elderly. Methods: A prospective registry from 89 centres and 50 cities in India. We recorded data in-hospital and at 30 days. We also did multivariate analysis to explain factors that affect outcomes. Results: We recruited 20,468 patients of whom age was recorded in 20,399. Of these patients 12,364 (60.6%) had STEMI and 8,035 (39.4%) had non-STEMI or unstable angina. Average age was 61.3 (95% CI 61.1–61.5) years. Among patients aged 45 years or more (45.0% vs 20.7%) (all p<0.001). The elderly however had more hypertension (43.1% vs. 24.5%), diabetes (35.5% vs. 19%), history of myocardial infarction (20.2% vs 10.5%), heart failure (2.1% vs 0.5%) and stroke (2.1% vs 0.5%) (all p<0.001). Older patients less frequently undertook medical therapy for myocardial infarction was better in men than women even after multiple adjustments for age, clinical indications or contraindications for specific drugs. Conclusion: In our study, using Sweden’s national cardiac quality register we found that the use of evidence based medical therapy for myocardial infarction was better in men than women even after multiple adjustments for age, clinical indications or contraindications for specific drugs. Future studies need to focus on why women with STEMI/LIBB is persistently undertreated.

Transfusion of blood products after cardiac surgery: where is the risk?
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Introduction: Patients undergoing cardiac surgery often require transfusions of both red blood cells, plasma and platelets. These components differ in both indications for use and immunological presentation. However, from statistical and observational stand-point there is a significant covariation between the components. Objectives: To explore the relation between transfusion of different blood components and long-term mortality. Methods: A retrospective single-center study was performed including 5261 coronary artery bypass grafting patients. Results: Patients receiving more than eight RBC transfusions, early death (7 days), and emergent cases were excluded. Patients were followed for 7.5 years and analysed with Cox proportional hazard survival analysis. A broad spectrum of potential risk-factors were included and a step-wise elimination was performed, while transfusion of red blood cells, plasma and platelets were forced to remain in the model. Results: In that model, transfusion of red blood cells was not associated with increased long-term mortality (HR=1.007, p=0.775), whereas transfusion of plasma was associated with decreased long-term survival (HR=0.999, p=0.001) and transfusion of platelets was associated with increased long-term survival (HR=1.08, p=0.011). All-cause ratios are per unit of blood product transfused. Conclusion: Including all types of blood products, we could not find any association between transfusion of red blood cells and long-term mortality. However, transfusion of plasma was associated with increased long-term mortality.

In-hospital case-fatality rate following coronary artery bypass grafting in men versus women
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Introduction: In spite of many reports investigating the influence of gender on the in-hospital case-fatality following coronary artery bypass graft surgery (CABG), it is still uncertain whether gender is an independent risk factor for operative mortality. Objectives: To evaluate whether women undergoing CABG have higher fatality during hospitalization than men. Methods: Data came from Beijing Hospital Discharge Information System, which covers all hospital admissions in Beijing, except those admitted in military hospitals. Patients with coronary heart disease (CHD), who were admitted in hospitals during Jan. 1, 2007, to Dec. 31, 2009 and underwent CABG during the hospitalization, were extracted. Results: A total of 5615 patients with CHD undergoing CABG were enrolled (4210 men and 1405 women). Women were older (66.8 vs 62.6 years, P<0.001) and more frequently had hypertension (72.9% vs 60.0%, P<0.001) and diabetes (43.7% vs 33.4%, P<0.001) compared to men. In the in-hospital case-fatality rate was higher for women than for men (3.6% vs 2.6%, P=0.037). However, the
in-hospital case-fatality rates were similar between men and women when data were further stratified by age. 1.4% and 1.6% for men and women, respectively, for age 25–64 years (P = 0.773), and 3.9% and 4.8% for men and women, respectively, for 65 years and older (P = 0.286). After adjustment for demographic characteristics and concomitant diseases by multivariable logistic regression, no significant difference was found in in-hospital case-fatality between women and men (OR = 1.32, 95% CI 0.92–1.98, P = 0.133). Conclusion: Our findings in an unselected population covering Beijing indicate that higher in-hospital case-fatality rate found in women after CABG may largely be explained by difference in age, rather than female gender per se. Thus, CABG should not be withheld in appropriate female candidates for fear of a higher in-hospital case-fatality.

Off-pump coronary artery bypass surgery: newer understanding

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Introduction: Increasing interest is being shown in beating heart surgery for the last one decade because of much beneficial effects on patients compared with CABG performed with cardiopulmonary bypass. Excellent results are shown in both good risk and high risk coronary artery disease with off-pump CABG. Still coarctation rate from off-pump to on pump is high due to inability to keep a fine balance between the hemodynamic stability during displacement of heart and comfortable access to anastomosis site. Objectives: Performing the surgery at low blood pressure levels (systolic pressure at 35–50 mmHg) by adequately reducing the afterload levels using vasodilator such as nitroglycerine and judiciously maintaining an optimal preload alleviates most of the problems encountered during OPCAB. Methods: We have performed 324 consecutive cases of OPCAB during the period between 2008–2011. Of these 282 patients were male and 42 patients were female between the age group of 36–86 years. The ejection fraction was between 20–60%. Conduits used were the left internal mammary artery and saphenous vein grafts. The number of grafts ranged from 1 to 6. Results: The conversion rate to on pump surgery was zero, use of intraaortic balloon pump was zero, no post operative mortality or major morbidity. There were no post operative neurological deficits or renal dysfunction in any of these patients. Conclusion: Performing Off-Pump CABG at low systemic arterial blood pressures by reducing the afterload with liberal nitroglycerine infusion and judiciously optimizing the pre load had multiple advantages. From the surgical aspect a soft heart which is easily amenable to manipulation for accessing the coronary arteries, no requirement for altering the position of the operation table, dilated coronary arteries for a more precise and accurate anastomosis and excellent post operative recovery.

Prior coronary artery stenting does not compromise coronary surgery

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Introduction: Although percutaneous coronary interventions (PCI) have undergone profound changes in techniques used as initial revascularization strategy and in patient selection, growing number of patients with previous PCI are being referred for coronary artery bypass grafting (CABG). Among surgeons, prior PCI is regarded as another risk factor which may compromise the outcome due to many reasons without the solid knowledge to substantiate this claim. Objectives: To determine the association between previous PCI and results of the following CABG in terms of 30 day mortality rate and major adverse cardiac events (MACE). Methods: A total of 791 consecutive patients that underwent first time isolated CABG were included in this prospective study. The patients were divided into 2 groups. 772 patients - CABG as primary revascularization procedure; 79 patients – previous PCI. T-test, chi-square test and univariate analysis were used to compare the groups. Results: The mean time between the last PCI and CABG was 12.77 months. Average number of stents per patient was 1.8 while the average number of percutaneously treated arteries was 1.32, 95% CI 1.04 to 1.047, p = 0.001 and 0.001 for CABG for which women had a higher rate (17.30% versus 14.66% - p = 0.001). Women were more likely to performed PTCA (60.05%) than men (49.95%) (p = 0.001). The mortality rate was 11.3% for men against 13.4% for women (p = 0.001), and 12.15 for PTCA and 15.55 for CABG (p = 0.001). In PTCA the mortality rate were slightly higher for women (12.37% versus 12.03% - p = 0.049), in contrast to CABG for which women had a higher rate (17.30% versus 14.66% - p = 0.001). A Cox proportional-hazards model, adjusted for age, gender, and procedure type showed a significant association between age (hazard ratio = 1.0665, 95% CI 1.0453 to 1.0477, p < 0.001) and CABG hazard ratio = 1.3821, 95% CI 1.3321 to 1.3927, p = 0.001) for poor survival. The global unadjusted survival time was 91.1% at 1 year of follow-up, decreasing progressively to 79.0% at 7.0 years, and for PTCA was 92.9% and 81.4%, in contrast to CABG that had poor survival, 69.0% and 73.4%, respectively (p = 0.001). Conclusion: Previous PCI has no influence in terms of mortality and morbidity on the outcome of subsequent surgical revascularization.

Two-patch technique for the closure of post-infarction ventricular septal defect

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Introduction: Despite improved surgical strategies, the postinfarction ventricular septal defect (VSD) remains therapeutically challenging. Objectives: Here, we describe 10 patients with postinfarction VSD treated by infarction exclusion operation using a two-patch technique. Methods: We have used a different two-patch technique in which both layers of the bovine pericardium were brought over the VSD and sutured to the septum with 4-0 prolene, the two layers functioning as a new septum for the patient. Our method also utilizes a different closure technique insofar as although the two layers of the bovine pericardium are joined and sutured together, they are also brought out of the ventriculotomy at each end; and because the left ventricle wall is friable, it is opened over ventriculotomy and sutured to the myocardium over the entire length with pledgeted sutures for extra hemostasis. The double-patch confers enough strength for the closure of VSD and pliability of tissue for suturing to the friable injured tissue of the septum as the bovine pericardium can be sutured with 4-0 prolene (each layer is opened over ventriculotomy for extra hemostasis). Results: Except one intraoperative death, other nine patients, were transferred to the ICU after surgery, were extubated after one to three days, and were discharged with successful results. They are good after 6–12 months follow-up. Conclusion: We believe that this technique is effective in postinfarction VSDs and maintains adequate hemostasis by excluding the infarction area.

PTCA versus CABG: long-term survival analysis in the real world of 261,569 patients in a developing country using probabilistic databases linkage

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Introduction: The clinical benefit of percutaneous transluminal coronary angioplasty (PTCA) as compared with coronary artery bypass grafting (CABG) for patients with coronary artery disease has not been established in a real world large cohort, especially in a developing country setting. Objectives: The purpose of this study was to evaluate the survival after coronary revascularization by PTCA or CABG. To determine the outcomes of these treatments in patients referred for, we conducted a seven year of 261,569 patients, comparing the two procedures in the real world in Brazil. Methods: We carried out a probabilistic linkage of 261,569 individual data file from all patients who underwent PTCA (152,943) or CABG (108,626) in Brazil, during the period of 2001–2007. This linkage was performed using administrative data from in-hospital admission Ministry of Health database with the Brazilian Mortality Information System of all population. In previous studies, the accuracy of probabilistic linkage for high complexity cardiac procedure was sensitivity 80.0% and specificity 100%. For univariate analysis, we employed chi square and Student’s test. For multivariate analysis, Cox proportional-hazards model was applied. Kaplan-Meier method was used to estimate survival. The significance was considered by p < 0.05. Results: Among all patients, 64.77% were male which were younger (63.8 years old compared to women) (65.43 years old) (p < 0.001). Women were more likely to be performed PTCA (60.05%) than men (57.61%) (p < 0.001). The mortality rate was 11.31% for men against 13.34% for women (p = 0.001, and 12.51 for PTCA and 15.55 for CABG (p = 0.001). In PTCA the mortality rate were slightly higher for women (12.5% versus 12.0% - p = 0.049), in contrast to CABG for which women had a higher rate (17.30% versus 14.66% - p = 0.001). A Cox proportional-hazards model, adjusted for age, gender, and procedure type showed a significant association between age (hazard ratio = 1.0665, 95% CI 1.0453 to 1.0477, p = 0.001) and CABG hazard ratio = 1.3821, 95% CI 1.3321 to 1.3927, p = 0.001) for poor survival. The global unadjusted survival time was 91.1% at 1 year of follow-up, decreasing progressively to 79.0% at 7.0 years, and for PTCA was 92.9% and 81.4%, in contrast to CABG that had poor survival, 69.0% and 73.4%, respectively (p = 0.001). Conclusion: Previous PCI has no influence in terms of mortality and morbidity on the outcome of subsequent surgical revascularization.
Conclusion: Overall, BES demonstrated the similar efficacy and safety compared with first generation DES as compared to first generation DES according to several clinical trials. Methods: A meta-analysis was performed on randomized controlled trials (RCT) comparing BES with SES or PES in patients with coronary artery disease undergoing percutaneous coronary intervention. The databases searched for RCT included PubMed, Embase, the Cochrane Central Register of Controlled Trials, and Web of Science. The same terms or relevant trials were also searched on the website including the U.S. National Institute of Health, escardio.org, PCORIonline.com, and TCTMD.com. Search terms included "biolimus," "eluting," "stent," and "randomized." The pooled odds ratios (OR) were calculated based on a fixed-effects model using Peto OR for rare events. However, if homogeneity across individual RCT was rejected by the Cochran’s Q test and the I² statistics (P < 0.10), a random-effects model was selected. Results: A total of 4 RCT were included in this meta-analysis, involving 2404 patients (1362 patients were randomized to BES and 1122 to first generation DES). Two RCT compared BES with SES, and the other 2 RCT compared BES with PES. At 9 months to 3 years, BES showed no difference in the proportion of target lesion revascularization compared with first generation DES (Figure) as well as death (OR: 0.84, 95% confidence interval (CI): 0.59–1.19, P = 0.53), myocardial infarction (OR: 0.99, 95% CI: 0.71–1.38, P = 0.94), or definite or probable stent thrombosis (ST) defined by the Academic Research Consortium (OR: 0.34, 95% CI: 0.02–5.43, P = 0.45). Similar findings were also observed between BES and SES. In comparison between BES and PES, however, BES demonstrated a significant decrease in definite or probable ST compared with PES (OR: 0.05, 95% CI: 0.01–0.42, P = 0.01).

Introduction: Biolimus A9-eluting stent (BES) is a novel second generation drug-eluting stent. Its efficacy and safety compared with first generation drug-eluting stents (DES), such as sirolimus-eluting stent (SES) and paclitaxel-eluting stent (PES), remain controversial. Objectives: The aim of this study was to evaluate the efficacy and safety of BES compared to first generation DES according to several clinical trials. Methods: A meta-analysis was performed on randomized controlled trials (RCT) comparing BES with SES or PES in patients with coronary artery disease undergoing percutaneous coronary intervention. The databases searched for RCT included PubMed, Embase, the Cochrane Central Register of Controlled Trials, and Web of Science. The same terms or relevant trials were also searched on the website including the U.S. National Institute of Health, escardio.org, PCORIonline.com, and TCTMD.com. Search terms included “biolimus,” “eluting,” “stent,” and “randomized.” The pooled odds ratios (OR) were calculated based on a fixed-effects model using Peto OR for rare events. However, if homogeneity across individual RCT was rejected by the Cochran’s Q test and the I² statistics (P < 0.10), a random-effects model was selected. Results: A total of 4 RCT were included in this meta-analysis, involving 2404 patients (1362 patients were randomized to BES and 1122 to first generation DES). Two RCT compared BES with SES, and the other 2 RCT compared BES with PES. At 9 months to 3 years, BES showed no difference in the proportion of target lesion revascularization compared with first generation DES (Figure) as well as death (OR: 0.84, 95% confidence interval (CI): 0.59–1.19, P = 0.53), myocardial infarction (OR: 0.99, 95% CI: 0.71–1.38, P = 0.94), or definite or probable stent thrombosis (ST) defined by the Academic Research Consortium (OR: 0.34, 95% CI: 0.02–5.43, P = 0.45). Similar findings were also observed between BES and SES. In comparison between BES and PES, however, BES demonstrated a significant decrease in definite or probable ST compared with PES (OR: 0.05, 95% CI: 0.01–0.42, P = 0.01).
Safety and efficacy of percutaneous coronary intervention for unprotected left main stem disease in a high volume non-surgical centre
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Introduction: Recent randomized trials suggest that both CABG and PCI are safe and effective treatments for unprotected left main coronary artery (ULMCA) stenoses in some patient cohorts. However, these data have been obtained in highly selected patient groups, where outcome and case-mix may differ from that of non-surgical units. Patients over 75 years are under-represented in these data sets. Objectives: The aim of this study was to analyse safety and efficacy of PCI for ULMCA in a high volume non-surgical centre with a large cohort of elderly patients. Methods: From June 2005 to May 2010, demographic data, procedural characteristics, all cause mortality, target lesion revascularisation and target vessel revascularisation data were collected for all cases of ULMCA PCI using our database. Results: 343 cases of ULMCA PCI were identified. Mean follow up was 2.3 ±1.1 years. 61% had angioplasty for 30.3 ±17.8 months. 85% of cases were performed as an emergency, 45.2% urgently and 46.6% electively. 48% of patients were <75 years and 28% >80 years. Technical success was 100%. Lesion location was distal in 74.6%, body 15.5% and ostium only in 17.5%. Of the distal ULMCA PCI, 73.5% had a single stent. Of the remaining cases, a crush technique was used in 71.5%. Final kissing balloon inflation was achieved in 84.6%. Intravascular ultrasound (IVUS) was used in all cases of 2 stent distal ULMCA PCI and in 57% of cases overall. Drug eluting stents (DES) were used in 95.6% of cases of 2 stent distal ULMCA PCI and in 62% cases overall. Overall survival was 88%. Excluding patients with shock, survival was 90%. In-hospital death was 1.7%, TVR was required in 7.9% and TVR 11.3%. Conclusion: This study demonstrates that ULMCA PCI in a non-surgical high-volume centre results in a high success rate and low mortality across all age groups. TVR was low despite a two stent strategy in a quarter of patients and aggressive follow up coronary angiography. ULMCA PCI is both safe and effective in this cohort of patients. PCI offers an important alternative to CAGB in the very elderly.

References:
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Efficacy of high-dose statins pretreatment on PCI-related inflammation and myocardial injury
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Introduction: Statins have been receiving increased attention in the role of the prevention of CHD. Recent years, studies have found acute pretreatment with statins can inhibit the PCI-related inflammation, protect the myocardia and improve the short-term prognosis. However, there was no research domestic about whether moderate-dose statins even short time could protect myocardia and anti-inflammation. Objectives: To explore the effect of atorvastatin in pretreatment on percutaneous coronary intervention (PCI)-related inflammation and myocardial injury. Methods: Eighty patients with coronary heart disease undergoing PCI were randomized into control group (n = 30), low-dose group (n =30) and high-dose group (n = 26). They were given 0, 20 and 80 mg atorvastatin tablet for 2 days before PCI, respectively. Control and low-dose group patients took 20 mg atorvastatin every night after PCI, while the high-dose group took 40mg per night. The neutrophil count, the levels of high sensitivity C reactive protein(hs-CRP), myeloperoxidase(MPO), enzyme, troponin T (cTnT), liver function, kidney function and anti-inflammatory cytokines (IFN-γ) were determined before PCI. The incidence of major adverse cardiac events(MACE) after successful PCI was also recorded. Results: The degree of MPO,CK-MB,TnT elevation in high-dose group was significantly less than that of control group (P < 0.05). The highest compliance rate of LDL-C postoperative also in the high-dose group (P < 0.05). The changes of hs-CRP level, neutocyte count, liver and kidney function were not significant before and after PCI in 3 groups (P > 0.05). Conclusion: Pretreatment with atorvastatin 80 mg for patients undergoing PCI for 48 hours can inhibit PCI-related inflammation and have a protective effect against myocardial injury. Safety did not differ between high-dose and low-dose atorvastatin.

The prognostic implications of TIMI risk scores in Middle Eastern patients with acute coronary syndrome. Results from the GLucometabolic Syndrome and Family Medicine, School of Medicine Jordan University of Science & Technology, Irbid, Jordan

Introduction: Middle Eastern patients with acute coronary syndrome (NSTEACS) and ST-elevation myocardial infarction (STEMI). Objectives: To study was undertaken to evaluate the impact of TIMI risk score on the prognosis of Middle Eastern patients with ACS. Methods: We prospectively followed up 656 patients with ACS for total mortality, and combined events of death, nonfatal MI or urgent coronary revascularization up to one year after admission. Results: Of the whole group, 472 (72%) had NSTEACS, and 184 (28%) had STEMI. Among NSTEACS patients; 31.0% had low risk score (total points 0–27), 43.5% had intermediate risk score (total points 3–8), and 25.5% had high risk score (total points 9–7). In-hospital mortality was not different in the respective risk score groups (1.4%, 0.5%, and 3.4%, p = 0.123). At 1 year; mortality was significantly higher in the high risk score group (12.8%) compared with the intermediate (4%) and low (1.4%) risk groups (p = 0.001). Among STEMI patients; 58.4% had low risk score (total points 0–3), 31.0% low intermediate risk score (total points 4–6), 8.0% high intermediate risk score (total points 7–9), and 2.4% high risk score (total points >10). In-hospital mortality rate was significantly higher in the two intermediate risk score groups (7.4%, 14.3%, respectively) and the high risk score group (50%) compared with the low risk score group (1.0%, p = 0.001). The high risk and the two intermediate risk groups also had higher one-year mortality (75%, 28.6% and 16.7%, respectively) than the low risk group (3.9%; p < 0.001). Similarly, composite events occurred at a significantly higher rate in patients with high risk scores than intermediate or low risk scores among NSTEACS and STEMI patients. Conclusion: In Middle Eastern ACS patients; high TIMI risk scores were associated with higher risk of cardiovascular events. Such patients are candidates for early aggressive therapeutic strategies.
Ultrasound enhanced prehospital thrombolysis using microbubbles in patients with acute ST elevation myocardial infarction

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Methods: We used data from patients (pts) included in a limited size independent ACS registry (RECORD) (18 hospitals, 796 pts). Six independent admission predictors of inhospital death (Kilip class ≥II, ST-segment elevation ≥1mm, systolic blood pressure ≤100mm Hg, first hemoglobin (Hb) level <110gL/L, age ≥65 years, history of diabetes) were attributed equal weight (1 point) and combined in a prognostic scale. Troponin levels were not selected as independent predictors of death (possibly because of missing values). Receiver cut off level for high risk (≥2 points) was established by ROC analysis. Prognostic sensitivity and specificity for inhospital death were 78.5%, inhospital mortality was 1.4 and 16.9% (p<0.0001), 6 months mortality 2.0 and 26.3% (p<0.0001) among low and high risk patients, respectively. Areas under receiver operator characteristic curves for RECORD and GRACE scores for inhospital death were similar (0.89 and 0.96 respectively). For validation of prognostic accuracy of the RECORD score we used three retrospective independent groups. 1) Patients with non ST elevation ACS (n=203) hospitalized in Moscow city hospital 29 and included in a local observational study. In this group death and new myocardial infarction (MI) during 6 months after ACS onset took place in 14.6% low risk and 32.6% high risk pts (p<0.001). 2) Pts with ST-elevation ACS (n=147) included in EXTRACT-TIMI-25 and OASIS-6 trials in Moscow city hospital 29. In this group death and new MI within 6 months after ACS onset was 17% low risk and 21.6% high risk pts (p<0.001). 3) Pts with ST-ACS included in Russian hospitals in the EHS-Snapshot survey (n=135). In this group inhospital death took place in 3.3% low risk and 24.0% high risk pts (p<0.0001). Conclusion: The rapid prognostic scale for ACS which has been created on the basis of data from Russian registry RECORD contains well-known risk factors except markers of necrosis. Its specific feature is inclusion of admission Hb level. On limited databases the scale demonstrated high prognostic accuracy for both short- and medium-term outcomes. The RECORD and GRACE scores have shown similar prognostic value for inhospital death. The RECORD scale is suggested for wider probing in larger studies.

Prevalence and awareness rate of diabetes among treated hypertensive patients in China: a report from CONSIDER (China national Survey for determinants of Detection and treatment status of hypertensive patients with multiple cardiovascular risk factors)

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Introduction: Both of hypertension and diabetes mellitus are important risk factors for cardiovascular disease (CVD) and substantially raise CVD risk when they co-exist, which has also important impact on the assessment of global risk and establishment of treatment goal for those patients in clinical practice. However, there is little information on prevalence and awareness rate of diabetes among hypertensive patients in China, especially those under treatment of anti-hypertension drugs. Objectives: To assess the prevalence and awareness rate of diabetes among hypertensive patients under anti-hypertension drugs and the treatment and control rates of elevated blood glucose. Methods: A cross-sectional survey of a consecutive sample of hypertensive patients who visited outpatient departments during the year of 2009 was conducted among 42 hospitals in 22 provinces across China. Demographics, history of diabetes, status of other cardiovascular risk factors, co-morbidities, current medications, blood pressure (BP) and fasting blood glucose test and OGTT results were recorded for each recruited patient. Results: Total of 5296 pts were included, including 2605 (50%) men. The mean age was 58.8 ± 10.5 years. The prevalence of diabetes was 24%, among them, the awareness rate of diabetes was only 66.5%. The treatment rate of glucose lowering drugs was only 8.5% among all diabetes and 68.3% among those known diabetes patients. The patients that we achieved the goal of glucose control (FGP <7mmol/l and 2-h OGTT <11.1mmol/l) was only 31% for all diabetes and 54.7% among those treated diabetes. There was 9% diabetes patients received full treatment and 15.5% with multiple anti-glucose lowering agents. Overall, BP control rate (SBP/DBP <140/90 mmHg) was achieved in 44.9% of the hypertensive patients with diabetes. Conclusion: The hypertensive patients have higher prevalence but lower awareness rates of diabetes even they are under treatment in China. The treatment rate of glucose lowering and rate of target glucose level are very low among patients with diabetes. It is critical to address the importance of achieving glucose level and improve the quality of care among treated hypertension patients in China.

Differential effects on compliance and its associated factors among patients switched from free-combination to fixed-dose combination of antihypertensive agents

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Introduction: Real life evidences showing that fixed-dose combinations (FDC) of antihypertensive agents are associated with improved compliance than the corresponding free-combination therapies are invariably from parallel group comparisons. However, direct comparison of FDC with free-combination therapies with regard to compliance in the same hypertensive patients switched from free-combination to FDC is still lacking. Objectives: We aimed to assess 1) the impact of switching from antihypertensive free-drug combinations to FDCs on overall compliance and compliance in patient subgroups stratified by their compliance with free-drug combinations; and 2) demographic and clinical factors associated with compliance changes in hypertensive patients switched from free-drug combinations to FDCs to refine the strategic use of FDCs in the management of hypertension. Methods: This study was a retrospective cohort analysis using the Taiwan National Health Insurance database from January 2002 to December 2006. Patients included should fulfill 2 criteria: (1) use of angiotensin-converting enzyme (ACE) inhibitor or
Angiotensin receptor blocker (ARB) and a diuretic at least 12 months before and within the preceding 12 months of the index date, and (2) use of an FDC consisting of an ACE inhibitor or ARB plus a diuretic 12 months after the index date. Compliance was measured by medication possession ratio (MPR). Results: A total of 896 patients were included. As a whole, MPR increased significantly from 42% in the pre-index free-combo period to 69% in the post-index FDC period (difference, 27%; 95% CI, 24% to 30%). The improvement in MPR was most evident in patients with a MPR of <50% in the pre-index period (difference, 44%; 95% CI, 41% to 47%), whereas for those with a pre-index MPR of ≥80%, MPR decreased in the post-index period (difference, −13%; 95% CI, −9% to −17%). Factors independently associated with improvement in MPR included only the number of concomitant medications after adjustment for MPR in the pre-index period. Conclusion: In patients switched from free-combo to FDC of antihypertensive agents, MPR increased significantly if the compliance with free-combination was not optimal. However, for patients with good compliance with free-combination therapies, switching to FDC resulted in a decrease in MPR, which might be due to the lack of flexibility in dosing with FDC.

Conclusion: During active treatment, ALI and TEL provided effective and similar BP and aldosterone reductions. However, after treatment withdrawal, ALI provided a more sustained MASBP reduction than TEL, paralleled by a prolonged reduction in PRA and aldosterone. However, after treatment withdrawal, ALI provided a more sustained RAAS suppression than TEL, paralleled by a prolonged reduction in PRA and aldosterone.

Conclusion: The effects of music therapy on patients with hypertension and previous revascularization: 11-year experience

Introduction: Patients who have clinical evidence of hypertension (HT) after acute myocardial infarction (AMI) and previous coronary artery bypass grafting (CABG) have a poor prognosis. Unrelieved anxiety can produce an increase in sympathetic nervous system activity leading to an increase in cardiac workload. Objectives: The purpose of this study was to evaluate the effectiveness of music therapy for reduction of new coronary events (NCE) in patients with HT and AMI after previous CABG. Methods: 760 patients (males 80.2%, mean age 59.6 ± 6.2 yrs) with AMI after previous revascularization have been selected from the patients consecutively submitted from April 1990 to April 2011. The patients with early periprocedural AMI were excluded from the study. The average time interval from CABG to AMI was 94.4 ± 10 months. The average number of grafts was 3.2 grafts/patient. HT was registered in 400 (52.6%) pts with AMI after previous CABG. All patients with HT were randomized and divided in 2 groups. Study group of 200 patients treated with music therapy and Control group of 200 patients with no music therapy. Each patient in study group underwent two sessions of medical therapy (12 minutes) in a day. Both groups were similar in baselines, post-AMI characteristics and post-AMI medical therapy. Results: Comparing parameters of Study and Control group of patients in 11-year follow-up period, Study group had lower anxiety score (r = 0.20, p = 0.12) with statistically significant reduction in systolic blood pressure (p = 0.0016), diastolic blood pressure (p = 0.0042), heart rate (p = 0.0190), angina (p = 0.0110), reinfarction (p = 0.0194), sudden deaths (p = 0.0416) and reoperation (p = 0.0101). Conclusion: This study provides support for the use of music therapy in patients with HT and AMI after previous revascularization to reduce blood pressure, heart rate and new coronary events expression. These effects of music therapy are probably because of decreasing in sympathetic nervous system activity.

Conclusion: After 12 weeks of active treatment and 7 days of treatment withdrawal, as assessed by 24 h mean ambulatory systolic blood pressure (MASBP, Millar Stik). Additional pre-specified analyses were plasma renin activity (PRA) and aldosterone geometric mean change in the subset with biomarker assessments (n = 335). Methods: Eligible patients (n = 819, mean sitting SBP = 140 ± 180 mmHg and 24 h MASBP = 135 mmHg) were randomized to ALI 150 mg or TEL 40 mg for 2 weeks, then up-titrated to ALI 300 mg or TEL 80 mg for 10 weeks followed by 7 days of placebo (withdrawal). MASBP, PRA and aldosterone were assessed at randomization (RAN), end of active treatment (EOT) and end of withdrawal (EOW). Results: Between RAN and EOT, MASBP reductions were similar with ALI and TEL. However, between EOT and EOW least squares MASBP increased by 2.7 mmHg with ALI and 6.5 mmHg with TEL. Between-treatment BP increases were significant for TEL (change of −3.8 mmHg compared with ALI, p = 0.0001). During active treatment, PRA increased by 232.2% from baseline and returned to initial levels at EOW with TEL, while ALI reduced PRA by 78.9% from baseline, and maintained this reduction after withdrawal (−71.9%), showing sustained efficacy. Plasma aldosterone decreased with both ALI (−62.4%) and TEL (−19.6%). However, at EOW, aldosterone remained significantly below RAN with ALI (−19.9%, p = 0.0121), while with TEL aldosterone rebounded to near RAN levels (Table).
Conclusions: Mortality of hypertension could be better reduced with effective, individual treatment options. We systematically assessed environmental, pharmacokinetic, and pharmacodynamic factors that may explain the differential response to antihypertensive drugs in black people. Aside small effects of genetic polymorphisms, ethnic differences in pharmacodynamics were most prominent, related to low renin, low NO bioavailability, and potentially high activity of the ATP regenerating enzyme creatine kinase (CK) associated with enhanced vascular contractility and salt retention. Aside renin, biomarkers for NO bioavailability and ATP regeneration might prove to be useful to predict blood pressure responses.

Trends of coronary heart disease and cerebrovascular disease in developed countries 1950-2005: a comparison

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Introduction: There has been a well documented epidemic of CHD in developed countries of Australasia, North America and Western Europe during the second half of 20th century (1). At the same time there was a constant decline in cerebrovascular disease (stroke) mortality in those countries. The CHD epidemic has declined since the early 1970s, stroke since 1950s, in Australasia and the US and later in Western Europe with almost the same pattern. The most important challenge to be faced when describing CHD epidemics is to take into account stroke as a competing cause of death. Objectives: A parallel analysis of the broader category of stroke, thrombotic and haemorrhagic, was performed to compare with CHD mortality secular trends from 1950–2005 in developed countries. Methods: Data were derived from the World Health Organization resources for the period of 1950–2005. Age and sex specific mortality rates were calculated using population estimates from the WHO database. Age- standardised mortality rates were calculated using the new WHO standard method for males and females ages 35–74 years. Secular trends of CHD and stroke in developed countries of the world for the period 1950–2005 were constructed. Due to substantial changes in the classification of heart diseases, sensitivity analyses were done comparing data from the ICD 7 and ICD 8 which revealed that the trend lines were virtually the same. Results: Trends of CHD and stroke mortality have been changing in parallel in developed countries. The magnitude of stroke mortality was 1.3 compare to CHD mortality in Australasia and North America and 1/2 in Europe. Age-adjusted mortality rates based on death certification for stroke in men and women aged 35–74 years in developed countries run in parallel with those for CHD and patterns of CHD and stroke were similar across the countries (apart from stroke mortality in Portugal). The gap between male and female mortality was wider in CHD compare to stroke. The magnitude of CHD mortality was higher in males compare to females in all developed countries. Whilst, the magnitude of stroke mortality was higher in females compare to males in most European countries. Conclusion: There is no obvious competing influence of stroke on CHD mortality rates in developed countries, however this may differ in developing nations (1). The competing influence of CVD on CHD mortality rates remains an open question in developing countries.

The changing patterns of heart disease in Nigeria: data from the Ibadan outpatient cardiac registry

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Introduction: Many developing countries including Nigeria are undergoing epidemiological and demographic transition and this is affecting the pattern of diseases in these countries. In the early 70s, a Cardiovascular Disease Registry (Ibadan Cardiovascular Disease Registry) was in place and the data from this study was used to establish the patterns of heart disease in this city then. Forty years after, we established an Outpatient Registry to reassess the current trend in patterns of heart disease in the same city. Objectives: The aim of the study is therefore to explore the possible changing patterns of heart disease in the city of Ibadan which is undergoing rapid epidemiologic and demographic transition. Methods: This is a simple registry that captures all Cardiac Patients attending the Outpatient Clinic since September 2009. Data obtained included: demographics, clinical diagnoses, investigations and treatment. Results: As at April 2011, 796 subjects have been captured into the registry. There are 330 men (415%). The mean age of all the subjects is 60.5 ± 14 years. In terms of spectrum of diseases, hypertension and hypertensive heart disease is now the foundation of heart disease in Ibadan. Ischaemic heart disease is emerging. Rheumatic heart disease and endomyocardial fibrosis are now rarely seen in the outpatient clinic unlike in the seventies when the last two constituted the significant proportion of heart diseases in Ibadan.

Conclusion: The patterns of heart disease in Ibadan, Nigeria is changing. While endemic diseases such as rheumatic heart disease and endomyocardial fibrosis are disappearing, diseases of lifestyle such as hypertension, ischemic heart disease and their associated risk factors are emmerging. This calls for public health measures to curtail the emerging epidemic.

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INSPIRE: methods and preliminary results of a large stroke registry from India

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Introduction: Stroke is a leading cause of mortality and disability in India. Yet, there is little data on the epidemiology, management and outcomes of strokes in India. Objectives: From a large number of different types of hospitals, to determine the etiologies, clinical management, outcomes and rehabilitation practices for acute stroke. Methods: A hospital-based Registry of 10,000 patients (target sample size) presenting with acute stroke from about 80–100 hospitals, including both tertiary care and secondary care centers from all regions of India. We collected data from consenting patients during hospitalization, at 3 and at 6 months. We now present descriptive data and unadjusted rates. Results: To date we recruited 3,700 patients from 45 centers. We analyzed 2,721 patients, of whom 2054 (75.5%) had ischemic and 667 (24.5%) had hemorrhagic stroke. Mean age was 59.6 years and 34.3% were females. Lower middle and poor patients
comprised 82%. Rates of known risk factors were: 44% hypertensive, 21% diabetes, and 5% dyslipidemic. Patients took 8.4 hrs to get to hospital from symptom onset. Rates of in-patient drug use were: antipateptidase 66.8%, low molecular weight heparin 16.3%, diuretic 16.7%, beta-blocker 12.1%, ACEI/ARB 19.9% and lipid lowering 65.4%. In hospital, overall 7.1% died (ischemic 4.6%, hemorrhagic 14.1%) and 5.4% had a recurrent stroke. Poor patients compared to rich were younger (<50 years: 28.6% vs 13.8%), smoked more (current smokers: 35.6% vs 12.5%), were less aware of risk factors (diabetic 13.1% vs 41.4%), were hypertensive (37.1% vs 62.1%) and had dyslipidemia (2.3% vs 13.8%). In-hospital mortality was higher in the poor (8.5%) compared to the rich (7.1%).

Conclusion: This is the first large stroke registry in India. Patients in India are younger and have high rates of risk factors. Socioeconomic status appears to influence presentation, treatments and outcome. Further analyses with larger numbers will better inform practice patterns, determine treatment gaps and help improve the management and outcomes of strokes in India.

### Regional differences in cardiovascular risk in Abu Dhabi: the Weqaya programme

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**Introduction:** Syria and neighbouring middle income countries are facing an epidemic of non-communicable diseases, especially diabetes, stroke and coronary heart disease (CHD). In spite of better and more advanced treatment, a rise in coronary heart disease mortality in Syria has been noted since the nineties. **Objectives:** To estimate population and CHD mortality trends in Syria, and to investigate main risk factors and treatments that play the most important role in CHD related death. **Methods:** The validated IMPACT model was used to estimate CHD mortality trends in Syria (Population 20 million, 2006). Data sources included official statistics, national and local; published and unpublished surveys, surveys from neighboring countries, randomized trials and meta-analyses. **Results:** Between 1996 and 2006 CHD mortality rates increase by 64% (54% in men and 75% in women). An extra 6370 CHD deaths occurred in 2006 compared to 1996. Based on the IMPACT model, increases in cardiovascular risk factors caused an extra 5140 deaths. Approximately 52% (2660) of these additional deaths was attributable to increases in systolic blood pressure, 20% (1005) to increase blood cholesterol, 15% (765) to increase diabetes prevalence, and 9% (465) to increase obesity prevalence. Modeling demonstrated that approximately 2145 deaths were prevented or postponed by medical and surgical treatments, approximately 36% of them (805) were attributable to the treatment of angina pectoris in the community (aspirin and statins being the most important drugs), 17% (370) to secondary prevention following acute myocardial infarction, 15% (330) to treatment of heart failure in the community (especially spironolactone), and 14% (290) were attributable to initial treatments for acute myocardial infarction (especially thrombolysis and aspirin). However, the contributions from surgery, and angioplasty were consistently small 4% (95). **Conclusion:** Most of the recent substantial CHD mortality increases in Syria was attributable to increases in major cardiovascular risk factors; mainly blood pressure and cholesterol. These finding stress the importance of primary prevention strategies targeting the whole population.

### A “J-shape” association between birth weight and adult systolic blood pressure (SBP) in Hong Kong Chinese women

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**Introduction:** Fetal origins hypothesis by Barker in 1990 is a well known hypothesis. One of the key finding was that low birth weight was associated with higher systolic blood pressure (SBP). Many previous studies indicated a linear inverse association between birth weight and adult SBP in Caucasians; however, few studies on this topic have been conducted in Chinese populations. **Objectives:** The purpose of this study was to examine the association between birth weight and adult SBP in a Hong Kong Chinese population, and to determine the interaction between birth weight and adult body weight on SBP. **Methods:** This study was integrated in a life course epidemiology study among 35–65 years old female nurses in Hong Kong. Three rounds of mail surveys were conducted, 1253 nurses participated in the study. Information on birth weight, height, body weight, blood pressure and other variables was collected by a self-administered questionnaire. These self-reported variables have been validated in a pilot study. **Results:** Using linear regression analysis, after adjustment for age, height, body weight, premature and salt intake, we observed a significant inverse association between birth weight and SBP (coefficient
B = -3.12, 95% CI: -5.96 to -0.29 in the birth weight <3.5kg group, whereas this association was not seen in the birth weight ≥3.5kg group (P = 0.05). The birth weight-SBP relationship was strengthened in overweight/obesity (BMI ≥23kg/m2, Asian standard defined by WH0) group (coefficient B = -0.70, 95% CI: -0.66 to -0.43), a significant interaction between birth weight and body weight was found in this group (P < 0.05), but such interaction disappeared in overall range of birth weight with body weight (P > 0.05). The curve estimation showed a quadratic curvilinear association between birth weight and SBP: SSBP = 138.04 + 15.75birth weight + 2.63birth weight^2, P < 0.05).

Image/graph I: Figure 1 Curve estimation of association between birth weight and systolic blood pressure

Conclusion: Unlike most previous studies, we found a "J" shape association rather than a linear association between overall range of birth weight and SBP. Both lower birth weight and higher birth weight predict higher adult SBP. The effect of birth weight on adult SBP was independent and amplified by later life overweight/obesity.

Pulse pressure predict coronary calcification better than other blood pressure parameters in women: WEGAC (Women & Coronary Artery Calcium) study

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Introduction: Coronary artery calcification is a predictor of future cardiovascular event. However, the correlation between blood pressure parameters and the presence and severity of coronary calcification in women has remained unclear. Objectives: This study evaluates the accuracy of BP components in predicting coronary artery calcification in women. Methods: This is a retrospective study carried out in 1503 consecutive female outpatients who had been evaluated for presence of coronary artery calcification from July 2010 to February 2011 at our institution. Blood pressure parameters were measured prior to CAC (coronary artery calcium score) examination. CAC was determined by Dual-Source Computed Tomography (DSCT) 64-slice scan. Results: Pulse pressures ≥60 mmHg predicted coronary artery calcium score better (OR = 4.176; p < 0.001) than other blood pressure parameters (systolic blood pressure, diastolic blood pressure and mean arterial pressure) after multivariable adjustment in 1503 women. Higher pulse pressures (≥60 mmHg) were associated with severity of coronary artery calcium score (Somers’D: r = -0.422; p < 0.001), indicated an increasing value of pulse pressure correlated with increasing severity of coronary artery calcium score (Spearman: r = -0.353, p < 0.001). Conclusion: High pulse pressures (≥60mmHg) may better predict presence of coronary calcification in women compared to other blood pressure parameters (systolic blood pressure, diastolic blood pressure and mean arterial pressure). Furthermore, higher pulse pressures were associated with severity of coronary calcification in women. Therefore, pulse pressure may help to identify subclinical coronary calcification in women population who need further evaluation.

Table. I. Regression coefficients for adult SBP (mmHg) per unit (kg) increase in birth weight combined with current body weight. And giving interaction analysis

<table>
<thead>
<tr>
<th>Model</th>
<th>Number of cases in the model</th>
<th>Coefficients</th>
<th>Standardised Coefficients</th>
<th>Sig.</th>
<th>95.0% CI for B</th>
<th>Lower B</th>
<th>Upper B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Systolic blood pressure</td>
<td>815</td>
<td>B</td>
<td>-3.12</td>
<td>-0.075</td>
<td>0.031</td>
<td>-5.956</td>
<td>-0.287</td>
</tr>
<tr>
<td>Current weight</td>
<td>0.647</td>
<td>0.373</td>
<td>0.000</td>
<td>0.521</td>
<td>0.773</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interaction B/W*</td>
<td>-0.128</td>
<td>-0.008</td>
<td>0.833</td>
<td>-1.319</td>
<td>1.063</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Systolic blood pressure</td>
<td>163</td>
<td>B</td>
<td>2.599</td>
<td>0.072</td>
<td>0.092</td>
<td>2.204</td>
<td>2.992</td>
</tr>
<tr>
<td>Current weight</td>
<td>0.615</td>
<td>0.503</td>
<td>0.000</td>
<td>0.470</td>
<td>0.832</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interaction B/W*</td>
<td>1.117</td>
<td>0.227</td>
<td>0.135</td>
<td>-0.353</td>
<td>2.687</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Systolic blood pressure</td>
<td>284</td>
<td>B</td>
<td>-3.695</td>
<td>-0.122</td>
<td>0.027</td>
<td>-0.961</td>
<td>-0.430</td>
</tr>
<tr>
<td>Current weight</td>
<td>0.861</td>
<td>0.484</td>
<td>0.000</td>
<td>0.571</td>
<td>1.151</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interaction B/W*</td>
<td>1.466</td>
<td>0.220</td>
<td>0.007</td>
<td>0.485</td>
<td>2.874</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

All models were adjusted for age, height, waist circumference, salt intake, family history of hypertension, premature birth and twin birth. Dependent variable was systolic blood pressure.

U-shape relationship between blood pressure and body mass index in Vietnamese population

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Introduction: Overweight/obese and hypertension are emerging cardiovascular disease risk factors in developing countries. Blood pressure (BP) and prevalence of hypertension often increase sharply with weight or body mass index (BMI). Although being still prevalent in these countries, the underweight people are usually ignored for their burden of hypertension or cardiovascular diseases. Objectives: This study explored relationship between blood pressure and BMI in underweight, normal weight and overweight population of Vietnam Methods: Datasets of total 23,563 non-pregnant adults aged 25–74 were collated from five epidemiological population-based cross-sectional surveys with similar designs from 2001 to 2009. All studies were designed and carried out by the Vietnam National Heart Institute (VNH) to identify the prevalence of different CVD risk factors or CVD burden in general population, using the same standardised protocol for the physical measurements (such as BP and BMI). Blood pressure was measured at least twice in a resting, sitting position using an automatic digital sphygmomanometer with an appropriate sized cuff. Other anthropometric measurements were performed at least twice with the participants wearing light clothing and no footwear. The relationship between systolic or diastolic BP and BMI in general population was evaluated, stratified by sexes and residential areas (urban versus rural). Results: An increase in BMI was generally associated with a significant increase either in mean BP (both systolic and diastolic) or prevalence of blood pressure in an observable, inverse fashion as BMI levels increased in both sexes. However, in the underweight population group, the age-standardised mean systolic blood pressure or prevalence of hypertension significantly increased in both sexes, making a U-shape relationship between BMI and hypertension. This BMI-hypertension inverse correlation in lean group was not significant for men living in urban areas, where both BMI and blood pressure were higher, suggesting that the U-shape relation would revert to a straight line when BMI shifted to the right.

Image/graph I: World Congress of Cardiology 2012 Oral Presentations e17
Prevalence of hypertension in boys and girls was between 6.1% to 11.7% and 4.5% to 9.8%, respectively. No significant differences were found between two sexes. Blood pressure of boys was higher than girls in all ages. Most subjects had mild hypertension and both systolic and diastolic blood pressures were increased with age in both sexes. The highest prevalence of hypertension in boys (11.7%) and girls (9.8%) were found in ages of 17 and 15, respectively. The lowest prevalence of hypertension in both boys (6.1%) and girls (4.5%) were observed in age of 9.

Conclusion: Hypertension is usually a diagnosis that requires lifelong attention and control. A healthy lifestyle can help prevent hypertension in children and teens.

References:
in 3-year mortality compared to those without D (p < 0.0001), and CHD with D who did not attend CRET had a 3-fold higher mortality (p < 0.001) compared those with D who completed CRET. Using a composite score with D, A, and H, those with high total PSS had a 4-fold higher mortality than those with lower PSS (p < 0.01), with >50% reductions in mortality risk with either changing to low PSS or remaining at high PSS with improved exercise capacity (both p < 0.01) after CRET. Conclusion: These results indicate the high prevalence of PSS, including D, A, H, and total PSS in patients with CHD, and the benefits of formal CRET to reduce PSS and PSS-induced mortality. These data support the EIM’s initiatives in secondary CHD prevention.

Level of education as an independent social risk factor of cardiovascular death in open male population of Western Siberia

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2Diseases Epidemiology in Siberia, Novosibirsk, Russian Federation

Introduction: Psychosocial factors are not still very well studied as contributors to cardiovascular risk factors. Objectives: To assess the relationship between the level of education and the risk of cardiovascular death in the open male population of Western Siberia. Methods: The epidemiological study was conducted with standard methods in the open male population of Tyumen (795 subjects) aged 25–64 years. Cardiovascular death rate was studied during 12 years follow-up (from 1996 till 2008). The risk of cardiovascular death was estimated in two steps using Cox proportional hazards model. In the first stage hazard ratio (HR) was calculated after adjustment for age, in the second stage there was an adjustment for age, occupation and marital status. Results: Over 12 years of the prospective study in the male cohort 65 deaths from cardiovascular diseases were recorded. In the first model primary-educated men had a higher risk of cardiovascular death compared to men with higher education (HR 2.5, 95% confidence interval (CI) 1.35–4.65; p < 0.005). There were no statistically significant differences between secondary education (HR 1.05, 95% CI 0.61–1.80; p > 0.05) and higher education. In the second model the risk of cardiovascular death in men with primary education insignificantly decreased compared with the first model (HR 2.44, 95% CI 1.13–5.26; p < 0.05). Men with secondary education compared to men with higher education after adjustment for all the factors had a lower risk than in the single-factor model (HR 0.90, 95% CI, 0.47–1.72; p > 0.05), but it was not statistically significant. Conclusion: In open male population of Western Siberia the highest risk of cardiovascular death was observed in men with low education level.

The burden of cardiovascular disease amongst psychiatric patients in Birmingham, UK

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Introduction: The prevalence of both cardiovascular and psychiatric disease is increasing in the UK and is representing an increasing burden on the health service. Evidence is unclear regarding the prevalence of cardiovascular disease in psychiatric conditions such as anxiety and depression but some research points towards an association between the two. Objectives: We investigated the prevalence of cardiovascular disease amongst patients with psychiatric disorders over an 8-year period from 2000 to 2007. We hypothesised significant proportions of cardiovascular disease amongst patients with psychiatric conditions. Methods: Anonymous information was obtained from the local Health Authority comprehensive hospital activity analysis register regarding 12383 patients with psychiatric conditions in Birmingham, UK in the period 2000–2007. Demographics and co-morbidities of these patients were studied. Results: Of 12383 patients, 2811 (22.7%) also had a cardiovascular diagnosis. The main diagnoses were Hypertension 10.1%, Ischaemic Heart Disease 5.9%, Atrial Fibrillation 4.7%, Peripheral Vascular Disease 4.0%, Congestive Cardiac Failure 2.7%, Ischaemic Stroke 1.8% and Hyperlipidaemia 1.4%. Remarkably during the study period the proportion of psychiatric patients with a cardiovascular diagnosis increased from 16.8% in 2000 to 27.1% in 2007 mainly due to an increase in Atrial Fibrillation, Hypertension and Ischaemic Heart Disease. Conclusion: A significant number of psychiatric patients also have cardiovascular co-morbidities and the trend is increasing. This finding could be explained by an important role for psychiatric factors in the aetiology of cardiovascular disease and/or the side-effects of psychiatric medication. Further research is required to elucidate the reasons for the high cardiovascular burden amongst psychiatric patients.

Depressive and mixed anxiety-depressive symptoms predict fatal and nonfatal end-points in arterial hypertension and coronary heart disease patients

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Introduction: The patients with arterial hypertension (AH) and coronary heart disease (CHD) often have depressive and anxiety disorders. Objectives: The aim of the first Russian multicenter prospective trial was to study the prognostic value of anxiety and depression in AH and CHD patients. Methods: The COORDINATA (Clinico-epidemiological) project performed a depression study in Cardiological practice: in patients with Arterial hyperTension and coronary heart disease was performed in primary care polyclinics in 37 cities of the Russian Federation. 235 physicians (GP and cardiologists) randomly included 5038 consecutive pts aged 55 years and more: 1769 with AH and 3269 with CHD. Anxiety and depressive symptoms were assessed by means of the Hospital Anxiety and Depression Scale (HADS). Big number of characteristics including risk factors and clinical status were studied by self-reports and medical records. Pts were followed for a median follow-up of 36 months. Logistic regression and Cox Proportional Hazards regression analysis were undertaken (adjusted to age, sex, AH and CHD). Results: Table 1 presents the predictors of combined end-points, including all-cause mortality, nonfatal myocardial infarction (MI) and stroke. The results showed that depressive and mixed anxiety-depressive symptoms had almost equal impact on the cardiovascular prognosis as MI, and even more impact then diabetes mellitus type II and high blood pressure. The markers of risk are presented in table 1.

Comparison of cardiac rehabilitation programs combined with relaxation and meditation techniques on reduction of depression and anxiety of cardiovascular patients

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1Cardiovascular Research Center, Mashhad University of Medical Sciences, Mashhad, 2Department of Psychology, Tarbat-e-Jaam Islamic Azad University, Tarbat-e-Jaam Branch, Tarbat-e-Jaam, 3Department of Educational sciences, Mashhad Islamic Azad University, Mashhad Branch, 4Young Researchers Club, Mashhad Islamic Azad University, Mashhad Branch, Mashhad, Iran, Islamic Republic Of

Introduction: Cardiovascular disease (CVD) is a major cause of death in developed countries. The goals of cardiac rehabilitation and secondary prevention are to prevent disability, resulting from cardiac disease, re-hospitalization and death from cardiac events. Most of the cardiac rehabilitation programs include special psychological interventions. Objectives: Aim of this study was to determine the effectiveness of rehabilitation techniques in cardiac patients including psychological-physical interventions such as Meditation and Relaxation. Methods: The subjects of this study were 45 patients with CVD and depression. The patients were allocated in three groups (Relaxation, Meditation, and Control). All the patients in two intervention groups of Meditation and Relaxation practised related Techniques, after routine rehabilitation programs. Results: Depression, anxiety scores and systolic and diastolic blood pressure in the relaxation group, compared with the control group, were not significantly different. There was a significant reduction on depressive, systolic blood pressure and heart rate of Meditation group compared with control group but no significant reduction in anxiety and diastolic blood pressure of Meditation group compared with control group was observed. Conclusion: Our findings suggest that medication techniques has better outcomes in cardiac patients for improvement of depression, reduction of systolic and diastolic blood pressure, and heart rate than relaxation techniques.

The impact of cardiovascular disease on household economic well-being in Chinese population

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Introduction: Cardiovascular disease claims 40% of total death and terrifies the public health and economic development in China. There are few national data regarding the impact of CVD on the household economic well-being. Objectives: To estimate the economic impact of CVD on the households in different living economic levels. Methods: Data for 3296 households with CVD patients were extracted from the database of National Health Services Survey, a nationally-representative household survey. Out-of-pocket payment (OPP) for CVD and the proportion of OPP CVD expenditures or health expenditures

Table 1

<table>
<thead>
<tr>
<th>Disease</th>
<th>Odds Ratio (95% CI)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>History of myocardial infarction</td>
<td>1.80</td>
<td>1.46-2.22</td>
</tr>
<tr>
<td>Post-myocardial infarction angina</td>
<td>1.76</td>
<td>1.43-2.17</td>
</tr>
<tr>
<td>HAUS-D &gt; 11</td>
<td>1.59</td>
<td>1.30-1.96</td>
</tr>
<tr>
<td>HAUS-total &gt; 11</td>
<td>1.33</td>
<td>1.08-1.65</td>
</tr>
<tr>
<td>Chronic heart failure</td>
<td>1.55</td>
<td>1.28-1.88</td>
</tr>
<tr>
<td>Nondrinkers due to disease</td>
<td>1.54</td>
<td>1.21-1.97</td>
</tr>
<tr>
<td>Diabetes mellitus type II</td>
<td>1.35</td>
<td>1.04-1.65</td>
</tr>
<tr>
<td>Stress: death of close relatives</td>
<td>1.30</td>
<td>1.06-1.59</td>
</tr>
</tbody>
</table>

Conclusion: Depressive and mixed anxiety-depressive symptoms are the strong predictors of combined end-points in AH and CHD pts.

World Congress of Cardiology 2012 Oral Presentations 19
in total household expenditures were analyzed. A household’s health expenditure was considered catastrophic if annual OOP were ≥ 40% of total, non-food household expenditures, since such spending is likely to result in impoverishment. Results: (1) Annual total OPP CVD expenditures were considered catastrophic in 4.2% of the households, and the rate was higher in households with lower monthly income than in those with higher monthly income (6.0% vs. 3.1%, P<0.002) and higher in households with patients who were hospitalized for CVD in the previous year of the survey than in those without hospital admissions (27.1% vs. 1.9%, P<0.001). (2) Ten percent of households fell into poverty due to medical expenditures and 2% households fell into poverty due to CVD expenditures. (3) The poverty gap for those below the poverty line was increased by 6.1% due to CVD expenditures. (4) The proportion of OPP CVD expenditures in total household expenditures per capita was much higher for hospitalized patients, compared with those without hospital admissions (14.6% vs. 2.0%, P<0.001). Conclusion: Cardiovascular disease has significant impacts on household economic well-being in China, particularly for the households of lower economic level and those with the patients hospitalized for CVD.

0080

Improved gender and hispanic disparities in the management of acute myocardial infarction in USA

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Introduction: Disparities in medical therapies and revascularization procedures have been reported for women and Hispanics in the management of AMI in USA. Hispanics have become the fastest growing and largest racial ethnic minority in USA, but inequalities in their access to medical care and socioeconomic position (SEP) have persisted. Objectives: A paucity of recent data on this subject from facilities in USA with a large Hispanic patient (pt.) base motivated this study. The main objective was to determine if disparities in the hospital management of AMI existed for women and Hispanics in this setting. Methods: Records of 646 consecutive pts. (53.7% women) admitted between 2005–2007 with a suspected AMI to a Southern California non-profit Community Hospital with on site tertiary cardiac services were reviewed. Results: Race/ethnicity was not classified in 61 pts.

Gender and Hispanic race/ethnicity did not influence the use of revascularization procedures, admission and discharge medications when an AMI was documented. Although HW received less PCI than NHWW, they showed a trend for more CABG, suggesting multifactorial differences. Medical insurance inequalities, a SEP proxy, between Non Hispanic Whites and Hispanics persist but apparently did not affect the provision of most services.

0081

Applying guidelines to use statins for primary prevention of CV events: not all Middle Eastern countries can afford it

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1AUB-MC, Beirut, Lebanon, 2Public Health, AUB-MC, Beirut, Lebanon

Introduction: Current evidence strongly supports the use of statins for primary prevention of CV events. The Canadian Cardiac Society based its recommendations on the results of AFCAPS (Lovastatin), JUPITER (Rosuvastatin), WOSCOPS (Pravastatin), and ASCOT–LLA (Atorvastatin). Applying these guidelines in Middle Eastern countries is proving quite challenging. Cost remains a significant barrier to convincing patients to take a preventive medication on a chronic basis. Objectives: To determine the cost of preventing 1 CV event using any of the 3 available recommended statins (atorvastatin, rosuvastatin and pravastatin) in 7 Middle Eastern countries. Methods: The 5-year Number Needed to Treat (5-year NNT) to prevent 1 CV event as per WOSCOPS (Pravastatin 40 mg/day), JUPITER (Rosuvastatin 20 mg/day) and ASCOT–LLA (Atorvastatin 10 mg/day) was derived from the studies to be 45, 29 and 49 respectively. The public cost of treatment for 5 years was calculated based on data from National Drug Registries for original brand prices for Lebanon, Bahrain, Jordan, Kuwait, Saudi Arabia, UAE and Oman. The Gross National Income (GNI) per Capita for each country was taken from the current World Bank reported figures. Results: The cost of preventing 1 CV event in 5 years was highest in UAE for Defined Daily Dose of Pravastatin 40 mg (fig 1). The ratio of cost of prevention of one CV event to GNI per capita was the highest at Jordan at 19.5 for Atorvastatin 10mg and lowest at Kuwait at 1.5 for rosuvastatin 20mg (fig 2). Rosuvastatin 20mg use was associated with the lowest cost for event prevention in most countries. Figure 1: Cost of statins to prevent 1 CV event in listed countries and corresponding GNI/Capita.

<table>
<thead>
<tr>
<th>Country</th>
<th>Cost of Rx Atorvastatin 10 mg*</th>
<th>Cost of Rx Rosuvastatin 20 mg*</th>
<th>Cost of Rx Pravastatin 40 mg*</th>
<th>Gross National Income /Capita*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bahrain</td>
<td>142041</td>
<td>81205</td>
<td>190526</td>
<td>33530</td>
</tr>
<tr>
<td>Jordan</td>
<td>112348</td>
<td>111143</td>
<td>105978</td>
<td>5770</td>
</tr>
<tr>
<td>Kuwait</td>
<td>141195</td>
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<td>20249</td>
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</tr>
<tr>
<td>UAE</td>
<td>140351</td>
<td>113296</td>
<td>271203</td>
<td>No Data Available</td>
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<td>Oman</td>
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<td>111143</td>
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<td>24410</td>
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<td>KSA</td>
<td>104295</td>
<td>122788</td>
<td>81205</td>
<td>23900</td>
</tr>
<tr>
<td>Lebanon</td>
<td>96219</td>
<td>79586</td>
<td>105589</td>
<td>14170</td>
</tr>
</tbody>
</table>

*All number are in US Dollars.
Conclusion: The cost of preventing 1 CV event after 5 years of treatment per GNI per capita ranges between 1.5–19.5 times in these ME countries. Of recommended statins, the cost effectiveness for event prevention was best for rosuvastatin 20mg in most countries. This might change if we compare different doses; however, we used the Defined Daily Dose of the primary prevention trials referenced in the guidelines. Cost reduction strategies are needed.

**Objectives:** To assess community perceptions and perspectives on essential health services in Africa: a Kenyan perspective.

**Methods:** Three methods - cross-sectional survey, qualitative inquiry, and case studies were used across two regions based on the 2008 DHS health index scores; high or low performing, to give an in-depth, triangulated understanding of community priorities, perceptions and perspectives on health service delivery and how they can be engaged. A multi-stage cluster and random sampling was used to select 3 districts based on their level of urbanization and four communities were then selected per district based on their location from the nearest health facility giving a total of 24 communities and 35 households per community. **Results:** More females (55%) than males were interviewed in total. Most pressing problems noted are still the traditional ones like malaria (93% urban-U; 84% peri-urban-P and 96% in the rural areas -R) followed by unexplained fever at 57% (U), 66% (P) and 77% (R) respectively in the urban, peri-urban and rural areas. More urban dwellers (76%) while diabetes accounted for 6% (U), 17.3% (P) and 21.3% (R) and hypertension 13.8%, 21.9% and 24.9% respectively in the urban, peri-urban and rural areas. More urban dwellers (76%) view hygiene as important source of health while the rural dwellers (57%) think regular check-ups as the most essential key to a healthy lifestyle. Less than 25% of all respondents in all the regions view risk avoidance, exercise and prompt health seeking as strategies for good health.

**Introduction:** Increasing recognition of the need to strengthen health systems in order to meet health needs of the people in Africa, who continue to experience high morbidity and mortality levels from both communicable and non-communicable diseases (NCDs) was the motivation for this multi-country study. **Objective:** To assess community perceptions and perspectives on essential health service delivery in Africa in order to develop appropriate mechanisms for health service delivery through community participation. **Methods:** Three methods - cross-sectional survey, qualitative inquiry, and case studies were used across two regions based on the 2008 DHS health index scores; high or low performing, to give an in-depth, triangulated understanding of community priorities, perceptions and perspectives on health service delivery and how they can be engaged. A multi-stage cluster and random sampling was used to select 3 districts based on their level of urbanization and four communities were then selected per district based on their location from the nearest health facility giving a total of 24 communities and 35 households per community. **Results:** More females (55%) than males were interviewed in total. Most pressing problems noted are still the traditional ones like malaria (93% urban-U; 84% peri-urban-P and 96% in the rural areas -R) followed by unexplained fever at 57% (U), 66% (P) and 77% (R) respectively in the urban, peri-urban and rural areas. More urban dwellers (76%) while diabetes accounted for 6% (U), 17.3% (P) and 21.3% (R) and hypertension 13.8%, 21.9% and 24.9% respectively in the urban, peri-urban and rural areas. More urban dwellers (76%) view hygiene as important source of health while the rural dwellers (57%) think regular check-ups as the most essential key to a healthy lifestyle. Less than 25% of all respondents in all the regions view risk avoidance, exercise and prompt health seeking as strategies for good health.
Dual-Energy-X-ray-absorptiometry, visceral fat area estimated by Bioelectrical Impedance Analysis and serum lipids and lipoprotein levels were measured in fasting blood samples. Results: After 10 weeks both LCD- and LCD + cTEMS-group had similar but significant weight loss (6.5 ± 3.0 kg, p < 0.001; 5.9 ± 2.8 kg, p < 0.001) and lean mass gain (1.3 ± 0.8 kg, p < 0.001; 1.8 ± 2.0 kg p < 0.001). The reduction in visceral fat area was 26.1 ± 10.0 cm² (p < 0.001) for LCD and 49.2 ± 25.6 cm² (p < 0.001) for LCD + cTEMS with a significant between-groups difference (p < 0.05). There were no significant changes in serum lipids in the LCD-group. In the LCD + cTEMS-group however, we observed an increase in HDL cholesterol (0.1 ± 0.2 mmol/L, p < 0.05) and a decrease in triglycerides (0.3 ± 0.8 mmol/L, p < 0.001). Conclusions: As a supplement to a weight low carbohydrate diet, cTEMS resulted in a significantly greater reduction in visceral fat accumulation and caused favorable changes in serum lipids. cTEMS may therefore serve as an adjuvant to the treatment of obesity and metabolic syndrome.

Introduction: The risk of type 2 diabetes is particularly elevated in South Asians compared to western populations, and is associated with enhanced morbidity and mortality. About 20% of those aged 40 years and older suffer from diabetes in Pakistan making it the 7th highest ranking country on the scale of global burden of disease. Interestingly, the inter-relationship between metabolic syndrome and type 2 diabetes mellitus (T2DM), blood pressure (BP), and lipids and glucose is inconsistent within different ethnic subgroups of South Asian populations compared to those observed in European-origin populations. Objectives: To test the hypothesis that genetic variants associated with diabetes related traits in Europeans would explain a similar proportion of phenotypic variance in a Pakistani population. Methods: We used individuals from the Control of Blood Pressure and Risk Attenuation Trial (COBRA) in Karachi, Pakistan. Individuals were aged 40 years or older. A total of 81 single nucleotide polymorphisms (SNPs) associated with either fasting glucose, BMI, blood pressure or triglyceride levels were genotyped to test individual SNPs and weighted genetic risk scores against the relevant metabolic trait. We next performed Mendelian randomization tests using an instrumental variables approach between pairs of metabolic traits. Results: Combining information from multiple genetic variants showed that fasting glucose variants, BMI variants, triglyceride variants, systolic blood pressure variants and diastolic blood pressure variants explain 2.9%, 0.7%, 0.5%, 1.2% and 1.8% of the variance in those traits respectively. These effects are consistent with those observed in Europeans. Using a Mendelian randomization approach we observed evidence that genetically influenced raised triglyceride levels do not causally affect type 2 diabetes risk (p = 0.0003) for the London-wide genome scanner 4. CONCLUSION: Genetic variants identified in Europeans are associated with diabetes related traits in South Asians with comparable effect size and can be used in Mendelian randomization studies.

Physical activity and exercise interventions for childhood obesity: a systematic review with meta-analysis of randomized clinical trials

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Introduction: While obesity has an increasing impact in childhood health all over the world, the effectiveness of physical activity interventions in pediatric obesity remains unclear. Objectives: To assess the effect of physical activity interventions to prevent or treat childhood obesity by a systematic literature review and meta-analysis of randomized clinical trials. Methods: Data Sources. A search of online databases (PubMed, EMBASE and Cochrane CENTRAL) and references of published studies (from inception until July 2011) was conducted, without language restriction. Study Selections: Eligible studies were randomized clinical trials (RCTs) enrolling children 6 to 12 years old which assessed the impact of physical activity interventions longer than 6 months on body mass index, systolic and diastolic blood pressure, total cholesterol and triglycerides. Data Extraction: Two reviewers independently carried out data extraction and quality assessment. Data Analysis: Calculations were performed using a random-effect model. Results: 198 articles were retrieved, 11 RCTs (11560 participants) were included. Physical activity (10 comparisons; n = 11560) participants) altered: A) BMI by -0.03kg/m² (95%CI -0.17, 0.10; I² 0.0%) vs. no intervention, B) Systolic blood pressure (3 comparisons; n = 1846 participants) by -0.59 mmHg (95%CI -2.29, 1.11; P = 0.77), C) Diastolic blood pressure by -2.04 mmHg (95% CI -2.04, -1.17; I² 47%), D) TC (3 comparisons; n = 1508 participants) by 0.93mg/dl (95%CI -8.31, 10.16; I² 87%) and E) Triglycerides (3 comparisons; n = 1707 participants) by -1.17mg/dl (95%CI -4.20, 1.86; 220.8%). Conclusion: Physical activity intervention programs longer than 6 months caused non significant reduction on BMI, systolic blood pressure and triglycerides and a statistically non significant reduction on diastolic blood pressure when compared intervention group with control. All comparisons included low to moderate intensity physical activity. New approaches, including trials with greater exercise intensity and association of more comprehensive strategies are needed to improve these results.

Reaching low-density lipoprotein cholesterol target levels among dyslipidemic individuals in the Levant region (Jordan and Lebanon): the Centralized Pan-Levant Survey on THE Undertreatment of Hypercholesterolemia (CEPHUS study)

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Introduction: Cardiovascular disease (CVD) is the leading cause of death in the Middle East and dyslipidemia is one of the most common risk factors for this. It is largely unknown whether dyslipidemia is adequately treated to recommended cholesterol target levels or not. Objectives: The CEPHUS survey evaluated the use and efficacy of lipid lowering agents (LLA) in reducing low-density lipoprotein cholesterol (LDL-C) to reach target levels recommended by the American and European guidelines, and the predichotic factors that influence reaching such target levels in the Levant region. Methods: A multi-center, cross-sectional survey enrolled 1012 consecutive dyslipidemic patients in Jordan and Lebanon (August 2010–January 2011) who were on LLA for >3 months with stable doses for >6 weeks. Collection of clinical data and fasting blood samples were done over one visit. Physicians and patients filled out a dyslipidemia diagnosis and treatment questionnaire. LDL-C target levels were defined according to the US National Cholesterol Education Program Adult Treatment Panels (NCEP ATP III) and the Joint European Task Force (JETF) guidelines. Results: Full analysis of 992 patients (41% women) showed mean age of 58 ± 11 years. Hypertension, diabetes mellitus (DM), and smoking were present in 66%, 50%, and 29%, respectively. History of coronary, peripheral or cerebro-vascular disease and obesity were present in 29%, 25%, and 18% respectively. LDL-C levels were prescribed for primary and secondary prevention and familial hypercholesterolemia in 46% and 53% and 1% respectively. Overall, 57%, and 64%of patients attained LDL-C goals recommended by the JETF and NCEP ATP III guidelines; respectively. However, according to the 2004 ATP III guidelines, of the very high risk group (53% of all patients) attained LDL goal of <70mg/dL. Smoking, DM, metabolic syndrome, CVD history, increased waist circumference, and elevated pre-treatment LDL-C were all associated with not reaching LDL-C goals. Conclusion: Among dyslipidemic individuals using LLA in the Levant region, only 26% of the very high risk group achieved recommended LDL-C targets of <70mg/dL overall. About 60% of patients achieved the JETF and NCEP ATP II target levels. National and aggressiveness awareness campaigns to effectively control LDL-C levels to recommended strategies are urgently needed.

Contractility of ventricular myocytes is well preserved despite altered mechanisms of Ca2+ transport and a changing pattern of mRNA in aged type 2 Zucker diabetic fatty rat heart

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Introduction: Cardiovascular complications are the major cause of morbidity and mortality in diabetic patients. Previous experiments have demonstrated alterations in ventricular myocyte shortening that are associated with alterations in Ca2+ signaling and expression of genes encoding Ca2+ transport and cardiac muscle proteins in young Zucker diabetic fatty (ZDF) rat compared to Zucker lean (ZL) controls (Howarth et al, 2011). Objectives: Ventricular myocyte shortening, Ca2+ signaling and expression of genes encoding Ca2+ transport and cardiac muscle proteins has been investigated in aged ZDF rats. Methods: Ventricular myocytes were isolated by enzymatic and mechanical dispersal techniques. A video edge detection system was used to measure cell shortening. Fluorescence photometry was used to measure intracellular Ca2+ (Ca2+). Patch clamp techniques were used to measure expression of genes encoding cardiac muscle proteins and expression of proteins. Results: Diabetes was characterized by a 4-fold elevation in non-fasting blood glucose in ZDF rats compared to controls. Amplitude of shortening, time to peak (TPA) and time to half (THAL) relaxation of shortening were unaltered in ZDF myocytes compared to age-matched controls. Amplitude and THAL decay of the Ca2+ transient was unaltered however, TPK Ca2+ transient was prolonged in ZDF myocytes (70±2.3 ms) compared to controls (58±2.3 ms). Amplitude of the L-Type Ca2+ channel was reduced across a wide range of test potentials (30 to 40%) in ZDF myocytes compared to controls. Sarcoplasmic reticulum Ca2+ content was unaltered, The gradient of the fura-2 ratio compared to cell length during late relaxation of the twitch contraction was less steep in ZDF myocytes compared to controls. Expression of genes encoding cardiac muscle proteins, muscle membranes, Ca2+ channels and cell membrane transport and intracellular Ca2+ transport proteins were variously altered. Myf6, Tnn1, Calc2a2, Sic1a1 and Atp2a2 were downregulated whilst Myz2, Cacna1g, Cacna1h and Atp2a1 were upregulated in ZDF ventricle compared to controls. Conclusion: Preserved ventricular myocyte shortening is associated with a changing pattern of mRNA encoding Ca2+ signaling and cardiac muscle proteins in aged ZDF rat.

**Effect of nuclear factor kappa B inhibition on molecular and structural heart remodelling in experimental hypertension**

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Introduction: Recently we have demonstrated involvement of nuclear factor-kappa B (NF-κB) in the upregulation of endothelial nitric oxide synthase (eNOS) in hypertension induced by N\textsuperscript{2}-nitro-L-arginine methyl ester (L-NAMe). Objectives: Thus, the goal of our study was to analyze effects of NF-κB inhibition on blood pressure (BP) and molecular and structural heart remodelling in L-NAMe hypertensive animals. Methods: Adult 12-week-old male Wistar Kyoto rats (WKY) were treated with the nitric oxide synthase inhibitor L-NAMe (40mg/kg/day) for 7 weeks. From the fourth week of L-NAMe treatment, the NF-κB inhibitor lactacystin (1mg/kg) was applied once a week. Furthermore, age-matched WKY received L-NAMe or lactacystin alone for 7 or 3 weeks, respectively. Total NOS activity, expressions of eNOS mRNA and protein were determined in the left ventricle (LV). NF-κB (1.58 ± 0.06-fold, P < 0.000) and inhibited NHE-1 activity (1.64 ± 0.10-fold, P = 0.000). Gs-Rgl1 clearly reduced PE-induced elevation of both Na\textsuperscript{+} and Ca\textsuperscript{2+} in the intracellular concentrations. Gs-Rg1 steadily declined PE-induced calcineurin activity (P < 0.000), almost in control. Gs-Rg1 markedly reduced translocation of NFAT3 and GATA-4–DNA binding activity (P < 0.000) induced by PE, similar to control group. Gs-Rg1 significantly improved cardiac function in the intracellular concentrations. Gs-Rg1 steadily declined PE-induced calcineurin activity (P < 0.000), almost in control. Gs-Rg1 markedly reduced translocation of NFAT3 and GATA-4–DNA binding activity (P < 0.000) induced by PE, similar to control group.

Conclusion: Decreased NOS activity along with increased oxidative load may be responsible for decreased NO bioavailability and further BP increase after NF-κB inhibition in L-NAMe-induced hypertension. Decreased level of NO may also contribute to fibrosis enlargement in the heart after lactacystin treatment. Thus, nitric oxide could represent a regulatory factor responsible for different NF-κB-dependent growth responses. Supported by grants APVV-0538–07, APVV-0742–10 and VEGA: 2/0190/11, 2011/07/26.

Results: L-NAMe treatment increased BP significantly (145 ± 2 mmHg vs. 110 ± 3 mmHg in control group) and protein expression was measured immunohistochemically and by Western blot analysis. The concentration of conjugated dienes, fibrosis, and collagen I and III levels were determined in the same tissue. L-NAMe treatment led to increased NF-κB (965) expression followed by elevation of both eNOS mRNA and eNOS protein expressions. Addition of lactacystin blocked, however, elevated eNOS protein expression followed by decreased NOS activity. Furthermore, lactacystin antagonized the decreased calcineurin concentration and fibrotic process induced by L-NAMe. The addition of lactacystin, however, did not affect LV hypertrophy and collagen I and III, already increased by L-NAMe. Conclusion: In conclusion, decreased NOS activity along with increased oxidative load may be responsible for decreased NO bioavailability and further BP increase after NF-κB inhibition in L-NAMe-induced hypertension. Decreased level of NO may also contribute to fibrosis enlargement in the heart after lactacystin treatment. Thus, nitric oxide could represent a regulatory factor responsible for different NF-κB-dependent growth responses. Supported by grants APVV-0538–07, APVV-0742–10 and VEGA: 2/0190/11, 2011/07/26.

**NHE-1 dependent calcineurin activation is a kind of mechanisms of ginsenosides-Rgl protecting cardiomyocytes from hypertrophy and heart failure?**

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Introduction: Ginsenosides-Rg1 (Gs-Rg1) is a main component of Ginsenosides extracted from Ginseng, a medicinal plant widely used in Asia, and is a kind of activity element playing a therapeutic role in the cardiovascular system. Objectives: The present study aimed at determining whether Gs-Rg1 exerts a direct anti-hypertrophic effect on cardiomyocytes, in vivo and, ex vivo, and whether it inhibits the heart failure process, in vivo in addition, further investigate the potential mechanisms for the above actions. Methods: Neonatal rat ventricular cardiomyocytes were randomly assigned to the following 3 groups: control group, PE group (phenylephrine, 10 umol/L, 1 adrenoceptor agonist) and Gs-Rg1 group (200umol/L Gs-Rg1 and 10 umol/L PE) for 36 hours; Cell surface area, Na\textsuperscript{+} –H\textsuperscript{+} exchanger 1 (NHE-1), calcineurin activity, GATA-4 and NFAT3 was analyzed. Male Sprague-Dawley rats (270 to 300 g), were randomly divided into sham, simple coronary artery ligations (CALAD) and Gs-Rg1 group (1 mg/kg, 1 times per day) for 4 weeks after coronary artery ligation. Echocardiography, hemodynamic measurements, NHE-1, and Calcineurin activation was performed. Results: Gs-Rg1 significantly attenuated hypertrophic effect of PE on neonatal cardiomyocytes (841 ± 13 um\textsuperscript{2} vs 1044 ± 17 um\textsuperscript{2} vs 933 ± 19 um\textsuperscript{2}, P < 0.001), Gs-Rg1 reduced PE-induced elevation of both Na\textsuperscript{+} and Ca\textsuperscript{2+} in the intracellular concentrations. Gs-Rg1 steadily declined PE-induced calcineurin activity (P < 0.000), almost near to control. Gs-Rg1 markedly reduced translocation of NFAT3 and GATA-4–DNA binding activity (P < 0.000) induced by PE, similar to control group. Gs-Rg1 significantly improved systolic and diastolic abnormalities (P < 0.001), left ventricular inner diameters (P < 0.000), and left ventricle weights (P < 0.000) in rats subjected to sustained CAL. Gs-Rg1 had significantly decreased markers of post-infarction cardiac dysfunction (inotropic 1-experiment 3000 cpm and 0.0001 and completely abrogated calcineurin-phosphatase activity in hearts subjected to CAL. Conclusion: Gs-Rg1-protects rat heart from hypertrophic and remodeling, which is partly mediated by inhibition of NHE-1–dependent calcineurin activation at least.

**Conclusion:** We found an association between ADPKD and IDCM and suggested altered calcium signaling as a possible mechanism. We propose ADPKD to be considered a risk factor for development of IDCM.

Although the leading cause of mortality in ADPKD is cardiovascular disease, the relationship between these conditions remains poorly understood. Interestingly, even young ADPKD patients with normal blood pressure and renal function exhibit ventricular dysfunction. PC2 is an intracellular calcium channel and is thus hypothesized to modulate intracellular calcium signaling, possibly affecting cardiac function. Objectives: Our aim was to study cardiac function in a zebrafish model lacking PC2 (Pkd2E). Next, we aimed to explore the relevance of this zebrafish model to human ADPKD by examining the Mayo Clinic’s ADPKD database for an association between ADPKD and idiopathic dilated cardiomyopathy (IDCM). Methods: For zebrafish cardiac output measurements, heart rates were counted and images of blood flow in the dorsal aorta were captured at a high frame rate. Tracking of red blood cells during one cardiac cycle and measurement of aorta diameter allowed stroke volume to be calculated. For calcium imaging experiments, isolated hearts were loaded with fluo-4 AM, followed by de-esterification before imaging. The isolated hearts were paced electrically and stimulated with drugs. The entire coding and flanking intronic regions of Pkd1 and Pkd2 were screened for mutations by direct sequencing, and PKD mutations were confirmed in 374 patients.

Results: Pkd2 mutant zebrafish showed low cardiac output and atrioventricular block. Isolated pkd2 mutant hearts displayed impaired intracellular calcium cycling, calcium alternans, and reduced intracellular calcium stores. These results indicate heart failure in the pkd2 mutants. In human ADPKD patients, we found IDCM to coexist frequently with ADPKD when compared to the general population, where the prevalence of IDCM is approximately 1:2,500. This association was strongest in patients with Pkd2 mutations; approximately 9% of Pkd2 patients also had IDCM.

**Conclusion:** PC2 modulates intracellular calcium cycling, contributing to the development of heart failure. We found an association between ADPKD and IDCM and suggested altered calcium signaling as a possible mechanism. We propose ADPKD to be considered a risk factor for development of IDCM.

**Posttranslational myofilament protein alterations contribute to post-infarction contractile dysfunction**

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Introduction: The molecular background of the post-infarction remodeling process (MI) is not yet completely known. Objectives: In this study, Mi-associated alterations in the cardiomyocyte contractile performance were assessed. Methods: Cardiomyocytes were obtained from the left ventricles of untreated (Cont) and infarcted (MI) mice from two different areas: the anterior wall (Ant) and the opposite site (Inf). In skinned cardiomyocytes, maximal Ca\textsuperscript{2+}–activated active tension...
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force ($F_e$), $Ca^{2+}$-independent passive force ($F_{pass}$), and $Ca^{2+}$-sensitivity of force production ($pCa_{50}$) were determined at 1.8 and 2.3 mm object lengths ($SL$). In parallel, the levels of protein kinase A (PKA)-specific phosphorylation of troponin I ($TnI$), markers of $SH$-oxidation and carbonylation of contractile proteins were assessed by Western immunoblotting and OxyBlot assay. Results: At identical $SL$s, $pCa_{50}$ was significantly lower at MI Ant site than at Cont. Ant or Inf sites of MI or Cont. $pCa_{1}$ (1.9 $\mu M$) Cont. Ant/n=20): 5.6 $\pm$ 0.03; Cont. Inf/n=7): 5.8 $\pm$ 0.03; MI Ant/n=23): 5.7 $\pm$ 0.03; MI Inf/n=6): 5.8 $\pm$ 0.03 (mean $\pm$ SEM). However, no significant differences could be found in $F_0$ at none of the different $SL$s ($F_1$ (1.9 $\mu M$) $\sim$ 10.7 $kN/m^2$; $F_2$ (2.3 $\mu M$) $\sim$ 16.3 $kN/m^2$). In contrast, $F_{pass}$ values were significantly higher of the MI Ant cardiomyocytes at 1.9 $\mu M$ SL than of the other groups (Cont. Ant: 0.4 $\pm$ 0.1 $kN/m^2$; Cont. Inf: 0.2 $\pm$ 0.1 $kN/m^2$; MI Ant: 0.7 $\pm$ 0.1 $kN/m^2$; MI Inf: 0.3 $\pm$ 0.1 $kN/m^2$). The increase in $pCa_{50}$ by stretching the sarcomeres was identical ($\Delta pCa_{50}$, $-0.5$) in all groups indicating the preservation of the Frank-Starling mechanism. A decreased level of $PKA$-dependent $TnI$-phosphorylation could be detected selectively at the MI Ant site (MI Ant/59.9: 7.6% vs. Cont./100: 12.8%, relative units). $SH$-oxidation of actin (MI Ant/49.1: 10.6% vs. Cont./83.9: 6.2%) and carbonylation levels of actin and myosin heavy chain at the MI Ant site were enhanced compared to Cont.. In vitro protein carbonylation resulted in a significant decrease in $pCa_{50}$ values which could not be reverted by antioxidant treatment. Conclusion: In conclusion, post-infarction remodeling resulted in a decrease of $Ca^{2+}$-sensitivity of force production and in an increase of passive force of cardiomyocytes at the Ant site. The phosphorylation status of $TnI$ could not explain these alterations, hence other types of posttranslational protein modifications, such as $SH$-group oxidation and protein carbonylation may also modulate the function of cardiac myofilaments following myocardial infarction.

Echocardiographic assessment of right ventricular systolic function in patient with repaired tetralogy of fallon: a cardiac MR comparison study

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Introduction: Recently, right ventricular (RV) dysfunction has been recognized as a prognostic factor in many congenital Heart disease. Supported by advances in echocardiography and MRI, assessment of RV function and morphology has gained interest. While echocardiography is used most frequently to assess function in clinical practice, it's ability to provide an accurate measurement of RV ejection fraction (RVEF) is limited. Cardiac Magnetic Resonance (CMR) is the gold standard method for quantitative assessment of RV volumes and function, but it is expensive for routine clinical follow up and sometimes it is contraindicated. Objectives: We sought to evaluate RV systolic function by CMR and compare it with tricuspid annular plane systolic excursion (TAPSE) as an echocardiographic index to assess right ventricular (RV) systolic function in patients with repaired TOF. Methods: 156 patients (52 women) with mean age of 20 $\pm$ 5.5 years (range 12 to 42 years were evaluated. TAPSE value measured by expert echocardiographer and was compared with RV ejection fraction (EF) determined by cardiac magnetic resonance (CMR, 1.5 T) in a cross-sectional study design. Results: A positive correlation between TAPSE and RVEF derived from CMR was observed by this study. We found TAPSE less than 13.5 highly sensitive for severe RV dysfunction (92 % sensitive) which was defined as RVEF $<$ 30% in CMR. Conclusion: In adults with repaired TOF assessment of RV function by tricuspid annular plane systolic excursion (TAPSE) has significant correlation with CMR. These quantitative methods improve the assessment of RV function and serve as an additional method to assess right ventricular systolic function in patients with contraindications to CMR. It cannot be viewed as a surrogate for RVEF measured by CMR but deserves further clinical investigation.


Increased catheter stability with robotic assisted navigation during pulmonary vein isolation, does it matter? Novel cardiac MR findings

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Introduction: Durable pulmonary vein lesions is integral in minimizing pulmonary vein reconnection and subsequent post-ablation recurrences. Catheter stability, tissue contact force and RF duration are determinants of lesion formation and may be operator-dependent. Remote robotic assisted navigation systems permit accurate titration of contact force while maintaining a stable catheter position. Objectives: We sought to compare cardiac lesions imaged on cardiac MR created by standard versus robotic assisted catheter ablation by quantifying the amount of tissue injury with delayed enhancement (DE) and tissue edema with T2-weighted enhancement (T2) on cardiac MR. Methods: Thirty PAF patients (mean age 54 $\pm$ 15.4 years, twenty male) undergoing their first left atrial ablation were randomized to either robotic assisted navigation (Sensus® X Robotic Catheter System, Hansen Medical, Inc) or standard navigation. Pre and 24 hours post procedure scans were performed. Following successful electrical isolation, 60 pairs of PVs (30 right, 30 left) were imaged with DE and T2 imaging sequences. Percentages (% of circumferential DE and T2 around the PV antrum was quantified 1. DE and T2 rings (DE&T2) were then overlaid to assess the combined total % encirclement. Ratios of DE/T2(Enc) was calculated to assess the proportion of tissue injury. Results: Robotic ablation (Sensus® X Robotic Catheter System, Hansen Medical, Inc) resulted in a greater circumferential lesion extent as assessed by DE and T2. Higher % encirclement of DE and T2 means around the pulmonary vein antrum were seen in the robotic assisted procedures In both groups, areas of T2 enhancement (edema) not only overlapped with areas of DE but also filled in gaps between areas of DE resulting in increased circumferential enhancement. Combination of T2 and DE confirmed a higher % encirclement in the robotic series (94%) versus standard navigation (83%) achieving a statistical significance ($p=0.04$). A higher mean ratio of DE over (T2 $+$ DE) of 0.76 $\pm$ 0.18 versus 0.63 $\pm$ 0.30 in the robotic arm suggests greater injury. Mean energy delivered was 85.2kJ versus 82.6kJ in the robotic versus standard navigation groups.

Conclusion: In comparison to manual ablation, robotic LA ablation achieves more tissue injury and a greater degree of PV antral encirclement. This may be a function of improved stability and contact force information.


Determination of cardiac normal values of professional athletes and comparison of cardiac effects of different sport activities determined by cardiac magnetic resonance imaging

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Introduction: Professional sport activity alters morphological and functional measures of the heart. In top athletes determination of normal values has particular significance making difference trained heart from pathological forms. Objectives: Our goal was to compare cardiac
Cardiac magnetic resonance imaging findings in patients with cardiopulmonary arrest

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Introduction: Cardiopulmonary arrest is caused by a variety of causes. Late gadolinium enhancement (LGE) on cardiac magnetic resonance imaging (MRI) shows the area of myocardial infarction or fibrotic change. Some reports show the association between LGE by angiogram had the LGE of multi vessels areas. 1 patients (20%) with single-vessel lesion had lesions were found in 14 patients with ACS. 10 patients (71%) with multi-vessel disease on LGE. Other patients showed no findings. On emergent angiography, multiple coronary artery lesions were found in 14 patients with ACS. 10 patients (71%) with multi-vessel disease on angiogram had the LGE of multi vessels areas. 1 patients (20%) with single-vessel lesion had the LGE of multi vessels area. (P = 0.044). Conclusion: LGE area found in patients with some specific causes of cardiac arrest. Cardiac MRI can identify the multi-vessel infarction of the patient with out-of-hospital cardiac arrest due to ACS with multi vessel disease. The patients who had multi vessel disease on angiogram had LGE of the multi-vessel area on cardiac MRI compared with single vessel disease.

Aortic blood velocity variation a better marker of volume responsiveness compared to pulse pressure variation in ventilated patients receiving high dose vasopressors

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Introduction: Static markers of cardiac preload are poor predictors of volume responsiveness, and dynamic markers such as the pulse pressure variation (PPV) are more accurate in sedated and ventilated patient on sinus rhythm (1). However this marker is often limited by the infusion of vasopressors (2). Objectives: The purpose of this study is to compare the PPV to Aortic Blood Velocity variation (ABV) as a predictor of volume responsiveness in patients on mechanical ventilation, hemodynamically unstable receiving high dose vasopressor. Methods: 34 patients hemodynamically unstable mechanically ventilation on sinus rhythm and well adapted to ventilator receiving high dose vasopressor (> 0.3 mcg/kg/min of Norepinephrine or Epinephrine) with initial PPV <12% were included. Pulse Pressure Variation was assessed through arterial line before volume infusion (Normal saline 500ml) and Aortic Blood Velocity Variation by tanshoracic echocardiography Doppler. Volume responsiveness is defined by an increase of 15% or more of the cardiac output (CO) by echocardiography. Results: Fourteen patients (41%) were responders and 20 patients (59%) were nonresponders. Before volume expansion, PPV was statistically higher in the responder group (7.9 [1.72] vs 4.5 [2.72], p < 0.003). A PPV cutoff value of 6.8% discriminated between responders and nonresponders with a sensitivity of 58% and a specificity of 65%. The area under the curve of the receiver operating characteristic curve was 0.78 (95% confidence interval, 0.62 – 0.95). ABV was significantly higher in the responder group (10.4 [2.53] vs 5.38 [1.85], p < 0.001). An ABV cutoff value of 7.9% discriminated between responders and nonresponders with a sensitivity of 92% and a specificity of 94%. The area under the curve of the receiver operating characteristic curve was 0.98 (95% confidence interval, 0.84 – 0.99).

Comparison of diagnostic performance of MR coronary angiography with CT coronary angiography in patients with >50% coronary artery stenosis and assess its diagnostic accuracy

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Introduction: Comparison of diagnostic performance of MR Coronary Angiography with CT Coronary Angiography in patients with coronary artery stenosis and assess its diagnostic accuracy. Objectives: To compare diagnostic accuracy of MR Coronary Angiography and CT Coronary Angiography in patients with significant coronary artery disease. Methods: Twenty patients diagnosed with >50% coronary artery stenosis on CT coronary angiogram were re-evaluated in their follow up with an MR coronary angiogram. All Patients were given Beta-blockers and Glyceryl trinitrate nitrate spray just prior to scanning. An ECG triggered, respiratory gated 3D Navigator MR coronary angiography of the right and left coronary arteries was obtained with TrueFISP sequence using the 1.5T MR system (SIEMENS AERA). The acquired MR images were compared to the CT coronary images by both two dimensional and quantitative vessel analysis techniques. For each patient, the left main and the segments in the three major coronary arteries (the proximal, mid and distal segments of the left anterior descending, left circumflex and the right coronary arteries) were assessed comprising of a total of 10 coronary segments per patient and a totally
of 200 segments for the twenty patients. **Results:** Of the total of 200 coronary segments evaluated, 25 segments had significant (>50%) stenosis on CT Coronary Angiography. All the 25 segments were also significant (>50%) stenosis on MR Angiography. None of the segments which had (<50%) stenosis on CT Coronary Angiography were found to have significant stenosis on MR Coronary Angiography. Therefore all 25 segments were found to have similar stenosis on both modalities. Of the significant 25 stenotic segments on CT Coronary Angiography, 15 segments (60%) showed similar stenosis on MR Coronary Angiography. 7 segments had a higher estimated stenosis (6–10%) on CT Coronary Angiography which may be partially explained by significant calcium in the segment, over-estimating the plaque and 3 segments had a higher percentage of stenosis on MR Coronary Angiography. **Conclusion:** Although Conventional Angiography is the gold standard and CT Coronary Angiography the foremost alternative, this pilot study has shown that MR Coronary Angiography is comparable to CT Coronary Angiography in the diagnosis of significant coronary artery disease. Future studies in comparing MR Coronary Angiography with Conventional Angiogram will be useful.

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**Coronary atherosclerotic plaque characterization with multimodality imaging in ex vivo human hearts**

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**Introduction:** Coronary artery disease (CAD) is a major cause of morbidity and mortality worldwide. The data gained from invasive and non-invasive imaging technologies may form the basis for new advances in the treatment and monitoring of atherosclerotic disease. **Objectives:** To investigate the ability of coronary computed tomography angiography (CCTA), intravascular ultrasound (IVUS), and optical frequency domain imaging (OFDI) to differentiate between early and advanced coronary plaques. **Methods:** From nine coronary artery 379 histological cuts were acquired, co-registered across CCTA, IVUS, OFDI and histology and assessed for the presence and composition of atherosclerotic plaque. **Results:** Cross sections without plaque in CCTA and with fibrous plaque in OFDI were almost never advanced lesions in histopathology (OR: 0.02 and 0.06, respectively; both p < 0.0001). Similarly, cross sections with plaque in OFDI and fibrous plaque in CCTA were almost never advanced lesions in histopathology (OR: 2.5, p < 0.0003; OR: 2.6, p < 0.0016; OR: 31.2, p < 0.0001, respectively). OFDI had a higher accuracy to discriminate early from advanced lesions as compared to IVUS and CCTA (area under the curve: 0.858 [95% CI: 0.802–0.913], 0.831 [95% CI: 0.554–0.709], and 0.679 [95% CI: 0.618–0.740]; respectively, p < 0.0001). The inter-observer agreement was excellent for OFDI and CCTA (κ = 0.87 and 0.85, respectively) and good for IVUS (κ = 0.66). **Conclusion:** Systematic and standardized comparison between invasive and non-invasive modalities for coronary plaque characterization in ex vivo human hearts demonstrated that CCTA and IVUS are reasonably associated with histological plaque type while OFDI was strongly associated. The overall performance of OFDI to differentiate early from advanced plaque is significantly better than that of IVUS and CCTA. Our data may help to develop initial concepts of sequential imaging strategies to identify patients with advanced coronary plaques.

**0102**

**0103**

**Do you know the radiation dose your patients have received? A pilot study**

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**Introduction:** Despite the fact that there has been a huge increase in the number of procedures related to the use of ionizing radiation in the United States over the last several years a radiation history is not recorded in patients' medical records. **Objectives:** Determine the level of radiation exposure over a six year period in patients admitted to an inpatient cardiology service because of chest pain and to highlight the need for attention to these levels because of the potential life time attributable risk (LAR) for cancer. **Methods:** Radiology records of a series of 200 patients admitted to a cardiology teaching service for complaints of chest pain were reviewed to determine the number of radiologic procedures that they undergone over the previous six years at the University of Florida. These data do not include radiation exposure at other sites. **Results:** Over a six year period, the total number of radiologic procedures performed in 200 chest pain patients was 5,586. The total estimated radiation received by the 200 patients was 15,036 mSv. Median age was 59 years with a range of 21–88 years. Fifty-four percent (n = 92) were male, mean age 64.1 years, mean HbA1c 7.0% were enrolled in this study and performed detailed cardiac workup including 320-row cardiac computed tomography angiography (CCTA) to assess asymptomatic CAD in type II DM patients. **Methods:** Consecutive asymptomatic type II DM patients (71 male, mean age 64.1 years, mean HbA1c 7.0%) were enrolled in this study and performed detailed cardiovascular workup including medical interview, laboratory study, physical studies (flow mediated vasodilation; FMD, Applanation tonometry; ARTA), imaging studies (CCTA, Cardiac ultrasound, DUS, Transesophageal echocardiography, TTE, TTEi) and all patients were divided into following criteria by CCTA (Group 0-no coronary plaque, Group 1-mild coronary plaque, Group 2-severe coronary plaque) and statistically analyzed by each parameter. **Results:** Results are shown in the Figures. **Image/graph:**

**0104**

The prognostic value of nonobstructive coronary artery disease on coronary computed tomographic angiography

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**Introduction:** The prognostic significance of nonobstructive coronary artery disease (CAD) on coronary computed tomographic angiography (CCTA) is not well demonstrated. **Objectives:** We tested the hypothesis that non obstructive CAD on CCTA is associated with increased all cause mortality or myocardial infarction (MI). **Methods:** We prospectively followed 715 consecutive symptomatic patients without known CAD who underwent 64-detector row CCTA. Patients with obstructive (50%) CAD by CCTA were excluded. Patients were followed up for DMI (median follow-up 1.7 years). Multivariable Cox regression was used to determine the independent predictors DMI. **Results:** A total of 341 (48%) and 374 (52%) patients had normal CCTA and non obstructive CAD on CCTA respectively. Patients with CAD were older (p < 0.001) with higher prevalence of hypertension (58% vs. 42%, p < 0.0001), diabetes (24% vs. 14%, p < 0.0001) and dyslipidemia (75% vs. 55%, p < 0.0001). After a median follow-up duration of 1.7 years, 23 patients died and 10 patients experienced myocardial infarction. Using multivariable Cox regression, the presence of non obstructive CAD was associated with increased risk for death/MI (Hazard ratio 2.8, 95% confidence interval 1.2–6.7, p = 0.02) after adjusting for confounders. **Conclusion:** The presence of nonobstructive CAD on CCTA of asymptomatic patients is independently associated with worse outcomes.
Conclusion: Ten years may be an optimal timing of detailed checkup for asymptomatic CAD in type II DM patients.

Evaluation of myocardial CT perfusion in patients presenting with acute chest pain to the emergency department: comparison with SPECT-MPI

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Introduction: Coronary CTA is an effective modality used in the ED. The added value of CT myocardial perfusion evaluation has not been defined yet. Objectives: to evaluate resting myocardial CT perfusion (CTP) from coronary CT angiography (CTA) datasets in patients presenting with chest pain (CP) to the ED, in comparison with myocardial SPECT. Methods: 76 patients (mean age 54.9±13; 42% females; 13% prior coronary revascularization and 16% with prior MI) presenting with CP to the ED underwent coronary 64-slice CT-Angiography (CTA). Myocardial perfusion defects were evaluated for CTP employing an AHA 17-segment model. CTP results were compared to rest sestamibi SPECT myocardial perfusion imaging (MPI) per-patient and per-segment. CTA was assessed for >50% stenosis per vessel and compared to stress/rest SPECT. Combined CTA/CTP approach was tested using vessel territory-based method. A quantitative approach was tested. Results: CTP demonstrated an sensitivity of 92% and 99%, specificity of 95% and 99%, positive predictive value (PPV) of 89% and 82%, and negative predictive value (NPV) of 98% and 99% on a per-patient and per-segment basis, respectively. The intermodality agreement of CTP to SPECT-MPI was kappa = 0.82 (p = <0.001). CTA showed an accuracy of 92%, sensitivity of 70.4%, specificity of 95.5%, PPV 67.4%, and NPV of 95% as compared to SPECT-MPI. Addition of CTP findings to CTA improved the PPV from 67% to 90.1%, primarily by reduced false positives. Conclusion: In patients presenting to the ED with CP, the evaluation of rest myocardial CTA demonstrates high diagnostic performance as compared to SPECT-MPI. Addition of CTP to CTA improves the diagnostic accuracy of CTA, primarily by reducing rates of false positive CTA.

Prevalence of coronary artery calcification in patients with normal 99Tcm-MIBI myocardial SPECT versus calcium score

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Introduction: The value of myocardial perfusion studies in the diagnosis of patients with ischaemic heart disease (IHD) has been well-established. However, it is not so sensitive in identifying coronary atherosclerosis. Coronary Artery Calcium Score (CACS) using the multi-slice computer tomography (MSCT) is excellent in diagnosing coronary atherosclerosis and reports have shown nearly 100% specific for presence of atheromatous coronary plaque. Objectives: In this study, we compare the prevalence of coronary calciumification in symptomatic patients with a normal 99Tcm-MIBI myocardial SPECT. Methods: A retrospective analysis was performed on symptomatic patients, who have undergone 99Tcm-MIBI myocardial SPECT and CACS in our institution from 2007–2011. A total of 1021 patients with clinically normal 99Tcm-MIBI myocardial SPECT and CACS were included in the study. SPECT imaging was performed on a GE scanner either with exercise stress or pharmacologic stress. Calcium scores were obtained using Aquilion One MSCT scanner. SPECT Imaging and calcium score tests were within 6 months of each other with no intervention in between. Results: 1027 patients were included in the study. The mean age was 56.9 (± 10.8). There were 718 males and 302 females (M:F). 37.4% MIBI is positive, while 62.6% of CACS performed were positive. 18.9% (193) calcium scores are >400. In patients with negative MIBI (2098), 64% had positive calcium scores. 15.4% of these cases have calcium score >400. Conclusion: In our study, even though a MIBI scan is negative, it does not mean that there is no coronary atherosclerosis. Here, 62.6% of cases showed the presence of coronary calcification and in 16.9% of these cases, the calcium score is >400. It is possible that in high-risk patients, a negative MIBI may be indicative of a negative, as noted in previous studies, in the presence of balanced ischaemia. In such patients, performing a CACS using the MSCT may be a good option. Further presence of balanced ischaemia. In such patients, performing a CACS using the MSCT may be a good option. Further presence of balanced ischaemia. In such patients, performing a CACS using the MSCT may be a good option.

Transcatheter interventions for multiple lesions in adults with congenital heart disease

Tahir Hamid1,*, Bernard Clarke1, Vaikom S. Mahadevan2
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Introduction: Historically congenital heart disease patients with multiple cardiac lesions have been referred for surgery, however with the advent of newer technologies and expertise, transcatheter treatment has evolved as an alternative option. Objectives: To demonstrate that patients with complex congenital heart disease can safely undergo multiple devices interventions without the need for surgery. Methods: We retrospectively analysed patients who underwent transcatheter interventions on more than one lesion at a leading tertiary care centre over a period of 2 years (January 2006–December 2008). Procedural data was obtained from the database and clinical follow-up data was obtained by reviewing medical notes. Results: There were 8 adult patients with congenital heart disease where more than one lesion was treated using an interventional procedure during the study period. Mean follow-up period was 16.8 ± months with a mean age of 39.0 ± 20 years. Demographic characteristics and procedural details are shown in Table 1. Images are shown as figure 1 and Figure 2.

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Conclusion: Complex congenital heart disease patients with multiple pathologies would have undergone a surgical approach until recently, but with the advent of newer techniques has led to the treatment with interventional percutaneous techniques obviating the need for complex surgery.

Psychosocial adjustment of patients with congenital heart disease

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1Department of Psychology, ISCS-N (CESPU), 2UNIPSA/CLS (CESPU), Gandra PRD, 3Hospital S. João, 4Faculty of Nutrition, University of Porto, 5Department of Pediatric Cardiology, Hospital S. João, 6Oporto Medical School, University of Porto, 7CINEIC, University of Coimbra, Coimbra, Portugal

Introduction: Progress in diagnosing, pharmacological treatment and surgery, has resulted in significantly improved survival rates among patients with Congenital Heart Disease (CHD). Objectives: We aimed to study Psychosocial Adjustment (PSA), Psychiatric Morbidity (PM), Quality of Life (QOL), School Performance (SP), Physical Limitations (PL), and Social Support (SS) of adolescents and young adults with CHD. Methods: We evaluated 99 CHD patients, 57 males, aged from 12 to 26 years old (M=18.12 ± 3.65), 55 cyanotic. The participants were interviewed on such topics as SS, family-educational background, self-image, PL and emotional adjustment, were administered a standardized psychiatric interview (SDS-L) and completed self-report questionnaires on QOL (WHOQOL-BREF) and PSA (YSR and ASR). Observational versions of the same questionnaires (CBCL, ABCL) were filled by one of their relatives. Full clinical and demographic history was collected. Results: We found a 21% rate of lifetime prevalence of psychopathology (14% in males and 31% in females) and 49% of school retentions (M=1.52 years ± 0.50). Patients with severe forms of CHD showed worse PSA than those with moderate and mild forms of illness (u = 762,000; p = 0.026), those submitted to surgery showed worse QOL on physical (t = 2.396; p = 0.019), psychological (t = 2.327; p = 0.022), SR (t = 1.711; p = 0.033) and general (u = 534,500; p = 0.040) dimensions, and worse PSA (more withdrawn: u = 506,500; p = 0.028). Participants without pharmacological therapy revealed better QOL in general domain (u = 1048,500; p = 0.024). SS has a great impact improving patients’ physical (t = 2.752; p = 0.007), psychological (t = 3.396; p = 0.001), SR (t = 4.699; p = 0.000), environment (t = 2.805; p = 0.006) and general (u = 482,000; p = 0.000) QOL and poorer SS resulted in more withdrawn (u = 499,000; p = 0.003) and social problems (u = 577,500; p = 0.022). Patients with more PL showed worse physical (t = 2.088; p = 0.039), psychological (t = 2.607; p = 0.011), SR (t = 2.267; p = 0.026) and general (u = 700,500; p = 0.000) QOL and more withdrawn (u = 783,500; p = 0.006). Female patients showed more somatic complaints (u = 205,000,p = 0.037), anxiety/ depression (u = 736,000;p = 0.002), aggressive behavior (u = 688,000;p = 0.000), thought problems (u = 624,000; p = 0.007), internalization (u = 716,000;p = 0.001) and externalization (u = 805,200;p = 0.038). Good performance in school also showed a significant impact increasing QOL and PSA. Conclusion: The PSA and QOL of patients with CHD are crucial. SS, PL, and SP have a significant impact over them.

Right ventricle function and exercise capacity in young people long term after surgical treatment of tetralogy of Fallot

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Introduction: In patients after surgical repair of tetralogy of Fallot (TOF) one of the important problems is pulmonary regurgitation which may lead to right ventricle dilatation and dysfunction. Objectives: The aim of study was evaluation of exercise capacity/function of circulatory system in young people, long term after surgical treatment of tetralogy of Fallot (TOF). Methods: We observed 35 pts. (12 woman and 23 man) aged 19–23 yrs (mean age 21.2) after correction of TOF. TOF was corrected at the age 10 months to 8th years of life. All pts underwent echocardiography examination and cardiopulmonary exercise treadmill test (ETT). Right ventricle diameter (long parametral view) and function by evaluation of tricuspid annular plane systolic excursion(TAPSE), pulmonary valve function with evaluation of pulmonic valve regurgitation fraction (PRFR), tricuspid regurgitation gradient (TRG), left ventricle function, ETT duration and workload, and max oxygen uptake (VO2max) and anaerobic threshold (AT) were evaluated. Values of VO2max and ETT work were also expressed as % of predicted values. Results: Left ventricle function was in normal limit (57.7%). Right ventricle dilatation (35.3 mm), decreased value of TAPSE (21.1 mm) and significant pulmonary valve insufficiency with PRFR 42.8 % as well as tricuspid regurgitation with TRG 47.1 mmHg were observed in all pts. Restrictive pattern of right ventricle was revealed in 6 pts (24%). Higher values of TAPSE (29.8 vs 20.8 mm; p = 0.03) and lower values of PRFR (38.7 vs 44.9%: p = 0.03) and TRG (44.8 vs 38.7 mmHg: p = 0.04) were noticed in patients with restrictive right ventricle. Exercise was well tolerated by all pts – they achieved about 88 % of predicted workload (167 W). Mean metabolic workload was 14.2 METS. Value of VO2max was decreased in all pts (24.7 ml/kg/min) as well as AT (0.91/mm), in relation to predicted values (50.5%). There were no significant differences of cardiopulmonary exercise treadmill test parameters between patients with and without restrictive right ventricle. Conclusion: Young people after surgical treatment of tetralogy of Fallot revealed good exercise tolerance in spite of mild to moderate right ventricle dilatation and pulmonary insufficiency. Exercise capacity did not differ significantly between patients with and without restricted right ventricle although pulmonary regurgitation was less pronounced in pts with restrictive RV pattern.

Clinical features of an adult population with aortic coarctation. Long term follow up and outcome

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Introduction: Since coarctation of the aorta (CA) is one of the most frequent congenital heart anomalies reaching adulthood, it is appropriate to investigate its course in adults. Objectives: To describe clinical features and outcomes of adults with CA. Methods: Observational retrospective study from a registry of 567 adults with congenital heart disease. CA prevalence was 10.9% (84 patients, 53% male). Mean age and range were 25.8 ± 9.2 and 15–55 years respectively. Patients with complex heart defects were excluded. The provenience (transition and/or surgical) was considered significant (confidence interval 95%). Results: Transition patients represented 62.5% of the total. Associated defects were found in 39% (bicuspid aortic valve 56%, ventricular septal defect 20%, subvalvar aortic stenosis 20% and bery aneurysms 4%). The prevalence of genetic syndromes was 7.8 % (80% Turner syndrome). Sixty four percent were treated surgically and 36% by interventional catheterization (77% balloon angioplasty and 23% stenting). ARC occurred in 30%, 60% of these had had surgery, and 10% each balloon angioplasty and stenting (p 0.28 for surgery with respect to interventions and NS between the interventional procedures). With regard to the age at the initial treatment in ARC in patients <1 and >1 year for surgery and angioplasty the p values and odds ratios were 0.23 (1.05) and 0.3 (1.3) respectively. SH requiring treatment was present in 20% 40% after surgery and 60% postangioplasty (p 0.05, odds ratio 0.7). Aortic aneurysms were found in 7.8%, all from the surgical group but one patient diagnosed before treatment requiring repair. Stroke occurred in 4.7% (3 patients), in 2 of them was the cause of referral. Conclusion: CA represents 10.9% of the patients in a registry of adults with congenital heart disease. Most come from transition. Associations are frequent, mainly bicuspid aortic valve. ARC occurred in 1/3 of patients and we found no significant difference with regard to the type and age of treatment. Aortic aneurysm presented mostly in surgical patients. SH was more frequent postangioplasty probably because this procedure is performed at an older age.
Mid-term results of mechanical pulmonary prostheses in adults with congenital heart disease: importance of anticoagulation

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Introduction: Pulmonary valve replacement (PVR) is performed increasingly late after correction of Tetralogy of Fallot (TOF). Most valves are replaced with an allograft or xenografts, although reparative procedures are the rule. Mechanical prostheses have less favorable long-term outcome due to the need for anticoagulation. We evaluated the midterm results of 38 mechanical valve replacements in the pulmonary position.

Methods: Between 2003 to July 2008, 122 patients underwent PVR. TOF was the common basic lesion. Thirty-eight patients underwent mechanical pulmonary prosthesis at the age of 25 ± 8.4 years (range 14 to 60 years) and female/male was 13/25 were enrolled. Seven patients (18.4%) had malfunctioning pulmonary prosthesis.

Results: Between 2003 to July 2008, 122 patients underwent PVR. The mean age of all patients was 25 ± 14.2 years. The most common basic lesion was Tetralogy of Fallot (TOF) (87%). Thirty-eight patients underwent mechanical pulmonary prosthesis mean ± SD of age was 25 ± 8.4 years (range 14 to 60 years) and female/male was 13/25 were enrolled. Seven patients (18.4%) had malfunctioning pulmonary prosthesis.

Table 1. Prosthesis malfunction in association with patients findings

<table>
<thead>
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<th>Malfunction</th>
<th>P Value</th>
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<tr>
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<tr>
<td>Age (years)</td>
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</tr>
<tr>
<td>Sex (M/F)</td>
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<tr>
<td>Male/Female</td>
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<tr>
<td>MVR</td>
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<td>Mean Pressure Gradient (mmHg)</td>
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<tr>
<td>Severe</td>
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Conclusion: Pulmonary valve mechanical prostheses can be performed with promising midterm results. Most of the prostheses malfunction respond to fibrinolytic therapy. We suggest intensive anticoagulant therapy in these patients.

Arrhythmia symptoms with and without arrhythmias in patients monitored with transtelophonic ECG after AF-ablation

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Introduction: Clinical follow-up after radiofrequency catheter ablation (RFA) for atrial fibrillation (AF) is based on data from questionnaires, 12-lead ECG or Holter monitoring. We investigated the correlation between symptoms and rhythm following AF-ablation using transtelophonic ECG-monitoring with thumb-ECG (Zenicor, Zenicor Medical System AB, Sweden).

Methods: All patients (pts) ablated for AF during 2009 were studied four months after RFA using the Zenicor system for ambulatory ECG-monitoring. The system consists of a device that measures 4.3x3.1x0.4 inches. The patient applies both thumbs onto two sensors on the device and a single lead ECG is recorded (lead I). The recorded ECG can then be sent from any telephone at any time.

Results: Seventy pts (124 male, 59.7 ± 8.4 years, 13 % structural heart disease, 34 % hypertension) were analyzed. Encircling of the pulmonary veins with PV isolation could be achieved in 96% of cases. Some patients wished no re-operations or have significant right ventricular (RV) dysfunction which makes them high risk for frequent operation.

Conclusion: The ablation of complex fragmented atrial fibrillation (AF) does not influence 12-month success of pulmonary vein isolation for the ablation of atrial fibrillation: a prospective randomized study

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1Institut Clin del Torax, Hospital Clinico Universitari de Barcelona, Barcelona, Spain

Introduction: The ablation of continuous and fragmented potentials has been proposed as an adjuvant therapy to the isolation of the pulmonary veins (PV) in an effort to improve results.

Conclusion: The ablation of complex fragmented atrial fibrillation (AF) does not influence 12-month success of pulmonary vein isolation for the ablation of atrial fibrillation.
Robotic navigation for catheter ablation of paroxysmal and persistent atrial fibrillation: a single-center experience after 110 cases

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Introduction: The Sensel™ robotic navigation system (Hansen Medical, Mountain View, USA) enables remote catheter navigation via a robotic steerable sheath (Artisan™, Hansen Medical). Objective: Our aim was to report our experience with the Sensel™ system regarding the treatment of patients (P) with paroxysmal and persistent atrial fibrillation (AF). Methods: Between September 2009 and November 2010, 110 P (59: 9 years, 89 males) underwent robotic circumferential pulmonary vein isolation (PVI) for paroxysmal AF (56, 51%) or paroxysmal or persistent AF (144, 49%). The mean procedure time was 253 (range 120–460) minutes. The mean fluoroscopy time was 13 (range 0–100) minutes. The mean cardiothoracic bypass time was 65 (range 40–120) minutes. The mean number of lesions performed was 41 (range 18–60). Freedom from atrial arrhythmias (both P and AF) was achieved in 50 (45.5%) patients. Results: PVI in all pulmonary veins was achieved in 103 P (94%). In 7 P (6%), one pulmonary vein could not be isolated, respectively. Block along the roof line could be achieved in all cases. The mean procedure time was 237 ± 51 minutes (232 ± 50 minutes in paroxysmal AF versus 242 ± 48 minutes in persistent AF, p < 0.05). The mean fluoroscopy time was 27 ± 8 minutes (27 ± 9 minutes in paroxysmal AF versus 26 ± 8 minutes in persistent AF, p < 0.05). The mean operator’s fluoroscopy exposure was 13 ± 6 minutes. As complications, two groin hematomas requiring transfusion and one pericardial tamponade after the end of the procedure requiring pericardiocentesis occurred, respectively. After a median follow-up of 9 months (range 3–14 months), the success rate after a single procedure was 65% for P with paroxysmal AF and 52% for P with persistent AF, respectively. Success rates increased to 75% in paroxysmal AF and 74% in persistent AF respectively, after a second procedure (in 22% of P with paroxysmal AF and in 40% of P with persistent AF). Conclusion: Remote navigation with the Sensel™ robotic system is effective, safe and requires limited fluoroscopy. We recorded 1.5 P, short- to mid-term success rates for P with paroxysmal and persistent AF were comparable to other technologies.

Changes of biochemical marker of brain injury induced by head-up tilt test related syncope in patients with vaso-vagal syndrome

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Introduction: Syncope is an example of a temporal, global hypoperfusion of brain, which may lead to brain injury. Objectives: Evaluation of injury influence of vaso-vagal syncope (VS) during head-up tilt test (HUTT) on the brain by analysis of myocardial oxygenation and serum level of neuron-specific enolase (NSE), the biochemical marker of brain neurons injury. Methods: Study population: 60 pts (38 women) aged 18–74 years (mean age 35.6), with VS, referred to HUTT. Other then reflex reasons of syncope were previously excluded in all pts. All pts underwent HUTT according to Westminister protocols. During HUTT regional saturation (rSO2) of frontal lobes of brain was measured using INVOS cerebral oximeter in all pts. Changes of rSO2 during HUTT was expressed as a relative decrease (%rSO2) in rSO2 in left and right channels in relation to baseline (rSO2) values. Blood sample for NSE serum level measurement was collected before and after HUTT, every 24 hours after HUTT. An increased level of NSE (N > 500 ng/ml) after HUTT was calculated. All results were analyzed in relation to the type of vaso-vagal response to orthostatic stress during HUTT (acc. to VASIS scale). Results: HUTT was positive in 51 pts (85%). Mixed type of VS was noticed in 28 pts (46%), cardiodepressive in 17 pts (28%), orthostatic in 7 pts (11%). NSE concentration before HUTT was in normal range. We observed the significant increase of NSE serum level 1 hour after HUTT in all pts in whom syncope was induced during the test, with normalization after 24 hours respectively (3.3, 4.2 and 2.5 ng/ml, p < 0.01). In 5 pts (8.3%) an increased normal range (12 ng/ml) 1 hour after HUTT. There were no significant changes of NSE serum levels in pts with negative results of HUTT (respectively: 6.1, 4.1 and 2.7 ng/ml, p > 0.02) NSE increase did not differ significantly between different types of vaso-vagal response. Increase of serum concentration of NSE during HUTT significantly correlate with desaturation (increase of oxygenation of frontal lobes of the brain) preceding syncope (r: 0.27, p < 0.04). There were no correlation between NSE increase after HUTT and age of pts and HUTT duration. Conclusion: Vaso-vagal syncope may lead to brain injury by hypoperfusion of brain, so we should pay attention in daily life.
Ivabradine in the treatment of vasovagal syncope

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Introduction: Ivabradine, a drug which inhibits diastolic depolarization of the sinoatrial node, is reported valuable in treatment of postural orthostatic tachycardia syndrome and in the management of cardiac pain, both conditions are where tachycardia is considered undesirable. Some patients with vasovagal syncope (VWS) show heart rates (HR) >120 bpm prior to vasovagal collapse on tilt testing. Ivabradine may therefore offer benefits also to these patients on the basis that prevention of tachycardia may avoid syncope. There are therapeutic agents of proven value in VWS. Objectives: We undertook a single centre prospective study of tit positive VWS patients, referred for investigation of recurrent syncope, with a HR >120 bpm prior to vasovagal collapse. Patients were recruited after the tilt test, treated with ivabradine in the absence of other medications and followed 3-monthly as out-patients. Methods: Patients received the adult dose of Ivabradine, 5mg twice daily during the observation period.

Results: There were 21 females and 6 males; their mean age was 24.9 years at recruitment (18–35). Twenty-five patients received benefit from the drug and, of these, 20 became asymptomatic during a follow-up period of 14 months (3–24). Two patients received no benefit and the drug was discontinued. After 18 months, four patients had the drug phased out without recurrence of symptoms. There were no severe side-effects prompting cessation of the drug. Conclusion: Ivabradine has an established role in the management of cardiac pain but it may be useful in other conditions where limitation of peak heart rate is appropriate. This small series of vasovagal syncope patients with a notable, tachycardia before collapse may point to the possibility of another indication for this drug. We believe that this study justifies a large randomized controlled trial of Ivabradine in treatment of tachycardiavagal vasovagal syncope.

Influence of co-morbidity on the occurrence 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 influence of concomitant disorders on the occurrence of depression syndrome (DS) in patients with vasovagal syncope. Methods: We observed 290 pts (180 women, 110 men) aged 18–72 (median of age 41.5 years), with diagnosed vasovagal syncope (VWS). Depression Beck Score questionnaire (DBSq) was applied to all pts for evaluation of presence of DS. Mild DS was defined if Beck Score ranged between 10 and 19, mild 20–25 and severe >25. Results: We observed concomitant disorders (evaluated together) at least in 55% of pts. Depression Beck Score in patients with DS was significantly higher (P<0.0001) in comparison to patients in which DS was not observed (P=0.006). Depressive symptoms were more frequent in patients with DS (54.9 vs. 34.7%, p=0.001). Significant prevalence of DS was particularly noticed in patients with history of arterial hypertension (HA), coronary artery disease (CAD), non-insulin dependent 2nd type of diabetes mellitus (NID-M) and dyslipidemia on the occurrence of depression syndrome in patients with VWS. 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. Concomitant disorders were noticed in 122 pts (42.1%): HA in 102 pts (33.2%), CAD in 55 (19.0%) pts, dyslipidemia in 80 pts (27.6%) and NID-DM – in 12 pts (41%). The prevalence of DS was significantly increased in patients with HA (68.5 vs. 34.6%; p<0.0001), CAD (52.7 vs. 40%; p<0.05), dyslipidemia (52.5 vs. 36.8%; p<0.02) and NID-DM (63.8 vs. 41%; p<0.0001). Conclusion: Depression syndrome, in spite of age-correlation, is also related to intensity of cardiovascular disorders like arterial hypertension, coronary artery disease or dyslipidemia.
Heart failure (HF) is a progressive disorder characterized by high morbidity and mortality. Serum markers provide the prediction ability, including the serum markers of extracellular matrix turnover, adipokines, and brain natriuretic peptide (BNP).

Each patient has a diagnosis of HF resulting from left ventricular systolic dysfunction (ejection fraction <50%). Serum BNP, MMP-2, PIIINP, resistin were checked. Results: A total of 116 patients were enrolled. The mean age is 61 years old and mean NYHA functional classification is 2.1. The follow-up period in other 108 patients was 773 ± 333 days. The ROC curve for the mortality analysis is shown in Figure 1. The AUC of ROC curve for resistin, PIIINP, BNP, MMP-2 are 0.707, 0.547, 0.555, 0.727, respectively. The ROC curve for heart failure admission analysis is shown in Figure 2. After adjusting age and NYHA FC, resistin and MMP-2 remained significantly associated with mortality (table 1 and 2).

**Table 1** Multivariate analysis of Cox regression to predict mortality

<table>
<thead>
<tr>
<th>Variable</th>
<th>Odds ratio (95% CI)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>1.044 (1.007; 1.082)</td>
<td>0.020</td>
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<tr>
<td>Resistin</td>
<td>1.012 (1.000; 1.025)</td>
<td>0.036</td>
</tr>
<tr>
<td>MMP-2</td>
<td>1.044 (1.000; 1.089)</td>
<td>0.005</td>
</tr>
<tr>
<td>BNP</td>
<td>1.044 (1.003; 1.089)</td>
<td>0.033</td>
</tr>
</tbody>
</table>

Exclude variable: Cre and BMI

**Table 2** Multivariate analysis of Cox regression to predict mortality

<table>
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<tr>
<th>Variable</th>
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Exclude variable: Cre and BMI

**Conclusion:** In conclusion, resistin and MMP-2 offer good prognostic tools for HF outcome prediction.

**References:**

**Common beta adrenergic receptor polymorphisms and the progression of heart failure following first acute myocardial infarction**

**Introduction:** Polymorphisms of the beta adrenergic receptor (ADRB) gene, including ADRB1 codon 389 and ADRB2 codon 27 SNP’s have been described to show associations with heart failure (HF) and sudden cardiac death in certain populations. **Objectives:** In this study Hungarian patients with HF following myocardial infarction were examined and markers of HF, including diastolic dysfunction were correlated with ADRB genotypes during follow up. **Methods:** Patients (n=66) have been enrolled following first acute ST segment elevation myocardial infarction (STEMI), inclusion criteria were (1) no history of HF, (2) no prior myocardial infarction, (3) no prior beta adrenergic receptor blocker treatment, (4) left ventricular ejection fraction (LVEF) ≤40% during the acute event, and (5) successful coronary revascularization. Metoprolol treatment has been introduced and 1 year later echocardiography was performed and plasma BNP was measured. Patients were genotyped for ADRB1 Arg389Gly and ADRB2 Gln270Glu using RFLP and RT-PCR genotyping assays. **Results:** Age was 64.2 ± 1.9 (mean ± SEM) and female to male ratio was 35:51. Dosage of metoprolol was 59.5 ± 3.8 mg (mean ± SEM). LVEF improved during 1-year follow up (from 36.3 ± 1.0% to 42.9 ± 1.9%, mean ± SEM, respectively, P<0.005). ADRB1 389 Arg/Arg 47.9%, Arg/Gly 48.3%, Gly/Gly 3.8% and ADRB2 27 Gln/Gln 38.9%, Gln/Glu 46.7%, Glu/Glu 14.4% genotype distributions had no gender difference. No association of ADRB polymorphisms with mortality, LVEF and metoprolol dosage was found. BNP plasma levels were, however higher in the ADRB2 Gln allele carriers (Gln/Gln, Gln/Glu), than in Gln/Gln patients (Glu/Gln, Glu/Glu) patients (1471±206 vs 826±139 pg/mL, mean ± SEM, respectively, P<0.03). **Conclusion:** In this study Hungarian patients with first STEMI and novel HF carrying the ADRB2 Gln allele had higher BNP levels than Glu homozygous patients. The ADRB1 389 Gly allele was associated with higher NYHA class in these post-infarct patients. Further multicenter studies are needed to clarify impact of our observations in this selected heart failure population.

**Reference:**
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**Image/graph 1:**

**Image/graph 2:**

**Reference:**
Prognostic value of galectin-3 and cardiac extracellular matrix markers in patients with chronic systolic heart failure

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Introduction: Galectin-3 (Gal-3) is one of the most likely mediators between macrophage activation and myocardial fibrosis. In recent studies, Gal-3 shows the ability of survival prediction in heart failure (HF) patients. However, in our previous study, the association of Gal-3 and serum markers of cardiac extracellular matrix (ECM) turnover are very strong. Cardiac ECM markers also show great prognostic implications in previous studies. Objectives: We compared the impact of galactin-3 and serum markers of cardiac ECM turn over on prognostic prediction of chronic systolic HF patients. Methods: Patients with chronic HF manifestations and a left ventricle ejection fraction (LVEF) <50% were enrolled in this study. Gender, age, medications, serum biochemical data, and outcomes of heart failure were recorded. Serum Gal-3, brain natriuretic peptide (BNP), extracellular matrix including type I and III and amionic proteoglycan of procollagen (PNI-PiP) and matrix metalloproteinase-2 (MMP-2), and tissue inhibitor of metalloproteinase-1 (TIMP-1) were analyzed. The primary outcome is all-cause mortality and the secondary outcome is all-cause mortality and hospitalization due to HF.

Results: A total of 105 (82 males and 23 females) patients were enrolled. The age was 62±15 y and LVEF was 37±10%. Their mean NTHA functional class was 2.1. Log Gal-3 is significantly correlated to log TIMP-2 (p<0.003), and log TIMP-1 (p<0.003), and log PNP (p<0.007), and log BNP (p=0.004). Seventeen patients died during 762±330 days follow-up. Using a univariate Cox proportional hazards regression, log TIMP-1 (HR=70.492, p=0.001), log MMP-2 (HR=516.357, p=0.001), and log PNP (HR=17.882, p=0.038) are strongly correlated to mortality. TIMP-1 is borderline correlated with mortality (HR=8.124, p=0.054), log PNP and log BNP are not correlated with mortality. After adjusting age and NYHA function classification, log MMP-2 remained significantly associated with mortality. For secondary outcome analysis, log-TIMP and log-MMP are strongly correlated with secondary outcome (both p<0.001), but not the other parameters. Conclusion: Serum Gal-3 level is highly correlated with serum cardiac ECM markers. High serum MMP-2 and TIMP-1 are highly associated with poorer survival in patients with chronic systolic HF but serum Gal-3 level is borderline correlated with outcome.

Dilated cardiomyopathy in Sub-saharan Africa: data from the Abeokuta heart disease registry

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2 Preventive Health, Preventative Health Baker Di Heart and Diabetes Institute, Melbourne,
3 Preventive Health, Preventative Health Baker Di Heart and Diabetes Institute, Melbourne,

Introduction: Dilated cardiomyopathy is one of the common causes of Heart failure in Sub-Saharan Africa. It is responsible for 10–40% of cases of heart failure with regional differences. In Nigeria previous report indicates that it is responsible for 8% to 47% cases of heart failure in hospital based clinical studies. The clinical as well as echocardiographic features of this disease has been scarcely studied. Objectives: We therefore used data from the Abeokuta Heart Failure Registry to explore the clinical as well as echocardiographic features of DCM. Methods: The study was conducted at the Federal Medical Centre, and sacred Heart Hospitals in Abeokuta. Eligible subjects were those with new onset HF or decompensated chronic established HF. The Framingham criteria were used for diagnosis of HF and all cases were confirmed by echocardiography. A standardized protocol was used to collect information on demographics, medical history, symptoms, signs, investigations as well as medication and outcome of patients. Diagnosis of DCM was made on the basis of exclusion of hypertension, diabetes, ischaemic heart disease, rheumatic heart disease coupled with echocardiographic features. Results: Seventy eight (78) cases of DCM were included. There were 42(53.8%) men and 36(46.2%) women with a mean age of 45.0±16.9yrs (range 7–89). Majority of the subjects presented with severe LV systolic dysfunction (EF−19.4±11.3) and restrictive LV diastolic filling pattern (50%). Common complications apart from heart failure include intra-cardiac thrombosis, pulmonary embolism, stroke and arrhythmia. Intra hospital mortality was low. Conclusion: DCM is a common cause of Heart failure in Nigeria. Being a heterogenous entity with severe LV systolic and diastolic dysfunction, intra hospital mortality is low but this is significant at 6 months follow up. Causes of death include arrhythmia (sudden death) and pump failure.

References:

Survival analysis in the real world of 53,210 children and adolescents hospitalized for heart failure between 2001 and 2007 in a developing country using probabilistic linkage of databases

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Introduction: The increasing development of therapeutics in heart failure (HF) has enabled an improvement in survival for adult patients. Nevertheless, it is unknown in the real world the survival of children and adolescents with this syndrome. In addition, etiology, sex, age and social conditions of the patient remain open in the prognosis. Objectives: To assess overall and by etiology survival of pediatric heart failure, using probabilistic linkage methods of databases. To study the influence on the prognosis of gender, age and social condition, measured by individual and community’s human development index (HDI) as potential indicators. Methods: A retrospective nation-wide study of 53,210 patients from 0 to 18 years old hospitalized for HF (2001–2007), among them there were 8,291 (15.6%) deaths. We performed
probabilistic linkage of databases from hospital admission and death certificates. We used the Kaplan-Meier method to construct the survival curve, and compared groups by log rank test. For evaluation of prognostic factors associated with death, we estimated hazard ratios (HR) with confidence intervals 95%, followed by Cox proportional hazards model. The significance was indicated by a p-value of 0.05.

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For evaluation of prognostic factors associated with death, we estimated hazard ratios (HR) with confidence intervals 95%, followed by Cox proportional hazards model. The significance was indicated by a p-value of 0.05.
Conclusion: Late survival is excellent in autograft patients, and comparable to the general age-matched population. Nevertheless, an increasing number of patients requires autograft reoperation during follow-up which can be done with very low mortality. The reoperation rate and observed echocardiographic valve function underline the importance of careful monitoring especially in the second decade after the initial autograft operation and in particular in patients with preoperative aortic regurgitation.

0139

A comparison of mortality between minimally invasive and conventional aortic valve replacement in patients with severe symptomatic aortic stenosis and low risk for conventional aortic valve replacement

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Introduction: Conventional aortic valve replacement (C-AVR) is the standard method in symptomatic aortic stenosis, while TAVI should be only performed in inoperable or high risk patients (ES≥15%). However some patients with low risk (ES<15%) or risk factors (frailty) that are not reflected by the Euroscore (ES) prefer the TAVI procedure.

Objectives: In the present single center study we have investigated both patient groups regarding their clinical parameters and mortality. The decision for TAVI or C-AVR was made interdisciplinarily in a global TAVI program. All TAVI procedures were performed in cooperation by an interdisciplinary team in a hybrid OR. The Edwards Sapien THV was used for transapical (TA) and transfemoral (TF) approach, the Medtronic CoreValve prosthesis was additionally used for TF approach.

Methods: Group I: TAVI was put through in 245 patients with logistic ES<15 and aged ≥75 y; TA: 91, TF: 173, Sapien THV: 225, CoreValve: 39 between 5/08 and 2/11.

Group II: C-AVR was put through in 425 patients with logistic EuroSCORE<15 between 5/08 and 2/11.

Results: TAVI patients were significantly older (79.8 y) than C-AVR patients (70.7 y, p<0.001). There were significantly more comorbidities in the TAVI group than in the C-AVR group (ES: 10.2% vs 5.33%, p<0.001). There were similar mortality rates in the low risk group (ES<15) or inoperable or high risk patients (ES≥15%). However, there were significantly more comorbidities in the TAVI group than in the C-AVR group (ES: 10.2% vs 5.33%, p<0.001). The 30-day-mortality in the low risk group was 2.3% lower compared to the C-AVR group (ES: 10.2% vs 5.33%, p<0.001). The 30-day mortality in the low risk group was 2.3% vs. 2.6% for TAVI and C-AVR, respectively. Conclusion: TAVI patients with low operative risk for conventional aortic valve replacement (ES<15 and ≥75 y) showed similar mortality compared with C-AVR after 30 days, although they are significantly older and had more comorbidities.

Coronary artery disease and severe aortic stenosis

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Introduction: The most common comorbidity that importantly influences outcomes of patients after aortic valve replacement (AVR) for severe aortic stenosis (AS) is coronary artery disease (CAD). Current guidelines recommend addressing all significant stenoses during AVR; however, addition of coronary artery bypass grafting (CABG) is associated with reduced short- and long-term survival. But is it the procedure, or the characteristics of patients who require AVR and CABG (AVR+CABG), that influence these outcomes? The answer may lead to more targeted diagnostics, therapy, and chronic disease management to improve prognosis.

Objectives: To provide detailed insight into this spectrum of severe AS and its relationship to outcomes, we sought to demonstrate the difference in survival of patients with severe AS with and without CAD receiving current recommended treatment, characterize their patient profiles, and identify unique risk factors for mortality for each of these groups. Methods: From 10/1991 to 7/2010, 2,286 patients underwent AVR+CABG and 1,637 AVR alone. Their characteristics were contrasted and a propensity score developed for matching (1,082 patient pairs). Analyses of mortality were performed for each group, then combined to identify common and unique risk factors.

Results: Patients undergoing AVR+CABG vs. AVR alone were older, more symptomatic, more hypertensive, and had lower ejection fraction and greater arteriosclerotic burden, but less severe AS; long-term survival was poorer (43% vs. 59% at 10 years). Both groups shared many mortality risk factors; however, early risk among AVR+CABG patients was reflective of effects of CAD, while late risk was reflective of diastolic left ventricular dysfunction measured as ventricular hypertrophy and left atrial enlargement. Matched patients had equivalent survival, but worse survival than unmatched AVR patients and better survival than unmatched AVR+CABG patients, who were older, more symptomatic, and had greater vasculopathy.
Profile of prosthetic valve thrombosis in a tertiary care hospital: 3 years experience

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Introduction: All mechanical valves are inherently thrombogenic. Inspite of taking anticoagulants many patients present with prosthetic valve thrombosis. Its very much needed at this point of time to study in detail about the various mechanisms and presentation of prosthetic valve thrombosis. Objectives: To analyse the patient profile, pattern of presentation, management of prosthetic valve thrombosis and mechanism of increased thrombogenicity in 48 patients presented with features of acute thrombotic occlusion of their prosthetic valves. Methods: All patients underwent detailed clinical examination, ecg, echo, INR tests. Results: Analysis was made regarding the causes for suboptimal anticoagulation in these patients. In 2 patients with tuberculosis rifampicin intake precipitated thrombosis. In 10 patients male: 8, female: 2 who had fever and diarrhoea suggesting subclinical dehydration as cause. Vitamin K rich foods like cabbage could have neutralised the effect of anticoagulation in other patients. In our study 38 patients had INR < 2.5. remaining 10 patients had valve thrombosis despite INR > 2.5 but still below the recommended 3.5. Conclusion: In short regular follow up, periodic monitoring of INR and adjusting it to the ideal level and stable diet pattern play important role in preventing complications of prosthetic valves. And in today’s world, patients can be followed up through phone where the dose of the patient's anticoagulants can be modified according to the INR levels which they can see in their native place and communicate to the doctors through phone.

References:

Prognostic factors in infective endocarditis

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Introduction: Infective endocarditis is a disease of high morbidity and mortality, and there are multiple factors which influence its prognosis. The rapid identification of high risk patients can determine the change in the course of the disease with a consequent impact on mortality. Objectives: The aim of this study was to identify the factors of poor prognosis in a sample of patients with infective endocarditis. Methods: We performed a retrospective analysis of patients hospitalized for endocarditis in a period of 7 years (2001 to 2008). The diagnosis of infective endocarditis was made based on the modified Duke criteria. The study identified the factors of poor prognosis in-hospital mortality was evaluated; these factors were related to patient characteristics (age, prosthetic valve endocarditis, diabetes mellitus), identified microbiomicroorganism, echocardiographic findings (degree of valvular dysfunction) and occurrence of complications (heart failure, embolic phenomena and septic shock). Qui-square and Fisher tests were used for univariate analysis as well as logistic regression for multivariate analysis. Results: 80 patients with infective endocarditis were studied, with a median age of 63 years (SD 15.8). 65% of these were male. By means of univariate analysis we found that both the development of heart failure as well as the occurrence of embolic events (respectively 45% and 38.8% of patients) had a statistically significant association with mortality (p = 0.0003 and p = 0.037). This relationship remained in multivariate analysis, having the embolic complications the greatest impact (p = 0.017 vs p = 0.012). There was no statistically significant relationship between the other factors and mortality. Conclusion: In our sample, the development of heart failure and the occurrence of embolic events were predictors of in-hospital mortality. The identification of patients with these complications is of particular importance since these patients are the ones who will benefit from increased monitoring and a more aggressive therapeutic strategy.

Our experience with 248 TTK-Chitra valve implantations in 215 consecutive patients

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Introduction: Surgery for Rheumatic valve disease is not affordable by many because of the cost. TTK-Chitra Prosthetic Valve is time tested cheaper, reliable alternative to costly valves available. This valve is implanted in > 55000 patients in many Countries, is monolithic frame of single block of Ultra High Molar Weight Polyethylene. Sewing ring is 100% Polyester fabric. Objectives: To study the immediate and medium term results of TTK-Chitra Valve implantations in Aortic, Mitral or both positions in terms of its mechanics as per Echocardiography, thromboembolic and other complications. Methods: Between December 2008 and July 2011, Two Hundred and fifteen patients, 105 males and 110 females, age 12 to 78 years (Mean 38.7), had 249 TTK-Chitra Prosthetic Valve Implantations at our centre. AVR 112, A VR 92 and MV 34, AVR with Mitral Valve Repair 18. Concomitant procedures were done in 17 cases, CABG 12, VSD 1, RS0V 1, Aneurysm Ascending Aorta and Arch 3. Mortality was 1.4 % (low cardiac out put). Jate
A translational approach to treatment of hypertrophic cardiomyopathy: pre-clinical rationale and design of a prospective randomized pilot trial with ranolazine

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Introduction: Hypertrophic cardiomyopathy (HCM) is the most common inheritable cardiac disease. It is frequently associated with reduced exercise capacity and symptoms such as angina and syncope. Moreover, HCM patients bear an increased risk of fatal ventricular arrhythmias. To date, HCM still lacks specific pharmacological therapies, capable of improving exercise tolerance and reducing arrhythmic burden. Objectives: We aim at identifying a possible novel pharmacological target in a preclinical study on human HCM samples and test its effectiveness by designing a pilot clinical study on HCM patients. Methods: We selected 26 HCM patients undergoing transaortic myectomy for symptomatic outflow obstruction; single ventricular cardiomyocytes were isolated from septal specimens and cells were used for patch clamp experiments and intracellular Ca2+ measurements. Results: HCM cells showed severely prolonged action potential (AP), compared to control septal myocytes. In HCM cells ranolazine significantly shortens AP duration, suggesting that the increased late Na+ current contributes to AP prolongation. HCM myocytes showed altered Ca2+ transients, with slower decay and higher diastolic Ca2+. Ranolazine appears to hasten Ca2+ transients and reduce diastolic Ca2+, especially at high frequency. Since these results suggest that ranolazine may improve diastolic function and exert an anti-arrhythmic effect in HCM, a pilot study was designed in order to test the effectiveness of ranolazine on exercise tolerance and symptoms in HCM patients. The protocol will be presented: briefly a total of 120 patients with symptomatic HCM patients undergoing transaortic myectomy for symptomatic outflow obstruction; single ventricular cardiomyocytes were isolated from septal specimens and cells were used for patch clamp experiments and intracellular Ca2+ measurements.

Conclusion: Collectively, these efforts will hopefully contribute to a change in paradigm for HCM research, moving the field into a new, translational and evidence-based era.

Diverse morphologic spectrum of stress-induced cardiomyopathy

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Introduction: Typically, stress-induced cardiomyopathy (SCMP) is characterized by transient left ventricular apical ballooning. Recently, case reports suggested that SCMP reveal various atypical morphologic features of left ventricle (LV), but there is paucity of data dealing with the clinical characteristics and presentations among these patients with atypical SCMP. Objectives: We investigated the morphologic variation of LV in SCMP patients based on echocardiography, and as well as their clinical characteristics and in-hospital outcomes. Methods: This was a multicenter, retrospective study. We enrolled 234 patients who were diagnosed as SCMP from 1998 to 2010 admitting to 6 referral centers in Korea. Diagnosis of SCMP was performed according to ’Proposed Mayo Clinic criteria’. All the patients underwent coronary angiography. Morphologic features of LV were determined by echocardiography, and categorized as follow: apical ballooning as ’typical’ and the others as ’atypical’ types, which were subdivided into 1) mid-LV ballooning, 2) reverse, 3) apical tip sparring, 4) global hypokinesia, and 5) unclassified types. Results: Among the 234 patients, apical ballooning type showed preponderance (59.4%) of SCMP followed by mid-LV ballooning (24.4%), unclassified (6.8%), apical tip sparring (4.3%), reverse (2.6%), and global hypokinesia type (2.6%), respectively. Patients with typical SCMP were older (88.4 – 79.9 years, p = 0.008) and hypertensive (61.9% vs. 39.9%, p = 0.001). In addition, patients with typical SCMP had ST segment elevation at initial ECG compared with patients with atypical types (p = 0.030). However, there was no differences in troponin elevating (p = 0.285), clinical presentations, and in-hospital mortality (81.6% vs. 8.5%, p = 0.438) between patients with typical vs. atypical SCMP. When determining the independent predictor for in-hospital mortality in SCMP patients, multivariable analysis revealed that age (HR 1.04, 95% CI 1.006 – 1.078, p = 0.029), shock (HR 3.929, 95% CI 1.057 – 14.604, p = 0.041), coronary artery disease (CAD) (HR 1.37, 95% CI 1.054 – 1.793, p = 0.040), and left ventricular ejection fraction (LVEF) (HR 0.938, 95% CI 0.891 – 0.988, p = 0.016) were the independent risk factors. Conclusion: There was diverse morphologic spectrum of LV in SCMP patients and atypical types accounted for two thirds of SCMP types, which might be helpful for undergoing differential diagnosis of patients with presentation mimicking acute myocardial infarction.

A multiomarker approach to assess prognosis at three months in pulmonary hypertension

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Introduction: Biomarkers have shown to add diagnostic and prognosis information in patients with right ventricular (RV) failure. Although attracting from a pathophysiologic concept, they haven’t been investigated as an integrative multiomarker approach in pulmonary hypertension (PH). Objectives: We sought to comparatively assess the impact of multiple biomarkers in defining clinical status and short term prognosis in PH. Methods: We prospectively studied 22 consecutive patients with Dana Point’s groups 1 and 4 PH after cardiac catheterization. Each patient underwent clinical evaluation, 6-minute walk test (6MWT), 2D and 3D echocardiography at baseline. Blood levels of E-1, MR-proADM, MR-proANP, copeptin, NT-proBNP, troponin I and functional von Willebrand factor (vWF) were also determined at baseline. Patients were clinically followed for the occurrence of events at 3 months of follow-up. An event was defined...
as clinical worsening requiring hospitalization. Results: Patients aged 54±17 years, 82% were female. Most were in WHO functional class II (68%) and 32% were in class III. Mean walked distance in 6MWT was 397±90m. Mean tricuspid annular systolic plan excursion was 19±6mm, systolic pulmonary arterial pressure was 82±25mmHg and 3D LVEF was 58±17%. During a mean follow-up of 69 days 23% of the patients (n=5) were hospitalised due to functional class worsening. Blood levels of copeptin (p=0.05), ET-1 (p=0.02), MR-proANP (p=0.04), and TFp (p=0.05) were significantly increased in hospitalised patients. Neither baseline NT-proBNP nor troponin I could discriminate patients requiring hospitalization. In a Cox regression analysis MR-proANP, TFpWF and MR-proADM were the only independent predictors of hospitalization. Conclusion: In our pivotal study MR-proANP, TFpWF and MR-proADM were found to add useful independent information for the assessment of short-term prognosis in PH. They were superior to commonly used biomarkers NT-proBNP and troponin I.

Cardiopericardial hydatid disease: a report of 21 cases

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Introduction: Cardiopericardial Hydatid disease is a rare manifestation of Echinococcosis with quite disastrous complications. It has no specific signs or symptoms. This disease is endemic in Asia. Objectives: In this paper we report 21 cases of cardiopericardial hydatid disease and describe the different clinical aspects of diagnosis and treatment. Surgically treated cases were followed for a mean time of 43 months. Methods: Results: Male to female ratio was 1.1/1. The age of the cases was in range of 8–36. Hydatid disease was diagnosed with a multimodal approach using transesophageal echocardiography and CT scan. There were 4 isolated cardiac and 1 isolated pericardial cases. 16 cases had multiloculated disease. LV was involved in 12 cases, RV in 4 cases, LV and interventricular septum in 4 cases and pericardium in 8 cases. 17 cases underwent surgery and received albendazol afterwards. 4 cases received only medical therapy because of devastatingly extensive disease. 8 cases were operated without cardiopulmonary bypass. In 3 cases the remaining cavity was filled with mobilized omentum. Conclusion: According to our data, open surgical repair or open repair is highly effective and should be recommended in all cases with cardiopericardial hydatid disease except for very extensive, multilocules disease with small cystless than 2 cm. In such circumstances medical therapy is the last resort.

Non-transplant cardiac surgery for end-stage sarcoidosis-induced dilated cardiomyopathy: a bridge for heart transplantation

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Introduction: Sarcoidosis with cardiac involvement might cause fatal conditions such as ventricular tachycardia and LV dysfunction. Objectives: We had surgically treated end-stage sarcoidosis-induced dilated cardiomyopathy (DCM) with functional MR and retrospectively review our surgical outcome. Methods: Consecutive 12 patients (2 males and 10 females; 57±11 years) with including 10 elective and 2 emergency cases were surgically repaired. Medical observation period was 50 months (1–120 months). In elective series, 10 patients were in NYHA class IV and patients depended on inotropes. In emergency series, 2 patients were in NYHA class IV and 1 patient was supported by IABP. PM or ICD was implanted in 4 patients. Performed mitral valve surgery included MVR in 6 patients and MVP in 6 patients. Due to the localized lesions of sarcoidosis, surgical veno-venous resection-was performed in 9 patients (3 for posterior resection procedure, 3 for septal anterior ventricular exclusion, and 3 for linear resection). LV incision line and abnormally myocardium were cryoablated to prevent from postoperative atrial ventricular arrhythmia. Results: In elective series, 10 patients were operated on. LV ejection fraction and NYHA class was improved in 7 patients (in class II and in class III as early results. By Kaplan-Meier analysis, 3- and 5-year survival rates were about 50% and 30% (Figure). Although EF was not significantly improved (31.8±28.7% vs. 31.8±28.7%; p=0.05), severity of MR was significantly improved (3.5±0.3 vs 1.9±0.8; p=0.25). LVdL was significantly decreased by operation (76±10 vs 64±6 mm; p<0.05). BNP was significantly reduced after operation (439±456 vs 841±402 pg/ml; p<0.05). In emergency series, no patients were survived (0/2 0%).

Pulmonary arterial hypertension in Argentina: insights from HINPULSAR registry

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Introduction: The epidemiology and management of patients with pulmonary arterial hypertension (PAH) in most of the Argentinean regions is poorly known. Objectives: We sought to characterize the clinical profile, diagnosis, evaluation and treatment strategies for this condition. Methods: Between Jan-10/Jul-11, 351 patients with diagnosis of PH were prospectively included in 30 centers from 13 provinces form Argentina. The inclusion criteria were: 1 year old, clinical diagnosis of PH and one of the following: systolic pulmonary arterial pressure (SPAP) estimated by echo Doppler ≤ 40 mmHg or right heart pulmonary arterial pressure (MPAP) obtained by right heart catheterization (RHC) ≤ 25 mmHg. Of them, 97 (27.6%) with diagnosis of HAP were included in the present analysis. Results: Mean age was 45±17 years and 75% were women. First diagnosis was done by non-cardiologist in 41%, 56% were referred from other centers, 16% were incident cases and 25% did not have social insurance. According with Dana Point classification, the distribution was idiopathic 54.6%, inherited 1%, drugs 3.1%, connective tissue disease 12.4%, portal hypertension 1% and congenital heart disease 27.8%. Diagnosis was made by SPAP ≤ 40 mmHg in 84% (mean 83±29 mmHg). The most frequent symptoms were dyspnea 91% (65% in functional class III-IV at the diagnosis), fatigue 50%, syncope 8%, chest pain 17%, palpitations 16% and heart failure 40%. The evaluation included ECG (91), chest X-ray (83%), 6 minute walking test (65%), V/Q scan (32%), pulmonary function test (60%), angio CT (3%) angiography (8%) and cardiological test (6%). Right heart catheterization was performed in 61 (63%) with SPAP 68±31 mmHg and MPAP 55±21 mmHg. vaneosmetry test in 37, who was positive in 17. Specific therapy was used in 84%: sildenafil 80%, iloprost 14%, bosentan 11%, ambrisentan 5% and treprostinil 3%. Conclusion: Epidemiology of HAP in Argentina is comparable with other series, with predominance of women and a half associated with an identifiable condition. Even though the evaluation included recommended work-up and high proportion of the specific treatment was prescribed, the clinical profile showed a delayed diagnosis.

O151
Predictive value of the Geneva score and the Wells rule for assessing clinical probability of pulmonary embolism

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Introduction: Clinical prediction rules (the Geneva score and the Wells rule) are widely used for rejection or confirmation of diagnosis in pts with suspected acute pulmonary embolism (PE). However, both have some well-known limitations. Objectives: The aim of our study was to evaluate the predictive value of the Geneva score and the Wells rule for assessing clinical probability of PE. Methods: 117 consecutive patients (62M/55F, aged 51,7±13,4 yrs) with established PE were enrolled in a single center prospective study. All of them had been referred to our hospital from year 2007 till 2010. We used the Geneva score and the Wells rule to estimate a clinical probability of PE. All pts had positive quantitative D-dimer test at admission. Diagnosis of PE had been confirmed by spiral CT pulmonary angiography. Results: Pts were divided into three groups according to the results obtained by the Geneva score and the Wells rule (low, intermediate and high clinical probability). Therefore, results of six groups were analyzed altogether. There was no difference between both scores in number of pts with high probability – 59 (50,4%) pts vs 60 (51,3%). However, the Wells rule 2-fold overestimated the number of pts having low probability of PE – 15 (12,8%) pts vs 7 (6%) pts. Remaining 51 (43,6%) pts assessed by the Geneva score and 42 (35,9%) pts assessed by the Wells rule showed intermediate probability. Hospital mortality was absolutely the same in pts with high clinical probability by both scores – 5 (8,4%) pts vs 5 (8,3%) pts, consequently in the Geneva score and the Wells rule groups. Mortality in pts with intermediate probability assessed by the Geneva score was almost equal to obtained in high probability group (9,8%), whereas in pts from the Wells rule group it was 2-fold lower (4,7%). However, the most valuable results were obtained in groups with low probability. Despite adequate treatment mortality was the highest – 2 (28,5%) pts vs 5 (33,3%) pts, accordingly in the Geneva score and the Wells rule groups. Conclusion: Both scores showed good and equal results in pts with high clinical probability of PE, whereas there was significant difference in assessment of pts with intermediate and, especially, low probability. The mortality was the highest in low probability group, despite scores used. Therefore the scores may underestimate the high-risk pts with PE.
Release kinetics of troponin T measured with a high-sensitivity assay in patients with acute myocardial infarction

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Introduction: High sensitive troponin T (hsTnT) assays have shown to improve diagnostic sensitivity in patients presenting with symptoms suggestive for an acute coronary syndrome (ACS). However, no unequivocal data are available on the exact release profile of cardiac troponin T levels measured with conventional and high sensitive assay after induction of myocardial ischemia. Objectives: In the present study we aimed to analyse the release kinetics of conventional troponin T (TnT), hsTnT and creatine kinase (CK)-MB in patients with hypoxia-induced ischemic acute cardiac event. As well as lipids and HbA1c, we measured new emerging risk factors like CRP.

Methods: We included 15 consecutive patients, who didn't have elevated IL-6 basal levels (P < 0.01). CK-MB levels increased continuously with a significant rise over the upper normal limit (r = 0.243, p = 0.001). During 12 month follow-up, the presence of C cystatin > 0.80 mg/dL was an independent risk factor (Cox hazard ratio: 2.95, P = 0.05).

Conclusion: Cystatin is useful in long-term prognostic stratification of patients with STEMI. Cystatin greater than 0.80 mg/dL identifies the subgroup of patients with impaired EF and increased long term risk of death or reinfarction.

0152

Risk stratification of ST elevation acute myocardial infarction

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Introduction: Risk stratification of ST elevation acute myocardial infarction (STEMI) has been a subject of intense research, with a recent focus on the analysis of new biomarkers. Cystatin C has been shown to be a sensitive marker of renal dysfunction and preliminary studies suggest that it might have superior potential prognostic in the stratification of patients with coronary disease. Objectives: To evaluate the long-term prognostic value of C cystatin in patients with STEMI. Methods: We included 15 consecutive patients admitted for STEMI, undergoing primary angioplasty. The biomarkers were assayed in a blood sample taken at the beginning of catheterization. Ejection fraction (EF) was determined by echocardiographic study, 24 to 72 hours after angioplasty. Hyperlipidemia was considered as an indicator of vulnerability and proved to be related to MACE. Risk stratification of ST elevation acute myocardial infarction was performed using the Kaplan-Meier survival curve and Cox regression, with stratification for EF (P < 0.40).

Results: We have the long-term follow-up of 127 patients: 62 ± 12 years, 74% male, follow-up of 717 ± 179 days. The composite endpoint of death or C cystatin > 0.80 mg/dL was significantly higher in patients who died or had reinfarction (0.85 ± 0.24 vs. 0.73 ± 0.03 mg/dL; P = 0.016). Even after stratification for EF, the presence of C cystatin ≥ 0.80 mg/dL was an independent risk factor (Cox hazard ratio: 2.95, P = 0.05).

Conclusion: Cystatin is useful in long-term prognostic stratification of patients with STEMI. Cystatin greater than 0.80 mg/dL identifies the subgroup of patients with impaired EF and increased long term risk of death or reinfarction.
the feasibility of early discharge in low-risk patients. Whether the biomarker NT-proBNP, which is also predictive in ST-elevation acute coronary syndromes, is also able to identify these patients, has not yet been evaluated. **Objectives:** To investigate the additive value of baseline NT-proBNP assessment over the Zwolle Risk Score (ZRS) in patients treated with primary PCI, eligible for early discharge. **Methods:** All patients who underwent primary PCI in the On-TIME 2 study were candidates for inclusion (N = 861). Patients were divided in percentiles according to their baseline NT-proBNP values. ROC curve analysis was used to assess optimal discriminatory accuracy for ZRS, NT-proBNP and the combination of ZRS/NT-proBNP. The main outcome measure was all-cause mortality at 30 days. **Results:** In 738 On-TIME 2 patients (86%) both ZRS and baseline NT-proBNP were available. The P25 and P75 values were 60.0 pg/ml and 343 pg/ml respectively. Both higher ZRS and NT-proBNP values predicted death at 30 days. There was a significant correlation between the ZRS and in NT-proBNP (R = 0.43, p < 0.001). On multivariate analyses, after adjusting for the ZRS, NT-proBNP independently predicted cardiac death at 30 days (Log NT-proBNP HR 2.0, 1.51–2.72, p < 0.001). The combination of baseline NT-proBNP/ZRS demonstrates the best discriminatory accuracy in predicting 30 days mortality (AUC 0.95). Optimal predictive value was found at a ZRS = 2 and NT-proBNP value of = 192 pg/ml. **Conclusion:** According to our analysis, in patients treated with primary PCI, baseline NT-proBNP assessment is useful in evaluating patients eligible for early discharge. Particularly the large group of patients with both a low ZRS, and low NT-proBNP might be suitable candidates for early – within 48 hours – discharge.

Long term follow up of 4 treatment strategies multivessel disease following primary percutaneous intervention for acute myocardial infarction

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**Introduction:** Multivessel disease (MVD) is present in ±50% of pts at primary percutaneous intervention (PCI) for ST-elevation myocardial infarction (STEMI). The optimal treatment for significant non-culprit lesions (NCL) is unclear. **Objectives:** To evaluate the optimal treatment strategy for NCL treatment in STEMI patients, we compared clinical outcome of 4 current treatment strategies. **Methods:** Of 1911 consecutive pts with STEMI referred for primary PCI from 2006 to 2010, MVD was present in 933 (49%) pts. Pts without prior bypass surgery (CABG), shock or resuscitation were retrospectively included in this analysis (n = 833; 43%). At primary PCI 64 pts also had PCI for all NCL (1-stage PCI; 66yrs, 71%) had medical treatment (MT). During follow up (FU) mortality, MACCE (mortality, re-AMI, repeat revascularization, cerebrovascular accidents) and admission for heart failure in 4 groups was evaluated. **Results:** In the 2-stage PCI group pts were younger (<0.001) and hypercholesterolemia ≤ 0.02 was more frequent. At median follow up of 3.2yrs (0–5.5yrs) overall mortality was 9% (7/833). Mortality was 10.1% in 1-stage PCI, 4.1% in 2-stage PCI, 7.9% in CABG and 10.1% in MT group, with a significant difference between the 2-stage PCI and the MT group (p = 0.04). Significantly more revascularizations were found in the 2-stage PCI group (p = 0.01). Cerebrovascular accidents were significantly more frequent found in the CABG group compared to the 2-stage PCI group (p = 0.04). No differences were found at median FU for re-AMI or admission for heart failure. **Image/Graph I:**

**Conclusion:** Of 4 current treatment strategies in current daily practice for pts presenting with AMI and MVD planned revascularization groups (2-stage PCI and CABG) had better survival at long term FU compared to 1-stage PCI or MT group. Follow up extended to 5 yrs with Kaplan-Meier survival plots will be presented. The present data support 2-stage PCI as the preferred treatment strategy for STEMI patients with MVD. Prospective randomized studies are needed to confirm these findings and provide tools for optimal revascularization strategy.
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respectively, p = 0.04). Increased event rate was found with each increasing quartile of urinary 11-dHTxB2 concentration (0%, 0%, 9.1% and 27.3% respectively, p = 0.02). No differences were noted in the urinary excretion of 11-dHTxB2 in different sex and age groups. 

MACE rate was higher among patients with aspirin resistance than aspirin sensitive patients (HR: 5.24 –53.19; P < 0.004) and LVEF below 30% (HR: 16.69; 95% CI 35 to 40 months) was 85% and 79% for patients undergoing CABG and PCI respectively (Log Rank>0.3). There were no fatalities among p undergoing protected PCI (with previous CABG). 

Conclusion: In high risk p PCI is a safe alternative with efficient results in the long-term clinical follow-up. The mortality occurred mainly during hospital admission and secondary to clinical condition.

O162

Does obesity influence the clinical outcome in primary PCI? 

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Introduction: Obesity is a well known atherogenic risk factor. However, recent studies suggest that low weight patients with coronary artery disease appear to be at particular high risk of mortality during long term follow-up. Objectives: To determine the effect of obesity on prognosis in patients with ST-segment elevation acute myocardial infarction (STEMI). Methods: We studied 338 STEMI patients (66±13 years old, 73% males), who underwent primary percutaneous angioplasty between January 1, 2008 and December 31, 2009. Patients were divided into obese (body mass index (BMI) ≥30 kg/m²) and non-obese (BMI < 30 kg/m²) groups. The prognostic effect of obesity on total mortality during long term follow-up (29±8 months) was assessed by univariate Kaplan-Meier survival analysis and multivariate Cox regression analysis, considering as covariates clinical (age, smoking habits, Killip class), electrocardiographic (location of ST elevation), echocardiographic (left ventricular ejection fraction [LVEF]) and angiographic (number of vessels with significant stenosis and culprit lesion territory) characteristics. Results: In the studied population, 33.7% were obese, 66% had hypertension, 31.3% were diabetics, 57.5% had hypercholesterolemia and 37.2% were smokers. The 30-day all-cause mortality was 9.5% and it achieved 16.8% (N=55) at the end of follow-up. Mortality was significantly lower in obese patients (8.7% vs. 16.9%, hazard ratio [HR]: 0.49; 95%CI 0.16 – 0.94; P = 0.037). In the multivariate analysis, were identified as independent prognostic risk factors: non-obesity (HR: 3.99; 95%CI 1.22–13.03; P = 0.022), cardiac shock at admission (HR: 6.55; 95%CI 1.63–25.90; P = 0.006), coronary multivessel disease (HR: 3.83; 95%CI 1.55–9.47; P = 0.004) and LVEF below 30% (HR: 6.69; 95%CI 5.24–53.19; P = 0.001). Conclusion: Obese patients have a more favorable long term prognosis after STEMI. Further studies are needed to identify the subgroup of non-obese patients at particularly high risk of death and to determine optimal body composition in the secondary prevention of coronary artery disease.

O164

Long-term outcomes of acute coronary syndrome in young adults: findings from GULF RACE-2

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Introduction: Long-term outcome of young patients with acute coronary syndrome (ACS) has not been described in the Middle East. Objectives: To evaluate the risk factors, presentations, clinical assessments and long term outcome of patients of Acute Coronary
Anemia is an independent risk for mortality after acute myocardial infarction in patients with and without diabetes

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Introduction: Anemia and diabetes are risk factors for short-term mortality following an acute myocardial infarction. Anemia is more prevalent in patients with diabetes. Objectives: We performed a retrospective study to assess the impact of the combination of diabetes and anemia on postmyocardial infarction outcomes. Methods: Data relating to all consecutive patients hospitalized with acute myocardial infarction was obtained from January 1, 1993, through December 31, 2009 at Chinese PLA General Hospital in Beijing. Patients were divided into 4 groups: diabetes and anemia (group A, n = 360), anemia and no diabetes (group B, n = 753), diabetes and no anemia (group C, n = 631), and no diabetes and no anemia (group D, n = 2263). Mortality at 30 days and 31 days to 12 months were the main outcome measures. Results: 30-day mortality was 16.9% in group A, 14.5% in group B, 8.1% in group C, 5.1% in group D (all p < 0.001). 31-day to 12-month mortality was 22.5% in group A, 17.9% in group B, 8.2% in group C, and 6.2% in group D (all p < 0.001). Anemia remained independent risk factors for mortality with odds ratio of 1.34 (1.05–1.70, p = 0.019) at 12 months. Conclusion: Patients with both diabetes and anemia have a significantly higher mortality than those with either diabetes or anemia alone. Cardiovascular death remained the most likely cause of mortality in all groups.

Impact of myocardial perfusion after primary angioplasty on long-term left ventricular remodeling in patients with ST-segment elevation myocardial infarction

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Introduction: Myocardial perfusion after primary angioplasty may influence myocardial remodeling. Objectives: The aim was to assess the impact of myocardial perfusion after primary angioplasty on ST-segment elevation myocardial infarction (STEMI) on left ventricular remodeling. Methods: Myocardial blush grade (MBG) was assessed at the end of primary angioplasty in 148 STEMI patients. Echocardiography were examined during the acute phase, 6 months and >24 months (mean 33.6 months) later. Results: Seventy-six patients obtained MBG 3. Indexed left ventricular end-diastolic volume (LVEDVI) and end-systolic volume (LVESVI) were larger and left ventricular ejection fraction (LVEF) was lower in MBG 0–2 patients at six months and >24 months although there were not significant difference in the acute phase (Figure). The 6 months acute phase ratio and >24 months acute phase ratio of LVEDVI and LVESVI was larger in MBG 0–2 patients than in MBG 3 (Table). Multivariable analysis revealed MBG 0–2 was an independent predictor of larger LVEDVI (>30 mL/m²) odds ratio (OR) 9.6 3.55 [95% CI 1.16–10.87], p = 0.026 and lower LVEF (<45%) OR 3.07 [1.04–9.01], p = 0.042 >24 months later.
mortality in patients with a first AMI has previously been present, but it has decreased over the past decade. Importantly and in addition there has been a major improvement in short-term mortality over the same period further emphasizing the benefits related to the current setup for caretaking and treatment of AMI.

In-hospital and long-term prognosis of acute myocardial infarction in Gypsy patients

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Introduction: There is a lack of data which analyzed prognosis of Gypsy patients (pts) with acute myocardial infarction (AMI). Gypsy (or Roma), an ethnic minority of northern Indian origin, live in many countries throughout the world and are well known for preserved traditions and resistance to assimilation. They are most often marginalized economically, spatially, politically and in terms of culture. Objectives: The aim of this study was to present prognosis of Gypsy pts with AMI. Methods: The study population consisted of 66 Gypsy pts with AMI (Gypsy group) and control group of 310 non-Gypsy pts with AMI, from February 2008 to April 2011. Results: At baseline Gypsy group was younger (p = 0.0114), with more men (p = 0.0462), smokers (p = 0.0012), diabetics (p = 0.0412), heredians (p = 0.0024) and with more pts with previous angina (p = 0.0234) and previous AMI (p = 0.0018). Control group of pts had more hypertensives (p = 0.0392). Other baseline characteristics were similar in both groups of patients. Indexes of infarct size were higher in Gypsy group (p = 0.0241). There were more LVF (p = 0.0106) and AV block (p = 0.0039) in Control group of pts. In-hospital mortality was similar (p = 0.3675). Approximately 2 years after discharge, Gypsy pts had more new coronary events (p = 0.0248), cardiac failure (p = 0.0359), reinfarction (p = 0.0316) and unstable angina (p = 0.0084) than did control pts. Cumulative mortality was better in Control group than in Gypsy group (p = 0.0268). Multivariate proportional hazards analysis showed that previous angina (p = 0.0105), diabetes (p = 0.0086), smoking (p = 0.0024) and age (p = 0.0342) were undependable prediction factors for survival. Use of digitals and diuretics, together with previous angina influenced on survival too (p = 0.0162) as well as male gender, older pts and diabetes together (p = 0.0368). Conclusion: Gypsy patients with AMI had bigger infarct and more reinfection, heart failure, angina and deaths. Previous angina, diabetes, smoking and age undependable as well as use of digitals, diuretic and anngia together and male gender, older pts and diabetes together, influenced worse survival in Gypsy group of pts.

Global burden of lower extremity artery disease and aortic aneurysm: update

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Introduction: The population burden of lower extremity artery disease and aortic aneurysms has been described in detail only in North America and Western Europe. We reported previously on preliminary estimates of incidence and prevalence worldwide but these are being updated, and the impact on mortality and morbidity determined. Objectives: The objectives are to determine the global burden of lower extremity peripheral artery disease and abdominal aortic aneurysms, measured by incidence, prevalence, mortality and disability adjusted years lost. Methods: The Global Burden of Diseases Program and is based on a systematic review of the world literature. We searched MEDLINE (1950-), EMBASE (1980-), AMED (1985-), CINAHL (1982-) and LILACS (2008-) using epidemiological and clinical sequelae terms. Studies were excluded if using standard DISMOD programs. Sevensy lower extremity artery and 69 aneurysm studies were found. Of these, 51 artery and 26 aneurysm studies met the inclusion criteria. In addition to studies in North America and Western Europe, others were found mostly in the Far East and Latin America. Lower extremity artery disease universally was rare before 50 years of age, increasing rapidly with age, and was similar in both sexes. By contrast, aneurysm prevalence was around 3 fold higher in men than women. The impact of lower extremity artery disease directly on mortality was minimal, in contrast to death occurring from aneurysm rupture. Further up-to-date details will be presented. Conclusion: In comparison to coronary heart disease and stroke, the epidemiological transition of peripheral artery diseases has been largely ignored. This study provides some estimates of burden which will be useful to countries in planning prevention and treatment services.

Carotid endarterectomy and carotid artery stenting utilization trends over time

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Introduction: Carotid endarterectomy (CEA) has been the standard in athrosclerotic stroke prevention for over 2 decades. More recently, carotid artery stenting (CAS) has emerged as a less invasive alternative for revascularization. It remains to be seen if an increase in stenting parallels a decrease in endarterectomy, if there are specific patient factors that influence one intervention over the other, and how these factors may have changed over time. Objectives: It was the aim of this study to report on current CEA and CAS utilization trends with respect to several specific patient demographic factors that may influence intervention, and how these factors may have changed over time. Methods: Using a nationally-representative sample of US hospital discharge records, data on CEA and CAS procedures performed from 1998 to 2008 were obtained. In total, 253,651 cases of CEA and CAS were investigated for trends in utilization over time. The specific data elements of age, gender, payer source, and race were analyzed for change over the study period, and their association with type of intervention was examined by multiple logistic regression. Results: Combined rates of intervention decreased from 1998 to 2008 (p < 0.0001). Throughout the study period, endarterectomy was the much more widely employed procedure. Its use displayed a significant downward trend (p < 0.0001), with the lowest rates of intervention occurring in 2007. In contrast, carotid artery stenting displayed a significant increase in use over the study period (p < 0.0001), with the highest intervention rates occurring in 2006. Among the specific patient factors analyzed that may influence utilization over time, white race was found to decrease significantly (p < 0.0001). In multivariate modeling, increased age, male gender, white race, and earlier in the study period were significant positive predictors of CEA use, whereas the opposite was true for CAS. Conclusion: Rates of carotid revascularization have decreased over time, although this has been the result of a reduction in CEA despite an overall increase in CAS. Among the specific patient factors analyzed, age, gender, race, and time were significantly associated with the utilization of these two interventions.
Apolipoprotein A5–1131T>C variance associated with increased susceptibility for ischemic stroke

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Introduction: Hypertriglyceridemia has been demonstrated to be associated with increased risk for ischemic stroke. Apolipoprotein A5 (apoA5) plays a key role in modulating plasma triglyceride levels and apoA5–1131T>C polymorphism has been reported as associated with elevated triglyceride levels. But limited data are available about the role of variation of the apoA5 gene in the development of stroke. Objectives: This study aims to explore the relationship between the apoA5–1131T>C polymorphism and ischemic stroke. Method: A total of 194 patients with ischemic stroke and 311 healthy controls were genotyped by polymerase chain reaction-restriction fragment length polymorphism. The levels of serum lipids profiles in all subjects were also measured by enzymatic methods. Results: Distribution of the apoA5–1131T>C-genotypes showed significant difference between stroke group and control group (p < 0.01). The -1131C allele frequency was significantly higher in ischemic stroke patients than that in healthy subjects (44.1% vs 32.3%, P < 0.01). C carriers got higher TG levels than that of non-C carriers (1.73 ± 1.50 mmol/L vs 1.38 ± 0.80 mmol/L, P < 0.05). Logistic regression analysis showed that the C allele was significantly associated with prevalence of ischemic stroke. After adjusted for BMI, hypertension, diabetes and HDL-C levels, the C allele was significantly associated with prevalence of ischemic stroke. Conclusion: The apoA5–1131T>C variance not only influences on serum TG levels, but also may be associated with increased susceptibility for ischemic stroke.

Deep selective cerebral hypothermia during cardiac arrest and acute stroke

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Introduction: The neuroprotective effects of hypothermia following cardiac arrest and acute stroke have been demonstrated in experimental models and clinical trials. Experimental studies indicate that improved efficacy and broadened indications can be achieved with moderate to deep hypothermia. However, current techniques require systemic cooling, and are unable to cool rapidly and deeply without serious detrimental effects. Objectives: To investigate a new catheter-based system and technique to rapidly and selectively cool the brain. Methods: Using a standard transfemoral technique in 21 swine (60–72 kg), the multipurpose catheter was positioned to isolate the right or left common carotid artery. Blood was withdrawn from the aorta via a lumen, cooled extracorporeally, and reperfused through a second lumen into the carotid artery. Outflow blood was cooled to 5–20°C, and reperfused at rates of 80–250 ml/min. The animals were cooled for 30–180 minutes, while lying on a heated circulating water blanket and covered with heated blankets. Two burr holes allowed access to thermistors that were placed to a depth of 1–1.5 cm in each cerebral hemisphere. Systemic temperature was assessed using a rectal probe. In one animal, left and right areas of the cranium over the frontal lobes were shaved, and sensors were attached to monitor cerebral oxygen saturation. Results: Cerebral cooling to 15°C was achieved with no significant systemic cooling. Initial cooling rates of 1.8°C/min were attained, and were dependent on flow rate and temperature of the perfused blood. Passive rewarming did not result in rebound hyperthermia. No adverse events were observed. In the animal in which cerebral oxygen saturation was measured, oxygen saturation increased in the cooled hemisphere, with little change in the contralateral hemisphere. Conclusion: This new catheter-based system and technique shows promise in providing rapid, selective deep cerebral hypothermia, and may offer an improved method for neuroprotection during cardiac arrest, acute stroke and other ischemic injury.

The audit of management of patients with arterial hypertension and high cardiovascular risks in Slovakia. The ARTHYP-SK

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Introduction: The morbidity and mortality on CV diseases is very high in Slovakia mainly due to poor blood pressure control, high prevalence of dyslipidemia, smoking habits and obesity. Objectives: The primary objective of this nationwide multicentric and prospective follow-up in Slovakia is to evaluate in real-life cardiological and internal practice the quality of management of pts with 2nd and higher grade of arterial hypertension (AH) according to ESC/EAS classification and with high CV risk. Methods: 57 physicians, internists and cardiologists enrolled into the follow-up 761 pts with the mean age 66.85 ± 16.54 years, 368 men (48%) and 393 women (52%) with the 2nd and higher grade of AH according to ESC/EAS classification and high CV risk. 86% of pts is treated for dyslipidemia, diabetes mellitus on treatment have 36%, 33% were smokers. New diagnosed AH had 10% of pts, several years presented but not treated AH had 7% and several years presented and treated AH had 83% of pts. Results: Mean casual systolic blood pressure (BP) at the enrolment was 164,76 ± 18.31 mmHg, mean diastolic BP was 98,06 ± 10.36 mmHg, mean body mass index 31,42 ± 4.51 kg/m². Mean values of 24 hour ABPM were: 24 hour systolic ABPM was 144.91 ± 16.74 mmHg, the % of measurements above 135 mmHg was 42,57 ± 28.96; awake systolic ABPM was 148.18 ± 17.48 mmHg, the % of measurements above 135 mmHg was 44.50 ± 30.56; asleep systolic ABPM was 135.69 ± 17.31 mmHg, the % of measurements above 120 mmHg was 38.47 ± 32.24. The mean amount of antihypertensive drugs used to treat 1 patient at the enrollment was 3.64, in the morning only 4.03, in the morning and at bedtime 1.74, After 302 ± 151.7 hours of follow-up, target value of BP (below 140/90 mmHg) were achieved in 55% of pts on intensified treatment (p < 0.0001), in 9% of pts suffering from diabetes mellitus or chronic kidney disease (below 150/80 mmHg) (p < 0.019). Mean values of ABPM has shown following decline of systolic and diastolic 24 hour: awake and asleep BP: 9,14/5,09 (p < 0.0001), 19,91/4,91 mmHg (p < 0.0001), and 8,24/4,59 mmHg (p < 0.0001), respectively. Conclusion: Intensified treatment of pts with 2nd and higher grade of AH according to ESC/EAS classification and high CV risk led target BP achievement in 55% of all pts. In pts suffering from diabetes mellitus or chronic kidney disease was target BP achieved only in 9% (below 130/80 mmHg). Relatively low rate of BP control was mainly due to high prevalence of resistant hypertension, which deserves much more attention in future.
Hypertensive heart failure in Nigerian Africans: insights from the Abeokuta heart failure registry

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Introduction: Hypertension is the commonest cardiovascular disease in Nigeria and the foundation of heart failure in the country. It is also the commonest risk factor for heart failure, chronic renal failure and stroke. A detailed clinical and echocardiography and outcome study of hypertensive heart failure has been scarcely studied in the country. Objectives: We used data from the Abeokuta Heart Failure Registry to determine the clinical characteristics, mode of treatment as well as outcome of hypertensive heart failure in Nigerians. Methods: Eligible subjects are hypertensive patients with new onset HF or those with acute or chronic heart failure. The study was carried out at The Federal Medical Centre and Sacred Heart Hospital, all in Abeokuta Nigeria. Diagnosis of heart failure was based on Framingham Criteria and all were confirmed by echocardiography. Ethics clearance was obtained for this study as part of Abeokuta Heart Disease Registry. Data obtained using a uniform case report forms include demographics data, clinical features, 12 lead ECG, echocardiography, treatment and outcome.

Results: One hundred and ninety seven (197) subjects were included in this study. There were 115 men (58.4%) and 82 women (41.6%). The overall mean age was 58.4±12.7 year, range 22–85 years. The men were younger than the women (57.2±12.3 range 22–85) vs (63.1±13.1 range 35–85). The mean SBP was 138.3±90.9 and DBP 83.9–19.0. There is an associated diabetes mellitus in 8 subjects, COPD in 4 , stroke in 3 and renal insufficiency in 7 subjects. The mean LA diameter, LVd in systole and LV ejection function were 4.6cm, 4.7cm and 55.2% respectively. There was an associated degenerative AIV in 16 (8.1%) and MIV in 29 (13.2%) subjects. MR was present in 6 (6.1%) and AR in 23 (12.2%), HF with normal EF was present in 52(26.4%). Intra-hospital mortality was 3.7% while about 17% were readmitted within 6 months. Conclusion: Hypertension is the foundation of heart failure in Nigeria. Most present in their prime of life with severe HF, secondary valvular insufficiency and significant readmission rate within six months after discharge from hospital.

Conclusion: Advertising of alcohol is completely banned in all media and scenes which have the effect of justifying or glorifying drinking are not be shown in the Bollywood movies. However, there is no dedicated health legislation which prohibits depiction of alcohol use in Bollywood movies. Indian adolescents are exposed to alcohol use depictions in Bollywood movies and such exposure is associated with alcohol use among indian adolescents. This requires immediate alcohol control policy intervention.

Vitamin D status and cardiovascular risk factors in Emirati adolescents

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Introduction: There is mounting evidence that vitamin D deficiency is associated with an increased risk for cardiovascular disease. There are few population-based data regarding vitamin D deficiency among adolescents in United Arab Emirates (UAE) where both vit-D deficiency and cardiovascular disease and its risk factors are highly prevalent in adults. Objectives: This study was conducted to determine the prevalence of vitamin D (25-hydroxyvitamin D [25(OH)D] deficiency and identify whether low serum vitamin D levels were correlated with cardiovascular risk factors. Methods: We conducted a school-based cross-sectional study in a random sample of youth aged 15 to 18 years in Al Ain, UAE. Participants (n = 312) had fasted for at least 8 hours, and agreed to draw blood. Anthropometric and blood pressure measurements were made by trained nurses. The short version of the International Physical Activity Questionnaire was used to assess the physical activity status in the study participants. Serum 25 (OH) D concentrations were measured by radioimmunoassay. We used the stepwise linear regression analysis to identify the significant Covariates of serum 25 (OH) D concentrations. Statistical significance was defined as p-values <0.05. Results: Of the all study participants 169 (52%) were females. Majority of the study participants (63%) were UAE nationals and rest (37%) were from other Arab and Gulf countries. Overall 81% of UAE and 77% of youth from other Arab and Gulf countries had 25(OH) D concentrations that were inadequate (<30 ng/mL). Mean 25 (OH) D levels were lower in females (17.5 SD 19.8-22.7) than males (26.2, 95%CI 24.6-27.8) and this difference was statistically significant. After adjustment for age, female gender, frequency of consumption of fast food, and body mass index (BMI) were positively correlated with vitamin D level.

Conclusion: Substantial number of adolescents, females in particular had low serum vitamin D levels. Vitamin D deficiency is significantly correlated with female gender, frequency of consumption of fast food, BMI and physical activity level of adolescents aged 15 to 18 years.

Small changes make a big difference: the call to action for the 2011 Australian GRFW campaign

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Introduction: The key message of the Australian Go Red for Women campaign over the past two years has been to “learn the facts and dispel the myths” in regard to heart disease. In 2011 we went one step further by adding a call to action that Australian women join our online Healthy Heart Challenge. The catch line to this was that small changes can make a big difference. This approach was based on qualitative research that indicated that women need help in integrating healthy actions into their busy lifestyles. Objectives: The key objective was to encourage Australian women 45–64 years to challenge themselves to improve ONE lifestyle goal out of a selection of six, for a 10 week period. The focus was to assist women make healthier choices in the small every day decisions they make, rather than have them commit to a large but potentially unsustainable action. The Heart Foundation supported women in their choice of goal by providing them with simple tips and information to keep them on track. Methods: Online registration enabled easy collation of data. This included: number of registrations, demographic profile of participants, sources of information about the challenge, selection of goals and activities, weekly progress reports from participants, and feedback on advocacy questions posed to them throughout the 10 week period. Promotion of the Challenge was also supported by mass media, public relations activity and word of mouth. Results: - 17,059 participants registered - half of those were in the target age bracket of 45–64 years - 56% were female - 30% of the six goals available 50% registrants chose the ‘be active every day’ goal 23% chose ‘improving every day nutrition’ 5% chose ‘increasing knowledge of heart health’ 1% chose ‘quitting smoking’ 7% chose ‘lowering high blood pressure goal’ 8.7% chose ‘lower high cholesterol level goal’ - 23% heard about the Challenge through their workplace or organisation - Analysis of findings from those who completed the challenge is underway and will be presented as part of this paper. Conclusion: The 2011 GRFW campaign has been our most significant campaign yet. National awareness of heart disease amongst women has increased. Corporate support of the campaign has grown and plans are well under way to more actively promote the HRC to workplaces in 2012. We believe there is salience in framing lifestyle messages to women in a way that makes the small everyday decisions to be healthier an empowering choice.

Gender disparities in medical care and early death after acute coronary syndrome in the Middle East: a study of >4000 cases

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Introduction: It is largely unknown if there are gender disparities in the treatment of acute coronary syndrome (ACS) in the Middle East and whether women have different outcome compared with men. Objectives: To study if women admitted with ACS have different clinical features and cardiovascular outcome compared with men in the Middle East. Methods: Clinical profiles and outcomes of 4229 ACS patients enrolled in 3 ACS studies were analyzed Results: Women (n = 799) comprised 19% of the whole group. Compared with men, women were older than men (mean age 63.2 vs 54.1, p = 0.01), had higher prevalence of diabetes (53% vs. 36%, p<0.0001) and hypertension (66% vs. 43%, p<0.0001), and they smoked less (21% vs. 63%, p<0.0001). Women were more likely to have non-ST elevation ACS than ST elevation myocardial infarction (78% vs 22%, p<0.0001) and they had less overall use of percutaneous revascularization (79.7% vs. 67.8%, p<0.0001). Women had less overall use of percutaneous revascularization during index hospitalization than men (51% vs. 64%, p<0.002) but had similar rates of utilizing coronary bypass surgery (6.2% vs. 7.3%, p=0.32). Conclusion: Similar to western women, Middle Eastern women with ACS were older than men and had more comorbid diseases. Women did not have significantly higher in-hospital mortality, despite less use of antplatelet treatment, reperfusion and revascularization procedures.

Waist circumference is an independent determinant of high blood pressure in Africans: age and gender implications

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Introduction: Previous studies reported a progressive increase in the prevalence of high blood pressure with increasing adiposity 1-2. However, there is no consensus on the effectiveness of the anthropometric measurement tools indicating general or regional adiposity in predicting high blood pressure, particularly in Africans. Objectives: The study sought to examine the independent contributions of weight, waist-hip ratio (WHR), body mass index (BMI), waist, hip
and arm circumferences to high blood pressure. Methods: A cross-sectional study involving 376 men (61.4%, aged 18–58 years old) and 236 (38.6%, aged 18–58 years) women was conducted in North Central region of Nigeria. The relationship between blood pressure and different anthropometric variables in both genders were assessed by using multiple linear regression models. Results: The values (means ± SD) of SBP and DBP for men were 121.8 ± 15.1 and 74.4 ± 13.5 mmHg while the values for women were 115.0 ± 13.9 and 72.5 ± 9.9 mmHg. When WC (14.9%) and WH (14.7%) cut-off points for android obesity were compared with BMI (6.5%), proportion of people with android obesity was twice that of general obesity. Data showed that a large WC was an independent predictor of elevated blood pressure in men and women. WC correlated positively with blood pressure in (<25 years) older subjects regardless of sex but not in the young group (<25 years). Conclusion: These results demonstrate that WC is a better independent predictor of high blood pressure especially in older Nigerians than BMI, weight, WH and arm circumference in regard to gender. A reduction in high blood pressure may be achievable if the WC is reduced in men and women. A narrow waist may protect against the development of high blood pressure in Africans adults. The measurement of WC may be of public health relevance in early identification of men and women at an increased risk of hypertension.

References:

Longitudinal investigation for cardiovascular events and risk factors in community-dwelling elderly
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Introduction: Cardiovascular and cerebrovascular diseases have become the first killer for people’s health, which mainly caused by atherosclerosis. Early diagnosis and intervention of atherosclerosis are the fundamental measures for prevention and treatment of the disease. Objectives: This study is aimed at probing the risk factors for cardiovascular events in community-dwelling elderly, the predictive function of brachial-ankle pulse wave velocity (baPWV) and its association with the carotid atherosclerosis, to provide preventive basis for cardiovascular and cerebrovascular disease in the elderly. Methods: In 2005, 725 retired men and their spouses, at age 60 or above, were selected to answer a questionnaire and receive Doppler echocardiographic examination for carotid intima-media thickness(IMT) and common carotid artery, external carotid artery and internal carotid artery. Aortic elasticity was assessed by baPWV which was measured by an automatic device. Most of cases were investigated and received the above examinations again in 2010. Cardiovascular events in community-dwelling elderly and the association between the baPWV and carotid atherosclerosis are probed by multiplicity logistic regression analysis. Results: First, it was found in the investigation that the incidence of all causes mortality and cardiovascular events was 13.9%. Hypertension, smoking and right baPWV at 5 years ago were an independent predictive factors of all causes death and cardiovascular events. There was an increased number of cases undergoing the procedure of PCI and CABG in patients with right baPWV>1700cm/s. Second, right baPWV was well associated with atherosclerosis in the same side. Third, the positive rate for detection of plaque in carotid artery was 41.5% in this study, which is obviously increased compared with it 5 years ago. Longitudinal study for the relationship of baPWV and carotid artery atherosclerosis showed people who were male, smoker and right baPWV>1700cm/s at 5 years ago had higher positive rate for detection of carotid artery atherosclerosis. Multiplicity logistic regression analysis showed that aging and smoking are predictive factors for carotid artery atherosclerosis. Conclusion: The baPWV may become an independent predictive factor for all causes death and cardiovascular events. The baPWV is associated with age, drinking, history of hypertension. Aging and smoking are predictive factors for carotid artery atherosclerosis.

Health centres: new preventive structure in public health service of the Russian Federation
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Introduction: Noncommunicable diseases (NCDs) are the leading cause of death and disability in developed and developing countries. According to the WHO data every year over 9.1 million deaths caused by NCDs can be prevented. Objectives: In 2010–2011 in the Russian Federation was developed a new preventive state health service structure - health centers (HCs). The aim was to increase citizens’ responsibility towards their health, to motivate people to give up unhealthy habits, including smoking and excessive alcohol intake, and to obtain the risk factors goals. Materials and methods: 502 HCs for adults

World Congress of Cardiology 2012 Oral Presentations

Youth for health: engaging Indian youth for prevention and control of NCDs
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Introduction: India faces a looming threat of non-communicable diseases. Globally, 5.3 million deaths occur due to unhealthy diet and physical inactivity. Most premature deaths occur in low and middle-income countries. India has the largest youth population in the world with over 47% people under the age of 20. To utilize this youthful human resource, it is crucial to engage with youth in schools, colleges and communities to empower them to campaign for health issues and create a healthy society, free from disease and illness. Objectives: To empower youth through enhanced health awareness by imparting health advocacy skills. Methods: Multi-tiered strategies incorporated, including: Youth Awareness: launch of a health campaign highlighting the importance of diet and physical activity in NCD prevention, healthy cooking and poster making competitions on the importance of balanced diet and physical activity, formation of health clubs in schools. Youth Advocacy: E-Connectivity for youth through Youth For Health (Y4H) social pages to discuss health issues by posting messages, online petitions, opinion polls etc., signing of pledges to follow a healthy lifestyle, conducting signature campaigns with various stakeholders and engaging policy makers in health campaigns and media sensitization. Community Engagement: community mobilization, rallies in schools and neighborhood communities. Results: A stupendous response was received from youth, parents and teachers in schools and community members in support of health advocacy and policy initiatives. Y4H network today spreads across 35 countries and connects over 2, 50,000 members globally. Youth online advocacy supported the replacement of weak pictorial health warnings to stringent new warnings, especially focusing on smokeless tobacco products. Approximately 0.1 million signatures to be collected urging the Government of India to integrate health promotion in its policies. Widespread media attention and engaging multiple stakeholders has facilitated multi-strung intervention to fight NCDs. Conclusion: Youth entirely, if channelized in the right direction, can be instrumental in bringing positive behavioural changes in the society. Inducing leadership and ownership skills amongst youth qualifies as a strong weapon in the fight against NCDs.

How to promote heart health policies: theory and practice
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Introduction: The development of CVD prevention has over decades moved from identification of causal risk factors and high risk prevention measures to community-based preventive programmes and preventive policies. Individual responsibility is often, and also should, be emphasized in promoting heart healthy behaviours. However, it is increasingly realized how lifestyles are strongly determined by social and physical environments, amenable by policy decisions. Objectives: Thus numerous recent CVD and NCD prevention strategies have identified evidence based policies needed for successful prevention. Now, the crucial question is, how can we promote or what are the drivers of such policies influencing eg. legislation and the private sector. Methods: Experience from Finland gives some experiences on these questions. A basic question is, do policies pull people or people policies. Results: The answer is that changing national lifestyles is in the end a social change process, where things influence continuously each other. However, policies and private sector actions are strongly influenced by opinions, intentions and changing behaviours of people. Conclusion: Thus, at the same time as health professionals should continuously try to define and directly promote prevention policies and actions, a strong emphasis should be mobilizing people for such actions, through broad health promotion and innovative communication.
Engaging cardiologists in tobacco control in Bangladesh
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Introduction: Bangladesh is going through epidemiological transitions and currently non-communicable diseases (NCD) account for about 45% of total deaths in the country. Bangladesh has one of the highest prevalence of tobacco use among the low income countries of the world. Cardiology as a separate specialty of Medicine has been developing in Bangladesh and a good number of cardiologists are practicing in Bangladesh. However involvement cardiologists in tobacco control was not strong.

Objectives: National Heart Foundation of Bangladesh (NHF), a non-profit organization led by cardiologists, took an initiative to form a network of physicians for tobacco control. Methods: NHF, has been involved in providing modern cardiac care as well as taking program for prevention of CVD. The leaders of the NHF is well respected in the country and has access to government high ups. To make the anti-tobacco stance of medical professional stronger, a forum namely United Forum Against Tobacco (UFAT) was formed with high ranking members of different professional organizations such as Cancer Society, Lung Foundation, Society of Medicine and Association of Physicians of Bangladesh. Results: NHF and UFAT have done several advocacy meetings with high-ranking policy makers including honourable president of the country and few ministers. Personal linkages with renowned physicians who are also the members of UFAT helped us to meet the key ministers and convince them about the importance of the smoke free areas, law amendment and increasing of tax for tobacco control. Orientation on tobacco control for physicians was also undertaken by the Forum for encouraging their participation. A tobacco cessation program has been established with the technical support from WHO. Initiatives have been taken to include the tobacco control in the undergraduate medical curriculum. Advocacy with Honourable prime minister, health minister and Foreign minister was done for taking positive role in the UN high level meeting on NCD to be held in September 2011 by the leading cardiologists of NHF. Conclusion: The efforts made by physicians along with other organizations have created a pressure on government and as a result Ministry of Health already initiated the process of amending the tobacco control act. A tax increase was announced in the last budget and smokeless tobacco was included in the tax net. The challenges now are to follow-up the positive steps taken by the government with constant vigilance to thwart the influence of tobacco industry.

Global progress on implementation of the WHO FCTC
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Introduction: The WHO Framework Convention on Tobacco Control (WHO FCTC), the world's first public health treaty, entered into force in February 2005 and has 174 Parties at the time of submission of this abstract (end of August 2011). Reporting on the implementation of the Convention is one of the obligations of the Parties under the treaty. The Conference of the Parties requires the Convention Secretariat to elaborate regular reports on global progress in the implementation of the Convention, based on the information from the implementation reports submitted by the Parties. Objectives: This presentation provides an overview of the status of implementation of the Convention globally, on the basis of the latest data provided by the Parties. For the Parties which have already submitted two implementation reports, tracking the progress made across two reporting cycles was also possible. This report also presents conclusions on overall progress, challenges and opportunities. Method: NHF and UFAT have done several advocacy meetings with high-ranking policy makers including honourable president of the country and few ministers. Personal linkages with renowned physicians who are also the members of UFAT helped us to meet the key ministers and convince them about the importance of the smoke free areas, law amendment and increasing of tax for tobacco control. Orientation on tobacco control for physicians was also undertaken by the Forum for encouraging their participation. A tobacco cessation program has been established with the technical support from WHO. Initiatives have been taken to include the tobacco control in the undergraduate medical curriculum. Advocacy with Honourable prime minister, health minister and Foreign minister was done for taking positive role in the UN high level meeting on NCD to be held in September 2011 by the leading cardiologists of NHF. Conclusion: The efforts made by physicians along with other organizations have created a pressure on government and as a result Ministry of Health already initiated the process of amending the tobacco control act. A tax increase was announced in the last budget and smokeless tobacco was included in the tax net. The challenges now are to follow-up the positive steps taken by the government with constant vigilance to thwart the influence of tobacco industry.

Environmental and psychosocial barriers to physical activity and cardiovascular disease risk in a middle-income country: the Grenada heart project
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Introduction: The global burden of physical inactivity on cardiovascular disease (CVD) risk is substantial. However, barriers to physical activity in low- and middle-income countries are not well known. Objectives: In this study we examined environmental and psychosocial barriers to physical activity and the association to CVD risk in Grenada, a middle-income country. Methods: A modified WHO/USPHS survey was administered to a random sample of the Grenadian adult population, and barriers to physical activity were assessed. The barriers were a priori grouped into environmental (e.g. poor lighting, high crime) and psychosocial (e.g. lack of motivation, lack of companions). Frequency of reporting barriers was compared across age, sex, and education groups. Level of leisure-time physical activity was grouped into one of three categories: none, low or high (upper tertile). The relationship between barriers and 10-year CVD risk (Framingham) was evaluated using multivariable linear regression adjusting for potential confounders (age, sex and education). The relationship between barriers and log-transformed 10-year CVD risk (Framingham) was evaluated using multivariable linear regression adjusting for potential confounders. Statistical analyses were performed using STATA v. 10. Results: Of 2827 participants, 58.5% reported at least one barrier to physical activity, of whom 30.7% reported environmental barriers and 65.3% reported psychosocial barriers. Women were more likely to report barriers than men, as were younger individuals (Table). Barriers were also more commonly reported by individuals with higher education level. Psychosocial barriers were associated with lower leisure-time physical activity, after controlling for age, sex, and education. However, environmental barriers were associated with greater activity (Figure, p<0.005). After controlling for age and education, there was no significant association between barriers and 10-year CVD risk (p=0.43 overall, p=0.60 psychosocial, p=0.82 environmental).

Physical activity as a harm reduction strategy for smokers
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Introduction: Much of the attention on tobacco harm reduction has been on modifying the product, but the extent of modifying physical activity of smokers in reducing the harm is less known. Objectives: The objectives of this study are to find out whether becoming physically active could reduce the smoking hazards, and if so, the extent of benefits in each of the smoking related diseases. Methods: In this prospective cohort study, 429,244 individuals (47.9% men) went through standard medical screening program(s) from 1996 to 2008, with an average follow up of 6.05 (SD: 4.21) years. The exercise volume of each individual, expressed in MET-hour/week, was placed into inactive (<3.75), low-active (3.75−7.49), or active (≥7.50) category. Hazard ratios (HR) for cardiovascular-disease (CVD) mortality, adjusted for 10 confounders, were calculated. Results: Smokers were
Relative contributions of cardiorespiratory fitness and body fatness to cardiovascular disease mortality in the aerobics center longitudinal study

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Introduction: The relative and combined contributions of cardiorespiratory fitness (fitness) or body fatness to the risk of cardiovascular disease (CVD) mortality are unclear. Objectives: As part of an Exercise is Medicine (EIM) initiative, we examined the independent and combined associations of fitness and fatness with CVD mortality in the Aerobics Center Longitudinal Study (ACLS) based on our published studies. Methods: The ACLS is a prospective observational study of individuals who received preventive medical evaluations. We included 3 studies from 1970–2003 of 21,925 healthy men (30–83 y; mean 44 y), as well as 13,155 with hypertension (HTN; 20–64 y; mean 48 y) and 2,316 with diabetes mellitus (DM; 21–89 y; mean 50 y) with assessments of and joint stratifications of both fitness and fatness with CVD mortality during 8–16 years of follow-up. Fitness was estimated from a maximal treadmill exercise test. Fatness was expressed by body mass index (BMI), percent body fat, and/or waist circumference. Cox proportional hazard models were used to estimate the hazard ratios (HRs) and 95% confidence intervals (CIs) for CVD mortality across fitness and fatness levels. Results: Higher levels of fitness were associated with a lower risk of CVD mortality in all three studies, whereas higher levels of fatness were associated with a higher risk of CVD mortality in healthy men and men with HTN. However, fatness (BMI) was not significantly associated with CVD mortality in men with DM. In the joint analysis of 21,925 healthy men, compared with lean (<16.7% fat) fit (most fit 80%) men, the HRs (95% CIs) of CVD mortality were 3.16 (1.12–8.92) in lean unfit (least fit 20%) men, 1.43 (0.77–2.67) in normal fat (16.7–24.9% fat) fit men, 2.94 (1.48–5.83) in normal fat unfit men, 1.35 (0.66–2.76) in obese (≥25% fat) fit men, and 4.11 (2.20–7.68) in obese unfit men, respectively. These findings suggest that unfit men had a higher risk of CVD mortality regardless of fatness, and fit men who were obese did not have a higher risk of CVD mortality, indicating fitness appears to eliminate the increased risk of CVD mortality associated with obesity. Very similar associations in men with DM or HTN were observed. Conclusion: Fitness is a strong independent predictor of CVD mortality regardless of fatness, and fitness appears to eliminate the negative effects of fatness on CVD mortality in men. These results support the EIM’s efforts at promoting exercise and fitness in CVD prevention.
**Preventing weight gain among Australian adults: results of the draw the line social marketing campaign**

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**Introduction:** The Draw The Line social marketing campaign aims to prevent unhealthy weight gain among Western Australian (WA) adults by promoting practical ways to make healthier choices. Launched in 2009, the campaign is a collaborative initiative of the Heart Foundation, Cancer Council WA and Diabetes WA, funded by the Department of Health, WA. **Objectives:** To implement a community-wide, multi-strategy campaign aimed at preventing weight gain in adults To evaluate the campaign using coss sectional surveys (random Computer Assisted Telephone Intervew: CATI) before and after the campaign. Methods: The campaign features mass media and support strategies, including television and print advertisements which were the focus of campaign evaluations. The five key messages promoted for avoiding unhealthy weight gain are: reduce your portion sizes, eat less sugar, eat less fat, be more active every day, and aim for a healthy weight campaign before and after the campaign. **Results:** We studied 515 males and 501 females. The prevalence of obesity adjusted for age and sex was 49%: 38% were overweight, 10% were obese and 1% was morbidly obese. There was no difference between persons who live in the city compared to those who live in the country.

**Prevalence and characteristics of obesity and its association to hypertension and other cardiovascular risk factors in South Serbia**

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**Introduction:** Obesity is a medical condition in which excess body fat has accumulated to the extent that it may have an adverse effect on health, leading to reduced life expectancy and/or increased health problem **Objectives:** To determine the prevalence of obesity and associated cardiovascular risk factors, specially hypertension in a population of South Serbia **Methods:** A cross sectional study was conducted in 137 442 persons who composed 6 different groups (criteria were the years of age). After randomization the total of 1051 persons were studied. Anthropometry, blood pressure, body mass index, fasting glucose were measured. Subjects were categorized according to body mass index (BMI) and waist circumference. **Results:** Age and sex adjusted prevalence of overweight and obesity was 49.2% and 17.1%, respectively. Age was a significant predictor of obesity and hypertension (p<0.001 for both). **Conclusion:** The prevalence of obesity, hypertension and other cardiovascular risk factors is very high in South Serbia.
Lipoprotein (a) and severity of coronary artery disease in Asian Indians

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Introduction: Lp(a), is an important independent and inheritable risk factor for atherosclerosis. Although Asian Indians are genetically predisposed to higher levels of Lp(a), its exact mechanism for APN to regulate inflammatory response and macrophages function remains unclear. Objectives: We aimed to elucidate how APN regulates inflammatory responses and cardiac fibrosis in response to Ang II. Methods: APN-knockout (APN KO) mice and wild type (WT) mice were subcutaneously infused with Ang II at a dose of 750 ng/kg/min. Ang II right carotid artery was ligated. The arteries were harvested 24 hrs later, mRNA was extracted and analyzed using one way ANOVA and Analysis of covariance.

Results: In both APN KO and WT mice, the number of coronary arteries involved. Baseline demographics and data regarding established coronary risk factors were obtained. Lipids, Lp(a), HbA1c, hs CRP, Fibrinogen were measured by standard established techniques in all the patients. Data obtained were analyzed using one way ANOVA and Analysis of covariance. Results: The mean (SD) Lp(a) levels in the 4 groups are as follows: Group 0 (N=276 pts) 47.1 (34.9), Group 1 (N=240) 53.1 (37), Group 2 (N=10) 7.3 (41), Group 3 (N=106) 64.9 (45). Lp(a) levels were higher in patients with more severe coronary artery involvement. Univariate analysis showed significant difference between Group 0 and Group 2 (p=0.04), Group 3 (p=0.50) but no difference between Group 0 and Group 1 (p=0.06). The difference in the Lp(a) levels among the groups persisted even after accounting for confounders like smoking, age, HbA1c, hs CRP and fibrinogen (Analysis of covariance F3, 897) = 5.791, P=0.001 ). In the post hoc analysis, there was a significant difference between Group 0 and 3 but not between the other groups.

Conclusion: In Asian Indians, higher levels of Lp(a) are associated with more advanced CAD and multi- vessel disease.

Adiponectin suppresses angiotensin II–induced inflammation and cardiac fibrosis through activating macrophage autophagy

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Introduction: Hypertension-induced cardiac remodeling is caused by inflammation. Adiponectin (APN) plays a protective role against cardiovascular injury; however, the mechanism for APN to regulate inflammatory response and macrophage functions remains unclear. Objectives: To test the hypothesis that blocking the APN receptor (CD36) attenuates the hypertensive responses in APN KO mice. Methods: Both APN KO and WT mice were subcutaneously infused with Ang II at a dose of 750 ng/kg/min. Ang II right carotid artery was ligated. The arteries were harvested 24 hrs later, mRNA was extracted and analyzed using one way ANOVA and Analysis of covariance.

Results: In both APN KO and WT mice, the number of coronary arteries involved. Baseline demographics and data regarding established coronary risk factors were obtained. Lipids, Lp(a), HbA1c, hs CRP, Fibrinogen were measured by standard established techniques in all the patients. Data obtained were analyzed using one way ANOVA and Analysis of covariance. Results: The mean (SD) Lp(a) levels in the 4 groups are as follows: Group 0 (N=276 pts) 47.1 (34.9), Group 1 (N=240) 53.1 (37), Group 2 (N=10) 7.3 (41), Group 3 (N=106) 64.9 (45). Lp(a) levels were higher in patients with more severe coronary artery involvement. Univariate analysis showed significant difference between Group 0 and Group 2 (p=0.04), Group 3 (p=0.50) but no difference between Group 0 and Group 1 (p=0.06). The difference in the Lp(a) levels among the groups persisted even after accounting for confounders like smoking, age, HbA1c, hs CRP and fibrinogen (Analysis of covariance F3, 897) = 5.791, P=0.001 ). In the post hoc analysis, there was a significant difference between Group 0 and 3 but not between the other groups.

Conclusion: In Asian Indians, higher levels of Lp(a) are associated with more advanced CAD and multi- vessel disease.

Angiotensin converting enzyme inhibitors effect on arterial stiffness: a meta-analysis and meta-regression of randomised controlled trials

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Introduction: Arterial stiffness assessed by measuring aortic pulse wave velocity (PWV) and augmentation index (AIx) is increasingly recognised as a surrogate predictor of cardiovascular risk. Increased arterial stiffness is associated with increased cardiovascular morbidity and mortality. Objectives: We conducted a meta-analysis to investigate angiotensin converting enzyme inhibitors (ACEIs) effect on arterial stiffness in comparison to placebo or no treatment and to other antihypertensive agents. Methods: The medical literature was searched on randomised controlled trials (RCTs) which assessed the effect of ACEIs on arterial stiffness. Data from included RCTs were pooled with use of fixed and random effects meta-analysis of the weighted mean change differences between the comparator groups. Heterogeneity across studies was assessed with the F statistic. Results: In 5 trials (n=469 patients), treatment with ACEIs (n=227) versus placebo (n=216) significantly reduced PWV (pooled mean change difference -1.69, 95% CI: -2.05, -1.33, p<0.00001 with insignificant heterogeneity). In 9 trials which included 378 patients, treatment with ACEIs (n=178) insignificantly reduced PWV when compared with other antihypertensives (ARBs, CCBs, b-blockers and diuretics) (n=220) (pooled mean change difference -0.34, 95% CI: -0.76, 0.09, p=0.12, F=0%). ACEIs effect on radial Aix in comparison to placebo was assessed in 6 trials. Treatment with ACEIs significantly reduced Aix (pooled mean change difference -3.79%, 95% CI: -5.99, -1.60, p<0.0001, 68%, p for heterogeneity <0.00001). In 6 trials, treatment with ACEIs significantly reduced Aix when compared with other antihypertensives (pooled mean change difference -3.81%, 95% CI: -6.0, -1.61, p=0.0007, F=25%, p for heterogeneity =0.19). Mean BP differences between baseline and end of treatment did not predict the treatment (ACEIs) induced changes in PWV (Systolic BP, n=12, beta=-0.13, p=0.17 and diastolic BP, n=12, beta=-0.37, p=0.3) and changes in Aix (Systolic BP, n=7, beta=-1.3, p=0.18 and diastolic BP, n=6, beta=-1.05, p=0.1). Conclusion: This study shows that ACEIs reduce PWV and Aix which are markers of arterial stiffness in patients with different pathological conditions. However, it is not clear whether ACEIs are superior to other antihypertensive agents in their effect on arterial stiffness. The ability of ACEIs to reduce arterial stiffness seems to be independent of its ability to reduce BP.
Cathespin S is essential to angiotensin II-induced abdominal aortic aneurysm formation in apolipoprotein E-deficient mice

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Introduction: Abdominal aortic aneurysm (AAA) is characterized by extensive aortic wall matrix degradation, which contributes to the remodeling and eventual rupture of the arterial wall. Elastolytic cysteine proteases, including cathepsin S (Cat S), are highly expressed in human aneurysmal tissues, but whether they contribute to the pathogenesis of AAA is unknown.

Objectives: The present study was designed to test the hypothesis that Cat S is involved in Ang II–mediated AAA formation in vivo. Methods: AAs were induced in apolipoprotein E (ApoE) and Cat S compound mutant (ApoE−/−Cat S−/−) mice and ApoE-deficient Cat S wild-type (WT) littermates (ApoE−/−) by chronic angiotensin II (Ang II) infusion and AAA lesions were analyzed in 28 days. Aortic diameter expansion ≥100% of that before Ang II infusion was considered an AAA and aneurysms in the abdominal aorta were quantified by the percent incidence as described previously. Serial sections of the abdominal aortas were prepared for elastin staining and immunohistochemical analysis. Data were expressed as the mean ± SEM. Non-parametrical Mann-Whitney U test from SPSS18.0 was used. A P value less than 0.05 denoted the statistically significant difference. Results: We found that Cat S expression was increased significantly in mouse AAA lesions. The AAA incidence in Cat S−/− mice was lower than that in WT mice (10% vs. 80%). Cat S-deficiency did not affect the activities of other cysteiny1 cathepsins or matrix metalloproteinases in aortic lesions, but significantly reduced abdominal aortic diameter, medial elastin fragmentation, medial smooth muscle cell (SMC) apoptosis, and angiogenesis. This action was further confirmed by electrophoresis. Further, Cat S-deficiency inhibited the accumulations of Mac-2+ macrophages and CD3+ T cells as well as expression of chemokine monocyte chemotactic protein-1 (MCP-1) in AAA lesions. In vitro studies suggested that Cat S participated in AAA formation by promoting SMC apoptosis, angiogenesis, and monocyte and T-cell transmigration and proliferation. Conclusion: These findings suggest that cysteiny1 cathepsin S plays an important role in AAA formation and suggest that Cat S is a new target for human AAA.

Gremlin is upregulated in aortic vascular smooth muscle cells early in the course of atherosclerosis formation in apoe-deficient mice

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Introduction: Previous studies from our laboratory have demonstrated that Gremlin, a BMP antagonist, is constitutively expressed in rat arteries, and potentiates proliferation, migration and apoptosis of vascular smooth muscle cells (VSMCs). In addition, BMP proteins have been associated with VSMC phenotypic changes in different vascular disorders, including atherosclerosis. Objectives: This study aims to evaluate the role of Gremlin in atherosclerosis progression in Apoe-deficient mice (ApoE−/−). Methods: Two-month-old Apoe−/− and their controls, C57/Bl6, were fed with regular low-fat or western diet (containing high-fat and cholesterol) for 12 and 16 weeks. After that, animals were sacrificed, aorta dissected, and VSMCs isolated and cultured. Gremlin mRNA expression was measured by quantitative PCR (qPCR). In a separate series of experiments, aortic sections were stained with the following techniques: HE, Masson, Verhoeff–Von Goy, and Oil-redOs. Immunohistochemistry (IHC) for Gremlin expression was also performed. Results: Gremlin mRNA accumulation was evident in aortas from animals fed with western diet for 8 weeks, especially in Apoe−/−. However, histological analysis demonstrated the presence of atherosclerotic lesions only after 16 weeks, predominantly in western diet-fed Apoe−/−. IHC analysis did not detect gremlin neither in vessels from animals after 8 weeks of diet protocol nor in regions with no atherosclerotic lesion in mice fed for 16 weeks with the above-mentioned diets. However, in areas of atherosclerotic plaques, Gremlin staining was readily detectable, particularly in Apoe−/− that received western diet. Of interest, after 8 weeks of diet protocol, we were able to demonstrate by qPCR that Gremlin mRNA was already upregulated in cultured VSMCs obtained from Apoe−/− vs. C57/Bl6 (regular diet: 1.53 fold, N=4, p<0.02 and western diet: 2.08 fold, N=4, p<0.01). Conclusion: Our preliminary results show that Gremlin is upregulated in atherosclerotic lesions. Of note, VSMCs overexpress Gremlin at an early time point in the course of lesion development, when plaques are not yet detectable by conventional histological analysis. Additional studies are underway to better understand the role of VSMC gremlin expression in atherosclerosis.

Endothelial dysfunction and myocardial ischemia evaluated with 13N-ammonia PET in patients with systemic lupus erythematosus or primary antiphospholipid syndrome

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Introduction: A significant correlation between autoimmune diseases and accelerated coronary atherosclerosis has been found, increasing the risk of developing cardiovascular disease. Objectives: The aim of this study was to evaluate the presence of endothelial dysfunction and myocardial ischemia in asymptomatic patients with SLE or PAPS. Methods: We studied 52 patients, 16 with inactive SLE, 18 with PAPS and 18 healthy volunteers. All underwent a 3 phase (rest, Cold Pressor Test and pharmacological stress) 13N-Ammonia PET on a 64 slice PET/CT scanner. Endothelial dysfunction was evaluated with Myocardial Blood Flow Quantification (MBF) in the Dynamic images, the Endothelium-dependent Vasodilator Index (EDAVI, CPT MBF/rest MBF, normal = 1.5), %ΔMBF (normal = 50%) and Coronary Flow Reserve (CFR, MBF/rest MBF, normal = 2.5) were calculated as Endothelial function parameters. Myocardial ischemia was evaluated by two experts in the field. Results: The mean age of the patients was 36.2 ± 9.5 years whilst the mean age of the control group was 34 ± 7 years. All of the patients were asymptomatic. Compared with the control group, the patients with SLE/PAPS had a significantly lower EDAVI (1.18 ± 0.55 vs 1.55 ± 0.37, p = 0.015), %ΔMBF (18.5 ± 43 vs 35 ± 37, p = 0.015) and a non-significant lower CFR (2.58 ± 0.81 vs 3.27 ± 0.72, p = 0.26). We found ischemia in 14/54 patients (26%) in the SLE/PAPS group, all the healthy volunteers studied showed normal myocardial perfusion images. Conclusion: Like other auto-immune diseases, and mostly due to the chronic inflammatory process, patients with SLE/PAPS have Endothelial Dysfunction. Even though these patients were asymptomatic and had low risk of CV disease, 41% of them had Myocardial ischemia without overt coronary Atherosclerosis. Myocardial Blood Flow quantification with PET allows us to detect patients at...
Introduction: Cardiac allograft vasculopathy (CAV) is the major cause of mortality in heart transplant recipients. Currently annual coronary angiography is performed to monitor the heart transplant recipients for the development of CAV. It is an invasive procedure and reported to be less sensitive in diagnosing early CAV because of the diffuse nature of the disease. Objectives: The aim of this study was to compare the prognostic value of positron emission tomography (PET) myocardial perfusion imaging (MPI) with coronary angiography.

Methods: We studied 54 heart transplant recipients (45 M and 9 F, mean age 49 ± 12 years) 5.2 ± 2.3 years after heart transplantation. All patients underwent rest N-13 NH3 MPI and dipyridamole (0.56 mg/kg over 4 minutes) stress N-13 NH3MPI and coronary angiography within 6 months of each other. Reversible or fixed perfusion defects on MPI were defined as abnormal. CAV by coronary angiography was diagnosed if coronary luminal stenosis was ≥ 50%. End points of the study were cardiac death, non-fatal myocardial infarction, percutaneous coronary intervention (PCI), coronary artery bypass grafting (CABG) and re-transplantation. Patients were followed for a mean of 10 ± 2 years and CAV related cardiac events were recorded. The predictive value of PET MPI and coronary angiography was compared using a Cox proportional-hazards model. Hazard ratios were calculated and a p-value of <0.05 was used to identify the significance.

Results: Out of 54 patients, 24 had no myocardial perfusion defect and 30 had either a reversible or fixed perfusion defect. On coronary angiography, 10 were CAV (-) and 44 were CAV (+). The sensitivity, specificity, positive predictive value, negative predictive value and accuracy of PET MPI to detect coronary angiography diagnosed CAV, were found to be 69%, 85%, 94%, 43% and 73% respectively. Using univariate Cox proportional-hazard analysis, an abnormal MPI was found to be a significant predictor of CAV related cardiac events with a hazard ratio of 21.42 as compared with abnormal coronary angiography with a hazard ratio of 0.34. There was no significant difference in baseline patient characteristics between the groups. Cardiac death was the most common cardiac event observed and the incidence of composite cardiac event was significantly higher in patients with PET MPI (+) as compared with MPI (-) (p = 0.014).

Conclusion: PET MPI in heart transplant recipients is a useful non-invasive test to predict CAV related cardiac events during a long term follow up.

Image/graph I:

Image/graph II:

Conclusion: (1) In patients with ESRD, 1) the prevalence of significant CAD is high, and this imposes a worse long-term prognosis independently of the number of affected vessels; 2) myocardial perfusion assessment by SPECT has a low sensitivity to detect 1-vessel CAD; 3) as a consequence, many pt with 1-vessel CAD could be mistakenly deemed to be free of CAD and, therefore, not treated accordingly, although their long-term prognosis seemed to be no different of that from pt with 2- or 3-vessel disease.

Usefulness of the cold pressor test in a population of 870 patients without demonstrated ischemic heart disease. Its implication after 87 months of follow-up

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Introduction: Endothelial dysfunction is the first change involved in the development of ischemic heart disease. Endothelial function in coronary arteries can be assessed in several ways, one of the methods used is myocardial perfusion studies with SPECT and the cold pressor test (CPT). Objectives: To determine the prevalence of positive CPT in a population of 870 patients (p) without demonstrated ischemic heart disease and stratify the predictive power of this test in coronary events during a follow-up of 87 months. Methods: 870 (p) were included, that were referred by their physicians for a myocardial perfusion test at rest and exercise, and whose images had shown a normal perfusion. No p had a history of myocardial necrosis, coronary artery bypass surgery, coronary angioplasty or stroke. The CPT was performed between the third and fifth day after the normal perfusion SPECT. It was considered positive when there was a decreased uptake of the radiotracer in a segment that did not
chronic kidney disease and stress myocardial perfusion imaging are independent predictors of cardiovascular events from pretest probability in patients with no history of coronary artery disease. In this population the prevalence of positive CPT was 38.2%. The positive CPT could identify patients suffering cardiovascular events. P with a positive test had 4.5 times more chances of suffering a cardiovascular event than those with a negative test.

**Introduction:** Pre-test probability of coronary artery disease (CAD) from clinical information is important for assessing diagnostic and risk stratification of CAD. Stress myocardial perfusion imaging (MPI) studies generally suggest a powerful predictor for cardiovascular events. Chronic kidney disease (CKD) has been established as the risk factors for cardiovascular events. However, the relationship of CKD, pre-test probability of CAD and stress MPI as a predictor of cardiovascular event is unclear. Objectives: The purpose of this study was to evaluate the prognostic value of these factors in patients. Methods: Patients who had no history of CAD underwent stress MPI (n = 328, male = 180 and female = 148, age = 68 years, CKD = 112, hemodialysis = 45, Pre-test probability assessed by age, gender, symptom, menopause, diabetes, hypertension, smoking, hyperlipidemia, family history and body mass index; low / intermediate / high = 19 / 209 / 100) were followed up for 15 months. CKD was defined by an estimated glomerular filtration rate of < 60 ml/min/1.73 m2 and/or persistent proteinuria. Cardiovascular events included cardiac death, non-fatal myocardial infarction, cardiovascular revascularization and congestive heart failure requiring hospitalization. Results: Cardiovascular events occurred in 37 patients (11.3%), among whom 12 patients (38.2%) had a positive CPT. 3,4% did not tolerate the CPT and 2.7% had to suspend the study due to a vagal reaction. The male subjects and hypertensive p were more likely to have a positive CPT. Conclusion: In this population the prevalence of positive CPT was 38.2%. The positive CPT could identify patients suffering cardiovascular events. P with a positive test had 4.5 times more chances of suffering a cardiovascular event than those with a negative test.
Radiation exposure in children with congenital heart disease: comparative study between 64 multislice CT scan and diagnostic cardiac catheterization
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Introduction: Radiation exposure in children with congenital heart disease is one of the most important risks in this radiosensitive age group. Objectives: We sought to compare radiation exposure resulting from diagnostic cardiac catheterization versus that of 64 multislice CT scans in children with congenital heart disease. Methods: The study included 44 patients who were previously diagnosed as having tetralogy of Fallot and who were referred for either diagnostic cardiac catheterization (group 1) or 64 multislice CT scans (group 2) using a non ECG gated low radiation dose protocol. Radiation exposure parameters were recorded in each group including the radiation dose area product (DAP) for cardiac catheterization and the dose length product (DLP) for MSCT as well as the effective dose (E) for both imaging modalities. The data was then statistically analyzed using paired T test to determine whether or not there is significant difference between these two modalities as regard radiation exposure. Results: There was no significant difference between both groups as regard age and weight. The radiation exposure time was significantly shorter in the MSCT group (0.05 ± 0.01 min) compared to the catheterization group (7.8 ± 4.7 min) (P < 0.0001). The mean DAP of the cardiac catheterization differed significantly from the DLP of the MSCT (3.61 ± 1.42 Gycm2) versus 0.081 ± 0.035 Gycm2) (P < 0.0001). The effective dose was 1.36 ± 0.86 mSv for the MSCT group compared to 2.45 ± 1.21 mSv for the catheterization group (P < 0.0001). Conclusion: The use of non ECG gated low radiation dose MSCT protocol provided significantly shorter scanning time as well as lower radiation doses compared to diagnostic cardiac catheterization in children with congenital heart disease.

Postnatal outcome in antenatally-diagnosed congenital heart disease: data from a fetal cardiac registry in the United Arab Emirates
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Introduction: Fetal echocardiography (FE) detects congenital heart disease (CHD) in the majority of cases, and may improve perinatal mortality. There is paucity of data in regards to the types and outcome of fetal CHD in the United Arab Emirates (UAE). Objectives: To report the postnatal outcome for all fetuses diagnosed with CHD in a referral center in the UAE. Methods: Retrospective chart review was performed for all fetuses undergoing FE in our institution. Data regarding fetal and neonatal CHD were included in a cardiac registry. The primary outcome was survival at 26 days of life. Secondary outcome measures included: number of patients with correct postnatal (PN) diagnosis, type of CHD detected, extracardiac malformations (ECM’s), and parental consanguinity. Results: Between January 2005 and December 2010, 1965 pregnant women carrying 2151 fetuses underwent a total of 2282 FE’s. CHD was diagnosed in 152 fetuses (7.1%), of which PN outcome was available in 120 fetuses. Eighty-six neonates (71.7%) survived through 28 days of life (including 90% neonates who had cardiac surgery. Fetal demise and stillbirths occurred in 5 (4.1%), and 8 (6.7%) fetuses, respectively. Perinatal mortality was higher in fetuses with ECM’s (4/120; 3.3%) compared to the catheterization group (2.45/11006) versus 0.081/11006 (P < 0.0001). The effective dose was 1.36 ± 0.86 mSv for the MSCT group compared to 2.45 ± 1.21 mSv for the catheterization group (P < 0.0001). Conclusion: The use of non ECG gated low radiation dose MSCT protocol provided significantly shorter scanning time as well as lower radiation doses compared to diagnostic cardiac catheterization in children with congenital heart disease.

Echocardiographic screening for congenital heart disease among 6270 asymptomatic school children in India
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Introduction: The prevalence of echocardiographically detected congenital heart disease (CHD) among asymptomatic school children in India is not known. Conventionally, auscultation has been used for community screening for CHD, but echocardiography with Doppler may be more sensitive and specific. Objectives: We carried out a cross sectional survey to diagnose heart defects in asymptomatic school children aged 5–15 years, living in rural areas, using portable echocardiography. Methods: The demographic data was collected. After history and physical examination, echo-Doppler was performed, using a bedside portable echocardiography machine. Results: A total of 6270 asymptomatic children were screened and 52% were male. The mean age was 10.79 ± 2.63 years. Echo-Doppler diagnosed CHD in 45 cases, giving a prevalence of 7.2/1000 school children (90% CI – 5.1 – 9.3/1000 children). The cardiac lesions identified by echo-Doppler included: atrial septal defect (19 patients), bicuspid aortic valve with regurgitation (9 patients), ventricular septal defect (4 patients), patent ductus arteriosus (5 patients). Two patients with operated Tetralogy of Fallot (TOF), 1 patient with un-operated TOF, 1 with Eisenmenger syndrome and 1 with ventricular septal defect with aortic regurgitation were identified. All the lesions requiring surgical interventions were also identified clinically. Only 2 out of the 15 patients needing a surgical or interventional therapy have undergone the same. Conclusion: The study establishes the community prevalence of CHD in India. All the lesions requiring an intervention are also identifiable by careful clinical examination. Majority of patients needing a definite intervention have not undergone the same in rural India.

Detection of critical congenital heart disease by pulse oximetry: preliminary data from the United Arab Emirates
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Introduction: Critical congenital heart disease (CCHD) occurs in 1–3/1000 live births (LB), and requires treatment in the neonatal period. Fetal and postnatal diagnosis can miss up to 50% of the patients, resulting in substantial morbidity and mortality. Pulse oximetry (POx) may accurately identify newborns with CCHD. Objectives: To describe our preliminary results after adopting the first program in the United Arab Emirates of newborn screening for CCHD using POx. The primary outcome was number of newborns with CCHD detected by POx. Secondary outcome measures included: sensitivity, specificity, positive (PPV) and negative predictive values (NPV) of POx, cost, and incidence of CCHD among all live newborns. Methods: All newborns delivered in our hospital after January 1st, 2011, were screened after 24 hours of birth by POx applied to the right foot. Newborns admitted to the Neonatal Intensive Care Unit were excluded, while those with saturations <95% were referred for prompt echocardiography. False negative results were tested by contacting the parents and/or examining the medical records of the screened newborns, after 2 weeks of discharge. Results: Between January 1st and June 30th, 2011, there were 2073 LB in our hospital, of which 1969 eligible newborns were screened at a median age, weight, and length of stay of 25 hours, 3010 grams, and 48 hours, respectively. Results are shown in tables 1 and 2.

Cost was 7.4 USD per screened newborn. During the same period, there were 3 newborns diagnosed with CCHD by fetal echocardiography, resulting in overall incidence of CCHD of 1.9/1000 LB (95% CI 0.6 –5.3).
Calcium supplementation reducing risk of hypertensive disorders complicating pregnancy: a meta analysis of multi-center RCTs

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Introduction: Hypertensive disorder complicating pregnancy is one of the leading causes of maternal mortality and morbidity. Studies have shown calcium supplementation during pregnancy may reduce the risk of hypertension, and may help to prevent preterm birth and fetal growth restriction. Studies on the effects of calcium supplementation during pregnancy have been developed worldwide. Some system review and meta analysis have carried through by some researchers, but there was no report of meta analysis about multicenter RCTs. Objectives: We aimed to assess the effects of calcium supplementation on the incidence of hypertension, preeclampsia, gestational hypertension, and related maternal and child outcomes. Selection criteria: Nulliparous women without hypertension, diabetes mellitus or renal disease. Multicenter randomized trials comparing calcium supplementation with placebo. Data collection and analysis: We assessed eligibility and trial quality by 3 researchers independently, extracted and double-entered data. Results: We included 4 studies of good quality (involving 14537 women). The risk of hypertension was reduced in calcium group (4 trials: risk ratio (RR) 0.91, 95% confidence interval (CI) 0.84 to 0.99). There was no reduction in the average risk of severe gestational hypertension associated with calcium supplementation (3 trials: risk ratio (RR) 0.81, 95% confidence interval (CI) 0.60 to 1.03). The average risk of preeclampsia was not reduced in the calcium group (4 trials: risk ratio (RR) 0.90, 95% confidence interval (CI) 0.79 to 1.04). There was no overall effect on the risk of severe preeclampsia between two groups (3 trials: risk ratio (RR) 0.80, 95% confidence interval (CI) 0.62 to 1.00). The average risk of preterm birth was not reduced in the calcium group overall (4 trials: risk ratio (RR) 0.95, 95% confidence interval (CI) 0.86 to 1.05). There was no overall effect on the risk of low birth-weight (2 trials: risk ratio (RR) 0.87, 95%confidence interval (CI) 0.73 to 1.05). Conclusion: Calcium supplementation appears to reduce the risk of pregnancy induced hypertension, but not reduce the risk of severe gestational hypertension, preeclampsia, severe pre eclampsia, preterm birth and low birth-weight.
Precipitants of hospital admission for exacerbation of heart failure
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Introduction: Identification of factors precipitating hospitalization for heart failure (HF) exacerbation provides targets for intervention to decrease high hospitalization rates. Objectives: To provide a comprehensive and systematic analysis of precipitants of hospital admission for exacerbation of HF. Methods: All admissions for 2008 to a regional tertiary referral medical center were thoroughly reviewed if they had any discharge ICD-9 code related to HF. Only those unique hospitalizations confirmed as a hospitalization for HF exacerbation using Framingham criteria, treatment expected for HF exacerbation, and adjudication by HF experts were included. Every page of the electronic and paper medical record was reviewed for symptoms experienced, patients’ and others’ responses, factors precipitating admission, management in the hospital and discharge details. Patients could have more than one factor precipitating admission. Results: A total of 482 patients (43.6% female; mean age 62 ± 15 years; 58% HF with systolic dysfunction; 42% HF with preserved ejection fraction; 5.4% died before discharge) had a confirmed HF exacerbation. Dyspnea was the most common symptom experienced by patients (92.5%) and 20.3% of patients waited until they were severely dyspneic before seeking treatment. The most common precipitating factor was medication or dietary nonadherence (42.4%) followed by renal insufficiency or failure (32.5%), infection (19.5%), ischemia (15.6%), hypertension (14.1%), dysrhythmias (13.1%), anxiety/depression/poor social support (12.9%), medication side effects/change in meds (9.3%), alcohol or drug abuse (6%), patient did not keep appointment (3.1%), poor follow-up care (3.5%), and diabetes (2.9%). Conclusion: Although a wide variety of psychosocial, behavioral and biological factors precipitate admission for HF exacerbation, the single most common factor is non-adherence to the recommended regimen. These data suggest that patient non-adherence must be targeted more aggressively by clinicians in order to decrease high hospitalization rates.

Evaluation of appropriateness and outcomes of in-hospital telemetry monitoring
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Introduction: Remote telemetry monitoring of the heart rhythm is an important part of diagnosis and treatment of cardiac patients.Practice Standards for Electrographic Monitoring by the American Heart Association (AHA) classifies patients into three categories. Objectives: The objectives of the study were to: i) investigate how patients are assigned according to the AHA classification and ii) describe number and type of arrhythmic events and subsequent change in management. Methods: A prospective observational design was applied. All patients assigned to telemetry at one university hospital in adult wards during a three month period were consecutively enrolled. Data were collected 24/7. A registration data sheet with sixty-four variables was developed, completed by monitor watchers at the central monitor station, and reviewed by the investigator. Medical records were reviewed in all patients. Results: Overall, 1194 registrations on 1032 patients were made. Eighteen percent of patients were classified to AHA Class I (monitoring indicated), 71% in Class II (monitoring may be of benefit) and 11% in Class III (monitoring not indicated). Using discharge diagnosis rather than admission diagnosis as baseline classification provided a closer correct distribution of patients: Class I (54%), Class II (31%) and Class III (15%). The most common admissions diagnosis in Class I were intoxications (17%), in Class II chest pain (58%) and in Class III dizziness (21%). Overall arrhythmia event rate was 33%. Respectively, 43% of patients in Class I, 28% in Class II and 46% in Class III experienced arrhythmia events. In particular, patients with heart failure (58%), arrhythmias (50%) and chest pain (23%) experienced adverse events. Overall, change in management occurred in 18%; 25% in Class I, 14% in Class II and 29% in Class III. Patients had both cardiac (85%) and non-cardiac (15%) admission diagnosis. Conclusion: Most patients in this study were monitored as appropriate, according to AHA Class I and II indications. Although it can be argued that number of Class III indication patients should be reduced, nearly half of them experienced arrhythmia events and one third received management changes. This challenges existing guidelines.

The importance of information on adherence to therapy after cardiac ischemia
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Introduction: The information about medication plays an important role in the safe and correct use of prescribed therapy and in the success treatment of diseases. But poor adherence is an ubiquitous problem with adherence rates of only approximately 50% in chronic illness. Patient’s satisfaction is a multifaceted construct that, among many other factors, directly affects the treatment. It seems important that the information provided meets the patient’s needs to improve their satisfaction. Objectives: information provided about therapy and treatment adherence. Methods: It is a quantitative and transversal study. We used a self-administered questionnaire for sociodemographic characterization, Appar Family (AF), Satisfaction with the information about the medication (SIMS) and its subscales: Action and Use of Medication (AUM) and Potential Problems Medication (PPM), and Measure Adherence to Treatment (MAT). The sample was not probabilistic, with 196 subjects with ischemic heart disease in follow-up conducted 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", 57.1% live in “rural” and 75.5% had “highly functional family.” We used the Student t test and linear regression in SPSS.

Results: Most patients (52.0%) show a “Good Adherence” to the treatment, 20.4% "Reasonable Adherence" and 27.6% “Low Adherence”. Men are more adherent than women (5.36 ± 0.66 vs 5.21 ± 0.72, p=0.092). As for the SIMS, 53.1% of patients are very satisfied (51.7% in men and 55.3% in women), 8.2% are fairly satisfied and 38.8% are unsatisfied. About 82.87% of the variation MAT is explained by SIMS (β = -0.189; t = -1.762; p=0.089). SIMS (β = 0.252; t = 0.001; p = 0.001), age (β = 1.200; t = 0.012; p = 0.204) and AUM subscale (β = -0.176; t = 1.704; p = 0.090).

Conclusion: Being satisfied with the information provided by health professionals is a key factor for patients participate in decisions about their treatment. This influences positively the level of patient’s adherence to therapy.

Prevalence of atrial fibrillation in primary care patients: a study by a telemedicine service in Brazil
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Introduction: Atrial fibrillation (AF) is associated with substantial morbidity and mortality. It increases the risk of death, heart failure, stroke and other thromboembolic events. Additionally, it is associated with higher medical costs, degraded quality of life and reduced functional status. Because anticoagulation in AF can consistently reduce the possibility of thromboembolic events including stroke, the study of its prevalence assumes great importance in primary care.

Although traditional cardiovascular research has been based in secondary or tertiary care settings, the majority of care for people with cardiovascular diseases, however, takes place in the primary care. Objectives: To assess the prevalence of AF 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 electrocardiogram (ECD) analyzed by cardiologists of the Centro de Teleseuado do Hospital das Clı ´nicas da Universidade Federal de Minas Gerais, a public telemedicine service in Brazil, in January 2011 were included. This service attends primary care patients of 608 public cities in Minas Gerais province. EDCA were sent from primary professionals through internet for analysis and interpretation of ECD. The prevalence of AF was assessed.

Results: A total of 16,605 primary care patients underwent ECG in the study period (mean age
Aortic sclerosis is a predictor of AF recurrence after sinus rhythm restoration in patients without significant structural heart disease

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Introduction: In patients with atrial fibrillation (AF), the arrhythmia recurrence is very frequent and associated with an increased risk of cardiovascular events, no information is available regarding the relationship between AS and AF. We hypothesized that the presence of AS, as a potential marker of left atrium (LA) remodeling, would be associated with an increased risk of AF recurrence (AF-r). Objectives: To analyze the relationship between aortic sclerosis and the occurrence of AF-r. Methods: We prospectively studied 146 consecutive patients (age >75: 27%; hypertension: 61%; LA area ≥ 20 cm²: 54%) with lone AF (paroxysmal: 42%; persistent: 58%) who were followed-up for one year after SR-r. The follow-up protocol included daily patient pulse monitoring, a weekly medical visit and a monthly 24 hours Holter ECG recording. AS was defined by focal areas of increased echogenicity and thickening of the aortic-valve leaflets without restriction of leaflet motion (velocity across the aortic valve ≥2.5 m per second). Lone AF was defined by LV EF≥50%, no left ventricular hypertrophy and no significant valvular disease. AF recurrence was defined as any AF of duration of at least 1 minute. Results: We identified 69 patients (46%) with AS. AS was more frequent in patients ≥75 years vs. <75 (69% vs. 47%; p<0.002), in hypertension (64% vs. 36%; p<0.001), in paroxysmal vs. persistent AF (67% vs. 47%; p<0.01) but similar in LA ≥20 cm² vs. LA <20 cm² (52% vs. 42%; p=0.3). The cumulative incidence of AF recurrence was 55%. AS recurrence was higher in patients with AS (75% vs. 43%; p<0.001; log rank test) Figure 1. After adjusting for age, risk factors, co-morbidities, LA size, medical treatment and clinical pattern of AF (Cox-regression analysis), AS was found the only independent predictor of AF-r (hazard ratio= 2.9; 95% confidence interval: 1.6–5.2; p<0.001). AS was associated with a higher incidence of recurrence in patients with non-dilated LA (63% vs. 39%; non-adjusted p=0.08) as well as in those with a LA area ≥ 20 cm² (72% vs. 42%; non-adjusted p=0.003).

Image/graph 1:

Conclusion: In patients with lone AF, AS is independently associated with an increased risk of recurrence after SR-r.

Clinical usefulness of the risk scores CHADS2 and CHA2DS2VASC

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Introduction: Atrial fibrillation (AF) is the most common sustained arrhythmia, its presence increases by five times the risk of stroke and duplicates mortality. The CHADS2 score is a validated tool with regard to risk stratification; recently the CHA2DS2VASC has been presented as a new score that might potentially improve risk stratification. Objectives: To determine the proportion of patients with CHADS2 ≥ 2 / CHA2DS2VASC ≥ 2 (both scores recommend oral anticoagulation –OA-) in a large cohort of patients admitted in a general hospital of Salamanca with an acute myocardial infarction (MI), acute heart failure (HF) or ischemic stroke. Methods: Retrospective study of patients admitted due to MI, HF or stroke from 2006 to 2007 in a General Hospital in Spain. For each patient the CHADS2 and CHA2DS2VASC risk scores were calculated. The total cohort was subdivided in four groups (every 30 months) according to the date of admission. We describe trends regarding the rate of prescription of OA or antiplatelet drugs.

Results: We recruited 6542 patients (2157 MI, 2138 HF and 2247 strokes) of whom 1700 (25.8%) presented with persistent or paroxysmal AF (46.0% male); average age 77.9 years (SD 10.9). Categorized by CHADS2: we observed that 200 patients (95.8 %) with MI; 904 (96.7 %) with HF and 408 (76.8%) showed a CHADS2 ≥ 2, thus with OA recommended; One hundred percent in patients with MI. 99.0% in those with HF and 95.5% in patients with stroke showed CHADS2/VASC risk score ≥ 2. The rate of OA prescription at discharge was 15.4, 36.1 and 38.3% respectively. Between the four study-periods there was a reduction in the prescription of antiplatelets (47.9 vs. 33.3, p<0.001) at discharge and an increase regarding the use of OA (27.0 vs. 48.0%, p<0.001) in patients with HF. No significant changes were found in patients with MI or stroke. Conclusion: In the light of our findings the usefulness of CHA2DS2VASC risk score is confining since nearly all patients with diagnosis of MI, HF or Stroke and AF showed a score ≥ 2 (indication of OA). The underutilization of OA is still a major cause of concern.

Detection of endothelial dysfunction in non rheumatic adult AF patients

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Introduction: Flow abnormalities which occur in AF patient due to irregular heart rate which resultant turbulent flow both in left atrium and systemically may lead to endothelial dysfunction. Objectives: To detect endothelial dysfunction in non rheumatic AF patient. And test the hypothesis that endothelial dysfunction is reversible upon restoration of normal sinus rhythm and correction of the blood flow dynamics. Methods: Endothelium-dependent (flow-mediated dilation) vasodilator function of brachial artery was measured using high resolution ultrasound in 30 patients with persistent non rheumatic AF who were scheduled for elective electrical cardioversion and in 10 control subjects. In patients who remained in sinus rhythm after cardioversion, these measurements were repeated after one month and two months. Results: Compared with control subjects, patients showed lower FMD during AF (6.66±1.62% vs. 14.29±2.93%, p<0.001). In patients who remained in sinus rhythm, FMD increased by 1 month (6.66±1.62% vs 10.71±2.81%, p<0.001) and two months (6.66±1.62% vs 14.28±3.48%, p<0.001). Conclusion: There is endothelial dysfunction associated with non rheumatic persistent AF patients which is reversible upon restoration of normal sinus rhythm and correction of blood flow dynamics.

References:

Mesenchymal stem cells genetically engineered to create cardiac pacemaker cells

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Introduction: At present, molecular approaches to the development of a biological pacemaker are a conceptually attractive alternate treatment modality for bradyarrhythmias. Objectives: The study was to test proof-of-principle if genetically engineered mesenchymal stem cells (MSCs) transfected with HCN2 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 HHCN2/pCDNA3. 3. Total RNA was extracted from control MSCs and those transfected with HCN2, and RT-PCR was performed. 4. Mesenchymal progenitors were extracted from control MSCs and those transfected with hHCN2. Western blot analysis was performed. 5. Whole-cell patch clamp was used to study membrane currents. After the I_0 was recorded, cells were superfused with extracellular solution containing 4 mM cesium chloride and the currents were measured accordingly. 6. MSCs transfected with either GFP-alone or GFP-HCN2 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 HCN2 protein, mHCN2-transfected hMSCs also express an anticipated high level of hHCN2 gene by RT-PCR and Western blot analysis. 2. i) 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 occurrence bradycardia rate of cardiac myocytes was 87±11 bpm when MSCs were transfected with control plasmid (expressing only GFP) and 149±14bpm when MSCs were expressing both GFP/mHCN2 (P<0.05). Conclusion: MSCs transfected with HCN2 genes by Lentiv are capable of actively pacing ventricular cardiac myocytes and can be modified to be cardiac pacemaker cells.

References:

Long term prognostic value of QRS duration in patients with permanent pacemaker

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Introduction: Wide QRS complex correlates directly with prognosis in patients with left bundle branch block and heart failure (HF). The clinical impact of QRS duration in right ventricular apical pacing is still unknown. Objectives: Our purpose was to analyze the long term prognostic value of paced QRS duration (pQRS-d) in patients with pacemaker and mean time of pacing upper than 40% in the follow up. Methods: Prospective study of 297 consecutive patients with implanted pacemaker between 2000 and 2002 (mean age: 76±10 years; male: 56%; VI pacing mode: 60%). pQRS-d was measured before discharge. The incidence of combined event (CE) happened 37%. Patients were classified into four groups depending on pQRS-d: Q1 ≤159 ms 37% 2733 days (2514-2952), Q2: 160 ms (n=190) 13% 3217 days (2878-3557), Q3: 161-189 ms (n=43) and Q4 ≥190 ms (n=90). As shown in table, incidence of CE was lower and CE free survival was increased in patients with pQRS-d ≤159 ms (Long-rank test; p=0.04 Q1 vs other groups). See figure.

Multivariate analysis (COX regression) included pQRS-d, age, sex gender, arterial hypertension, incidence of CE was lower and CE free survival was increased in patients with pQRS-d ≤159 ms (Long-rank test; p=0.04 Q1 vs other groups). See figure.

Conclusions: Wide QRS complex is significantly associated with an increased risk of cardiovascular death and heart failure in long term follow up.

Does cardiac resynchronisation therapy reduce inappropriate shock therapy in patients with implantable cardioverter-defibrillators?

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Introduction: Despite the benefit of implantable cardioverter-defibrillators (ICD), a significant number of patients experience inappropriate shock therapy (IST) post implant. An increasing number of patients with advanced heart failure receive combined ICD and cardiac resynchronisation therapy device (CRT-D). The incidence of inappropriate shock therapy shock in this group is less well described. Objectives: To assess the incidence of IST and predictors of IST in ICD and CRT-D patients. Methods: All patients implanted with an ICD and CRTD between October 2007 and January 2009 were studied. The IST event rate and predictors of IST were analysed using Kaplan-Meier estimates and Cox proportional hazard models. Results: 185 patients with ICD/CRTD were included in the analysis: 100 ICD patients (mean age 67±1.3; male 85%; ischaemic cardiomyopathy 80%) and 85 CRT-D patients (mean age 70±1.2; male 85%; ischaemic cardiomyopathy 68%). In total 18 patients experienced at least one episode of IST during the follow-up period (median 25 month, IQR 24). There was a significantly lower IST cumulative event rate in the CRT-D vs. ICD group, 19.8% and 4.5% respectively by 36months (p=0.017), see Figure 1. The majority of the IST was caused by atrial arrhythmias. Documented atrial fibrillation/flutter prior to implantation was a strong independent predictor of IST, HR 3.79 (p=0.016).

Conclusion: Patients with CRT-D had a significantly lower incidence of IST compared to patients receiving an ICD. This may be due to a reduction of atrial arrhythmia burden. Further study is needed to assess whether cardiac resynchronisation therapy reduces the incidence of atrial arrhythmia.

Intravascular defibrillator (PICD): chronic implantation in a canine model

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Introduction: A percutaneously placed, implantable intravascular defibrillator has been approved for use in humans. This study evaluated the implant techniques as well as stability of the PICD during a 9 month period following placement of the device in a canine model. Methods: Twenty-three hounds (weight 30–55kg) were anesthetized and under sterile conditions a custom sheath was introduced into the right femoral. Two guidewires were placed in the left jugular vein and the PICD advanced via the right femoral vein over one of the wires into the vasculature. Utilizing a delivery catheter the device was positioned such that the titanium electrodes (cathodes) were located in the superior vena cava and the inferior vena cava. A self-expanding Nitinol anchor was advanced to the jugular via the second wire, and deployed to secure the PICD in the vasculature. With a delivery catheter the RV coil electrode (anode) was positioned in the RV apex and screwed into place. The catheters, wires, and sheath were removed with an average implant time of under 20 minutes. In one group of animals (n=13), serial venograms were performed at 7, 14, and 28 days. In a second group (n=5) and third group (n=5), venograms were performed at 90 days.
and 270 days, respectively. Animals were examined by a veterinary doctor on a weekly basis to assess their general condition. **Results:** All canines recovered from the surgical procedure without serious adverse event. One post-op hemotoma was observed which resolved spontaneously at 10 days. All devices remained in the implanted position with no evidence of anchor movement or migration. Venograms revealed open IVC and jugular veins in all animals. General condition of the animals was deemed excellent at all time points. **Conclusion:** The PICD can be rapidly and safely implanted in animals. Long-term intravascular defibrillator placement is feasible in a canine model.

**Comparative analysis of the quality of life of heart failure patients in South Western Nigeria**

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**Introduction:** Heart failure (HF) is a common, chronic clinical syndrome with appreciable impact on both prognosis and lifestyle of patients. Two main aims of management include preventing disease progression and improving quality of life (QoL). Not much work has been done in this area in Sub-Saharan Africa and most of the available instrument were developed using the Caucasian population. **Objectives:** We therefore evaluated the QoL of stable HF patients attending the cardiology clinic of the Lagos University Teaching Hospital using a disease specific instrument, Kansas City Cardiomyopathy Questionnaire (KCCQ) and a generic one, the WHODDL-BREF. **Methods:** Consenting, stable HF patient were recruited from the cardiology clinic of the Lagos University Teaching Hospital. Relevant clinical data and echocardiographic parameters were retrieved from their clinical notes and the subjects filled out the questionnaire (self administered). The KCCQ and the WHODDL-BREF. The four main domains in the WHODDL-BREF was compared with scores on the KCCQ for relationships. **Results:** Complete data set of 190 patients were analysed. There were 91 males and 99 females with a mean age 51.90 ± 13.21. Only 26% had college education and 75% had very poor personal resources (pensioners, artisans, traders and unemployed). Most, 81.6% were married. About 54% were paying their medical bills themselves. The mean QoL score using the KCCQ score was 59.61 ± 23.80. Physical limitation and social limitation was severe to moderate in about 16% and 35% of the subjects respectively using the KCCQ instrument. With The KCCQ, 6.9% felt their QoL was poor and 20% felt it was fair while 11.6% and 20.5% felt their QoL was poor and fair respectively with the WHODDL-BREF. There was significant positive correlation, p<0.0001, between the KCCQ instrument and the four domains of the WHODDL-BREF; physical health (r= 0.485), psychological (r= -0.316), social relationships (r = 0.470) and environment (r = 0.428). **Conclusions:** Over 25% of HF patients in environment have unacceptable level of quality of life which has to be addressed in their management. The generic WHODDL-BREF would suffice in our environment if the specific KCCQ instruments are not available.

**Patients’ perception of heart failure and its management in a developing country**

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**Introduction:** Heart Failure (HF) is a major cause of hospital admission and mortality in Malaysia. Non-compliance and poor awareness of available treatment contributed significantly to recurrent admission and mortality especially in those of lower socioeconomic background. Thus, early identification of these patients’ perception and HF knowledge are essential in their management. **Objectives:** We aim to explore the perception and knowledge of their disease among poor income HF patients in a developing country with multi-ethnic background. **Methods:** Patients with a household income less than RM300/month(US$1000) admitted to the Cardiology ward for HF or attending HF clinics in a public hospital of Penang, Malaysia within a two-month period were interviewed using a standard questionnaire concerning their perception and treatment of HF. **Results:** A total of 70 patients, aged 57.7 ± 14 year old, 72.9% male were recruited. There were 47.1% Chinese, 24.3% Malay, and 28.6% Indian, most were only educated up to primary (n=25, 36%) or secondary school level (n=31, 44%), Half (46.8%) of them had at least one counseling by dedicated HF pharmacist before the interview. As a whole, 46(62.9%) were aware of their diagnosis but interestingly, when asked about aetiology of HF, 15.7% (n=11) attributed it to poor diet, another 15.7% and 7.1% attributed it to stress and sedentary lifestyle respectively. Despite counseling, 41.2% (n=14) of them were still not aware of the aetiology and half (47.1%) of them claimed that they did not have enough information about their disease. Besides, most (61.4% and 65.7%) were not aware that leg oedema and orthopnoea were symptoms of HF. In addition, most were aware of the dietary restrictions and importance of compliance but a significant 58.6% (n=41) of them did not know that herbal medication or over the counter medication might cause potential de-compensation of HF.

### Table 1. Utility values for assessment dates by caregiver type (0=dead, 1=full health)

<table>
<thead>
<tr>
<th></th>
<th>Day 1</th>
<th>Day 3</th>
<th>Day 5</th>
<th>Day 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caregiver</td>
<td>Mean SD</td>
<td>Mean SD</td>
<td>Mean SD</td>
<td>Mean SD</td>
</tr>
<tr>
<td>Formal</td>
<td>0.339 ± 0.152</td>
<td>0.563 ± 0.245</td>
<td>0.731 ± 0.381</td>
<td>0.764 ± 0.301</td>
</tr>
<tr>
<td>Informal</td>
<td>0.675</td>
<td>0.421</td>
<td>0.562</td>
<td>0.713</td>
</tr>
</tbody>
</table>
New model of home telemonitored cardiac rehabilitation based on nordic walking training in patients with heart failure: safety, effectiveness and compliance

Ewa Piotrowska1, Barbara Dobraszkiewicz-Wasilewska2, Adam Grzebieleowski2, Anna Jasionowska2, Maria Bednarczyk-Banaszak2, Joanna Gliwowska2, Ryszard Piotrowski1
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Introduction: The benefits of cardiac rehabilitation (CR) in patients (pts) with heart failure (HF) are well established. Now we are looking for an optimal and effective type of training. Objectives: To assess safety, effectiveness and compliance of home telemonitored cardiac rehabilitation based on nordic walking training in patients with heart failure. Methods: The study group comprised 64 pts (59.7 ± 9.3 years) with HF (NYHA II and III; EF <40%). After three weeks of clinical stability, the pts were randomized to either 8 weeks of nordic walking, five times a week, at 40–70% of maximal estimated heart rate - training group, n = 35 (TG), or to a control group, n = 29 (CG). In order to perform CR, a special device was created which made it possible to: (1) do the training according to a programmed plan, (2) send ECG via mobile phone to the monitoring center. The effectiveness of CR was assessed by changes - delta (Δ) in 6-minute walking test distance (6-MWT) and NT-pro-BNP level as a result of comparing 6-MWT (m) and NT-pro-BNP (ng/ml) from the beginning and the end of the program. Results: The groups were comparable in terms of demographic data, baseline clinical and pharmacotherapy. Safety of CR: In neither group there were deaths, necessary for hospitalization because of HF decompensation. Effectiveness of CR: Within-group analysis. The distance in 6-MWT increased significantly only in TG pts: from 449.8 ± 49.9 m to 459.5 ± 39.4 m (p = 0.0001), NT-pro-BNP level tended to be lower only in TG pts 1362 ± 798 pg/ml vs. 1143 ± 559 pg/ml (p = 0.0118). In the untrained CG the unfavourable results were observed: 6-MWT 488 ± 83 m vs. 458 ± 79 m (p = 0.3507); NT-pro-BNP 705 ± 635 pg/ml vs. 853 ± 754 pg/ml (p = 0.1846). Between-group analysis The differences between TG and CG were statistically significant in 6-MWT (p = 0.0001) and NT-pro-BNP (p = 0.017). Compliance of CR: All patients in the TG completed the 8 weeks CR programme. Conclusion: In heart failure patients home telemonitored cardiac rehabilitation based on nordic walking training is safe and effective. Compliance to home telemonitored cardiac rehabilitation based on nordic walking training seems promising.

Improving cardiac effort tolerance in chronic heart failure: role of noninvasive herbal procedure Sampurna Hriday Shuddhikaran
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Introduction: Heart disease is a worldwide problem affecting people in all communities. India bears 60% of the world's heart disease burden in the next two years and the average age of patients with heart disease is lower in Indian men compared to people belonging to the economically productive group. Objectives: (1) to study the exercise tolerance capacity of the chronic heart failure patient and (2) to study the effect of the Sampurna Hriday Shuddhikaran (SHS) model in improving the exercise tolerance capacity of chronic heart failure patients. Methods: A novel herbal procedure SHS which combines a four-fronged intervention of Shreeni (oil massage to reduce vascular tone), Swedan and Hrid Dhara (thermal therapy to reduce salt and water retention), and Drasht (rectal herbs to increase cardiac contractility) was used in each patient who received twice daily sessions of 90 min each for 6 consecutive days. Symptomatic patients (age >70 years) with congestive heart failure grade 1–3 of New York Heart Association classification, of either sex, with an ejection fraction more than 25% and who provided written informed consent were included in study. Patients with a history of myocardial infarction in the previous 2 weeks, uncontrollable hypertension (systolic blood pressure >160 mm Hg and diastolic blood pressure >110 mm Hg), Evaluation parameters used were exercise tolerance capacity (measured by the standard 6-min walk test [6MWT] and improvement in stress test [ST]), improvement in grade of symptoms (GOS) and improvement in metabolic equivalents (METs) taken on day 1 (pretreatment) and on day 6 (posttreatment). Results: A total of 500 patients were evaluated. Mean age = 57 ± 6 years; mean BMI = 23.5 ± 3 kg/m²; pre-existing diabetes mellitus on treatment = 32%; and past history of coronary angiography or bypass = 8%. The mean improvement in exercise tolerance as measured by 6MWT and ST postintervention was 72.6 m in 6 min and 136.1 ± 52.5 s in 9 min (p < 0.003), respectively. The corresponding improvement in VO2 max and METs was 3.8 ± 2.84 L/min and 2.5 ± 1.3 METs. Patient symptoms also improved. Vital parameters were stable. No significant adverse events were seen in any patient. Conclusion: Sampurrna Hriday Shuddhikaran using a novel MICR protocol was effective in improving the exercise tolerance and oxygen uptake in symptomatic chronic heart failure patients, and this improvement was independent of age, sex, and body-mass index.
Clinical characteristics of non-responders and super-responders

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Introduction: We aimed to assess the benefit of CRT in the elderly population (aged more than 75 years). The primary objective was to compare the response of CRT in elderly patients (aged 75 years or more) with younger patients.

Methods: This is an observational retrospective study that looked at our 10-year registry. 86 of those patients were aged 75 or more. The average age in this arm was 78.7 years. 60% of those patients had ischemic cardiomyopathy. Average EF prior to CRT was 28.2%. After CRT, the average EF was 59.5%.

Results: We found that the elderly response to CRT is comparable to the younger population. There was no significant difference in the baseline demographic, co-morbidities, and clinical characteristics between the two groups. However, the mortality outcomes in both cohorts of patients were different.

Conclusion: The response of CRT in elderly patients is comparable to the younger population, but the mortality outcomes are different. Further studies are needed to explore the mechanisms behind this phenomenon.

Acoustic cardiography parameters to predict outcome after cardiac resynchronization therapy

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Introduction: Acoustic cardiography is an automated method that records, analyzes, and displays simultaneous ECG and heart sound data. Recently, acoustic cardiography has been used in cardiac resynchronization therapy (CRT) devices optimization. Objectives: We sought to investigate the predictive value of acoustic cardiography parameters in CRT recipients.

Methods: Consecutive patients were studied immediately prior to CRT implant. Patients were followed for CRT device implantation and 3–6 month after implantation of CRT-device. Current medication included angiotensin-converting enzyme inhibitors (88%), furosemide (8%), beta-blockers (98%), amiodarone (18%), spironolactone (10%). PB was established according to the following criteria: 1) three or more regular oscillations; 2) regularity was defined if the standard deviation of three consecutive cycle lengths (T) was 10% or more regular oscillations; and 3) minimal average amplitude of ventilatory (VE) oscillation was less than 5 L.

Results: We found that the response of CRT to PB was not significantly different between the age groups. However, the mortality outcomes were different. The 5-year survival rate was 58, log rank p = 0.03.

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Conclusion: In this cohort of CRT recipients, S3 strength was a significant predictor of outcome. Further study of the role of acoustic markers in patient selection for CRT application may be warranted.

Long-term follow-up of mitral valvuloplasty with single balloon
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Introduction: Mitral balloon valvuloplasty (MBV) with single balloon (MBVSB) is the less expensive technique to perform MBV. Objectives: To evaluate long-term follow-up (FU) of MBVSB and to determine independent predictors of survival (IPS) and event-free survival (EFS). Methods: From 1987 to 12–31-2010, 526 procedures (proc) of MBV was performed, 404 (77.1%) with MBVSB Balm, being 256 proc with long-term FU. The balloon diameter was 25 mm in 5 proc and 36 mm in 251, mean dilatation area 7.0±0.30 cm². The FU was 54.6±32.8 (1 to 174) months. To determine IPS and EFS it was used the multivariate Cox analysis. Results: Mean age was 38.0±12.6 (13 to 83) years, being 222 (86.8%) female, 215 (84.0%) in sinus rhythm, echo score (ES) 7±2: 1.5 to 14 points and echo mitral area (EWA) pre-MBVSB =0.90±0.21 cm². Mean pre and post-MWA (Gorlin) 0.93±0.19 cm² and success MVSA =1.5±1.0 cm² in 244 (46.1%) provoked mean pulmonary artery pressure pre and post MBV were 27±10 and 20±7 mmHg. Three (2.1%) patients( p) began with severe mitral regurgitation (SMR). At the end of the FU 119 (46.5%) were in NYHA FC II, 70 (27.3%) in FC III, 52 (%) in FC IV and there were 11 deaths (4.3%). There were 17 (6.2%) p with new SMR at the end of the FU. Twelve (4.7%) p were submitted to new MBVSB27 (10.8%) to mitral valve surgery (MVS) and 70 (26.3%) p used no medication at the end of the FU. IPS were: ES <0.001, HR =0.116, 95% CI 0.035–0.384, age <50 years old (p =0.011, HR =0.203, 95% CI 0.072–0.690) and absence of MVS in the FU (p =0.004, HR =0.170, 95% CI 0.059–0.557). Independent predictors of EFS were: absence of prior concomitant (p =0.002; HR =0.148, 95% CI 0.051–0.428), female (p =0.036, HR =0.466, 95% CI 0.229–0.951) and MWA post MBV = 1.50 ±0.19 cm² (p =0.001). IPS were: ES <0.001, HR =0.466, 95% CI 0.484–2.867. Conclusion: MBVSB Balm was efficient with durable results similar to other techniques. IPS were: ES = 8 ≥ age 50 years old and absence of MVS in the FU. Independent predictors of EFS were: absence of prior concomitant, female gender and MWA post MBV = 1.50 ±0.19 cm².

Percutaneous mitral valvuloplasty: immediate and mid-term follow-up results in 5700 patients
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Introduction: Percutaneous Mitral Valvuloplasty (PMV) has emerged as an effective nonsurgical technique for the treatment of patients with symptomatic Mitral Stenosis (MS). Less is known about the mid-term and long-term results of PMV from developing countries. Objectives: This report highlights the immediate and mid-term follow-up results of this procedure in an unselected cohort of patients with rheumatic mitral stenosis from a single center. Methods: Between October 1998 and April 2011, 5,700 MS patients with mean age of 32 ± 25 years (range, 8 - 76 years) was performed PMV using the Inoue balloon. A detailed clinical, echocardiographic, haemodynamic assessments was done pre, soon after procedure and at every 3 months for the first year and at 6-month intervals thereafter. Results: The procedure was technically successful in 5,659 patients (99.28 %), but optimal result (MVSA > 1.5 cm²) without severe complications) was achieved in 5,638 (98.99%). The mitral valve area increased from 0.7 ± 0.2 to 1.7 ± 0.3 cm² (on 2D echocardiography) and from 0.6 ± 0.2 to 1.8 ± 0.3 cm² (on PHT) (p <0.001). The reduction in mean transmural valve gradient (MVG) was from 19 ± 6 to 6 ± 4 mmHg. There was an influence of age, echo score and the balance of mitral commissural valve on the results achieved by PMV. However, no influence of gender, atrial fibrillation, prior-commissurotomy, combined mitral regurgitation and pre-PMV mitral valve area on the results of PMV was found. Complications rate was low including 6 patients (0.009%) died (procedure related); 19 (0.03 %) with cardiac tamponade; 63 (0.11 %) with severe MR. Data of 600 patients followed over a period of 5 ± 0.6 years (range, 1 - 9 years) revealed MVSA of 1.65 ± 0.3 cm². Mitral valve restenosis was seen in 105 (17.5 %) patients, of which all were having recurrence of NYHA class III or more. The procedure was successful in all 117 pregnant women but only (0.08%) and it is noticeable that the procedure, the follow-up to the delivery was uneventful for both mothers and babies. The procedure was also successful in 72 patients and saved 57 emergency and 110 end – stage MS heart failure patients who had extreme high risk for surgery. There are 87 children and adolescent patients who also got great benefit form this procedure. Conclusion: Percutaneous Mitral Valvuloplasty (PMV) is an effective and safe procedure with gratifying results in a high percentage of patients. The benefits are sustained in a majority of these patients on mid-term follow-up.

2058 Surgical management of prosthetic mitral valve malfunction
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Introduction: The number of patients undergoing revaluation for valvar heart disease is increasing and will continue to increase as the general population ages. These reoperations most commonly involve structural deterioration of a bioprosthesis. Regeneration of these valves was reported to be usually more difficult than primary operations because of dehiscence around the heart with an associated risk of reentry, the presence of more advanced cardiac pathology, and the existence of more frequent concomitancies such as pulmonary hypertension. Objectives: As a consequence of these and other factors, reoperative valve surgery historically has been associated with a considerably higher operative mortality than primary valve surgery. In the modern era, however, with use of alternative surgical approaches and advanced perioperative care, there has been significant improvement in outcomes. Early diagnosis and systematic surgical management is the key for optimum results. Methods: From 1992 through June 2009, 430 mitral valve operations were performed in 395 patients at the Dubai Heart Center. Of this cohort, 30 patients presented with prosthetic mitral valve dysfunction and had complete follow-up data obtained from our prospective valve clinic database. Mean age 38 ± 11.24 Female 6 males, we studied Time from diagnosis to surgical intervention, Indication for surgical intervention, Surgical approach. Type of prostheses and Surgical outcome. Results: In this series 80% of patients were women. Mean age was 38 ± 11 years. Most prosthetic valve thromboses occurred with mechanical prostheses (77%). The time interval from first valve replacement to prosthetic valve thrombosis was 39 ± 42 months. The most frequent clinical presentation was severe congestive heart failure (91.5%). All percent of patients underwent a surgical procedure, consisting of thrombectomy in 86%, mitral valve replacement in 94%. Operative mortalitity 20%. The 30-day operative mortality and total in-hospital mortality after prosthetic valve malfunction were7% and 8.5%, respectively. Conclusion: Prosthetic mitral valve dysfuction could be operative or post operative. Mechanical valves have a low incidence of reoperation, mostly for prosthetic thrombosis or dehiscence. Acute thrombosis occurs significantly earlier than pannus formation and constitute surgical emergency. Early diagnosis and systematic surgical management is the key for optimum results and increased survival. Monitoring of anticoagulation (Warfarin Clinic) has reduced incidence of valve thrombosis.

2059 Functional tricuspid regurgitation: echocardiographic determinants and mechanisms of severity
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Introduction: Functional tricuspid regurgitation (Tr) is associated with significant cardiac morbidity and mortality. Mechanisms and determinants of functional Tr severity have not been well established. Objectives: To analyze the mechanisms and factors predisposing the patients to determine functional Tr severity by transesophageal echocardiography, in patients aged 18 years and above, referred for echocardiography with various clinical indications. Methods: Between May & December 2010, a total of 110 functional Tr patients underwent comprehensive 2-D & 3-D echocardiographic assessment. Tr severity was defined using standard (ACC/AHA) criteria. Tricuspid annulus (TA) dimension, tricuspid valve (TV) tethering height, right & left heart geometry & function, and systolic pulmonary arterial pressures (PASP) were assessed for significant association with Tr severity. ANOVA, Kruskal Wallis and multiple stepwise linear regression tests were used in the analysis. Results: Of the total 110 patients, Tr was severe in 47, moderate in 30 & mild in 33. Rheumatic heart disease was the most common clinical diagnosis. Functional Tr severity correlated with right ventricular (RV) & TA geometry, right atrial (RA) size, RV function & estimated PASP on univariate analysis. TV tethering distance (p <0.001), end-diastolic TA dimension (p =0.001), RV end-systolic eccentricity index (p =0.001) & end-systolic RA area (p =0.026) independently determined functional Tr severity on multivariate analysis. Using ROC curve analysis, the sensitivity and specificity for predicting more than moderate Tr were 96% & 95% with a TA end dia diameter of >3.59cm, and 96% & 91% with a tethering distance >0.79cm respectively. With increasing Tr severity, TA enlarges and assumes a relatively circular shape with a greater increase in the antero-posterior dimension. Degree of tethering correlated with Tr severity in all the three leaflets (p < 0.001).
Mitral valve prolate cardiomyopathy

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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 left ventricular systolic function, which have been described as Marfan-related cardiomyopathy. Objectives: Our aim was to evaluate the left ventricular function in young adults with mitral valve prolapse (MVP) without significant mitral regurgitation (MR) using two-dimensional strain imaging. Methods: We studied 76 asymptomatic young subjects (mean age 19.7±1.8, 72% male) with MVP from REPLICA study (pREvalence of mitral valve ProLapse in young Adults) in comparison with 80 sex- and age-matched healthy subjects. MVP was diagnosed by billowing of 1 or both mitral leaflets >2 mm above the mitral annulus in the long-axis parasternal view. Longitudinal strain and strain rate (SR) were determined from three standard apical views, using spackle tracking, for each LV wall (Vivid 7 Dimension, Echocardiography) with grey-scale frame rate 50–55/sec. Results:

<table>
<thead>
<tr>
<th></th>
<th>MVP (1 cluster)</th>
<th>MVP (2 cluster)</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>n=17</td>
<td>n=61</td>
<td>n=80</td>
<td></td>
</tr>
<tr>
<td>Systolic strain</td>
<td>15.4±2.9</td>
<td>20.6±1.6</td>
<td>10.6±4.9</td>
</tr>
<tr>
<td>Inferoseptal ε</td>
<td>-14.5±2.8</td>
<td>-13.9±2.8</td>
<td>-15.8±2.6</td>
</tr>
<tr>
<td>Inferolateral ε</td>
<td>-13.3±3.3</td>
<td>-16.4±2.9</td>
<td>-18.7±3.9</td>
</tr>
<tr>
<td>Anteroseptal ε</td>
<td>-12.7±2.2</td>
<td>-18.6±3.4</td>
<td>-21.9±3.9</td>
</tr>
<tr>
<td>Global strain</td>
<td>-18.9±2.9</td>
<td>-24.7±2.9</td>
<td>-27.4±4.2</td>
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<tr>
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<td>-24.7±2.9</td>
<td>-27.4±4.2</td>
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Conclusion: This study emphasizes the role of TV deformations (TA dilation, TA shape alteration, TV leaflet tethering) and right side cardiac chamber geometric alterations in the pathogenesis of functional TR. Magnitude of PASP, Left ventricular function and geometry did not determine functional TR severity. Findings of this study have potential mechanistic and therapeutic implications, and will pave way for future research.

Progression of tricuspid regurgitation following mitral valve replacement for rheumatic valve disease: predictive factors for aggravation

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Introduction: Severe tricuspid regurgitation (TR) is a long term complication after mitral valve replacement. Its exact mechanism remains unclear and its management is unsatisfactory. The aim of the present study was to evaluate predictors of severe isolated TR late after mitral valve surgery. Objectives: determine predictive factors for aggravation of tricuspid regurgitation following mitral valve replacement for rheumatic valve disease. Methods: Between 1981 and 2007, a total of 624 patients who had mitral replacement without tricuspid valve surgery were followed up. Postoperative TR Gr III was considered significant TR. Results: The mean age was 35.7 years. 62% of patients were women. Preoperatively, 174 patients (28%) had TR Gr II, and 450 patients (72%) had Gr I or less TR. Previous percutaneous mitral valvotomy was noted in 52 (9%). Atrial fibrillation was noted in 75 % of patients. Mean tricuspid annulus diameter (mm) was 32±6 mm. 14% of patients had LVEF <50%. Preoperative systolic PASP > 40 mmHg was revealed in 30%. Right ventricle dilatation was found in 11%. The mean follow up was 12±7 years after surgery (3 to 25 years). The prothetic mitral function was within an acceptable range in the majority of patients (mean gradient 4.6 ± 2.1). The mean systolic PASP was reduced from 51±12 to 41±10. None of the patients with severe TR had a dysfunctional mitral prosthesis. Severe tricuspid regurgitation after surgery was noted in 15%. Mean tricuspid annulus diameter was 43±10 mm. Neither of these patients were operated. Follow up showed greater mortality in the severe TR group, with approximately 50% of mortality at 60 (3 to 7 ans) months after diagnosis. In Univariate Analysis preoperative Gr II TR, atrial fibrillation, huge left atrium, left ventricular dysfunction were significant risk factors for TR development. Multivariate analysis identified preoperative gr II, atrial fibrillation and huge left atrium as statistically significant predictors for late TR after surgery. Conclusion: The development of late TR is well known after mitral valve surgery, RV dilatation, Rhythm leaflet involvement contributes to severe TR occurring long after mitral valve replacement.
deformation may be the first signs of deterioration of the LV systolic function and existing of cardiomyopathy in mitral valve prolapse.

Six month follow-up of ugandan primary school children diagnosed with rheumatic heart disease in a large echocardiography-based prevalence study

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Introduction: Early detection and prophylaxis can prevent devastating sequelae of rheumatic heart disease (RHD). Echocardiography (echo)-based screening improves detection in endemic regions. However, the best protocol to optimize sensitivity and specificity is unclear and there are no reported longitudinal follow up data for children diagnosed by echo-based screening. Objectives: We report the first follow-up data of RHD positive children, identified through a large RHD prevalence study and assess the feasibility of incorporating strain analysis into a screening protocol. Methods: Between August and November 2010, auscultation and portable echo were used to screen students, ages 5 to 16, from randomly selected schools in Kampala, Uganda. Children with positive screens were referred for subsequent echos at Kampala’s main referral hospital and were enrolled in a followup program with repeat clinical and echo evaluation every 6 months for 5 years. These echos were blindly reviewed by 3 cardiologists classifying disease likelihood as definite, probable, and possible, based on the 2008 WHO/NIH Joint Consensus Statement. Children with probable and definite RHD began penicillin prophylaxis. Left ventricular strain analysis was performed offline on 6 month follow up echos. Results: Screening of 4869 of 5066 (97%) eligible students occurred in 6 schools. 72 were diagnosed with possible, probable, or definite RHD (1.5%). 86% (62/72) came for initial follow-up. 43 of 55 children who could be reached to invite for 6-month follow up returned for evaluation during a 2 day period in May, 2011, Average time between visits was 220 days. 5 children changed category of disease – 2 probable cases advancing to definite, 2 probable cases changing to possible, and 1 possible case becoming normal. 13 of 17 children prescribed RHD antibiotic prophylaxis. Adequate images for strain/stain rate calculations were available in22/43 patients. There were no differences in strain but there was a trend towards increased strain rate (-1.47 vs -1.10, p<0.07) in patients with probable or definite RHD vs those with possible RHD. Conclusion: This is the largest single-country childhood echo based RHD prevalence study and the first report that followup is feasible. Longitudinal data will provide important information about outcomes of children found to have subclinical RHD. Strain analysis on routine clinical echos is feasible and may provide additional insight into subclinical pathology.

What is normal? Echocardiographic findings in low-risk children living in a region with high rates of rheumatic heart disease

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1Menzies School of Health Research, Darwin, 2James Cook University, Cairns, 3Women’s and Children’s Hospital, Adelaide, 4Royal Darwin Hospital, Darwin, 5Baker ID, Alice Springs, 6University of Western Australia, Broome, Australia, 7Starship Children’s Hospital, Auckland, New Zealand

Introduction: Echocardiographic screening for rheumatic heart disease (RHD) is becoming more widespread, yet there are uncertainties around the significance of mild valvular regurgitation or morphological abnormalities, and few studies in low-risk children. Objectives: To describe the echocardiographic findings of healthy school-aged children in northern Australia, and to apply existing and proposed diagnostic criteria for RHD. Methods: Portable echocardiography was performed on 1087 predominantly Caucasian children aged 5–15 years in Cairns and Darwin. Abbreviated echocardiograms were performed, followed by comprehensive studies in those with pre-determined indicators of possible abnormalities. Screening echocardiograms were subsequently reported in a blinded standardised fashion by cardiologists. Results: Of the 1087 children screened, 106 (9.8%) had a comprehensive echocardiogram. 33 (3%) had at least 1 morphological abnormality of the mitral valve (MV). A thickened anterior MV leaflet (defined as ≥3mm) was most common (19 children), Aortic valve morphology was abnormal in 10 (0.9%). Any degree of mitral regurgitation (MR) was found in 214 (19.7%), with the majority reported as trivial. Of 50 children with MR jets ≥1cm, median jet length was 1.48cm (range 1.0–2.5). 11 children had MR jets ≥2cm seen in at least 1 view. Aortic regurgitation (AR) was found in 23 (2.1%). Of 10 children with AR ≥0.5cm, median jet length was 0.95cm (range 0.6–2.6). Five children had AR jets ≥1cm two of whom had jets ≥2cm. There were no cases of mitral or aortic stenosis. Congential abnormalities were detected in 12 children (1.1%). No children fitted the current NIH/WHO criteria for RHD. Conclusion: The majority of children screened by echo-based screening in this low-risk population were normal. However, some children were abnormal at least by the proposed diagnostic criteria for ‘definite’ RHD, and 3 children were in the ‘borderline’ category. The echocardiography was performed in healthy school-aged children, but significant regurgitation and morphological valvular abnormalities associated with RHD are rare. The single apparent case of RHD detected in this low-risk cohort suggests that the current and proposed diagnostic criteria for RHD are appropriately specific. It is expected that these criteria will identify true positives when applied to our high-risk cohort of 4000 remote indigenous children.

Preoperative risk factors for long-term survival following cardiac surgery for rheumatic heart disease in the young

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1Green Lane Pediatric and Congenital Cardiac Servic, Starship Childrens Hospital, Auckland, New Zealand

Introduction: Risk factors for long-term mortality in children who require cardiac surgery for rheumatic heart disease (RHD) are incompletely defined and coronary artery surgery following repair of RHD are extrapolated from adult series. Objectives: To define long-term outcomes of cardiac surgery for RHD in the young. To determine pre-operative factors that impact on long-term survival. Methods: A retrospective review of 212 RHD patients under-20 years who underwent their first cardiac surgery between 1965 and 2006 at a tertiary referral hospital and were enrolled in a followup program with repeat clinical and echo evaluation every 6 months for 10, 15 and 19 years, was reviewed. Results: Long-term survival at 5, 10 and 15 years was 92%, 84% and 75% respectively. Freedom from late reoperation at 5, 10 and 15 years was 89%, 65% and 56%. Multivariate analysis identified three independent risk factors for greater mortality: pre-operative atrial fibrillation Hazard Ratio (HR) 5.2 (p<0.01), left ventricular ejecotional fraction ≤25% (p<0.01) and concomitant tricuspid valve surgery HR 4.0 (p<0.01). Conclusion: In this young population pre-operative risk factors for long-term survival following cardiac surgery for RHD were identified atrial fibrillation, indexed LVESD ≥2.0 and the need for concomitant tricuspid valve surgery.

Preoperative risk factors for long-term survival following cardiac surgery for rheumatic heart disease in the young

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Introduction: Rheumatic heart disease (RHD) is a major public health problem in low and middle-income countries. The disease may be responsible for 1.4 million deaths annually, and causes serious morbidity as a result of congestive heart failure, stroke and infective endocarditis. Despite this staggering burden, there exist no contemporary data documenting the current presentation, clinical course, complications and treatment of patients with RHD. Objectives: The Rheumatic Heart Disease Global Registry (REMEDY) was recently launched with a view to bridging this knowledge gap. Methods: This is a prospective, international, multi-centre, hospital-based registry of patients with a primary diagnosis of RHD, confirmed by echocardiography. Complete cases until March 2011 are included in this analysis. Results: Five-hundred and seventy-nine patients were enrolled in REMEDY from 10 sites in Africa and India over a 10-month period, 41% had had surgery. Of the remaining 59%, 102 participants (28%) had mitral valve disease, 29 (8%) had aortic valve disease and 12 (3%) had involvement of both mitral and aortic valves. Among those with RHD of any kind, 102 (30%) were in atrial fibrillation (AF) at enrolment and 54% (n = 215) had undergone valve replacement surgery. A history of at least one of the following complications: stroke, major bleeding or infective endocarditis, was obtained from 24% of patients. Ninety-seven (65%) of the 149 patients in atrial flutter or AF were on oral anticoagulation. Among these, 171 were unaware of their target INR and 14% had no INR measurement in the 6 months prior to enrolment. INR was in the target range in only 22% of patients. Although the patients all had moderate or severe disease, only 36% were on secondary prophylaxis with penicillin. Among those who had undergone valve replacement surgery, a mere 26% were on secondary prophylaxis. In one site contributing 341 participants (59% of the total group), 7 participants (3%) died over the first 10 months of the study; the mean age of death was 53 years. Conclusion: Rheumatic heart disease causes major morbidity and is associated with high mortality. Even among patients seen at hospitals, compliance with guideline-recommended treatments (oral anticoagulation and secondary prophylaxis) is poor. These initial results from REMEDY reinforce the need for political commitment and urgent action to reduce disease burden, morbidity and mortality.

References:

A contemporary review of rheumatic heart disease in Bornean Malaysia

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Introduction: Rheumatic Heart Disease (RHD) remains a major burden in developing countries, accounting up to 60% of all cardiovascular diseases of young adults. Up to two-thirds of school-aged patients dropped out due to rheumatic fever (RF) or RHD, a major burden in term of human capital development. In Malaysia, RHD is endemic in rural population, particularly in
Borneo states, Malaysian data for just 5 years reported around 2500–3500 cases/year with mortality rate of 3–4% per annum. In the State of Sabah, there were more patients referred for valve surgery RHD than coronary artery bypass surgery in last 5 years. World Heart Foundation (WHF) had called for awareness and advocacy of this disease. **Objectives:** The objective of this report is to describe the contemporary characteristics of RHD, with a focus on secondary prevention. **Method:** This was conducted in 2 cardiology referral centres in Borneo state of Sabah Malaysia. Between December 2010-February 2011, patients with RHD who attend Cardiology Clinic, were included in this registry. Data was collected by review of medical records, using a standard form, including demography, disease severity, clinical complications and treatments and prognostic information in rehabilitation treatment centres in Borneo state of Sabah Malaysia. From 2010 to 2011, 1300 patients were registered in 3 months; Female: Male ratio of 2.3. Mean age was 44.8 years. Amongst the ethnic groups, the highest percentage was in Kadazandusun (29%), followed by Chinese (17.5%), and Bajau (17.2%). Major hist strategies did not change the risk of acute rheumatic fever. Majority (55.5%) had severe disease, as define by echocardiography findings of severe valve stenosis or incompetence in at least one valves. Approximately 27% have atrial fibrillation. The most commonly affected valve is mitral (48%) followed by aortic (26.4%). Sixty five percent had history of valve surgery. Only (28%) of patients had secondary prophylaxis among those who were under 40-year-old, about 72% received secondary prophylaxis. Mostly on oral penicillin V 250mg bid. **Conclusion:** RHD is still a significant disease burden in developing nation like Malaysia. Our registry findings show that majority of patients have severe disease. There is a need to increase advocacy and awareness to increase the effective use of antibiotic secondary prophylaxis.

### 0269 Impact of age on presentation and outcome of acute coronary syndromes in Gulf registry of acute coronary events (Gulf RACE)-2

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**Introduction:** Coronary artery disease (CAD) is the leading cause of death worldwide particularly in elderly patients. **Objectives:** We examined the impact of increasing age on clinical presentation and outcome in patients presenting with acute coronary syndrome (ACS). **Methods:** Collected data from the 2nd Gulf Registry of Acute Coronary Events (Gulf RACE2) which is a prospective multicenter study done 6 adjacent Eastern Gulf countries. Patients were divided into 3 groups according to their age: ≤50 years, 51–70 years and ≥70 years. Patients’ characteristics and clinical outcomes were analyzed and compared. 1- and 12-month all-cause mortality was assessed. **Results:** Among 7,930 consecutive ACS patients, 2755 (35%) were ≤50 years, 4110 (52%) were 51–70 years and 1065 (13%) ≥70 years. The mean age was 56.9 ± 12 years. The proportion of women increased with increasing age from 12.5% among patients ≤ 50 years to 31% among patients ≥ 70 years. The risk factor pattern varied with age. Younger patients were more often obese, smokers and had a positive family history of CAD compared to elderly whereas, elderly were more likely to have diabetes mellitus, hypertenion, and dyslipidiasis. Non-ST- elevation ACS increased with increasing age while, STEMI decreased with increasing age. Advancing age was associated with undertreatment with amplatelet, β blockers statins, and vasorulization therapies. In hospital worse outcomes increased in elderly. In comparison to young age, 1- and 12-month mortality rate increased in elderly from 4% to 15% and 6% to 25% respectively (P < 0.001). **Conclusion:** Despite being high risk group, elderly patients presenting with ACS were less likely to receive guideline- recommended therapies. They had a high rate of adverse hospital outcomes and short and long-term mortality. Guidelines adherence and improvement in hospital care for elderly patients with ACS may potentially save a substantial number of patients.

### 0271 Impact of short-term exercise training on QT dispersion in patients after myocardial infarction

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**Introduction:** Patients after myocardial infarction are at high risk of new cardiovascular and arrhythmic events. QT dispersion (QTd) is a measure of the dispersion of repolarization, and is being used as an indicator of arrhythmogenicity. Abnormally high QTd has been correlated with an increased risk of arrhythmic events and mortality. **Objectives:** The present study was conducted to establish the influence of short-term exercise training on QT dispersion in patients after myocardial infarction. **Methods:** The study involved 317 patients after myocardial infarction, in the single rhythm without AV blocks or branch blocks. Average age of patients was 57.2 years. Patients were randomly divided into the physical training group (training group: 275 patients) and control group (non-training group: 42 patients). Patients were similar as to age, site of infarction and baseline stress test duration. In all subjects clinical examination, standard ECG and exercise test on treadmill according to Bruce protocol were performed and after that the patients were randomly divided. The exercise training group patients were instructed to follow a training program using the bicycle ergometer (10 min, 2 times a day). The patients continued to take the same medicaments in same doses. From standard ECG corrected QT dispersion (QTdC) and QTd was calculated. **Results:** After three weeks, we have found significant reduction of QTd from 60.9 ± 25.9 to 60.9 ± 24.8 ms, p < 0.001 and QTdC from 75.4 ± 28.7 to 64.7 ± 26.8 ms, p < 0.001 in the training group. Also, in the traininggroup, we have found significant reduction of heart rate from 83.2 ± 15.7 to 71.4 ± 12.9 beats/min, (p < 0.001), of systolic blood pressure from 143.3 ± 18.4 to 128.2 ± 12.9 mmHg, (p < 0.001) and of diastolic blood pressure from 77.0 ± 12.4 to 69.9 ± 11.5 mmHg, p < 0.001. In contrast, the non-training group showed no significant changes. **Conclusion:** The study showed that short-term exercise training have favourable effects on QT dispersion, systolic and diastolic blood pressure in patients after myocardial infarction.

### 0272 Lung function and cardiac rehabilitation program: maximum volume ventilation as a marker for effort perception and functional capacity

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**Introduction:** Maximum voluntary ventilation (MVV) is the maximum volume of air inhaled in one minute and its reduction may reflect changes in airflow dynamics and in muscle strength. **Objectives:** Evaluate the influence of MVV in cardiac rehabilitation program (CRP). **Methods:** All patients admitted to an outpatient CR after suffering an acute coronary event between September 2008 and August 2010. MVV was assessed by baseline spirometry, depression by Hospital Anxiety and Depression Scale (HADS), functional status by Short Form-36v2 (SF-36v2)
after adjustment to age, gender and all the other factors correlated with MV, this spirometric parameter remained positively correlated with functional capacity and EP at CRP initiation [peak MET level at initial exercise stress testing (r = -0.35, p < 0.001); EP/MET (r = -0.37, p < 0.001)] and with functional capacity at CRP ending [peak MET level at final sessions (r = -0.32, p < 0.05)].

After this adjustment, MV lost its significance correlation with SF-36v2 physical component summary (r = -0.17, p = 0.27, p < 0.001) and psychosocial profile at admission [HADS-depression (r = -0.21, p = 0.05), HADS-anxiety (r = -0.21, p = 0.05)]. MV at the admission was also highly correlated with functional status at the end of the CRP [peak METs at final sessions (r = -0.40, p < 0.001)].

Almost 50% of married patients had MD (p = 0.02). Other sociodemographic factors had no association with clinical depression. ACS subtypes did not influence the frequency of depressive symptoms or MD. Conclusion: Compared to previous studies, we found a higher frequency of MD, regardless of ACS subtypes. Follow-up study will address the impact of depressive symptoms and MD in long-term outcomes.

Effect of heart rate reduction by atenolol or ivabradine on peripheral endothelial function in type 2 diabetic patients

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Introduction: Several experimental studies showed that heart rate reduction could exert beneficial effects on endothelial function. However, there is poor evidence of this effect in the clinical setting. Objectives: To assess the effect of heart rate reduction on peripheral endothelial function in type 2 diabetic patients. Methods: We enrolled 43 type 2 diabetic patients (age 60 ± 10.26 (79 vs. 89) years, n = 26%). Subjects were randomized to placebo (P-group, n = 15) in addition to their standard daily therapy. Heart rate and blood pressure were measured at baseline and after 1 month of therapy. Peripheral endothelial function was measured by assessing right brachial artery dilation during post-ischemic forearm hyperemia (flow mediated dilation, FMD) and in response to administration of 25 μg of sublingual glyceryl trinitrate (nitrate-mediated dilation, NMD). Results: Clinical and laboratory variables were similar in the 3 groups both at baseline and at follow-up. A comparable significant reduction of heart rate was observed in A-group and in I-group (86.14 ± 10.56 bpm vs. 89 ± 13 to 75 ± 8). Patients in A-group showed a significant improvement of FMD at 1-month follow-up, whereas no changes occurred in the other groups (Table). One way ANOVA with Benferroni’s correction for multiple comparisons showed that percentage variation of FMD in A-group (35 ± 9%) was significantly higher than the variation of FMD in P-group (−3 ± 15%, p < 0.01) and in I-group (25 ± 37%, p < 0.05). No changes were found in NMD between baseline and follow-up in the three groups.

Conclusion: Despite a comparable reduction in heart rate, atenolol, but not ivabradine, improved FMD in type 2 DM patients, suggesting that changes in heart rate by themselves are unlikely to significantly influence systemic endothelial function.
Physiological ischemia training enhanced endothelial progenitor cell quantity and activity

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Introduction: It was recently reported that exercises could enhance the circulating endothelial progenitor cells and augment the neovascularization applied in the ischemic heart disease treatment. But the application was limited because of the cardiac accidents. In our laboratory, we proposed physiological ischemia training (PIT) for the treatment of myocardial ischemia. In our serial research, we had found that PIT could increase capillary density, blood flow in the ischemic region and elevate VO2F levels. It is not clear that PIT effect on the activity of EPCs. Objectives: This study aims to investigate the effects of physiological ischemia training (PIT) on the quantity and activity of endothelial progenitor cells (EPCs) in rabbits with intermittent myocardial ischemia. Methods: Eighteen male adult New Zealand rabbits were randomly divided into three main groups (n = 6): only intermittent myocardial ischemia group (MI); physiological ischemia training together with intermittent myocardial ischemia group (PIT). PIT was induced by electrical stimulation (40% maximum current strength, 1 ms, 40 Hz) for 4 minutes a session, twice a day, 5 days a week for 4 weeks. Intermittent myocardial ischemia was induced by left ventricular branch intermittent occlusion for 2 minutes a session, twice a day, also for 4 weeks. 20 ml blood was drawn from ear central artery before and post the 4-week experiment in all groups. The number of EPCs (CD34+/K(+)) in blood was counted by fluorescence-activated cell sorter. EPCs were isolated, cultured and identified by double-positive staining with 11-dodocetyl-3,3',3'-tetramethylindocarbocyanine-labeled AC-LDL (DiI-AC-LDL) and Ulex europaeus agglutinin-I (UEA-1). EPC migration and proliferation were detected with a modified Boyden chamber and tetramethylindocarbocyanine-labeled Ac-LDL (Dil-Ac-LDL) and Ulex europaeus agglutinin-I (UEA-1). Results: EPCs were characterized by DilI-AC-LDL and UEA-1 double staining. A increase of circulating EPCs in Group MI and PT post 4wk training were observed (Group PT: 0.046 ± 0.007, Group MI 0.038 ± 0.016, p < 0.001). PIT group significantly improved EPCs migration to 196 ± 22% (p < 0.05), compared with Group MI and SO. However, there were no significant difference between EPCs proliferation and apoptosis founded in all groups. Conclusion: Our results indicate that PIT could enhance EPCs number and functional activity, which will benefit for the angiogenesis process.

Physiological ischemia training evoked endogenous EPCs and enhanced neovascularization in myocardial ischemia animals in vivo

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Introduction: Physical training represents a successful and routine strategy applied in ischemic heart disease. However, it has potential risks and sometimes will cause cardiovascular accidents. This study is to investigate physiological ischemia training (PIT), an isometric contraction of normal skeletal muscles induced by electric stimulation, is therefore proposed as a safer and effective treatment. However, the synergistic effects of PIT and Myocardial Ischaemia (MI) on the dynamics of mobilization of endogenous EPCs and neovascularization still remain unknown. Objectives: This study is to investigate the synergistic effects of physiological ischemia training (PIT) and Myocardial Ischaemia (MI) on Circulating Endothelial Progenitor Cells (CEPCs) and neovascularization in rabbits in vivo. Methods: Thirty-six adult male Zealand rabbits were randomly grouped into four groups: Group A had neither PIT nor MI as a control group; Group B underwent PIT only; Group C underwent MI only; and Group D underwent both PIT and MI. PIT is as isemic exercise training induced by electric stimulation (40% current maximum strength, 1 ms, 40 Hz). Animals performed 4-minute PIT, twice a day, 5 days a week for 4 weeks. MI was conducted with 2-min ischemia, twice a day, 5 days per week for 4 weeks. At the end of the four-week-experiment, CEPCs were quantified for the expression of CD34 and FITC-by fluorescence-activated cell sorter analysis and capillary densities were also evaluated by morphology. Results: At the end of experiments, compared with the control group, CEPCs increased in Group B (383.53 ± 68.68%, p < 0.05). Group C (611.22 ± 280.42%, p < 0.05) and Group D (697.20 ± 167.92%, p < 0.05). In the same group, compared with the baseline, CEPCs increased to 216.67 ± 103.51% in Group B (p < 0.001), 237.50 ± 167.52% in Group C (p < 0.001) and 383.33 ± 127.12% in Group D (p < 0.001). No statistical differences were shown in group A (p > 0.05). At the endpoints, neovascularization was assessed by a capillary density. It was found to be 326.00 ± 76.77 (mm2) in Group A, 327.50 ± 121.95 (mm2) in Group B, 523.67 ± 43.47 (mm2) in Group C, and 824.00 ± 106.47 (mm2) in Group D. Conclusion: PIT increased endogenous EPCs significantly. Compared with MI, PIT could enlarge the CEPCs more and protect the ischemic myocardium by neovascularization.

Detection of myocardial microvascular disease in Latino type-I diabetes mellitus using 31P magnetic resonance spectroscopy

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Introduction: The present study aims at determining if there are metabolic changes in the myocardium in diabetics that can suggest microvascular ischemia. We hypothesize that the microvascular disease of diabetes can lead to myocardial ischemia that can induce abnormal high-energy phosphate metabolism and resultant left ventricular dysfunction. Objectives: The present study aimed at determining if there are metabolic changes in the myocardium in diabetics that could suggest microvascular ischemia to explore the hypothesis that myocardial microvascular disease can lead to myocardial ischemia that can induce myocardial ischemia. Methods: Myocardial 31P magnetic resonance spectroscopy at 3T was performed in young Latino subjects with Type-1 diabetes mellitus. Results: EPCs were characterized by Dil-Ac-LDL and UEA-1 double staining. A increase of circulating EPCs in Group MI and PT post 4wk training were observed (Group PT: 0.046 ± 0.007, Group MI 0.038 ± 0.016, p < 0.001). Group PT significantly promoted EPCs migration to 196 ± 22% (p < 0.05), compared with Group MI and SO. However, there were no significant difference between EPCs proliferation and apoptosis founded in all groups. Conclusion: Our results indicate that PIT could enhance EPCs number and functional activity, which will benefit for the angiogenesis process.

Extracorporeal shockwave myocardial revascularization (ESMR) therapy: a novel therapy for refractory angina

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Introduction: With improvement in cardiovascular care, there is a rapidly growing group of patients who remain severely symptomatic by symptoms of myocardial ischemia but yet not suitable for conventional revascularization therapy. ESMR therapy is an approach to noninvasive treatment of myocardial ischemia, which is based on the principle that shockwave energy can disrupt the plaque and cause microvascular revascularization of myocardial ischemia. Objectives: To analyse the effect of ESMR in patients with refractory angina in improving angina symptoms and myocardial perfusion. Methods: Sixteen patients (81% with three vessels disease and 19% with two vessels disease) who fulfill these inclusion criteria: 1. Patient with refractory angina 2. Presence of angina which cannot be controlled by medical therapy, percutaneous coronary intervention or coronary artery bypass graft surgery 3. Patients with Canadian Cardiovascular Society angina class II to IV 4. Proven reversible myocardial ischemia as shown by SPECT 5. Patient was declined PCI or CABG by the attending cardiologist or surgeon were recruited and treated with ESMR 3 sessions per week for 3 cycles at intervals of three weeks. Each patient had total of nine sessions with 500 shocks in each session. They were assessed clinically using CCS angina class, Seattle Angina Questionnaire, exercise tolerance test and myocardial perfusion. Results: There were significant improvement in CCS angina class (p-value = 0.001), angina symptoms based on SAD (p-value = 0.002) and decreased in nitroglycerin usage (p-value = 0.024). An increased in the duration of exercise stress test was demonstrated (7.47 vs 9.85 minutes, p-value < 0.0001) and correlated with an improvement in METS (4.86 vs 6.12, p-value < 0.0001). There was also improvement in mean defect extent score at stress on SPECT, pre and 3 months post ESMR treatment, 29.36 ± 9.75% and 24.63 ± 11.26% (p-value = 0.021) respectively. Conclusion: We observed an overall improvement in both clinical symptoms and myocardial perfusion after ESMR therapy. This exciting novel therapy offers new hope in symptomatically CAD patients not amenable to conventional therapy.

References:

Introduction: Patients presenting with non-ST-segment elevation myocardial infarction (NSTEMI) frequently have multiple coronary plaques, which may be detected with multidetector computed tomography (MDCT). The prognostic value of noncalcified plaque (NCP) in nonobstructive lesions is uncertain. Objectives: We sought to determine whether the amount of NCP in nonobstructive coronary lesions as detected by MDCT was a predictor of future coronary events.

Methods: We included 312 consecutive patients presenting with NSTEMI, who underwent 64-slice MDCT coronary angiography and coronary artery calcium scoring before invasive coronary angiography. All patients were treated according to current guidelines based on an invasive treatment approach. Quantitative measurements of plaque composition and volume were performed by MDCT in all nonobstructive coronary lesions. The endpoint was cardiac death, acute coronary syndrome, or symptom-driven revascularization. Results: After a median follow-up of 16 months, 23 patients had suffered a cardiac event. Age, male sex, and diabetes mellitus were all associated with an increasing amount of NCP. In a multivariate regression analysis for events, the total amount of NCP in nonobstructive lesions was independently associated with an increased hazard ratio (1.18/100-mm3 plaque volume increase, p < 0.01). Contrary to this, neither Agatston score nor the amount of calcium in nonobstructive lesions was associated with an increased risk. Conclusion: MDCT plaque imaging identified patients at increased risk of recurrent coronary events after NSTEMI by measuring the total amount of NCP in nonobstructive lesions. The amount of calcified plaque was not associated with an increased risk.

Delta change in high-sensitivity troponin-T level is a better predictor of significant coronary artery disease after NSTEMI than the absolute value itself

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Introduction: The introduction of the Roche high-sensitivity Troponin-T assay (TnT-Hs) has the potential for an increasing number of patients having a positive troponin. It is known that a serial increase in TnT-Hs is of importance and currently, an increase (delta change) of >20% is considered to be of clinical significance locally. However, there remains some debate about the level of delta change in serial sampling. Objectives: To investigate the use of the new TnT-Hs assay in patients with NSTEMI (non-ST elevation myocardial infarction) admitted to the local CCU. To assess the value of different delta changes in predicting significant coronary artery disease (CAD). Methods: In this prospective observational study, a pre-designed form was used to collect clinical, biochemical and angiographic data on 100 patients. Results: The population consisted of 84 male patients and 36 females; and the mean age was 69 years. 84 patients had an angiogram as an inpatient. The positive predictive value of TnT-Hs for significant CAD was 85%. In those with an initial TnT-Hs of <100 ng/L, a delta change in the repeat value at >6 hours was compared. Significant CAD was present in 50% of those with a delta change of <100%, compared to 86% of those with a delta change of >100% (p = 0.03). Breaking this down further, significant CAD was found in 33% of those with a delta change of <50%, 67% of those with a delta change of 50%–100% and 86% of those with a delta change of >100% (p = 0.08). 70% of those with a final TnT-Hs value of >100 ng/L had significant CAD, compared to 96% with a final TnT-Hs of >103 ng/L (p = 0.15). Conclusion: The degree of delta change in TnT-Hs is associated with the presence of significant CAD. Currently, there is no consensus recommendation on the value of TnT-Hs delta change that is significant. We demonstrated that a high delta change appears to be a better predictor of underlying CAD than absolute troponin-T value itself. This could have implications in further risk stratification of patients with NSTEMI.

References:
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CRUSADE hemorrhagic risk assessment in patients with acute coronary syndromes without ST-segment elevation

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Objectives: The purpose of this study was to evaluate the risk of major bleeding (MB) and in-hospital mortality (HM), according to the criteria of the CRUSADE score, in a population of patients (P) admitted for Acute Coronary Syndromes without ST-segment elevation (NSTEMI) in a Cardiology Department (CD). Methods: We conducted a retrospective, descriptive and correlative study, encompassing 703 P with NSTEMI admitted in a CD between January 2008 to September 2010. We evaluated baseline characteristics, the therapeutic used, and the rates of MB and HM. The results were compared with data from the CRUSADE Registry. For statistical analysis we used SPSS 13.0. Results: The rate of MB (p = 0.001) was lower than that observed in CRUSADE Registry. In this study, there was a lower incidence of MB than predicted by CRUSADE in P of high-risk (p = 0.008), Heart failure on admission (p = 0.01), female gender (p = 0.027), hematocrit <35% (p = 0.014) and femoral access (p = 0.026), were independent predictors of MB. The predictive capacity of the CRUSADE bleeding score in our sample has an area under the ROC curve of 0.698. The HM was similar to the CRUSADE (p = 0.766). Only MB (p = 0.030) was an independent predictor of mortality. Table 1 - Baseline characteristics and in-hospital events in this population and the CRUSADE study.
tools such as the Global Registry of Acute Coronary Events (GRACE) scoring has been recommended to help determine the best management strategy. The correlation between GRACE score and severity of coronary disease is uncertain. Objectives: To assess the usefulness of GRACE score in predicting significant coronary artery disease (CAD). Methods: In this prospective observational study, a pre-designed proforma was used to collect clinical, biochemical and angiographic data on 100 patients admitted to the local Coronary Care Unit with a diagnosis of NSTEMI. A GRACE score was retrospectively calculated for all patients. Results: There were 64 male patients and the mean age was 69 years. The GRACE score for 6 month mortality was <3% (low) in 29% of patients, >3–6% (intermediate) in 23% and >6% (high) in 48% of patients. Coronary angiography was performed in 90% of the low-risk, 96% of the intermediate-risk and 75% of the high-risk groups (n=84). The main reasons for not performing cardiac catheterization were advanced age and significant co-morbidities. CAD of greater than 70% stenosis was found in 77% of the low-risk, 82% of the intermediate-risk and 84% of the high-risk groups. Clinical judgement remains an important part in assessing patients with suspected CAD. References: 1. Granger CB, Goldberger RJ, Dabbous OH et al. for the Global Registry of Acute Coronary Events Investigators. Predictors of hospital mortality in the global registry of acute coronary events. Arch Intern Med 2003;163:2345–2353. 2. De Araújo Gonçalves P, Ferreira J, Aguiar C, Seabra-Gomes R, TIMI, PURSUIT, and GRACE risk scores: sustained prognostic value and interaction with revascularization in NSTE-ACS. Eur Heart J. 2005;26:851–2.

**NT-pro-BNP: a useful marker in hypertensive gestational syndromes?**

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**Introduction:** NT-pro-BNP proved to be released in response to augmented parietal stress and systemic endothelial dysfunction. Hypertensive gestational syndromes (HGS) are considered to compromise. **Methods:** A transversal case-control study was performed, 71 NPW and 50 HGS admitted at a private hospital between 2008 and 2011 were included. Patients with renal chronic failure, cardiac disease and mola were excluded. Media NT-pro-BNP was: 1126.8 pg/ml, 199.6 pg/ml, 1809 pg/ml and 138.5 pg/ml respectively.

**Conclusion:** NT-pro-BNP significantly increased in HGS compared to NPW and correlated with established markers of severity in this pathology, showing evidence to be considered as a useful marker of haemodynamic maternal compromise.

**The effect of visit-to-visit variability in blood pressure on stroke and coronary events in the TNT and IDEAL trials**

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**Introduction:** Visit-to-visit variability in systolic blood pressure (SBP) has been shown to predict cardiovascular risk independently of mean SBP in patients with hypertension and other cardiovascular risk factors. However, it is not known whether BP variability is predictive of increased risk of cardiovascular events (CVE) in patients with stable CHD treated with statins. **Objectives:** The main objective of this study was to determine the association between visit-to-visit variability in BP and the risk of CVE in the large cohorts of CHD patients in the TNT and IDEAL trials, and to investigate whether BP and BP variability were associated with differences in clinical benefits observed with different statin therapies. **Methods:** Mean values of BP parameters from 18,182 patients in the TNT and IDEAL trials were calculated and analyzed to determine the risk of CVE in relation to visit-to-visit variability in SBP, expressed as standard deviation (SD) and other parameters independent of mean SBP. **Results:** Visit-to-visit variability in SBP and diastolic blood pressure (DBP) were significant risk factors for stroke and coronary events after adjusting for treatment and/or other BP parameters (Table 1). Significantly higher visit-to-visit variability was only observed for DBP with atorvastatin 10 mg but not with atorvastatin 80 mg in TNT. After adjusting for treatment effect and/or other BP variability on parameters (SD, coefficient of variation [CV], variability independent of mean [VIM], and average variability independent of mean [AVIM]), risk of stroke was significantly elevated with increasing mean SBP. The treatment effect (atorvastatin 80 mg versus atorvastatin 10 mg in TNT, atorvastatin 80 mg versus simvastatin 20–40 mg in IDEAL) for reducing risk of stroke and coronary events was not affected by adjustment for SBP or DBP variability or other BP parameters (Table 2).

**Image/graph I:**

**Table I:** Effect of visit-to-visit blood pressure variability on risk of stroke

<table>
<thead>
<tr>
<th>Model</th>
<th>HR (95% CI)</th>
<th>X</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>TNT (N=1820)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rx + SD BP</td>
<td>1.31 (1.18-1.44)</td>
<td>28.3</td>
<td>&lt;0.0001</td>
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<tr>
<td>Rx + CV BP</td>
<td>1.29 (1.18-1.43)</td>
<td>22.6</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Rx + VM BP</td>
<td>1.27 (1.15-1.41)</td>
<td>20.0</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Rx + ASV BP</td>
<td>1.35 (1.22-1.48)</td>
<td>26.2</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>IDEAL (N=1662)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rx + SD BP</td>
<td>1.40 (1.28-1.54)</td>
<td>50.5</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Rx + CV BP</td>
<td>1.39 (1.28-1.53)</td>
<td>44.9</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Rx + VM BP</td>
<td>1.37 (1.24-1.51)</td>
<td>40.2</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Rx + ASV BP</td>
<td>1.41 (1.29-1.54)</td>
<td>50.9</td>
<td>&lt;0.0001</td>
</tr>
</tbody>
</table>

**Conclusion:** Higher visit-to-visit variability in SBP or DBP is associated with significantly increased cardiovascular risk. The clinical benefit seen with atorvastatin 80 mg in reducing the risk of CVE in TNT and IDEAL is not mediated through reduction in BP or visit-to-visit variability in BP.

**Image/graph II:**

**Table II:** Treatment effects

<table>
<thead>
<tr>
<th>Stroke</th>
<th>HR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.97 (0.66-1.46)</td>
<td></td>
</tr>
</tbody>
</table>

**Coronary events | 0.80 (0.70-0.90) |
| 0.92 (0.74-1.16) |
| 0.64 (0.75-0.93) |

**Conclusion:** Higher visit-to-visit variability in SBP or DBP is associated with significantly increased cardiovascular risk.

**Trace mitral regurgitation and its relationship to left atrial size in a hypertensive population**

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**Introduction:** Trace mitral valve regurgitation (TMR) is often considered benign. Enhanced echocardiographic techniques make visualization of trace mitral regurgitation easy. Its presence is often attributed to an artifact of valve closure or a feature related to closure of anatomically normal valves, rather than other structural or hemodynamic abnormalities. This retrospective study was done to evaluate the association of TMR and left atrial (LA) dilation. **Objectives:** To evaluate if TMR has any clinical significance in hypertensive patients. Methods: We reviewed echocardiograms of 500 consecutive hypertensive patients with no mitral valve disease or left ventricular (LV) dysfunction (defined as LV ejection fraction <50%) and with mitral regurgitation not exceeding a trace amount. All echocardiographic studies were performed with commercially available machines with phased-array transducers. TMR was defined as a narrow jet arising at the coaptation point, extending less than 1 cm from the leaflet. The LA dimension was measured at end systole according to ASE guidelines. LA was dilated if it measured more than 40 mm. Results: Of the 500 patients, 266 (53.2%) were males and 244 (46.6%) were females. Their ages ranged from 42 to 92 years. Of the total, 296 (59.2%) had normal LA size and 204 (40.8%) had dilated LA. Of the total, 239 (47.8%) had TMR. Of the 296 with normal LA, 79 (26.7%) had TMR. Of the 203 with dilated LA, 160 (78.8%)
had TMR. **Conclusion:** TMR is more common in hypertensive patients with a dilated LA than those with a normal LA. Its presence is therefore not benign in hypertensive patients. Further studies are needed to evaluate its progression in these patients, and its relationship to future morbidity and mortality.

**References:**

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**2091**

**Quantification of high blood pressure in a general population cohort in a rural setting**

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**Introduction:** High blood pressure (HBP) defined as ≥ 140/90 mmHg, if uncontrolled could lead to several health problems such as coronary heart disease, heart and kidney failure. In Uganda, the prevalence of HBP is not readily available, particularly for the rural setting. The Medical Research Council Research/UVIRA Virus Research Institute, Uganda Research Unit on AIDS has a General Population Cohort (GPC) in rural south west Uganda which provides an ideal setting for quantifying HBP in a rural setting. **Objectives:** We aim to establish the state of blood pressure in a rural population in south west Uganda. **Methods:** The GPC has been followed for 22 years through annual medical surveys conducted by trained field staff. This year’s survey is ongoing and data on 5931 people aged 13 years or more have been collected. Lifestyle and anthropometric data are being collected; BP is being measured and history of treatment for HBP recorded. BP was measured three times with resting intervals of 3–5 minutes, using the Omron M6. BP was taken as the mean of the second and third reading. We report the distribution of BP and estimate the prevalence of HBP by age and gender. We also assess the association between BP and tobacco and alcohol intake and body mass index (BMI). **Results:** We report preliminary results on 5931 participants (43% men, 57% women) who had BP measurement. Systolic and diastolic BP respectively ranged between 74–232 and 45–150 mmHg, with respect to control means (SD) of 122.17 (15.7) and 74.1 (10.3) mmHg. The prevalence of reported current treatment for HBP was 4%, majority being women. There was a 16% prevalence of HBP for both sexes. HBP prevalence varied by age: 6% among the 13–24 year old, 10.5% for 25–40 and 34.5% among those over 40 years. There was a significant difference in BP by gender among the 25–40 year old with men having a higher HBP prevalence (13.4%) compared to women (8.8%) (P = 0.004). Tobacco and alcohol intake and BMI were significantly associated with BP (all P < 0.05). **Conclusion:** Results indicated a high prevalence of HBP in this population, especially among those aged above 40 years (34%) but also with a substantial prevalence among the 25–40 year old (10%). These results highlight this is a potentially hidden public health problem. It is therefore important to design appropriate health education targeting rural populations, addressing both the treatment seeking behaviours as well as risk factors.

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**2092**

**The impact of arterial hypertension on right ventricular deformation**

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**Introduction:** Last year the new echocardiographic techniques make possible to investigate the early deformation on left and right ventricle. **Objectives:** The aim of our study is to determine the effect of arterial hypertension and hypertensive cardiac remodelling on right ventricular(RV) function, using vector velocity echocardiography to determine strain and strain rate. To assess metabolic and cardiovascular profile of prehypertensive individuals, specially evaluating the association between prehypertension and C-reactive protein (hs-CRP) levels. **Methods:** A total of 11.011 brazilian adults (mean age: 43 years; 22% female), undergoing a check-up protocol during the years 2006 to 2009, were categorized into three groups: normotension, prehypertensive (≤120 x 80 mmHg), and hypertensive (≥140 x 90 mmHg) and hypertension (≥140 x 90 mmHg or prior diagnosis of hypertension). We assessed metabolic and cardiovascular profile of each group. **Results:** Prevalence of normotension, prehypertension and hypertension was 27.9%, 33.9% and 18.2%, respectively. When compared with normotensive subjects, prehypertensive individuals were older (mean age: 47.2 vs 40 years; p < 0.001); had higher Body Mass Index (BMI) (mean: 26.7 vs 24; p < 0.001); higher plasma triglycerides levels (mean: 139 vs 106mg/dL; p < 0.001); higher LDL-cholesterol levels (mean: 128 vs 117mg/dL; p < 0.001); higher gamma-glutamyl transpeptidase levels (mean: 28 vs 20mg/dL; p < 0.001) and lower HDL-cholesterol levels (mean: 46 vs 52mg/mL; p < 0.001). Prehypertensive subjects were more likely to have impaired fasting glucose: OR 1.69 (95% CI 1.39 –2.04); overweight (BMI ≥ 25): OR 2.48 (95% CI 2.24–2.74); hepatic steatosis: OR 2.23 (95% CI 1.97–2.53); metabolic syndrome: OR 3.05 (CI 2.67–3.49); and C-reactive protein (hs-CRP) levels above 3mg/L OR 1.52 (95% CI 1.35–1.71). We observed an increase in hs-CRP levels by 0.018 mg/L for each increase of 1 mmHg in SBP and by 0.025mg/L for each increase of 1 mmHg in DBP. **Conclusion:** Prehypertension is associated with increased prevalence of cardiovascular risk factors, identifying a group of higher cardiovascular risk which represents a large portion of the population. Identification and systematic approach of prehypertensive individuals should be part of routine cardiovascular assessment.
Effects of working environment on ischaemic heart disease burden profile in young Egyptian males
Hany Negm1, Hatice Haykal2, Mohammed Shalaby2, Noura Al Enazi3, Gaston Alkhokhlo1,*, Ahmed Saleh1

Introduction: Ischemic Heart Disease “IHD” recently observed in young population is mostly attributed to increased exposure to traditional risk factors where atherosclerosis is the prime mover. Few studies were directed to understand the environmental and occupational determinants potentially modifiable risk factors. Objectives: To evaluate the impact of various work environments on ischemic heart disease burden profile in young Egyptian male workers. Methods: Three years follow up of ischemic events in 13,622 young men. They were randomly enrolled in three groups based on type of industrial profession. Group I (Motor industry) which included 4779 individuals, Group II (Construction industry) which included 6230 individuals and Group III (Food industry) which included 2613 individuals. Major risk factors analysis were collected from outpatient visits and investigations results, followed by multivariate in time on site monitoring on groups record of in-patient admissions, Coronary care unit admissions, Diagnostic coronary angiography, Interventional coronary procedures and coronary artery bypass surgeries. Results: Mean age in Motor industry group was 34.6 ± 9 and in Construction group was 35.8 ± 9 while in Food industry group it was 31.6 ± 7. Total prevalence of coronary artery disease in the three groups was 1.5% and Prevalence of hypertension was 4.3%. Total prevalence of diabetes mellitus in the three groups was 3.5% while prevalence of dyslipidemia was 2.3%. Prevalence of coronary events in Motor industry was significantly higher than the other two industries. Whilst the prevalence of coronary events in construction industry was higher than food industry. Highly significant increase in number of total arterial disease and criteria risk factors due to coronary syndromes and Myocardial infarction in addition to number of interventional coronary procedures “diagnostic and therapeutic” was observed in Motor industry and Construction industry when compared to food industry. Conclusion: There is marked increase in number of risk factors in young Egyptian male workers with considerable probability of early development of coronary heart disease. Psychological, physical or chemical work environment might attribute to coronary artery diseases either directly or through augmenting known risk factors. Mortality due to IHD might be affected by the type of industry. Cooperation between general practitioners–occupational diseases specialists–cardiologists may improve the efficiency of prevention programs.

0298
From CVD epidemiology to public health: finnish experience on sustained national CVD prevention
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Introduction: The presentation describes the background and the historical development in Finland for action in public health focus through prevention of cardiovascular (CVD) and other major noncommunicable diseases (NCD). Objectives: The work in Finland from the North Karelia Project to national action is presented, with emphasis on broad intersectoral work to achieve sustained improved public health. Methods: In 1972, the North Karelia Project was started as national demonstration programme to reduce the extremely high CVD mortality rates. The project was based on the results of some classical epidemiological studies with the aim to change the risk related lifestyles in the whole population through broad intersectoral community action, first in the pilot area of North Karelia and later on on national level. Results: Over years great reduction in the population levels of the risk factors has taken place, associated with dramatic reduction in age adjusted CVD and NCD rates and improvement in public health. The all cause mortality in working age has greatly reduced, life expectancy increased and functional capacity & subjective health much improved. Conclusion: Successful national action in Finland has much been based on many intersectoral actions that have taken place, due to increasing interest and awareness of the population. This has been accompanied by political commitments and supporting legislation. The experience emphasizes the importance of strong leadership and broad collaboration - also the importance of strong epidemiological and social theory base combined with sustained strong practical work. The experience is a powerful demonstration on how CVD and NCD can be much reduced and in a cost effective and sustainable way. The experience in Finland also gives strong support to the approach of the WHO Global NCD Strategies and the political efforts for NCD prevention and control of global health work.

Cardiac rehabilitation: not only aerobic capacity improvement, but also quality of life
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Introduction: Phase II cardiac rehabilitation (CR) is a class I indication in secondary prevention (PREV-2). CR has demonstrated positive effects not only on aerobic capacity and mortality, but also on quality of life of CHD patients. The latter have been also described in high risk primary prevention (PREV-1) subjects. Objectives: To describe the impact of CR on aerobic capacity and quality of life in subjects undergoing 36 program sessions. Methods: Prospective study in a Chilean university CR program in subjects with or without CHD. Subjects completed 36 CR sessions between 2002 and 2008. All subjects underwent a symptom-limited stress test and a 6-minute walking test (6MWT) at the beginning of OR. Both at admission and at 36 sessions, 6MWT distance, blood pressure, heart rate, body mass index, waist and quality of life were measured. Quality of life was determined by SF36 survey and the scores were differentiated by physical and mental health dimensions for analysis. Results: 1043 subjects were admitted to the program, of which 21% (n = 220, age 58 ± 11 yo, 24% women) completed 36 CR sessions: 138 where in PREV-2 and 82 in PREV-1. As shown in the table, both PREV-1 and PREV-2 subjects improved aerobic capacity measured by 6MWT (11% increase in PREV-2 and 8% in PREV-1) as well as quality of life (both physical and mental health dimensions) to the end of the CR program. No differences where registered between PREV-2 and PREV-1 subjects regarding to walking distance or SF36 scores. Also, there were no differences in these parameters by gender.

0299
Effectiveness evaluation of a school program for obesity prevention in young Egyptian males
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Introduction: Due to rapid lifestyle changes in Brazil, we are now facing a childhood obesity epidemic. There is a need for effective programs to address this problem. Objectives: Adoption of healthy lifestyles by school children, through achieve healthy literacy, increase physical activity, decrease sedentary behaviors, reduce fatty food consumption, increase fruits and vegetables consumption. Methods: Cohort multi-component health promotion intervention study, with 9 intervention of interest (TAKE IT!®) and 8 comparative intervention control (Shake It Up Kids) Brazilian schools for matched comparison to determine its impact on outcomes assessed longitudinally in a cohort of 2,038 children using pre-intervention (April 2009) and follow-up (November 2009) children survey on transdiastolic stage of behavior change evaluating. Results: Analyzing only the preparation and action stages, there was respectively a 54.33 and 25.31; 17.15 and 64.06; 91.97; 29.12 and 50.89; 4.65 and 14.38 percent increase in TAKE IT!® Program children numbers in these stages at post-intervention compared to pre-intervention (P<0.001), for fatty foods consumption, consumption of fruits & vegetables, physical activity, sedentary habits behavior related to TV / DVD screen time, sedentary habits behavior related to computer / games screen time, responses which suggests a strong intervention effect in the context of cognitive-behavioral and environmental processes of self-revaluation and social-liberation, and also behavior processes of self-liberation, helping relationship, contingency management and counter conditioning. Analyzing only the precontemplation and contemplation stages, we found similar numbers, suggesting a strong intervention instrument content of cognitive-cognitive-experiential processes of Consciousness Raising, Dramatic Relief, Environment-Reevaluation. Conclusion: The TIRE 101 program stimulated children forward movement through eating and physical behavior stages, providing them with processes that facilitate healthy lifestyle choices, potentially reducing children obesity prevalence.
Impact of contemporary cardiac rehabilitation and exercise training programs in secondary coronary prevention

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Introduction: The use of formal cardiac rehabilitation and exercise training (CRET) programs is grossly under-utilized in the United States and the world. Objectives: As part of an Exercise is Medicine (EIM) initiative, we examined the impact of a contemporary CRET program on standard coronary heart disease (CHD) and psychological risk factors. Methods: We assessed CHD, inflammatory, and psychological risk factors in 538 consecutive patients (64 ± 11 years; 73% men) before and after a formal, phase II CRET program to determine the benefits of CRET. Results: As demonstrated in the Table, there were modest improvements in body mass index (BMI; -1% p < 0.0001), HDL-cholesterol (+8%; p < 0.0001), triglycerides (-12%; p < 0.0001), and precisely measured excess capacity as assessed by gas exchange (peak oxygen consumption +13%; p < 0.0001) following CRET. However, improvements in inflammation or C-reactive protein (CRP; -30%; p < 0.0001), psychological scores (range -29% to -45%; all p < 0.0001), and prevalence of anxiety, depression, and hostility (range -59% to -63%; all p < 0.0001) were all more markedly favorable following CRET. Conclusion: Despite the low utilization of CRET world-wide, these results support marked benefits of CRET, especially on inflammation and psychological stress, in patients with CHD. These results support the EIM’S initiative of promoting exercise training and improved fitness in secondary CHD prevention.

Binational comparison of barriers to cardiac rehabilitation (CR) use in Canada and Brazil

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Introduction: Despite the well-established benefits of CR, this intervention is greatly under-utilized globally. Barriers to its utilization have been identified in high-income countries, low-income countries and in developing regions. The objective of the present study was to assess the accuracy of the standard exercise prescription (ET) in the estimation of the functional capacity from the work rate achieved on an ergo-meter and to sustain the importance of the CPET as a routine part of the cardiac rehabilitation (CR) process. The aim of the present study was to assess the inaccuracy of the standard exercise prescription (ET) in the estimation of the functional capacity from the work rate achieved on an ergo-meter and to sustain the importance of the CPET as a routine part of the cardiac rehabilitation (CR).

Group peak V2 before/after CR P value PWL before/after CR P value
A 16.7+/-5.7 vs 21.13+/-6.092 0.000 111.9+/-28.58 vs 107+/-25.46 0.202
B 14.0+/-4.8 vs 16.0+/-4.2 0.000 109.1+/-26.5 vs 105+/-24.4 0.000

Conclusion: Despite the significantly lower availability of CR in Brazil and the universal healthcare system in Canada, cardiac outpatients in Canada perceived significantly greater CR barriers. The nature of the barriers identified suggest Canadians have higher expectations of outpatient care, and that different strategies would be required to promote enrolment in these countries.

Reference: http://www.yorku.ca/sgrace/crbarrierscale.html

Internet ECG monitoring and alarming based on combined non-linear heart rate analysis during cardiac rehabilitation

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Introduction: Abnormal non-linear heart rate variability (nHRV) shortly after myocardial infarction (MI) are risk factors for mortality, but the association of nHRV and outcome in the postinfarction population is unknown. Objectives: To apply four nHRV analysis for the individual forecasting of serious cardiac events in telemedicine setting during the cardiac rehabilitation of postinfarction patients. Methods: The parameters of four nHRV analysis were used as a . sentinel index: the change of the correlation dimension (CD), the detrended fluctuation analysis (DFA), the approximate entropy(ApEn), the multiscale-entropy analysis (MSE) parameters could be detected within hours, and the medical management would be changed immediately to prevent life-fatal or fatal cardiac events during the postinfarction rehabilitation process. The standard methods were used for the DFA and ApEn analysis. The CR or named D2 were determined by the Skinner method (the ‘‘point’’ estimation (PD2)). The MSE method incorporates two procedures: the ‘‘coarse-graining’’ procedure is applied to the time series and SampEn is calculated for each coarse-grained time series, and then plotted as a function of the scale factor. In our 3-year telemedicine study, 176 postinfarction patients were monitored twice in a week with our 24-hour telemetry ECG equipment. Our internet telemetry server calculated with 1–2 hours delay the non-linear parameters, and compared these data with the previous ones. Results: During the 3 years follow-up (176 with (G1), and 180 age-matched postinfarction control group without (G2) telemetry management) 17 deaths in the G1, and 34 in the G2 group were observed (p<0.01). The sensitivity, specificity, positive and negative predictive accuracy of the CD values in predicting all-cause mortality with these cutoff values were 64.1, 76.2, 68.5, 82.5. Multiscale entropy stratified patients by mortality and was an independent predictor of death. Multiscale entropy alone (area under ROC curve (AUC) = 0.66 – 0.71) predicted death comparably to covariates alone (AUC = 0.72). DFA and ApEn analysis did not show statistical differences between the two groups. Conclusion: The major finding of the study is that the frequent internet monitoring of heart rate is capable of predicting fatal outcomes not only in statistical way, but also as an individual forecasting.

Cardiopulmonary exercise testing vs standard exercise testing to estimate the actual changes in functional capacity after cardiac rehabilitation in male coronary patients

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Introduction: The ACC/AHA 2002 guideline update for exercise testing, discourage the use of the cardiopulmonary exercise testing (CPET) as a routine part of the cardiac rehabilitation (CR). Objectives: The aim of the present study was to assess the inaccuracy of the standard exercise testing (ET) in the estimation of the functional capacity from the work rate achieved on an ergo-meter and to sustain the importance of the CPET as a routine part of the CR.

Objectives: To compare barriers to CR enrollment and use in Canada and Brazil. Methods: Two cardiac samples, consisting of 257 Brazilian (234 female, age—63 ± 12) and 1343 Canadian outpatients (24% female, age—69 ± 10), were compared cross-sectionally. Of these, 139 (58.6%) in Brazil and 944 (65.8%) in Canada were enrolled in CR. Barriers were assessed using the 21-item self-report Cardiac Rehabilitation Barriers Scale (CRBS), psychometrically-validated in English and Portuguese. The CRBS assesses perceptions of patient, provider and health system-level barriers, rated on a 5-point Likert scale, with higher scores indicating greater endorsement of the given barrier. Given the unequal sample sizes, non-parametric tests were used to assess differences between countries. Results: Canadian respondents were significantly more likely to be older(<0.001), male(p<0.01), obese(<0.001), have greater educational attainment(<0.001), hypertension(p<0.001), dyslipidemia(p<0.001), have a history of CABG(<0.001) and heart failure(p<0.01) than Brazilian participants. The mean total barriers score for Brazilians was 1.71 ± 0.63 and for Canadians was 2.37 ± 1.0 (p<0.001). For 17/21 barriers, Brazilian respondents reported significantly greater barriers p<0.001. The greatest item score disparities were for already exercising at home or in the community, wait times, and lack of follow-up by the program. Canadians rated already exercising at home/community (2.85 ± 1.42) and travel(2.0 ± 1.30) as their greatest barriers, and Brazilians rated distance(2.85 ± 1.59) and cost(2.0 ± 1.30) as the greatest barriers. Conclusions: Despite the significantly lower availability of CR in Brazil and the universal healthcare system in Canada, cardiac outpatients in Canada perceived significantly greater CR barriers. The nature of the barriers identified suggest Canadians have higher expectations of outpatient care, and that different strategies would be required to promote enrolment in these countries.
changes in functional capacity. In these pts the CPT will be irreplaceable to avoid misleading end-stage renal disease evaluation and the exercise prescription for the everyday life after completion of the CR program.

From guideline to clinical practice - reinforced primary care at high-risk patients

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Introduction: The results form Euroaspir III Primary Care Romania has shown an increased prevalence of unhealthy lifestyle and inappropriate use of cardioprotective medication. Objective: The main objective of this study is to repay the standard of preventive cardiology through more lifestyle intervention, good control of cardiovascular risk factors and optimal use of prophylactic drug therapies in order to reduce the risk of developing cardiovascular disease in high risk individuals. One key point in the protocol is to assess the efficiency of treatment in Euroaspir III patients through optimizing the medication according to current guidelines, so that every patient receives the appropriate cardiovascular preventive treatment. Methods: We conduct a prospective study of 16 months on 325 patients; 55±8.7 years old, 36.2% males, who took part in Euroaspir III Primary Care. They were identified by their drug treatment: antihypertensive drug therapy and/or, lipid-lowering drug therapy and/or, diabetes therapy. The primary care physicians were trained by an interdisciplinary team to reinforce lifestyle changes (European Prevention Guideline) and to optimize medication according to each patient. So, we define the "coaching model of primary care" as 3 consecutive patient visits (every 6 months) to the primary care physician offices, consisting in lifestyle advice and medical recommendation update. Results: The weight has decreased from 78.7±16 to 75±10.05 kg (p<0.01); the body mass index has decreased from 28.64±5.3 to 27.87±4.89 (p<0.05); the male’s waist circumference (cm) has decreased from 100.2±10.9 to 98.19±11.3 (p<0.03) the women’s waist circumference (cm) has decreased from 93.7±36.1 to 91.7±12.57 (p<0.05); the total cholesterol (mg/dl) has decreased from 214.39±44.17 to 203.8±42.46 (p<0.001) the systolic blood pressure (BP/mmHg) has declined from 146.10±16.18 to 138.39±13.35 (p<0.01), the diastolic BP has decreased from 84.94±10.70 to 83.48±9.19 (p<0.01). The number of patients who reached the target for total cholesterol has increased from 60 to 198. The number of patients who reached the target for LDL cholesterol has increased from 32 to 160 Conclusion: Our results show the importance of lifestyle changes that the multidisciplinary intervention on this kind of high risk patients. The empowerment in primary care practice is the key of long term patients risk reduction.

The campaign for plain packaging of tobacco products in Australia. Lessons and learnings for heart foundations and societies of cardiology

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Introduction: Experimental studies over the past 15 years have suggested that plain packaging of tobacco products could reduce the appeal of smoking, helping existing smokers to quit and deterring young people from starting. With 15,000 tobacco-caused deaths a year, Australian tobacco control groups, especially the Cancer Council Australia, National Heart Foundation of Australia, Action on Smoking and Health Australia andQUIT Victoria, have consequently supported the mandatory introduction of plain packs, with the Australian Government announce in early 2010 its intention to implement the measure, from July 2012. If successful, this will be a world first and therefore of international significance. But the 2010 federal election left the Australian Government with a minority in both houses of parliament, making passage of the enabling legislation uncertain. The tobacco industry has mounted a multi-fronted campaign to stop the plain packaging legislation, fearing its successful implementation in Australia will spark similar moves in other countries that are similarly determined to reduce death and disease caused by smoking. Objectives: To outline a model for heart foundation/cardiology society engagement in cutting-edge tobacco control campaigns with lessons and learnings from the National Heart Foundation of Australia’s involvement with the campaign for plain packaging of tobacco products in Australia. Methods: A case study in advocacy highlighting tools and processes used to support the campaign for plain packaging of tobacco products. Results: The campaign for plain packaging in Australia has highlighted the importance of close collaboration, flexibility, innovation, swift reaction, actions (and in some cases reappraisal) of regular strategies with tobacco control partners.

Absence of ‘smokers’ paradox’ among Middle Eastern patients with acute coronary syndrome

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Introduction: Western studies have shown that smokers admitted with acute coronary syndrome (ACS) have an apparent lower mortality rates compared with nonsmokers. Objectives: To study if this ‘smokers’ paradox also exists in Middle Eastern patients with ACS. Methods: We compared clinical and coronary angiographic features at admission, and mortality at one year (immediately after index hospitalization and angioplasties) diagnosis between smokers and nonsmokers. Results: Smokers (n=659) accounted for 53.2% of the whole group and were younger than nonsmokers (mean age 50 vs. 63 years, p<0.05). 70% of smokers were younger than 60 years of age, compared with 43% of nonsmokers (p=0.001). Smokers were more likely to be men (82% vs. 67% of nonsmokers). However, the proportion of patients with diabetes mellitus were more prevalent among smokers (33.4% and 29.8%, respectively) than those in nonsmokers (54.2% and 50%, respectively). Incidence of anterior wall myocardial infarction (MI) was not significantly lower among smokers than that among nonsmokers (51.7% vs. 55.9%, p=NS). High TIMI risk scores in patients with ST elevation ACS were less prevalent in smokers compared with nonsmokers (60% vs. 75%, p<0.003), but was similar in smokers and nonsmokers in patients with ST elevation MI (11.1% vs. 9.8%, p=0.201). Smokers and nonsmokers had similar incidence of nonobstructive coronary lesions (15.9% vs. 13.7%, p=NS) and multivessel disease (44.4% vs. 51.1%, p=NS). Mortality among smokers was not significantly higher than that in smokers during index admission (2.3% vs. 2.2%, p=NS), at 1 month (4.7% vs. 3.5%, p=NS), or at 1 year (6.5% vs. 7.0%, p=NS). Conclusion: Despite being younger, with less prevalence of comorbid diseases, and lower TIMI risk scores; smokers in the Middle East with ACS did not have better angiographic features or better 1 year outcome compared with nonsmokers. Absence of smokers’ paradox in the Middle East warrants further studies.

An evaluation of the LIVE (control of coronary Risk factor initiaLVe) program

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Introduction: LIVE is a multi-disciplinary program in the National Healthcare Group. It is a disease management program using clinical practice guidelines, collaboration with allied health professionals, patient education with the aim of rapid control of cardiovascular risk factors in patients with coronary artery disease. Case managers are tasked to carry out medication titration based on algorithms. Patients who reached treatment goals are referred to primary health care. Objectives: To determine the effectiveness of LIVE in the control of blood pressure (BP)<130/80mmHg, low-density lipoprotein (LDL)<2.5mmol/l, death and/or recurrent major adverse cardiac events (MACE) and transfer to primary health care. Methods: The evaluation used a cohort design comparing outcomes between eligible patients from Tan Tock Seng Hospital enrolled in the program between January 2005 and December 2009 against those eligible but not in the program. The non-enrolled group serve as controls. Both groups were reviewed for 1 year during which changes in BP, LDL, death and/or the recurrence of MACE were evaluated. Risk adjusted effect measures were evaluated using logistic regression and propensity score matching. Results: A total of 3430 patients were enrolled in LIVE, of whom 76% were male, 33% were 65 years or older, 63%, 14% and 14% were Chinese, Malay and Indian, respectively. For patients with an elevated baseline LDL, the proportion that achieved target within 1 year was higher among program patients (58.4% vs 44.6%; p=0.000) compared to controls. Mean time-to-target LDL was significantly shorter for program patients (89.1±161-193 days vs 251–266 days). More program patients achieved target BP compared to controls (66.4% vs 61.8%; p=0.038). Mean time-to-BP target was shorter for program patients, but this was not statistically significant. Among patients with a history of an acute coronary syndrome, the risk of death and/or re-infection within 1 year of was lower for program patients (0.07 vs. 0.73, 95%CI=-0.53 to -0.10). After 4.1 years of the program, 729 patients (21.3%) were discharged to primary care. Conclusion: The LIVE program had favorable effects on LDL and BP as reflected by the higher rates of target achievement amongst program patients as well as the shorter time-to-LDL targets. The results suggest a reduction in the risk of death and/or re-infection within 1 year from the intervention into the program. These findings demonstrate the potential of evidence-based multi-modal disease management strategies.

Disparities in awareness that smoking causes cardiovascular disease: evidence from the International Tobacco Control (ITC) policy evaluation project surveys in sixteen countries

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Introduction: Tobacco use and secondhand smoke (SHS) exposure are risk factors for cardiovascular disease (CVD), and account for approximately10% of CVD deaths. Worldwide...
deaths from tobacco are estimated at 5.1 million a year, and are expected to rise to 8 million yearly by 2030, with 85% of deaths in low-and-middle income countries (LMIC). Objectives: Because (1) educating people about the health risks of tobacco is a component of World Health Organization’s (WHR) Framework Convention on Tobacco Control (FCTC), and (2) the health risks of smoking are a primary reason people give for quitting, this study will examine smokers’ knowledge of the CVD risks of tobacco use and SHS exposure. Methods: Data from 16 countries from the International Tobacco Control (ITC) Policy Evaluation Project was used to compare smokers’ knowledge that smoking and SHS exposure causes CVD to their knowledge that smoking causes lung cancer. The ITC Project is an international cohort study of tobacco use designed to measure the impact of WHO’s FCTC. Examinations of health knowledge focused on differences between: (1) LMIC and high income countries (HICs), (2) countries with and without cigarette health warning labels with information about CVD risk, and (3) sex, and socioeconomic status (SES). Results: Knowledge that smoking causes CVD ranged from 97.3% in France to 64.2% in China for heart disease and from 91.7% in Germany to 22.9% in Brazil for stroke. Knowledge that smoking causes lung cancer was higher, ranging from 99.3% in France to 80.2% in China. In China, Bangladesh, and Mexico, knowledge that SHS causes heart disease/attacks was 45.3%, 60.9%, and 80.0% respectively. Knowledge that SHS causes lung cancer was higher at 67.5%, 67.0%, and 89.8% respectively. Associations between health warning labels and knowledge of CVD risk, and differences in knowledge by sex and SES will be examined in the presentation. Conclusion: Knowledge of the CVD risks of tobacco was lower compared to lung cancer risks, with disparities in LMICs compared to HICs for all health risks. Strategies to address inequities in knowledge will be discussed, including health warning labels. The role of heart health experts will also be explored, including how they may help their patients understand the heart health risks of smoking, minimize their SHS exposure, and quit smoking.

3010
Status of the smoking cessation and its costs in Eastern Mediterranean countries in 2010
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Introduction: Among the basic responsibilities of health care institutes in various countries is treatment of tobacco dependence. Methods applied have different costs and do not affect all people the same. Treatment is influenced by local environment and culture as well as individual interest and needs. Objectives: This study was designed with the purpose to address the situation with smoking cessation efforts and its expenditure and to provide basis for future studies and implementing tobacco control programs across countries in the region. Methods: This was a cross-sectional observational study prepared succeeding the third Intergovernmental negotiation body in regards to illicit tobacco trade protocol of the framework convention on tobacco control. This study was in form of questionnaire distributed to participating country representatives from the Eastern Mediterranean region who were all either focal point individual or expert in tobacco control programs. Information needed included methods for tobacco cessation, cost of services including counseling by primary physician or specialist, gum or nicotine patch, Zyban, champa and other practices were collected. Results: In 10 countries (47.6%), smoking cessation programs and Counseling was directed by primary physicians. Also, 8 countries (38%) provided services through specialists. In 13 countries (61.9%), nicotine gum and in 14 countries (60.7%) nicotine patch is accessible in pharmacies. In 5 countries (22.6%), Zyban (buproprion150mg) and in 7 countries (33.3%), Champa (Varnicline 1 mg) are available at pharmacists with written prescription. The mean costs of each service were higher than a pack of cigarette significantly. Conclusion: In countries with support services for tobacco cessation, doctors need to provide care at society level, less costly and accessible for every body and in countries where such programs have not been initiated, it is recommended that effort to do so occur.

3011
A cross-sectional study on chewing khat and tobacco smoking among doctors in Yemen
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Introduction: Khat has amphetamin-like action and chewing khat is a legal social and legal basis activity in Yemen. It has been reported that chewing khat and smoking are known risk factors of myocardial infarction, high blood pressure and stroke. Objectives: To determine the prevalence of chewing khat and to assess the association between chewing khat and socio-demographic, behavioral tobacco smoking and work characteristics among Yemeni doctors. Methods: This study is a component of a larger study conducted among 563 Yemeni doctors in the four main hospitals in Sana’a city. A self administered questionnaire was developed for this study to obtain data on socio-demographic, behavioral and job characteristics. Data analysis included descriptive and chi-square tests. Results: The mean age of doctors was 35.1 ± 4.9 years and the age ranged from 23 to 55 years. Three hundred and thirty five (59.5%) were males, 169 (30.9%) were females. Two hundred and forty eight (44%) of the doctors chewed khat. Bivariate analysis showed that being older (≥ 40 years old or above), male, married, owning home, having children, and smoking cigarettes were significantly associated with chewing khat (p< 0.001). As for work characteristics, being a specialist, working with both the government and the private sector, long duration of work and high income were also associated significantly with khat chewing (p< 0.001). Conclusion: A substantial number of Yemeni doctors chewed khat. Tobacco smoking and socio-demographic factors were associated significantly with chewing khat in this study. Considering the significant factors identified among Yemeni doctors, strategies should be developed aimed at improving knowledge and awareness among these health providers with specific focus to be given to male and older doctors.

3012
Characterisation of metabolic syndrome in rural Uganda
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Introduction: Non-communicable diseases are rapidly becoming leading causes of morbidity and death in low and middle-income countries, including those in sub-Saharan Africa. It is estimated that over 18 million Africans will have type 2 diabetes by 2030. In 2004, approximately 1.2 million deaths were thought to be attributable to cardiovascular disease (CVD) in this region; this figure is expected to double by 2030. Metabolic syndrome is a constellation of interrelated risk factors of metabolic origin that are associated with increased risk of developing diabetes and CVD. Yet, the magnitude and distribution of metabolic syndrome or its components have not been fully studied in sub-Saharan African countries in a large scale epidemiological context. Objectives: To characterize and report on the prevalence and distribution of metabolic syndrome in a rural Ugandan population. Methods: We are carrying out a cross-sectional population-based survey of cardiometabolic risk factors and infection. Results: We will report separately on the prevalence and distribution of each component of metabolic syndrome, namely obesity, blood pressure, HbA1c (as an indication of glucose tolerance), and lipids. Obesity measurements include body mass index, waist circumference and waist to hip ratio. Lipid measurements include total cholesterol, HDL, LDL and triglycerides. We will also report on those factors in combination using the WHO, IDF and ATP III diagnosis criteria for metabolic syndrome. The consistency across these definitions will be discussed. Age and sex specific estimates will be presented. Conclusion: This study provides insight into metabolic syndrome in an under-developed population with both genetic and environmental characteristics from other published cohorts. Metabolic syndrome will present a major health problem in sub-Saharan Africa, competing for limited health resources with infectious diseases. Population based epidemiological studies can provide reliable data to help inform public health policy and programmes aimed at addressing the rise in cardiometabolic disorders in Uganda.

3013
Non-invasive predictors for asymptomatic significant coronary artery stenosis assessed by 320-slice multi-detector computed tomography in type II diabetes mellitus patients
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Introduction: The type II diabetes mellitus (DM) is well known as important risk factor for coronary artery disease (CAD). Some of the patients have no symptoms and difficult to prevent coronary event due to symptomsless CAD. However, controversy still exists regarding the screening of type II DM patients for occult CAD with coronary computed tomography (CCTA). Recently various non-invasive tests including flow-mediated vasodilation (FMD), brachial-ankle pulse wave velocity (baPWV), and carotid intima-media thickness (IMT) using carotid ultrasound, have been used to predict coronary atherosclerosis. Objectives: The aim of this study was to determine optimal predictors of asymptomatic CAD assessed by 320-row cardiac computed tomography (CCTA) in type II DM patients. Methods: Consecutive 101 asymptomatic type II DM cases (71 males, 29 females, age 64 ± 15 years, Modified PCAT score of 15% or higher) with normal baseline ECG and completed detailed cardiovascular checkup including medical interview, laboratory study, physiological studies (FMD, and baPWV) imaging studies (CCTA) were enrolled and performed detailed cardiovascular checkup including medical interview, laboratory study, physiological studies (FMD, and baPWV) imaging studies (CCTA). At baseline, patients were divided into two following criteria by CCTA (Group 0: Absence of plaque and no luminal stenosis, Group 1: Presence with ≥ 49% stenoses, Group 2: 50–99% stenoses and total occlusion) and statistically analyzed by each parameter. Results: Of the 101 study subjects, 28 patients were divided into Group 0, 35 patients were classified into Group 1, and 40 patients were categorized into Group 2. Table 1 shows the basic characteristics of each group. Gender, diabetes duration, maximum IMT, FMD and calcium score were significantly different between three groups. Multivariate logistic regression analysis revealed two independent predictors of significant coronary artery stenosis (diabetes duration OR 3.51, 95% CI 1.01–12.16, p = 0.048) and calcium score (OR 4.17, 95% CI 1.20–14.40, p = 0.024) (Table 2). FMD and maximum IMT tended to be higher in patients with significant coronary artery stenosis, but the difference was not significant. Image: graph / table
Glycosylated hemoglobin is a predictor of adverse cardiac events after coronary stent implantation among patients without diabetes mellitus

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Introduction: The effect of glucose homeostasis and metabolic hormones on the outcome after percutaneous coronary interventions is controversial and has not been extensively investigated in non-diabetic patients. Objectives: We have assessed the hypothesis that glycosylated hemoglobin (HbA1c), metabolic hormones such as leptin and adiponectin have a potential effect on the outcome after coronary stenting among patients without known diabetes mellitus. Methods: In our prospective study, 300 patients underwent coronary angiography and stent implantation and during a 4-year follow-up the occurrence of adverse cardiovascular events (death, acute myocardial infarction, revascularization of target and non-target vessels) was investigated.

Results: Patients without known diabetes mellitus (n=250) and with adverse cardiovascular events (n=50) had significantly higher baseline levels of glycosylated hemoglobin (5.92±0.05 vs. 5.39±0.05, P<0.01) and leptin (P<0.001) as compared to patients without adverse events (n=200). Fasting plasma glucose and plasma insulin levels and glucose levels during an oral glucose tolerance test were however not different. Leptin and adiponectin plasma concentrations and leptin/adiponectin ratio did not differ either between the two groups. By using a multivariable Cox regression analysis, after adjusting for body mass index, low density lipoprotein, glucose, insulin, leptin and adiponectin levels, glycosylated hemoglobin (HR=1.28, 95% CI=1.045–1.441, P<0.005) and age (HR=1.32, 95% CI=1.013–1.708, P<0.01) remained significant independent predictors of adverse cardiovascular events. Conclusion: Among patients without known diabetes mellitus even a subtle increase of glycosylated hemoglobin can predict adverse cardiovascular events after percutaneous coronary interventions.

Endothelial progenitor cell senescence in premature CAD patients

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Introduction: Endothelial progenitor cells (EPC) play an important role in the repair of endothelium. Many studies have reported depletion in the number of EPCs in Coronary Artery Disease (CAD) patients however they have all been carried out in old patients. Studies in premature CAD patients are lacking. Also the mechanism responsible for depletion of EPC in CAD patients needs to be clearly understood. Objectives: The objective of the study was to measure EPC number in premature CAD patients and compare them with that in normal controls. We further looked at EPC senescence by measuring telomere length and telomerase activity in the premature CAD patients and controls. Correlation of EPC senescence with other cardiovascular risk factors was also assessed. Methods: Fifty premature CAD patients less than 50 years of age and 50 age matched normal controls were recruited for the study. EPCs were enumerated by flow cytometry. CD34 and KDR were used as membrane markers to identify EPCs. EPCs were isolated by magnetic activated cell sorting and telomere length was measured by quantitative real time PCR. Telomerase activity was measured in EPC by TRAP assay. The cardiovascular risk factors assessed included total and HDL cholesterol, triglycerides, hsCRP, homocysteine and insulin. Results: The mean age of CAD patients was 43.1 years and that of controls was 39.8 years. The mean level of circulating EPC was significantly lower in premature CAD patients as compared to normal controls (0.018 vs. 0.034, P<0.05). Even after adjusting for age, male sex, BMI and smoking and use of medication the difference remained significant. Mean EPC telomere length was significantly lower in CAD patients as compared to controls (3.83±0.5 vs. 5.14±0.5, unadjusted P<0.005, adjusted P<0.05). The relative telomere activity was also lower in cases (1.41±0.24 vs 2.2±0.26, adjusted P<0.04). Triglycerides correlated negatively with EPC number, telomere length and telomerase activity whereas HDL correlated positively with EPC number and telomerase number. Conclusion: Significantly lower EPCs in premature CAD patients suggest impaired repair mechanism predisposing to endothelial dysfunction at a very young age. A shorter EPC telomere length and reduced telomerase activity points to an accelerated senescence of EPC. Association of triglycerides and HDL with EPC numbers points is suggestive of a possible role of classical risk factors in regulating EPC numbers.

Cross-talk between mesenchymal and haematopoietic stem cells as a mode of action after intracoronary stem cell transfer

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Introduction: Different mode of action has been suggested using proposed strategies (i.e. or intramyocardial (i.m.) stem cell delivery. Objectives: We have investigated the cross-talk between cardially delivered allogeneic mesenchymal stem cells (MSC) and recruited endogenous hematopoietic stem cell (HPC) after MSC delivery. Methods: Closed chest reperfused AMI was induced in New Zealand rabbit (n=8) followed by cell transfer, first with allogeneic MSCs and then with allogeneic HPCs. The allogeneic MSCs were transfected with luciferase. One week post-AMI, the animals were randomized, and received either 11.6±2.1 x 106 transfected MSCs i.m. using the NCGA 3D...
technology (n=5, group IM), or 10.4×10^6 IC (n=5, group C). One day after MSC delivery, in vitro bioluminescence imaging (BLI) was performed to visualize the injected MSCs. Myocardial expression of 1) matrix metalloproteinase 2 (MMP-2) (marker of ischemia-induced oxidative stress, and cleavage of the SDF/CXCR4 axis due to SDF-1, a prime territory, thereby limiting homing), 2) CXCR4 (signaling hom for HPC recruitment), 3) presence of HPC (CD34+), and 4) hemozminiac and fibrinogen, and angiogenic factors (vascular endothelial and fibroblast growth factors) of the BLI-positive areas. Mobilization of the HPCs as a response to myocardial ischemia was measured by FACS.

**Results:** Myocardial expression of MMP-2 was significantly elevated in group IC as compared with group IM and ICIM (6.6±4.9 vs. 7.0±4.9 and 6.6±4.9 vs. 4.4±2.3, respectively), possibly due to increase in myocardial blood flow post-IC MSC delivery. However, the myocardial CXCR4 expression was significantly lower at the site of injection in group IC as compared with group IM and IC. Furthermore, enhanced mobilization of the HPCs was measured in peripheral blood at lower degree of co-localized (in vivo) MSCs injection into HPC in group IC, as compared with groups IM and IC (150±21 vs 110±35 and 56±33 CD34+ HPC/L cell, p<0.05). Contrary, BLI revealed better cell retention with higher myocardial expression of homing and angiogenic factors in group IM, as compared to groups IC and C. 

**Conclusion:** One day after MSC delivery, the main mechanism of action of injected Lac-MSC seems to be paracrine via in jecteds, or enhanced cross-talk between injected MSC and recruited enotone HPC using the ic delivery.

**Mesenchymal stem cells neither fully acquire the electrophysiological properties of mature cardiomyocytes nor promote ventricular arrhythmias in infarcted rats**

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**Introduction:** The electrophysiological properties of implanted MSCs in infarcted hearts remain unclear, and the risk of proarrhythmic effect of transplanted MSCs is still controversial. 

**Objectives:** To investigate the electrophysiological properties and proarrhythmic effects of MSCs in the infarcted hearts. 

**Methods:** Rats were randomly divided into myocardial infarction (MI) group, MI-DMM group (received DMEM medium injection) and MI-MSCs group (received MSCs injection). GFP-labeled MSCs were injected into the viable myocardium bordering the infarcted region. Survival of implanted MSCs was assessed by fluorescence detection in vivo. One day after MSCs delivery, the main mechanism of action of injected Lac-MSC seems to be paracrine via in jecteds, or enhanced cross-talk between injected MSC and recruited enotone HPC using the ic delivery.

**Result:** One hundred twenty four patients were included in study, mean age 58 y. Twenty one patients (17%) died in the ICU. Comparision between survivors and non survivors did not show any difference in proarrhythmic, cardiac and clinical laboratory parameters, so the area under the curve of the receiver operating characteristic curve was 0.5, that indicate the test predict the poor outcome in patients with acute exacerbation of COPD which also has important prognostic implications for patients with AECOPD. Thus, TAPSE should be incorporated as routine echographic assessment of patients with AECOPD.

**Systolic function of the right ventricle an independent predictor of short term survival in COPD patients admitted to ICU for acute exacerbation**

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**Introduction:** Right ventricle (RV) function was successfully evaluated by tricuspid annular plane systolic excursion (TAPSE) a simple echographic parameter recorded on M mode at the tricuspid annulus. Recent studies had showed that this simple parameter might be surrogate for RV function and resulting in higher risk for arrhythmias and thrombo-embolic events.

**Methods:** A study group of 566 male patients, were divided in four groups healthy controls (21–40 years), IV; IV–60y; IV–60y; IV–60y–80y. The echocardiographic study in three groups of coronary patients (IV–40y; IV–60y–80y–100y) was performed to study the contractile function of the left atrium we assessed by strain measurements the reservoir function (RF), the conduit function (CF) and the booster pump function (BPF). Echocardiographic data were obtained for radial motion from roof of left atrium and for longitudinal motion from septum and lateral wall of left atrium. Measurements were obtained during endexpiration to eliminate respiratory variation. 

**Conclusion:** Significant decrease (<0.01) of MI and CF with age, statistically more pronounced in coronary patients until age of 80, Progressive increase of BPF with age until 60 years. In ischemic heart disease there exists a tendency to progressive decrease of BPF with age. The decrease was more pronounced in coronary patients than in non coronary patients. The contractile function of the left atrium we assessed by strain measurements the reservoir function (RF), the conduit function (CF) and the booster pump function (BPF). Echocardiographic data were obtained for radial motion from roof of left atrium and for longitudinal motion from septum and lateral wall of left atrium. Measurements were obtained during endexpiration to eliminate respiratory variation. 

**World Congress of Cardiology 2012 Oral Presentations**

**O324 Systolic heart failure, independent factors affecting left atrial function and resulting in higher risk for arrhythmias and thrombo-embolic events**

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**Introduction:** In the contraction relaxation cycle of the myocardium the atria play an important but often forgotten and neglected role. The atria contribute up to 30% of left ventricular filling and cardiac output and are particularly important in the setting of impaired left ventricular function. 

**Objectives:** Left atrial function can be evaluated by strain measurements of the atrial walls. Ageing and ischemic heart disease lead to an increase in fibrinosis, causing remodeling of atrial myocardial and atrial dysfunction. Our study aimed to prove that age and ischemic heart disease may independently affect atrial function. 

**Methods:** A study group of 566 male patients were divided in four groups healthy controls(21–40 years), IV; IV–60y; IV–60y; IV–60y–80y. The echocardiographic study in three groups of coronary patients (IV–40y; IV–60y–80y–100y) was performed to study the contractile function of the left atrium we assessed by strain measurements the reservoir function (RF), the conduit function (CF) and the booster pump function (BPF). Echocardiographic data were obtained for radial motion from roof of left atrium and for longitudinal motion from septum and lateral wall of left atrium. Measurements were obtained during endexpiration to eliminate respiratory variation. 

**Conclusion:** Significant decrease (<0.01) of RF and CF with age, statistically more pronounced in coronary patients until age of 80, Progressive increase of BPF with age until 60 years. In ischemic heart disease there exists a tendency to progressive decrease of BPF with age. The decrease was more pronounced in coronary patients than in non coronary patients.
Use of right ventricular diameter and tricuspid annular tissue Doppler velocity parameters to predict pulmonary hypertension

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Introduction: The assessment of pulmonary artery pressure is important in clinical management and prognostic evaluation of patients with cardiovascular and pulmonary disease. Pulmonary arterial hypertension (PAH) can be detected invasively by right ventricular catheterization. At present non-invasive assessment of PAH by Doppler echocardiography relies on presence of tricuspid regurgitation (TR) which may not be present in milder forms of PAH, thus limiting its use for its early detection. Tissue Doppler Imaging (TDI) has evolved as a new quantitative tool for the assessment of cardiac systolic function, diastolic function, and the hemodynamic of left ventricular filling. Objectives: The present study was done to determine the accuracy of a new index, based on the right ventricular diameter and tricuspid annular TDI parameters, for diagnosing presence of PAH.

Methods: Eighty consecutive patients who underwent right heart catheterization and patients with right heart catheterization derived pulmonary artery systolic pressure (PASP) >35 mm/Hg were identified as PAH group (n = 45) and PASP <35 mm/Hg were identified as no PAH group (n = 35). The sensitivity and specificity of RVD, Tpeak, and RVD/Tpeak ratio for detection of PAH were estimated. The areas under the receiver-operator characteristic (ROC) curves for the PAH predictors were estimated. Results: The correlation coefficients of RVD, Tpeak and RVD/Tpeak with PASP was 0.54, -0.46, and 0.70 (p<0.001). ROC, constructed using RVD/Tpeak of patients between two groups, gave a RVD/Tpeak cut off value of 21 cm/s as the value with a best combination of sensitivity and specificity for PAH. At this RVD/Tpeak cut off value of 21, the sensitivity and specificity of RVD/Tpeak in diagnosing PAH was found to be 91% and 63%, respectively which correctly classified 89.7% of the patients.

Conclusion: RVD/T peak ratio is a good predictor for pulmonary arterial hypertension.

Impaired diastolic reserve is an early marker of diabetic cardiomyopathy

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Introduction: Diastolic dysfunction is an important prognostic marker and is an early sign of diabetic cardiomyopathy. Diastolic reserve is the ability of left ventricular filling pressures to remain normal with exercise. An impaired diastolic reserve may be an early sign of cardiac diastolic dysfunction. Examining diastolic reserve may allow earlier detection of diabetic cardiomyopathy. Objectives: We evaluated exercise E/e’ as a measure of diastolic reserve and the determinants of raised exercise E/e’.

Methods: 130 patients (89 male, aged 53-110 yrs) were included in the study. We performed exercise Doppler echocardiography and V02-max testing. Global mean peak systolic longitudinal strain (S) and strain rate (SR) were measured in the 3 apical views at rest, and septal e’ was measured at rest and post exercise. Multivariate analysis was done to find the multivariate predictors of increase in exercise E/e’.

Results: The mean exercise duration was 9±3 minutes, 9.7±7 MTS. Three patients had indoluble ischaemia on exercise echocardiography. Diabetics and patients presenting with dyspepsia performed significantly less exercise than other groups (7 ± 11 MTS, p=0.001; 68 ± 8 vs. 11 ± 11 MTS, p<0.001, respectively). Exercise METs were correlated with exercise E/e’ (r=0.44, p<0.001). Post exercise predictors of an increase in exercise E/e’ are shown in the following graph:

Conclusion:
1) Resting diastolic function measured by resting e’, resting E/e’, and diabetes were the only independent determinants of diastolic reserve.
2) Diabetic patients have abnormal exercise E/e’ indicating impaired diastolic reserve.
3) Examining diastolic reserve may allow earlier detection of diabetic cardiomyopathy.

Normotensive offsprings of hypertensive Nigerians have increased left ventricular mass and early diastolic alterations

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Introduction: Reports have shown that normotensive offspring of hypertensive parents (OHP) are at increased risk of developing systemic hypertension (SH) and adverse cardiovascular events later in life. The pathological antecedents of this are thought to be alterations in the structure and function of left ventricle. Objectives: The present study aimed at characterizing left ventricular mass and function of OHP and compared with offspring without parental hypertension. Methods: Sixty-five offsprings of hypertensive Nigerians aged 15–25 years with 65-age and sex-matched offspring of normotensive parents (ONP) were studied for early makers of hypertensive cardiovascular disease. Those with heart murmurs, structural heart diseases and blood pressure >140/90 mmHg were excluded. Electrocardiography (ECG) and echocardiogram were done in standard positions. Results: Mean left ventricular posterior wall thickness, left ventricular mass, left ventricular mass index (LVM) and relative wall thickness (RWT) were significantly higher in the subjects than controls (p=0.001, 0.046, 0.03 and 0.004 respectively). LVM correlated positively with systolic and diastolic blood pressure, waist circumference (WC), ECG voltage, and posterior wall diastolic dimension. Waist circumference was an independent predictor of LVM in OHP. Mean mtrial E velocity in the OHP (73.3 ± 12.6 cm/s) was significantly lower than in ONP (80.2 ± 22.5 cm/s), p<0.01. However, mean mtrial A velocity and E/A ratio; deceleration time and isovolumic relaxation time were similar in both groups (p=0.25, 0.7, 0.6 and 0.9 respectively). Mean 5 velocity of pulmonary venous flow was significantly lower (p=0.01) in the subjects than in the control, although both were within normal limits in the two groups. Conclusion: We concluded that normotensive offsprings of hypertensive Nigerians have increased left ventricular mass and have alterations in diastolic function, and should be considered a special group that needs early dietary and lifestyle adjustments to prevent future cardiovascular events.

References:

Angiotensin 1–7 promotes cardiac angiogenesis following myocardial infarction

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Introduction: Recently the classical view of RAS has been challenged by the discovery of angiotensin converting enzyme (ACE2). The major role for ACE2 is to cleave angiotensin (Ang)II to generate Ang(1–7). The latter is an active peptide with cellular actions mediated by Mas receptors. The role of Ang(1–7) is under investigation. Cardiac ACE2, Ang(1–7) and Mas receptors are significantly increased following myocardial infarction (MI) and colocalized with angiogenesis. Objectives: The purpose of this study was to determine whether Ang(1–7) plays a role in cardiac angiogenesis following MI and contribute to cardiac repair. Methods: MI was created by left coronary ligation in eight-week-old male Sprague Dawley rats. Rats with MI were treated with or without Mas receptor antagonist, A779 (200mg/min given by minipump). Sham-operated heart served as controls. Results were collected at days 7 post-MI. We detected cardiac angiogenesis density by immunohistochemical CD31 labeling and quantitated using image anayzing system and the expressions of VEGF-A and VEGF-D (the key angiogenic regulators) were determined by RT-PCR and Western blot. Results: We found (i) pre-existing blood vessels in the infarcted myocardium underwent neocrosis post-MI, whereas newly formed vessels appeared in the infarcted myocardium at day 7 post-MI; (ii) VEGF-A was reduced in the infarcted heart, while VEGF-D was significantly increased in the infarcted myocardium; (iii) A779 treatment significantly reduced vascular density in the infarcted myocardium; and (iv) A779 treatment significantly decreased VEGF-D expression in the infarcted heart. Conclusion: These observations suggest that Ang(1–7) stimulates angiogenesis in the infarcted heart through stimulating VEGF-D and contributes to cardiac repair.

Remote monitoring in children and young patients with a congenital heart disease and electronic devices

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Introduction: In children and young adults self-perception and self-responsibility is not fully developed. An automated day to day data evaluation and transmission system not requiring any action from the patient can assist to diagnose clinical problems or to anticipate device failure. Objectives: An automated day to day data evaluation and transmission system not requiring any action from the patient can assist to diagnose clinical problems or to anticipate device failure. Methods: Out of 150 patients 45 patients received a pacemaker (PM) or defibrillator (ICD) and 105 patients home Monitoring Offsion (Biotronik). Patients' at implantation ranged from 5 weeks to 37.6 years [median 12.4 years]. The individual follow up time from the daily monitoring data is 7 days up to 5.3 years (mean 1.7 years). Results: The
Cross-talk between notch and estrogen receptor in human vascular endothelial cells

Cristiana Caliceti1,*, Cinzia Fortini1, Micaela Pannella1, Paola Rizzo1, Roberto Ferrari1-2
Cardiovascular Research Center, University of Ferrara, Ferrara, Italy

Introduction: Epidemiological data suggest a protective effect of estrogens on the cardiovascular system. Pre-menopausal females have a lower incidence of cardiovascular disease than age-matched male and the risk of cardiovascular diseases drastically increases in postmenopausal women. The molecular mechanisms by which estrogens exert this protective activity are not completely understood. The Notch receptors 1 and 4 are involved in controlling the sprouting of new blood vessels and proliferation, migration and survival of endothelial cells (1). Activated Notch inhibits endothelial cells apoptosis induced by inflammatory agents (2,3). In estrogen receptor positive breast cancer cell lines, Notch signaling is inhibited by 17-beta-estradiol through the estrogen receptor alpha (3). It is still unclear the mechanism by which estrogen could modulate Notch signaling in endothelial cells. The aim of this study was to evaluate the effects of estrogen treatment on the regulation of Notch activity in human vascular endothelial cells. Methods: Early passage human umbilical vein endothelial cells (HUVECs) were grown in a steroid-depleted, red phenol-free medium and treated for 2, 4, 8 and 24 hours with 1 nM 17beta-estradiol treatment, increased levels of Notch1 and Notch4 precursors were observed (image II). These results suggest that estrogen stimulates synthesis and maturation of both receptors. All effects were abolished by 17beta-estradiol up to 8 hours resulted in a significant decrease of the Notch1 and 4 precursors precursors were observed (image II). The main finding of this study is that estrogen has a dual role in endothelial cell biology, since it can promote the synthesis and maturation of Notch receptors 1 and 4, while inhibiting their activation.

Results:

- Treatment of HUVECs with 17beta-estradiol up to 8 hours resulted in a significant decrease of the Notch1 and Notch4 precursors.
- All effects were abolished by 17beta-estradiol.
- The main finding is that estrogen has a dual role in endothelial cell biology, promoting the synthesis and maturation of Notch receptors 1 and 4, while inhibiting their activation.

Conclusion: Our results indicate that estrogen treatment in HUVECs raises Notch activity by transcriptional and post-translational mechanisms. Since Notch activation protects endothelial cells from apoptosis, our data could help in understanding the molecular mechanism by which estrogens exert a protective effect on cardiovascular functions.

References:

World Congress of Cardiology 2012 Oral Presentations

O332

Hypoxic preconditioning protects rat hearts against ischemia-reperfusion injury: role of arachidonate 12-lipoxygenase

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Introduction: Hypoxia or ischemia is known to stimulate arachidonate 12-lipoxygenase (ALOX12) whichgenerally 12-Hydroxyeicosatetraenoic acid (12-HETE) from arachidonic acid. 12-HETE is involved in myocardial protection against ischemia/reperfusion (IR) injury by limiting an endogenous ligand of transient receptor potential vanilloid 1 (TRPV1) in channel activation. We previously showed that hypoxic preconditioning (HPC) protects rat hearts against IR injury but it is unclear that the effect of HPC is dependent on ALOX12. Objectives: The present study investigated whether HPC enhances the activity of ALOX12 and its downstream products and its effect on TRPV1. Methods: The heart from rat is kept in room air in air preconditioned with 10% oxygen for 4 weeks were isolated and mounted on the Langendorf apparatus. Acute IR injury was induced by a 30-min stop of perfusion and 4-h reflow. ALOX12 inhibitor bicalutimide (10 μM) or selective TRPV1 antagonist capsaicin (Cag, 0.1 μM) was given 5 min before reperfusion in the HPC + IR hearts. Myocardial protection was assessed by measuring left ventricular developed pressure (LVDP), release of lactate dehydrogenase (LDH), and infarction. The ALOX12 expression and 12-HETE content were examined. Results: HPC but not IR markedly up-regulated ALOX12 as compared to the control (Figure 1a). Interestingly, preconditioning increased myocardial content of 12-HETE and prevented its IR-induced decrease (Figure 1b). The HPC heart survived IR had a better postischemic LVDP recovery as compared to IR hearts (Table 1). HPC significantly decreased LDH release and limited infarction caused by IR. Blockade of either ALOX12 or TRPV1 abolished the cardioplegic recovery, and LDH and infarction mitigated by HPC.

Table 1. Changes in LVDP, LDH release, and infarction in groups

| Group | Parameters | LVDP (mmHg) | LDH (U/L) | Infarct (%)
<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>100±7</td>
<td>71±9</td>
<td>17±3</td>
<td>32±5</td>
</tr>
<tr>
<td>HPC</td>
<td>113±9</td>
<td>54±7</td>
<td>8±2</td>
<td>56±9</td>
</tr>
<tr>
<td>HPC + IRAOX12</td>
<td>113±9</td>
<td>54±7</td>
<td>8±2</td>
<td>56±9</td>
</tr>
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N = 8 for each group. Values are expressed as mean ± SEM. IS, infarct size as percentage of area at risk. *P<0.05 compared to the control (C) group. ^P<0.05 compared to the IR group

**Cross-talk between notch and estrogen receptor in human vascular endothelial cells**

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Results:

- Treatment of HUVECs with 17beta-estradiol up to 8 hours resulted in a significant decrease of the Notch1 and Notch4 precursors.
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Conclusion: Our results indicate that estrogen treatment in HUVECs raises Notch activity by transcriptional and post-translational mechanisms. Since Notch activation protects endothelial cells from apoptosis, our data could help in understanding the molecular mechanism by which estrogens exert a protective effect on cardiovascular functions.

References:

World Congress of Cardiology 2012 Oral Presentations

O332

Hypoxic preconditioning protects rat hearts against ischemia-reperfusion injury: role of arachidonate 12-lipoxygenase

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Introduction: Hypoxia or ischemia is known to stimulate arachidonate 12-lipoxygenase (ALOX12) which generally 12-Hydroxyeicosatetraenoic acid (12-HETE) from arachidonic acid. 12-HETE is involved in myocardial protection against ischemia/reperfusion (IR) injury by limiting an endogenous ligand of transient receptor potential vanilloid 1 (TRPV1) in channel activation. We previously showed that hypoxic preconditioning (HPC) protects rat hearts against IR injury but it is unclear that the effect of HPC is dependent on ALOX12. Objectives: The present study investigated whether HPC enhances the activity of ALOX12 and its downstream products and its effect on TRPV1. Methods: The heart from rat is kept in room air in air preconditioned with 10% oxygen for 4 weeks were isolated and mounted on the Langendorf apparatus. Acute IR injury was induced by a 30-min stop of perfusion and 4-h reflow. ALOX12 inhibitor bicalutimide (10 μM) or selective TRPV1 antagonist capsaicin (Cag, 0.1 μM) was given 5 min before reperfusion in the HPC + IR hearts. Myocardial protection was assessed by measuring left ventricular developed pressure (LVDP), release of lactate dehydrogenase (LDH), and infarction. The ALOX12 expression and 12-HETE content were examined. Results: HPC but not IR markedly up-regulated ALOX12 as compared to the control (Figure 1a). Interestingly, preconditioning increased myocardial content of 12-HETE and prevented its IR-induced decrease (Figure 1b). The HPC heart survived IR had a better postischemic LVDP recovery as compared to IR hearts (Table 1). HPC significantly decreased LDH release and limited infarction caused by IR. Blockade of either ALOX12 or TRPV1 abolished the cardioplegic recovery, and LDH and infarction mitigated by HPC.

Table 1. Changes in LVDP, LDH release, and infarction in groups

| Group/Parameters | LVDP (mmHg) | LDH (U/L) | Infarct (%)
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<tbody>
<tr>
<td>Control</td>
<td>100±7</td>
<td>71±8</td>
<td>17±3</td>
</tr>
<tr>
<td>HPC</td>
<td>113±9</td>
<td>54±7</td>
<td>8±2</td>
</tr>
<tr>
<td>HPC + IRAOX12</td>
<td>113±9</td>
<td>54±7</td>
<td>8±2</td>
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N = 8 for each group. Values are expressed as mean ± SEM. IS, infarct size as percentage of area at risk. *P<0.05 compared to the control (C) group. ^P<0.05 compared to the IR group
Validation of a new method for non invasive estimation of pulmonary vascular resistance using Doppler echocardiography in patients with VSD and pulmonary hypertension

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Introduction: High pulmonary vascular resistance (PVR) in children with congenital heart disease (CHD) can severely limit surgical repair or long term survival. Doppler echocardiography allows for the noninvasive investigation of cardiopulmonary hemodynamics and thus is of utmost importance in follow up of patients with elevated PVR. Objectives: To validate whether the ratio of peak tricuspid regurgitation velocity (TRV, m/s) to the right ventricular outflow tract velocity –integral (TVI, cm) obtained by Doppler echocardiography (DE) (TRV/TVI) provides a clinically reliable method to determine pulmonary vascular resistance (PVR) in patient with pulmonary hypertension secondary to ventricular septal defect (VSD). Methods: DE examination and right heart catheterization were performed in 50 patients within one hour of each other. The ratio of (TRV/TVI) was then correlated with the invasive PVR measurements using regression analysis. The models (PVR echo 1 = 4.7 + 28.577 X (TRV/TVI)echo and PVR echo 2= 5.159 + 14.754 X (TRV/TVI)echo) and PVR echo 3= 9.175 + 27.38 x (TRV/TVI)echo - 5.606 X BSA) showed satisfactory agreement with a mean difference value of (1.5 ± 5.6, 0.6 ± 5.5 and 0.8 ± 4.8) for models 1, 2 and 3 respectively and standard error of estimation were (5.6, 5.5 and 4.8 WU) in models 1.2 &3 respectively. Other Bland –Altman analysis between PVR obtained invasively and that by DE, using the same models but in a subset of patients who were below 4 years of age (BSA –0.6) were done with satisfactory agreement and standard error of estimation (3.8, 3.4 and 2.8 WU) in models 1.2&3 respectively. Conclusion: The ratio of (TRV/TVI) obtained by Doppler-echocardiography provide a reliable non invasive method to determine patients with high PVR prior to surgical correction of VSD.

MicroRNA-221 promotes cardiac hypertrophy in vitro through the modulation of p27 expression

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Introduction: Cardiac hypertrophy has been recognized as an important risk factor for cardiac morbidity and all-cause mortality. Accumulating evidence suggests that microRNA (miRNA) is one of the central players in cardiac hypertrophy. Objectives: The aim of this study is to investigate whether microRNA-221 plays a regulatory role in cardiac hypertrophy. Methods: The expression of miR-221 was measured by realtime FCR in the hypertrophic and failure mouse hearts induced by 2-week and 9-week thoracic aortic banding (TAB), as well as in left ventricular of patients with hypertrophic cardiomyopathy. Primary cultured neonatal rat ventricular myocytes were transiently transfected with miR-221 mimic or antagonist. Myocardial hypertrophy was evaluated by morphometric analysis and reactivation of fetal gene program. The target of miR-221 was predicted by Targetscan algorithm and was verified by luciferase assay and western blot. Results: Increased expression of miR-221 was observed in pressure-overload induced hypertrophic and failure mouse hearts (1.5-fold and 1.6-fold, respectively, p<0.05). In the heart of patients with hypertrophic cardiomyopathy, the expression of miR-221 was up-regulated to two folds (p<0.01). Overexpression of miR-221 in isolated cardiomyocytes increased cell size (1.5-fold, p<0.001) and activated the fetal gene program, in which atrial natriuretic peptide increased up to 3.1-fold (p<0.01) and brain natriuretic peptide increased up to 3.2-fold (p<0.01), respectively. Conversely, knockdown of miR-221 by introducing antisense oligonucleotides into isolated cardiomyocytes resulted in a decrease of atrial natriuretic peptide expression (p<0.01). A computer-based prediction algorithm led to the identification of p27, a cardiac hypertrophic suppressor, as a putative target of miR-221. Overexpression of miR-221 in cardiomyocytes reduced the expression of p27 at protein level. The luciferase activity of wild-type p27 3’UTR plasmid was significantly inhibited by miR-221, whereas the mutated p27 3’UTR plasmid ablated miR-221-mediated repression of luciferase activity, showing that p27 is a real target of miR-221. Conclusion: Our study provides first insights that miR-221 promotes cardiomyocyte hypertrophy through the modulation of p27 expression, suggesting that microRNA-221 might be a new intervention target for cardiac remodeling.

Urine predictors in the early detection of acute kidney injury in infants and young children after open heart surgery

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Introduction: Acute kidney injury(AKI) and subsequent acute renal failure after cardiac surgery are associated with high mortality and morbidity especially in infants and young children. Some novel biomarkers were newly used to predict the AKI events. Objectives: We aimed to evaluate the ability of clinical factors and the novel biomarkers to predict AKI after CPB. Methods: We enrolled 58 children (ages < 3 years) undergoing congenital heart surgery with CPB. Urine samples were collected preoperatively and at 4, 6, 12, 24 hours after the initiation of CPB for determination of concentrations of Neutrophil Gelatinase–Associated Lipocalin (NGAL), Interleukin-18 (IL-18), microalbumin (MA), N-acetyl-glucosaminidase(NAG) and -D-glucoaminidase(NAG) in urine. Results: The expression of NGAL was increased up to 3.2-fold (p<0.001), whereas NAG was increased up to 1.5-fold (p<0.01) and brain natriuretic peptide increased up to 3.1-fold (p<0.01), respectively. Conversely, knockdown of miR-221 by introducing antisense oligonucleotides into isolated cardiomyocytes resulted in a decrease of atrial natriuretic peptide expression (p<0.01). A computer-based prediction algorithm led to the identification of p27, a cardiac hypertrophic suppressor, as a putative target of miR-221. Overexpression of miR-221 in cardiomyocytes reduced the expression of p27 at protein level. The luciferase activity of wild-type p27 3’UTR plasmid was significantly inhibited by miR-221, whereas the mutated p27 3’UTR plasmid ablated miR-221-mediated repression of luciferase activity, showing that p27 is a real target of miR-221. Conclusion: Our study provides first insights that miR-221 promotes cardiomyocyte hypertrophy through the modulation of p27 expression, suggesting that microRNA-221 might be a new intervention target for cardiac remodeling.
(0.747), which was significantly lower than the other four biomarkers (P<0.05). Five children (4/29, 13.8%) who had CPB duration>150min including one death in AKI group developed acute renal failure (ARF) while no ARF happened in non-AKI group. Conclusion: Higher RACHS-1 category, longer CPB duration and ACT are risk factors of AKI and ARF after cardiopulmonary bypass surgery in infants and young children. Urinary biomarkers are valuable early predictors of AKI after surgery.

MicroRNA-223 prevents cardiomyopathy hypertrophy by targeting cardiac troponin I-interacting kinase

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Introduction: Some microRNAs (miR) play regulatory role in cardiovascular disease. In microarray map, microRNA-223 (miR-223) shows abundant expression in myocardium. TNNI3K, one novel cTnI-interacting and cardiac hypertrophy related kinase which belongs to MAPK family, is computationally predicted target of miR-223. Regulatory mechanism of miR-223 / TNNI3K axis in cardiac hypertrophy has not been reported. Objectives: Our study was designed to investigate the role of miR-223 and its direct target gene, cardiac troponin I-interacting kinase (TNNI3K), in regulation of cardiomyopathy hypertrophy. Methods: Neonatal rat cardiomyocytes (CMs) were cultured from 1–2-day-old Sprague-Dawley rats. Cardiomyopathy hypertrophy was induced by endothelin-1 (ET-1). Expression of miR-223 in CMs was detected by real-time PCR. miR-223 mimics transfection was performed to achieve overexpression of miR-223 in CMs. Cell size was measured via surface area calculation under fluorescence microscopy after anti-alpha-actinin staining. Expression levels of ANP, alpha-actinin, Myh6, Myh7, as cardiac hypertrophy related marker genes, were measured via surface area calculation under fluorescence microscopy after anti-alpha-actinin staining. Level of TNNI3K protein was assayed by western blot. Luciferase assay was performed to confirm the direct binding of miR-223 to the 3’UTR of TNNI3K mRNA. Results: In ET-1 induced hypertrophic CMs, expression of miR-223 was lower than that in normal CMs (Normal CMs: 1.00±0.08 vs. Hypertrophic CMs: 0.62±0.16, P<0.05). Under stimulation of ET-1, miR-223 overexpressed CMs showed alleviated hypertrophic phenomenon, which characterized by less cell surface area (miR-223 group: 2590±781nm2 vs. ET-1 only group: 4600±1040nm2, P=0.01) and lower expression of ANP, alpha-actinin, Myh6, Myh7, as cardiac hypertrophy related marker genes, were detected by RT-PCR. The expression of TNNI3K protein was analysed by western blot. Luciferase assay was performed to confirm the direct binding of miR-223 to the 3’UTR of TNNI3K mRNA. Results: In ET-1 induced hypertrophic CMs, expression of miR-223 was lower than that in normal CMs (Normal CMs: 1.00±0.08 vs. Hypertrophic CMs: 0.62±0.16, P<0.05). Under stimulation of ET-1, miR-223 overexpressed CMs showed alleviated hypertrophic phenomenon, which characterized by less cell surface area (miR-223 group: 2590±781nm2 vs. ET-1 only group: 4600±1040nm2, P=0.01) and lower expression of ANP, alpha-actinin, Myh6, Myh7, when compared with ET-1 stimulation only CMs. In miR-223 overexpressed CMs, the expression of TNNI3K protein was significantly decreased (miR-223 group: 0.03±0.01 vs. Control: 0.39±0.06). Co-transfection of a miR-223 expression vector with pmirGLO-TNNI3K led to the reduced activity of luciferase in a dual-luciferase reporter gene assay, suggesting that TNNI3K is a direct target gene of miR-223.

Conclusion: All results suggest that TNNI3K, a novel cardiac-specific kinase gene, is a direct target of miR-223. miR-223 / TNNI3K axis plays a important role as suppressor in cardiomyocyte hypertrophy and could be used in clinical treatment of hypertrophy in future.

Heart rate variability in patients undergoing univentricular heart repair: a follow up study

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Introduction: Management of patients with univentricular heart physiology is still an enigma. Previously, BD Glenn and Fontan are the recommended procedures of choice. Altered cardiac autonomic control may play a role in long term outcome of patients undergoing univentricular heart repair. Objectives: In the present study we compared the Bidirectional (BD) Glenn surgery with open antegrade flow with the Fontan methods. Methods: Based on surgical procedure, 46 patients were divided into a BD Glenn group (n=27) vs. a Fontan group (n=19) group. HRV was measured preoperatively, early and at 3–6 months postoperatively. The autonomic drive to heart was quantified by HRV (time and frequency domain) measured from 900 sec recording of ECG. Comparisons between and within groups were performed by ANOVA and paired t-test respectively. Results: All HRV parameters were comparable in both the groups preoperatively. At 1st follow up, all time and frequency domain parameters decreased in both the groups, which was not statistically significant. Between the groups comparison showed significantly higher parasympathetic tone in BD Glenn group with open antegrade flow with the Fontan operation with regard to their effect on cardiac autonomic activity as measured by heart rate variability (HRV) indices, prior to and after early surgery. Conclusions: In the present study, BD Glenn group with open antegrade flow with the Fontan showed significant increase in heart rate variability (HRV) indices, prior to and after early surgery. Methods: Based on surgical procedure, 46 patients were divided into a BD Glenn group (n=27) vs. a Fontan group (n=19) group. HRV was measured preoperatively, early and at 3–6 months postoperatively. The autonomic drive to heart was quantified by HRV (time and frequency domain) measured from 900 sec recording of ECG. Comparisons between and within groups were conducted using Mann-Whitney U and Friedman test respectively. Results: All HRV parameters were comparable in both the groups preoperatively. At 1st follow up, all time and frequency domain parameters decreased in both the groups, which was not statistically significant. Between the groups comparison showed significantly higher parasympathetic tone represented by fast mean square of successive R-R interval differences (RMSSD) BD Glenn vs. Fontan, 19.99 (11.16–30.99) vs. 7.48 (2.93–16.07), p=0.048). SDSD [18.99 (11.16–31.00) vs. 7.49±5.17–0.01], p=0.048 and lower sympathetic tone as depicted by Low frequency normalized unit (LFnu) 20.638 (7.53–37.38) vs. 48.692±16.47–70.04), p<0.02) in BD Glenn group. At 2nd follow up as compared to 1st follow up, there was significant increase in overall cardiac autonomic tone (coefficient of variance (CV), 3.77±2.65–6.57) F(5,193.55–8.40) p=0.08, Total Power (TP) 124.1265.62–292.34) PV 0.15(116.66–743.18), p=0.013 and sympathetic tone (LF, 17.57±56.61–30.80) J 19.74±19.89–167.15), p=0.031 in BD Glenn group. In Fontan group, there was significant increase in parasympathetic tone (RMSSD), 7.49±5.17–0.01) vs. 14.21(10.72–19.24) p=0.033 and High Frequency (HF), 7.95±(43.98) vs. 35.54±15.93–0.03, p=0.033. Between the groups comparison showed that cardiac autonomic tone was more in BD Glenn group (CV, BD Glenn vs. Fontan, 5.19±3.5–4.80 vs 3.54±3.09–4.42), p=0.027. Conclusion: BD Glenn surgery with open antegrade flow, the Fontan procedure leads to statistically significant reduction in overall cardiac autonomic tone.

Evaluation of effectiveness of palivizumab prophylaxis in patient with congenital heart disease in Gulf region

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Introduction: Respiratory Syncytial Virus (RSV) is significant viral pathogen that produces annual epidemics. RSV lower respiratory tract infection causes significant morbidity and mortality in young children with congenital heart disease. Palivizumab is the only immunoprophylaxis therapy approved by the FDA for prevention of serious lower respiratory tract disease caused by RSV in infants (up to 2 years of age) diagnosis of cyanotic or complex congenital heart disease Objectives: This is the first study in Gulf region for Palivizumab in Congenital Heart Disease Methods: Prospective observational study. Patients were recruited from out-patient clinic, surgical data base and in-patients. We set our RSV team (doctor, three nurses, and one clinic coordinator) and 8 clinic session per month. Then patients were entered in data base sheet and followed up. Verbal consent was obtained from all patients. Total doses of five of Palivizumab 15/mg/kg were given monthly starting from October 2010 to February, 2011. Patients were interviewed every clinic for previous month side effects, RSV infection and hospital admission. We excluded patients with RSV positive, DNR, corrective surgery with no residual, no consent and death Results: With the total number of sixty one (61) patients, nine (9) patients were excluded for RSV positive, DNR, completion of surgery, no consent and death. There was 3 deaths during the study period not related to RSV (Down Syndrome with ASD, end stage dilated cardiomyopathy and complex cyanotic heart disease post BT shunt), Fifty two patients were analyzed. Cyanotic CHD were 52% (27), Acanthocyt 48% (25). Females were 56% (29) male were 44% (23). Twenty two patients completed 5 doses, 13 patients completed 4 doses, 7 patients received 3 doses, 8 patients received 2 doses and 2 received 2 doses. Less than 5 doses were due to late inclusion, completion of surgery, financial reasons and non-compliance. Three patients acquired RSV infection needed hospitalization for less than 5 days in two patients and one patient for 8 weeks due end-stage heart failure repeated RSV test was negative. No ICU admission. No adverse side effects were reported. The compliance in our group is 98.5% (only 3 doses missed) Conclusion: Palivizumab is safe, well tolerated and effective; prophylaxis of severe RSV infection in patient with complex congenital heart disease post BT shunt.
Primary rhythm disorders in children: the need for prompt diagnosis and treatment

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Introduction: Primary Rhythm Disorders in Children: the need for prompt diagnosis and treatment

Objectives: Primary rhythm disorders (RD) are important and often life-threatening diseases that need to be identified and treated early.

Methods: All pediatric patients with primary RD seen in 3 referral hospitals in Khartoum in the period July 2004–2011 were reviewed. Clinical, electrocardiographic (ECG), 24-hour Holter ECG and echocardiographic data were collected and the treatment and follow up were recorded. Those with RD secondary to congenital or acquired heart diseases were excluded.

Results: In the study period 26 patients with PRD were identified. Male to female ratio was 1.6:1. Age ranges from 0 (antenatal diagnosis) to 12 years. The patients were divided into 3 diagnostic groups: group 1: 10 patients with complete atrioventricular block (AVB), group 2: 10 patients with supraventricular tachycardia (SVT) and group 3 were 6 patients with other RD. In group 1 the most common time of presentation was soon after birth (71%) with 2 patients identified by antenatal examination, one patient presented with severe bradycardia needing emergency pacing. Four patients (40%) had permanent pacemaker insertion (PPM). 3 patients died, 2 of which with a PPM. In group 2 the peak age for SVT was 1–4 weeks (30%) and 10–12 years (70%). Young infants improve by 12 month of age while older children were using medications (most common are propranolol or flecainide) for >1 year and were referred for ablation therapy. One neonate required cardioversion and amiodarone infusion to maintain sinus rhythm. In group 3 the most common diagnosis was VT (5/6 patients). VT was due to long QT (LQT) syndrome which was identified in 3 families all with history of sudden death and primary right ventricle outflow tract VT in one patient. One family has Jervell and Lang Neilsen syndrome with 4 affected members and 2 deaths. All patients with LQT syndrome were started on propranolol with improvement of symptoms. The patient with primary VT which was successfully ablated in Italy.

Conclusion: We presented the spectrum of primary RD in Sudanese children with emphasis on the need for early identification and treatment especially of AVB and LQT syndrome as they can lead to life-threatening events.