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High prevalence of novel gain-of-function mutations in KCNA5 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 I\textsubscript{ur}. This current is specific for the atria and two studies have identified loss-of-function mutations 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, D323H) and 3 previously reported rare variants (R61Q, A251T, R578K). The mutations are located at highly conserved regions in proteins that are highly conserved through evolution, and they are likely to be disease-causing. Trafficking analyses with immunostaining, showed that mutated behaved similarly to wt, 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 I:

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 I\textsubscript{ur}, can contribute to the development of AF.

0004

Genetic loci on chromosomes 4q25, 7p31 and 12p12 are associated with onset of lone atrial fibrillation before the age of 40 years

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Introduction: Three distinct genetic loci on chromosomes 1q21, 4q25, and 16p22 have been associated with atrial fibrillation (AF) in genome-wide association studies (GWAS). Five additional loci have been associated primarily with the PR interval and subsequently with AF. Objectives: We aimed to investigate if eight single nucleotide polymorphisms (SNPs), representing the eight genomic loci previously linked with AF in GWAS, were associated with early-onset lone AF before the age of 40 years. Methods: We included 209 patients with early-onset lone AF before 40 years, and a control group consisting of 534 individuals free of AF. The eight SNPs were genotyped using TaqMan assays. Results: Three SNPs were found to be significantly associated with early-onset lone AF before the age of 40 years: rs2200733 (OR = 1.82, 95% CI: 1.16–2.27, p = 0.004), rs3807899 (OR = 1.35, 95% CI: 1.06–1.72, p = 0.015) and rs11047543 (OR = 1.70, 95% CI: 1.18–2.44, p = 0.004). When correcting for multiple testing, rs2200733 and rs11047543 were still significantly associated with AF (table 1). Image/graph i:

Table 1 Association results with early-onset lone atrial fibrillation for the 8 loci

<table>
<thead>
<tr>
<th>SNP</th>
<th>Chr</th>
<th>Basepair</th>
<th>MAF controls (case)</th>
<th>OR (95% CI)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>rs7917295</td>
<td>1</td>
<td>13736433</td>
<td>1</td>
<td>0.300 (0.337)</td>
<td>0.103–0.31</td>
</tr>
<tr>
<td>rs11047543</td>
<td>7</td>
<td>11768996</td>
<td>3</td>
<td>0.414 (0.383)</td>
<td>0.312–0.512</td>
</tr>
<tr>
<td>rs3807899</td>
<td>1</td>
<td>2855491</td>
<td>T</td>
<td>0.469 (0.319)</td>
<td>0.194–0.451</td>
</tr>
<tr>
<td>rs3807899</td>
<td>12</td>
<td>2015235</td>
<td>T</td>
<td>0.383 (0.417)</td>
<td>0.286–0.615</td>
</tr>
<tr>
<td>rs11047543</td>
<td>7</td>
<td>11047543</td>
<td>12</td>
<td>0.166 (0.109)</td>
<td>0.101–0.244</td>
</tr>
</tbody>
</table>

Conclusion: Three SNPs: rs2200733 (4q25), rs3807899 (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.

0005

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-ac-

tivated potassium channels (SKs) in cardiac myocytes that plays a crucial role in cardiac

eropolarization. Interestingly, the SK channels is expressed more abundant in the atria compared to the ventricles. Previous studies showed that Amiodarone possesses the pharmacological effects of class I, II, III, and IV antiarrhythmic agents mediating 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. 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 study 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 currents , added amiodarone (1,5,10,100 mol/L),the remaining K1 mix currents density(\(\text{pA/pF}\)\(\text{mV}^{-1}\)) dropped by \(2.16 \pm 0.18\) pA/pF at \(-120\text{mV}\), and then added amiodarone(10,100,1000 mol/L), the remaining K1 mix currents density was unchanged(\(\text{pA/pF}\)\(\text{mV}^{-1}\)); after recording K1 mix currents , added amiodarone (1,5,10,100 mol/L), amiodarone showed a concentration-dependent inhibition effect on SK current. SK1 mix currents density respectively was \(2.59 \pm 0.18\) pA/pF, \(2.16 \pm 0.21\) pA/pF, \(1.67 \pm 0.28\) pA/pF, \(0.4 \pm 0.18\) pA/pF at the test potential \(-130\text{mV}\). Conclusion: Our result show that SK channels were observed in human atrial myocytes, and amiodarone might be a potent drug to SK channels.

Image/graph i:
High prevalence of mutations previously associated with LQT 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, KCNE1–2, KCNJ2, CAV3, KCNE2 and KCNJ5 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: A467T and A302V in KCNQ1; P347YS in KCNQ2; T1104M, D1819N, R1897W and F2004L in KCNJ5, IS7T 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 KCNJ5 (D1819N) had a QTc = 457 ms and QTc = 467 ms, 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 lc 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 structure and function. Left ventricular hyper-trabeculation (LHT) 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 LHT in an elite athlete population. Methods: Between 2006 and 2011, 692 athletes (mean age 22.4 ± 4.3 years, 74.7% male) underwent 12-lead ECGs obtained from rest and during exercise. Forty-five (6.5%) athletes had evidence of LHT. None of the patients were on medications. Results: LHT was more prevalent in athletes (n=47) compared to controls (n=2) (8.3% vs. 0.4%; p<0.001). None of the individuals fulfilled diagnostic criteria for any form of cardiomyopathy. Amongst athletes, LHT was significantly more common in Afro-Caribbean (black) individuals (12.3% vs. 4.0%; p<0.001) and in male athletes (8.5% vs. 1.7%; p<0.001). Athletes with LHT demonstrated significantly greater prevalence of T-wave inversions and greater maximal left ventricular wall thickness on echocardiography (Table 1).

Conclusion: The ECG evidence indicates that KCNJ5 mutation Gly387Arg may have a modifier effect on QT interval. Among mutation carriers, no gene-specific repolarization patterns are found, and AF is only seen in 60’s of age.


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 20–25% of BrS patients in the world have this mutation. Copy number variations 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 35±9 vs. 69±7 year-old, respectively. Total 438 genes showing CNVs in at least 25% (41/16) of subjects were detected and the copy numbers of NALCN (Na leakage channel) in chromosome 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+ 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 gene 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 B6 patients without SCA54 mutation. This genetic structural variants deserve further functional assays.

OR010

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 (KCNQ1, KCNH2, SCN5A, 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 (KCNQ1, KCNH2, SCN5A, KCNE1, KCNE2) known to be implicated in LQTS was conducted. Results: Causative mutations were identified in 10 families (48%). Heterozygous KCNQ1 mutations were detected in 5 families with RWS whereas homoyzgous KCNQ1 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 (KCN1, SCN4A, KCNQ2, 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.

OR011

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 reviewed for ER changes at baseline and during ajmaline and exercise testing. ER was defined as J-point elevation in ≥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 20/21 patients (11.6%). Height. ER during exercise were more likely to be symptomatic than those in whom ER changes diminished (p = 0.01). Subtle structural abnormalities were demonstrated in 3/3 of these patients. Image/graph 1:

OR012

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 may 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 spots 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 genes involved in the Nav1.5 channel complex: SCN5A, SCN1A–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 SCA54 variants. Results: In total, 7 patients had non-synonymous rare variants in the sodium current genes equaling 11% of all SIDS cases, SCN5A harbored 5 rare variants (R458C, R535*, S1103Y and R1193Q in SCN5A, T78M in CAV3). Rare non-synonymous variants were not found in SCN1A, 51S103Y and R1193Q in SCN5A, T78M in CAV3 and L105P in CAV3. In 66% of all cases rare variants were 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 in SCN5A, T78M in CAV3 and L105P in CAV3). Rare non-synonymous variants were not found in SCN1A, 51S103Y and R1193Q in SCN5A, T78M in CAV3 and L105P in CAV3. All variants were absent in our cohort of 200 controls. Functional analysis on R458C and S1609L in SCN5A revealed significant changes in peak-current as well as in inactivation times compared to WT–SCN5A. Rare non-synonymous variants were not found in SCN1A, 51S103Y and R1193Q in SCN5A, T78M in CAV3 and L105P in CAV3. Rare non-synonymous variants in the sodium current genes play 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.

OR013

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

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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. Methods: Description, clinical and socio-demographic 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 identified with cardiopathy diagnostic. Seven were in the functional IV (NYHA/ROSS) and 37.5% in class III. The level 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 66% after 416 days. The HF diagnostic increased 6.3 times the risk of death in the cardiopathy group. Cardiac murmur was detected on 77.8% of the PTS, hepatomegaly (62.7%) and pulmonary rates (40.3%); third heart sound was not frequent. The left ventricular ejection fraction (LVEF) was normal for 81.5% of these PTS. Furosedine was the most used medication (72%), with digoxin, ACE inhibitors and spironolactone appearing in less than 40% of the prescriptions. Dobutamine was prescribed for 30% of the PTS, propranolol for 10%, beta-blockers for 5.3%, sildenafl for 4% and andiomendine for 1.3%. Conclusion: The majority of the PTS with HF had congenital cardiopathy with preserved LVIF 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 than those used for adults.

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 normal 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, ventricular 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 oxaloacetate 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 test, LVEF and RVSP had positive correlation with LVEF (r = 0.381, p < 0.001, and r=0.412, p < 0.001, respectively); similarly, SGPT were negatively associated with LVEF (r = -0.146, p = 0.039), and had positive relationship with RVSP (r = 0.254, p = 0.000). SGPT did not correlate with any of the analyzed variables. Patients were followed for an average of 24±17 months; 75 all cause deaths were recorded, of which 41 cardiac deaths. By Cox regression analysis, after adjustment for covariates, LVEF (p = 0.061) and RVSP (p = 0.0001) were independent predictors of all cause mortality in this population.

**0019 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 ischemic heart disease, but its effect in 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 (3 mg/kg weekly for 6 weeks). They were divided into 4 groups: transplant group (BMCs, n = 15), medium group (medium injection, n = 10), low group (group healthy, n = 9) and diseased group (DOX, without therapy, n = 10). All the animals were killed after 12 weeks post operation. Then, BMCs were prepared in the laboratory and injected epimyocardially in the rabbit hearts. The proliferation was almost the same like the proliferation in the healthy group. Also the cell proliferation in the medium group was higher it was 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 transplants was negligible. Only in the healthy group there was significantly less necrosis and less cell death. There was no differences in apoptosis between the other groups. Conclusion: Autologous BMC transplantation induce cell proliferation and reduces cell apoptosis. This regulation could be one possible mechanism in myocardial regeneration.

**0020 Functional and cellular heterogeneity in a porcine model of pacing 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. To achieve effective oral pharmacological therapy for heart failure, we screened a citrus flavonoid, auraptene, to prevent left ventricular systolic functional deterioration following myocardial infarction in rats.

Methods: 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. progression 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, m/f: 76/92 86.9%) were enrolled in this study. Patients were followed up 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 due to progressive heart failure, and 141 alive patients belonging to the low risk group (LRG). A multivariate discriminant model was developed, where the change of the individual entropy/ scale ratio in time were the identified variables (P<0.05). The whole patients were divided into quartiles of DS HRV. The risk of death increased disproportionately with each quartile of DS HRV with an adjusted relative risk of 4.2. A 3.5-fold increase in mortality in patients in the upper compared to the lower quartile of HS (HR 0.3±2.2, p<0.001) was observed. Conclusion: The left 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.

**0023 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 strategy to repair the damaged heart and improve heart function. Using fingerprints from Ciz1, 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 somatic tissues by limited attempts at expressing recombinant Ciz1 including embryonic stem cells, and roles for Ciz1 in cell 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 other functions. In this study we investigated another function in adult cardiomyocytes.

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 isolated altered nuclear dynamics with evidence for altered cell cycle regulation, which is currently under further investigation. Conclusions: The results suggest that Ciz1 may represent a suitable novel candidate for therapeutic application in cardiovascular disease.
Introduction: TAVI procedure is currently considered the alternative option in elderly patients (pts) with AS deemed unsuitable for conventional surgery. However, its effect on MR is frequently present in patients with calcific aortic stenosis, who would otherwise have been left untreated due to their expected high surgical risk. Since TAVI was introduced into clinical cardiology only a few years ago, data on durability and long-term clinical outcome is scarce. Thus we analyzed our patient series in this regard with a follow-up period of up to four years.

Objectives: From May 2007 to August 2011, 109 patients (age: mean 61 ± 6 years, median 56 years, range 26–92 years; male: 56%) with symptomatic severe AS and a mean logistic EuroSCORE of 26 ± 1.5% (range 6–73%) underwent TAVI with the self-expanding CoreValve bioprosthesis in our center. Before intervention, echocardiography revealed a peak pressure gradient (PPG) of 99 ± 28 mmHg, a mean pressure gradient (MPG) of 59 ± 16 mmHg, and an aortic valve area (AVA) of 0.5 ± 0.1 cm². Methods: Follow-up visits, including clinical assessment and echocardiographic evaluation, were scheduled at 30 days, 3 months, 6 months, and 12 months after TAVI procedure, and annually thereafter. Cumulative survival rates were calculated using Kaplan-Meier life-table analysis. Results: Acute procedural success rate was 99.5%. Device implantation resulted in a significant and sustained reduction of PPG (20.6 ± 8 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 MPG (11.3 ± 3 mmHg one year, 9.4 ± 2.7 mmHg two years, 10.5 ± 3.3 mmHg three years, and 10.3 ± 4.4 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), 94.4% (patients at risk = 109), 74.3% (patients at risk = 59), 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 have been left untreated due to their expected high surgical risk.

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. Magnetic field (0.5 Tesla) was created around the mounted valve within the 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. Application of progenitor cells for construction for three-dimensional tissue engineering 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.
Angiography guided therapy in an all-comer ACS population

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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 (24%) 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 (54%), (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.
Acute coronary heart disease morbidity and mortality in Russian population (RESEARCH 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 analyzed the data for all forms of acute CHD, along with 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 on premonitory symptoms from district doctors and patient relatives. Results: CHD prevalence amounted 402.0 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 morbidity was increased from 14.96 per 100,000 in 30–39-year-old males to 128.43 per 100,000 in 50–59-year-old males with plateaus in 60–69 years and decreasing since 70 years. Despite the peak of ACCHD morbidity (29.46 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 30.33% lethality for 90–99 years). In females, morbidity was increasing from 11.01 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 morbidity (19.45 per 100,000) was registered 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 CHD morbidity in all ages groups of Russian males and females. In males, despite the highest ACCHD onset probability in 50–59 years, this age group demonstrated the better survivability as well as senile males. In females, despite morbidity peak value 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 elderly. Methods: A prospective registry from 89 centres and 50 cities in India. We recorded data in hospital and at 30 days. The data was multivariate analysis to explain factors that affect outcomes. Results: We recruited 20,458 patients of whom age was recorded in 20,399. Of these patients 12,364 (60.6%) had STEMI and 6,025 (30.3%) had non-STEMI or unstable angina, and 6139 (30.1%) were young (20–39 years). The 5-year: ischaemic (45.0% vs 20.7%) (all p < 0.001). The elderly however had more hypertension (43.1% vs 25.4%), diabetes (35.5% vs 19%), history of myocardial infarction (20.2% vs 10.5%), heart failure or lung rales at admission. For Aspirin any bleeding complication during admission was more common in the elderly (3.3% vs 1.9%, p < 0.001). The elderly had more revascularisation (24.9% vs 22.1%) and percutaneous coronary intervention (7.9% vs 7.1%) was more frequent in the elderly (both p < 0.001). Mortality at discharge was more common in the elderly (3.3% vs 1.9%, p < 0.001). The 30-day outcomes were higher in older patients: death (8.2% vs 3.4%), reinfarction (2.0% vs 1.4%), cardiac arrest (2.9 vs 1.7%) and stroke (0.7% vs 0.2%), (all p < 0.001). Relative to younger patients the odds ratio (95% confidence interval) for mortality in the elderly was 2.57 (2.17–2.99). For adjustment for risk factors, this reduced to 2.39 (2.04, 2.80) and on accounting for treatments it further reduced to 2.19 (1.68, 2.58). Conclusion: Younger patients had higher rates of smoking, obesity, STEMI, and received evidence-based drugs and coronary interventions. These differences accounted for about 40% of the variation in mortality. Ensuring that the elderly receive appropriate treatments can improve their outcomes.

References:

Gender perspectives on adherence to treatment guidelines in patients with acute myocardial infarction in Sweden

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Introduction: In the management of myocardial infarction (MI) patients, current guidelines recommend reperfusion therapy and medical treatment with beta-blockers, statins, aspirin, anagiotin-converting (ACE) inhibitors or angiotensin II receptor blockers (ARBs). These recommendations apply to both men and women. Adherence to guidelines is reflective of the quality of care and is closely associated with a better prognosis. Objectives: The aim of this study was to evaluate the use of recommended medical therapy in patients hospitalised for acute ST-elevation myocardial infarction or left bundle branch block (STEMI/LBBB) in Sweden. Methods: Patients with a discharge diagnosis of STEMI/LBBB in Sweden (N = 31198) from the Register of Information and Knowledge about Swedish Heart Intensive care Admissions (RKS-HIA) during 2004–2008 were included. Discharge medications were reviewed. Multiple adjustments were performed in the evaluation of use, including age. For ACE/ARB’s patients fulfilled at least one of the following criteria: known history of heart failure or chronic hypertension or lung rales at admission. For Aspirin any bleeding complication during hospitalisation or vitamin K antagonist at discharge was accounted for.

Results: 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. Further studies need to focus on why women with STEMI/LBBB are persistently underreated.

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 standpoint 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, where 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 this 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 = 1.060, p < 0.001), and transfusion of platelets was associated with increased long-term survival (HR = 1.034, p < 0.001). All risk ratios are per unit of blood product transfused. Even after 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 rate 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 (66.3 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
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 coverture 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 35–50mmHg) by adequately reducing the after load levels and using vasodilators such as nitrates and glyceryl trinitrate can be judiciously maintaining an optimal pre load alleviates most of the problems encountered during OPCAB. Methods: We have performed 324 consecutive cases of OPCAB during the period between 2009–2011. Of these 282 patients were male and 42 patients were female between the age group of 36 – 86 years. The mean age was 63.1 years old and 63.1 years old for patients with prior PCI and patients without prior PCI respectively. 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 in these patients was 2.38 compared to patients without prior PCI 2.64 (p

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 in a developing country using probabilistic databases linkage

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 intracted tissue of the septum as the bovine pericardium can be sutured with 4–0 prolene (each layer is open 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 postinfractor 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 follow up 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 filled from all outpatient who underwent PTCA (152,943) or CABG (108,626) in Brazil, during the period of 2001 until 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 86.0% and specificity 100%. For univariate analysis, it was employed chi square and Student t test. For multivariate analysis, Cox proportional-hazards model was applied. Kaplan-Meier method was used to estimate survival. The significance was considered by p

Conclusion: The global unadjusted survival time was 91.1% at 1 year of follow-up, decreasing progressively to 79.9% at 7 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

![Kaplan-Meier survival estimates](image/graph1.png)

<table>
<thead>
<tr>
<th>Age</th>
<th>Initial CABG</th>
<th>Prior PCI</th>
<th>p</th>
</tr>
</thead>
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<td>NS</td>
<td>62.6 ± 8.7</td>
<td>62.9 ± 8.5</td>
<td>NS</td>
</tr>
<tr>
<td>Sex</td>
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<td>71.9%</td>
<td>70%</td>
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<td>83.6%</td>
<td>81.6%</td>
<td>NS</td>
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<td>29.6%</td>
<td>30%</td>
<td>NS</td>
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<tr>
<td>Dyslipidemia</td>
<td>78.5%</td>
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</tr>
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<td>26.6%</td>
<td>NS</td>
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<td>9.7%</td>
<td>13.3%</td>
<td>NS</td>
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<tr>
<td>3 vessel coronary disease</td>
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</table>
Conclusion: Age and CABG, but not gender, is independently related to prognosis in this large, nation-wide cohort of patients submitted to coronary revascularization.

Clinical outcomes of Biolimus A9-eluting stents compared with first generation drug-eluting stents in patients with coronary artery disease: a meta-analysis of randomized controlled trials

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Introduction: Biolimus A9-eluting stent (BES) is a novel second generation drug-eluting stent. Its efficacy and safety compared with first generation drug-eluting DESs (such as sirolimus-eluting stent (SES) and paclitaxel-eluting stent (PES), remain controversial. Objective: The purpose of this study was to review 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, PCRandom.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 in 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 SES up to 3 years. Further follow up is warranted to evaluate long-term clinical outcomes.

Conclusion: Overall, BES demonstrated the similar efficacy and safety compared with first generation DES. However, BES was associated with a reduction in definite or probable ST compared with PES up to 3 years. Further follow up is warranted to evaluate long-term clinical outcomes between BES and first generation DES.

In-hospital outcome of transradial ad hoc versus staged coronary intervention for chronic total occlusion lesions

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Introduction: Ad hoc percutaneous coronary intervention (PCI) has become a common practice. No study has focused on ad hoc chronic total occlusion (CTO) PCI. Objectives: compare in-hospital clinical outcomes for Ad hoc versus staged CTO PCI. Methods: A total of 512 patients underwent S61 procedures using the transradial approach (TR) for CTO PCI, were reviewed. We compared CTO PCI in ad hoc group (G1) versus staged group (G2). Results: Retrograde approach was used in 15.1% of all cases. Longest procedure time in G2 (P=0.009).Procedural success was comparable (82.9 vs.77.3, P=0.16) in G1 and G2 respectively. Comparative results for G1 and G2, total mortality was 0.7% (0 vs.1.8, P=0.17) major adverse cardiac events (11 vs.11.7%),contrast nephropathy (4.9 vs.5.5%,P=0.8),similar total hospital stay. Prior MI, left ventricular dysfunction and renal impairment were significant predictors, long CTO lesions and tortuous vessels showed only a trend, for in-hospital worse outcome Conclusion: TR ad hoc CTO PCI is safe and feasible, with acceptable success rate and in-hospital outcome.

References:


The Morriston Arterial Access Study for InterVention in the Coronaries (MASSIVE-C); an update

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Introduction: PCI operators might refrain from transradial PCIs on the basis of the difficulty to master the technique and the lack of evidence of benefit of radial over femoral PCIs. Objectives: Between 2007 and 2009, the radial approach was adopted in our centre (transitional period). We sought to study the impact of this switch from femoral to radial PCIs. Methods: We data-mined our interventional database, clinical notes, discharge summaries, laboratory databases to document procedure-related characteristics for all coronary angioplasty procedures performed between 01/01/07 – 11/12/09. Cases were also propensity matched in an attempt to reduce bias (SPPS). Results: We identified 2845 cases (2084 M 73%, mean age [SD] 63.6 [±11] years, range 29–88 y) whose datasets were complete for the purposes of this analysis were included in the study. There were 2845 PCIs (183 patients had 2 separate radial approaches). In 47% of cases (1301), patients were assigned to primary PCI according to the protocol. The radial approach was used in 47% of cases, increasing during the study period, from 36% to 59% of procedures (p<0.0001 for trend). Conclusions: We were able to propensity match 520 cases based on the access (Delta ≤5%). There was no difference in mortality, need for transfusion or incidence of haematoma between the groups. Age (adjusted odds ratios 0.993; 95% CI 0.888–0.973), cardiothoracic (adjusted odds ratios 21.36; 95% CI 6.48–70.38, relative risk 16; 95% CI 6.5–39) and receiving transfusion (adjusted odds ratios 7.70; 95% CI 2.30–25.80, relative risk 6.4; 95% CI 2.5–16) were the only significant determinants of 1-year mortality. Hospital stay was different between the 2 groups (femoral 1.74 days, radial 1.86 days, p<0.001). Noteworthy, there was no difference between radial and femoral PCIs hospital stay among the propensity matched cases. Conclusion: The radial approach works well and is adopted rapidly by interventionalists in the real world, where it tends to be associated with less transfusion requirements and maybe a trend toward better survival. However, there are sub-groups of patients who would benefit more by performing femoral PCIs and vice versa.

Protective effects of anisodamine on contrast induced nephropathy in patients with ST segment elevation myocardial infarction undergoing primary percutaneous coronary intervention

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Introduction: Contrast-induced nephropathy (CIN) is one of most serious complications after percutaneous coronary intervention (PCI). Patients with acute myocardial infarction undergoing primary PCI are at high risk for CIN. Anisodamine, an alkaloid extracted from a Chinese herb, is widely used in the treatment of septic shock, acute glomerulonephritis and diabetic nephropathy, and shows protective effect on renal function. Objectives: To investigate the protective effect of anisodamine in PCI patients with ST-segment elevation myocardial infarction (STEMI) undergoing primary PCI. Methods: Consecutive patients undergoing PCI were randomly assigned to one of two groups: patients in anisodamine group (ANI group) were assigned to receive anisodamine (3–4ug/kg/min intravenous infusion of anisodamine with 5% dextrose in water) 30 minutes prior to PCI, followed by continuous intravenous infusion (0.2–0.5ug/kg/min) to isometric systolic systolic blood pressure (SBP) to 140 mmHg with the same volume. All patients were hydrated with intravenous isotonic saline (0.9%) for 12 hours prior to PCI. The Serum creatinine (Scr) concentrations were measured at admission, 24 hours, 48 hours and 72 hours after PCI. Results: A total of 126 patients completed the study, while 64 in ANI group and 62 in CON group. The SCR concentrations significantly increased from the peak value occurring at 48 hours, and then began to decrease. At 48 hours after PCI, the SCR concentration significantly increased to the maximum in both groups (P<0.0001). In ANI group, the SCR concentration decreased significantly (P<0.0001) at 72 hours, and returned to the baseline level (P=0.05). In CON group, however, the SCR concentration decreased significantly (P<0.0001) at 72 hours, but was still higher than baseline level (P<0.0001). The SCR concentrations at 48 and 72 hours after PCI were much lower in ANI group than those in CON group (both P<0.0001). The eGFR significantly decreased after PCI, the lowest value occurring at 48 hours, and then it began to increase. In ANI group, the eGFR increased significantly (P<0.0001) at 72 hours, and was similar to the baseline level (P=0.05). In CON group, the eGFR increased significantly (P<0.0001), but failed to return to baseline at 72 hours (P=0.0001). The eGFR at 24, 48 and 72 hours after PCI were higher in ANI group (all P<0.05). The incidences of CIN in ANI group were lower than those in CON group within 72 hours after PCI (all P<0.05). Conclusion: Intravenous infusion of anisodamine prior to primary PCI may prevent the incidence of CIN in STEMI patients.

World Congress of Cardiology 2012 Oral Presentations
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) stenosis in some patient cohorts. However, these data have limited applicability to PCI performed in confined centres, 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 angiographic follow up at 6.3±1.7 months. 8.5% 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 86%. Excluding patients with shock, survival was 90%. In-hospital death was 1.7%, TVR was required in 7.9% and TLR 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 CABG in the very elderly.

References:
(2) Percutaneous Coronary Intervention versus Coronary Artery Bypass Graft for Unprotected Left Main Coronary Artery Disease: The Endless Debate. Melfiga, Valagigmi, M, Busman, P.S., Serruys, PW, JACC 2008; 52:582-584

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 myocardium and improve the short-term prognosis. However, there was no research domestic about whether moderate-doses statins even short time could protect myocardium 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 (30), low-dose group (30) and high-dose group (20). 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, well the high-dose group took 40 mg per night. The neutrophil counts, the levels of high sensitivity C reactive protein, myeloperoxidase, troponin T, myeloperoxidase, CK-MB, cTnT, liver function, kidney function, blood lipids and electrocardiogram were determined before and after PCI. The incidence of major adverse cardiac event (MACE) after successful PCI was also recorded. Safety did not function were not significant before and after PCI in 3 groups (P>0.05). Incidence of major adverse cardiac events was lowest in the high-dose 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, neutrocayte count, liver and kidney function were not significant after and before PCI in 3 groups (P>0.05). Conclusion: Pretreatment with atorvastatin 80 mg for patients undergoing PCI got 4 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 score in Middle Eastern patients with acute coronary syndrome. Results from the GLucometabolic Syndrome (NSTEMACS) and ST-elevation myocardial infarction (STEMI). To study was to understand how 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 NSTEMACS, and 184 (28%) had STEMI. Among NSTEMACS patients; 31.9% had low risk score (total points 0–2), 43.5% had intermediate risk score (total points 3–4), and 25.5% had high risk score (total points 5–7). 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%) risk groups (p<0.001). Among STEMI patients; 58.8% had low risk score (total points 0–3 of 14–15), 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). Similarity; composite events occurred at a significantly higher rate in patients with high risk scores than intermediate or low risk scores among NSTEMACS and STEMI patients. Conclusion: In Middle Eastern ACS patients; high TIMI risk scores were associated with high 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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Introduction: Treatment of acute ST elevation myocardial infarction (STEMI) aims at immediate restoration of coronary blood flow, either by primary percutaneous coronary intervention (PCI) or thrombolysis. In animal studies, transcoronary diagnostic ultrasound and intracoronary microbubbles with a low dose thrombolytic agent have shown to dissolve thrombi in STEMI, the so-called sonothrombolyis. To examine this effect in patients with acute STEMI in a (pre)hospital setting, we have initiated the Sonolysis trial. Objectives: Can sonothrombolysis achieve epicardial coronary recanalization with a lower and safer dose of a thrombolytic agent? The pilot data for safety and feasibility of this trial will be determined. Methods: Ten patients (mean age 66.8 ± 8 years, 8 males) with a first acute STEMI based on a proximal occlusion of the infarct-related artery were included. All patients were pretreated in the ambulance with a single bolus alteplase (50 mg), a loading dose of aspirin (600 mg), and heparin (5000 IU) intravenously. At arrival in the hospital, 5 patients were randomized to receive a continuous infusion of intravenous microbubbles with guided high mechanical index impulses (1.18) using a 3D diagnostic ultrasound transducer for 15 minutes, whereas 5 patients in the control group received placebo without ultrasound, immediately followed by coronary angiography and PCI, if indicated. Results: All 10 enrolled patients successfully received study treatment and underwent PCI. The coronary angiogram revealed that 3 of 5 patients who received ultrasound and microbubbles had TIMI 3 flow in the culprit vessel, whereas only 1 of 5 patients of the control group had complete epicardial coronary recanalization. No significant difference in safety and outcomes between both groups was recorded. Specifically, the frequency of non-wire adverse events was no different between both arms, as well as no serious adverse (cardiac) events occurred. Conclusion: In conclusion, treatment of patients with an acute STEMI using 3D diagnostic ultrasound and intracoronary microbubbles in the presence of low dose thrombolytics is feasible in an acute cardiac care setting. Furthermore, the study protocol seems safe during treatment and follow-up.

Reference:

Stress hyperglycemia is a marker of high risk in acute ST elevation myocardial infarction and a marker of left ventricular remodeling

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Introduction: High admission glycaemia, stress hyperglycemia (Sh) in STEMI is associated with high risk of in-hospital mortality, heart failure, cardiogenic shock, AF, VT and VF, new atrio-ventricular block, no-reflow. It is not conclusively indicated that Sh may be the marker of high post-hospital risk. Objectives: The aim of the paper is to analyse in-hospital and long-teen risk associated with Sh in STEMI and to study if Sh is a marker of forthcoming left ventricular (LV) remodeling. Methods: We prospectively enrolled 275 patients (200 male, 75 female). 24–84 years old, who were admitted with the first acute STEMI and treated with thrombolytic therapy or primary PCI. Systolic function of LV was measured by estimation of fractional contraction fraction (contractile dysfunction), ejection fraction, systolic and diastolic volumes (Sh) and Simpson rule. Patients were divided according admission glycaemia in three groups: 1. with already diagnosed diabetes mellitus (DM), 40 patients; 2. without Sh, without DM (108 patients); 3. with Sh, without DM, 127 patients. They were evaluated for in-hospital and one-year mortality and LV systolic function during one year period. SV was defined as admission blood glucose level ≥ 8 mmol/l. Results: The groups were similarly related to gender. Patients with DM were significantly older than patients without DM and without Sh (60.98 vs. 57 years) and 54.20 vs. 11.1 years, p < 0.05. In patients without DM, Sh was associated with 5.612 times higher in-hospital mortality. No difference was found between groups in sudden death after 1, 6 and 12 months follow-up. But, Sh can be marker of LV remodeling, because of significant increase of EDV during one year period in group with SH without DM.

Rapid assessment of prognosis in patients with acute coronary syndromes: the prognostic accuracy of a novel RECORD and GRACE scores is similar

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Introduction: Usage of prognostic scales is importance in management in patients (pts) with acute coronary syndromes (ACS). Objectives: To create a scale for rapid assessment of prognosis of inhospital death and MI of pts with ACS based on data collected in Russia

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 (Killip class ≥II, ST-segment elevation ≥1mm, systolic blood pressure ≤100mm Hg, first hemoglobin (Hb) level ≤1100/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 many values were cut off level for high risk (≥2 points) was established by ROC analysis. Predictive 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 0.86 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) within 6 months after ACS onset took place in 14.6% low risk and 32.6% high risk pts (p<0.0001). 2) Pts with ST-elevation ACS (n~147) included in ETRACT-TIMI-25 and OASIS-6 trails in Moscow city hospital 29. In this group death and new MI within 6 months after ACS onset took place in 6.7% low risk and 21.6% high risk pts (p<0.0001). 3) Patients with MI 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 hyperEfficent patients with multiple cardiovascular risk factors)

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Introduction: Both 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 5206 patients were recruited, 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 66.6%. The treatment rate of glucose lowering drugs was only 6.8% among all diabetes and 86.8% among those known diabetes patients. The patients that well achieved the goal of glucose control (FPG <7mmol/l and 2-hr OGTT ≤11.1 mmol/l) was only 31% for all diabetes and 54.7% among those treated diabetes. There was 9% diabetes patients receive full treatment and 25.5% with multiple and fast glucose lowering agents. Overall, BP control rate (SBP<130/90 mmHg) was achieved in 46.9% of the hypertensive patients with diabetes. Conclusion: The hypertensive patients have higher prevalence but lower awareness 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 controlling 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 fulfil 2 criteria: (1) use of an angiotensin-converting enzyme 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-combination 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-combination 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.

Aliksiren provides sustained anti-hypertensive efficacy and persistent PRA suppression following a one-week treatment withdrawal

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Introduction: Both aliskiren (direct renin inhibitor) and telmisartan (angiotensin receptor blocker) are established antihypertensive drugs that act on the renin angiotensin aldosterone system (RAAS). Objectives: This 12-week double-blind study evaluated sustained antihypertensive efficacy of aliskiren (ALI) compared with telmisartan (TEL) after 12 weeks active treatment and 7 day treatment withdrawal, as assessed by 24 h mean ambulatory systolic blood pressure (MASBP). 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 = 818, 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 (EOA) and end of withdrawal (EWAD). Results: Between RAN and EOA, MASBP reductions were similar with ALI and TEL. However, between EOA and EWAD 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% from baseline and returned to initial levels at EWAD, 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 (−42.3%) and TEL (−19.6%). However at EWAD, aldosterone remained significantly below RAN with ALI (−19.9%; p = 0.0121), while with TEL aldosterone rebounded to near RAN levels (Table).

Image/graph I:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>MASBP (mmHg)</th>
<th>PRA (ng/L)</th>
<th>Aldosterone (pg/mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALI 150 mg</td>
<td>140 ± 140</td>
<td>0.009 ± 0.005</td>
<td>0.009 ± 0.007</td>
</tr>
<tr>
<td>TEL 40 mg</td>
<td>140 ± 140</td>
<td>0.009 ± 0.005</td>
<td>0.009 ± 0.007</td>
</tr>
<tr>
<td>ALI 300 mg</td>
<td>140 ± 140</td>
<td>0.009 ± 0.005</td>
<td>0.009 ± 0.007</td>
</tr>
<tr>
<td>TEL 80 mg</td>
<td>140 ± 140</td>
<td>0.009 ± 0.005</td>
<td>0.009 ± 0.007</td>
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</tbody>
</table>

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. Sustained effects on MASBP, aldosterone, and PRA following 7 days of ALI withdrawal suggest that the sustained antihypertensive efficacy observed with ALI following treatment withdrawal may be related to sustained RAAS suppression.

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

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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. Unrelied 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 (ICE) in patients with HT and AMI after previous CABG. Methods: 760 patients (males 80.3%, mean age 59.6 ± 6.2) years with AMI after previous revascularization have been selected from the patients consecutively submitted from April 1990 to April 2011. The patients with early perioperative 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 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 = 0.0110), 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 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.

Why do hypertensive black people respond better to calcium blockers and diuretics? A systematic review

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Introduction: Mortality of hypertension is greater in black people. Importantly, adequate responses to calcium blockers and diuretics are reported with attenuated responses to beta blockers and ACE inhibition. Knowledge of the biomarkers that affect these differential responses might better guide individual therapy and reduce mortality. Objectives: To conduct a systematic review of factors that predict the differential response of black people to antihypertensive drugs. Methods: We sought to identify published or unpublished studies that considered explanations for the differential clinical efficacy of antihypertensive drugs in blacks, including systematic literature searches in PubMed, EMBASE, LILACS, and the African Index Medicus. Results: Retrieved papers 1180, included 35 tables showed reported causes for the differential drug responses.

Image/graph I:

<table>
<thead>
<tr>
<th>Drug Type</th>
<th>Salt intake</th>
<th>Pharmacokinetics</th>
<th>Pharmacodynamics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calcium blockers</td>
<td>No difference in response</td>
<td>Nephrotoxic clearance lower</td>
<td>Enhanced smooth muscle contractility in black's central to pathophysiology of hypertension</td>
</tr>
<tr>
<td>Diuretics</td>
<td>No data</td>
<td>No data</td>
<td>Greater salt retention in black people. Sodium retention is energy driven. Diuretics directly cause K+ effusion</td>
</tr>
<tr>
<td>ACE inhibitors</td>
<td>No data</td>
<td>No data</td>
<td>Lowering ACE and increasing NO less effective in blacks. NO bioavailability hampers in black people, potentially linked to GFR dependence and high KC</td>
</tr>
<tr>
<td>Beta blockers</td>
<td>No data</td>
<td>Greater first pass effect and elimination rate propranolol</td>
<td>Beta blockers work through MCHR, propranolol. Reduction renin less effective in black men</td>
</tr>
</tbody>
</table>

Objectives: Comparing factors in 760 patients with HT and AMI after previous CABG 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: 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 compared to CHD 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, as explored, data can fluctuate which may differ in developing nations (1). The competing influence of CHD on CHD mortality rates remains an open question in developing countries.

Reference:

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. 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 epidemiological 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.

References:

Analyzing falls in coronary heart disease mortality in the West Bank between 1990 and 2009

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Introduction: Palestine and neighbouring Middle income countries are facing an epidemic of non-communicable diseases, especially diabetes, stroke and coronary heart disease (CHD). Objectives: To analyse CHD mortality and risk factors trends in the West Bank, occupied Palestinian territory (2.5 million population) between 1998 and 2009. Methods: Data on populations, mortality, patient groups and numbers, treatments and risk factor trends were obtained from national and local surveys, routine national and WHO statistics, and critically appraised. Data were then integrated and analysed using a previously validated CHD policy model. Results: CHD mortality rates fell by 20% in the West Bank, 57% between 1989 and 2002. Smoking prevalences were high in men, x%, but decreased 10%. Population blood pressure levels and total cholesterol levels also decreased. Conversely, BMI rose by 1–2kg/m² and diabetes increased by 20%, especially among women. Population modelling demonstrated that approximately one third of the mortality decreases were attributable to treatments, particularly for secondary prevention and heart failure. However, the contributions from statins, surgery, and angiotensin were consistently small. More than two-thirds of the mortality fall was attributable to changes in major risk factors, mainly total cholesterol, blood pressure and smoking. Conclusion: CHD mortality fell by 20 percent between 1998 and 2009 in the West Bank. More than two-thirds of this fall was due to changes in major risk factors, particularly total cholesterol, blood pressure and smoking. Our results clearly indicate that risk factor changes prevents more CHD deaths and saves substantially more lives in the general population compared to specific treatments for individual patients. This emphasizes the importance of population-wide primary prevention strategies.

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

Cother Hajat 1,*, Sid Bouziane 2, Christian Guttmann 3, Zainab Shather 1,*, M. Samer Rastam 1,*, Radwan Al-Ali 1, Fouad M. Fouad 1, Wasim Maziak 1,2, Martin O’Flaherty 2, Simon Capewell

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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% (58% in men and 75% in women). An extra 3670 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 fasting blood glucose, 13% (685) to increase obesity, 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 (855) 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%). Conclusion: Most of the recent substantial increase in CHD mortality 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.

Conditional...

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

Cother Hajat 1,*, Sid Bouziane 2, Christian Guttmann 3, Zainab Shather 1

1 Public health and research, 2Health Authority Abu Dhabi, 3ETHIC, Abu Dhabi, United Arab Emirates

Introduction: The United Arab Emirates (UAE) have been shown to have high cardiovascular risk burden, recently confirmed by the Weqaya programme covering 94% of the Abu Dhabi population. Objectives: To investigate differences in cardiovascular risk between urban/rural and two major regions in Abu Dhabi. Methods: Adults (18<) were screened using self-reported indicators, anthropometric measures and blood tests in dedicated clinics. Results were compared between Middle/Island (Abu Dhabi City) and Eastern (Al Ain) regions using residence and urban/rural derived from the screening clinic. Results: Of 160,507 subjects (86% of Abu Dhabi National population), 95,441 (59.5%) live in Middle/Island and 65,076 (40.5%) in Eastern regions and 46,537 patients, 40,954 (88.0%) in urban and 5,583 (12.0%) rural. Mean age was similar between urban (35.8) and rural (35.6) but higher for Middle/Island (35.1) than Eastern (34.8). Prevalence rates were higher for obesity, hypertension and smoking in urban (p<0.001) and central obesity and pre-diabetes in rural areas (p<0.001).

<table>
<thead>
<tr>
<th>Risk factor</th>
<th>Middle/Island</th>
<th>Eastern</th>
<th>p value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Obesity (BMI)</td>
<td></td>
<td></td>
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<tr>
<td>n (%)</td>
<td>33,386 (34.70)</td>
<td>22,300 (34.70)</td>
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<tr>
<td>Overweight (BMI)</td>
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<td>n (%)</td>
<td>30,259 (32.15)</td>
<td>20,719 (32.24)</td>
<td>0.575</td>
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<tr>
<td>Central Obesity</td>
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<tr>
<td>n (%)</td>
<td>54,062 (56.14)</td>
<td>36,459 (56.14)</td>
<td>0.339</td>
</tr>
<tr>
<td>Dyslipidaemia</td>
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<td></td>
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<tr>
<td>n (%)</td>
<td>8,171 (39.95)</td>
<td>11,073 (45.81)</td>
<td>&lt;0.001</td>
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<tr>
<td>Hypertension</td>
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<tr>
<td>n (%)</td>
<td>5,023 (24.94)</td>
<td>4,261 (17.49)</td>
<td>&lt;0.001</td>
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<tr>
<td>Smoker</td>
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<tr>
<td>n (%)</td>
<td>11,098 (11.64)</td>
<td>6,816 (10.51)</td>
<td>&lt;0.001</td>
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<tr>
<td>Pre-diabetes</td>
<td></td>
<td></td>
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<tr>
<td>n (%)</td>
<td>5,544 (27.20)</td>
<td>6,758 (28.05)</td>
<td>0.006</td>
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<tr>
<td>Diabetes</td>
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<td></td>
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</tr>
<tr>
<td>n (%)</td>
<td>5,044 (27.20)</td>
<td>4,042 (16.58)</td>
<td>0.359</td>
</tr>
</tbody>
</table>

Risk factor

*adjusted for age and gender

Conclusion: Upper BMI increased in rural and men in Abu Dhabi. Pre-diabetes was more frequent in Middle/Island than Eastern, and in men than women. Other risk factors such as hypertension, smoking and dyslipidaemia were more frequent in urban and men. This study confirms 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 findings 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...
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) compared to 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.

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

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Introduction: Overweight/obesity 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 collected 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 (VNHI) 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, image 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.

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

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1Heart center, Siloam hospital Lippo Village, 2Medical school, Pelita Harapan University, Tangerang, 3Indonesian Society of Hypertension, Jakarta, 4Medical School, Hasanuddin University, Makassar, Indonesia

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) compared to 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.
Conclusion: Mean systolic BP and prevalence of hypertension generally increased with BMI in normal- or overweight population groups but in underweight population, hypertension was also prevalent, representing a U-shaped relationship between BP and BMI, highlighting a need for BP control. A healthy lifestyle can help prevent hypertension in children and teens.

References:

Prevalence of hypertension in 10–17 years old schoolchildren in Iranian population

Alireza Ghorbanibaghami1;4, Ali Khalili1,2
1Department of Nursing, Gachsaran branch, Islamic Azad University, Gachsaran, Iran, 2Islamic Republic Of

Introduction: Hypertension is the most common chronic medical problem prompting visits to primary health care providers. High blood pressure is often called the silent killer because in the initial stages it presents with no symptoms. Objectives: The aim of this study was to determine the prevalence of hypertension in school children 10–17 years old of Ahvaz, Iran. Methods: In this cross-sectional study, a cluster sampling was performed, and 1000 subjects between 10–17 years old were selected from 10 boys and 10 girls schools of Ahvaz city. Body weight, height and blood pressure were measured using standard procedures. Results: 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 10. Conclusion: Hypertension is usually a diagnosis that requires lifelong attention and control. A healthy lifestyle can help prevent hypertension in children and teens.

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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.

**0075**

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

Vadim Kuznetsov, Ekaterina Akimova, Georgiy Pushkarev, Valery Gafarov

1Tyumen Cardiology Center, Tyumen, 2Interdepartmental Laboratory of Cardiovascular Diseases Epidemiology in Siberia, Novosibirsk, Russian Federation

Introduction: Psychosocial factors are not still very well studied as contributors to cardiovascular death 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 1.13–5.28; 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.

**0076**

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 toward an epidemiological link 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’s 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 18.6% in 2000 to 27.1% in 2007 mainly due to 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.

**0077**

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

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1National Research Center for Preventive Medicine, Moscow, Russian Federation

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 prOGram studying depResion 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 (979 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 38 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.

**0078**

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

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Introduction: Cardiovascular disease (CVD) is a major cause of death in developed countries. The goals of cardiac rehabilitation and adherence 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 practiced 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 depression, 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 inclulc was observed. Conclusion: Our findings suggest that meditation techniques has better outcomes in cardiac patients for improvement of depression, reduction of systolic and diastolic blood pressure, and heart rate than relaxation techniques.

**0079**

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
in total household expenditures were analyzed. A household’s health expenditure was considered catastrophic if annual OPP 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.

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 diagnosis of AMI were reviewed. Results: Race/ethnicity was not classified in 61 pts. 85.7% of the pts. were Hispanics (50%) and Non Hispanic Whites (35.7%). No gender differences in age (66.9±14.8), diabetes, hypertension, lipid disorders, medical insurance were found. Men had more AMI (93% vs 51%, p<0.001), death (7.3% vs 3.8%, p<0.05), smoking, CATH, PCI and CABG than women. However, there were no gender or Hispanic ethnicity differences in the proportion of procedures performed when an AMI was documented (TableFig1). Hispanic women (HW) showed no differences in death, AMI, CABG and Stress Test as compared to Non Hispanic White Women (NHW) with the exception of PCI (31% vs 50%, p<0.03). A trend (NS) for more AMI in NHWW and CABG in HW was noted. Non Hispanic Whites had more private/commercial insurance than Hispanics (60.9% vs. 32.1%, p<0.01), regardless of gender. No differences were found in the composite use of ASA/Antiplatelets, B-blockers, ACEI /ARB and lipid lowering treatment during admission or at discharge (TableFig1).

Conclusions: 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.

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

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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 (Pravastatin), 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 20mg*</th>
<th>Cost of Rx Pravastatin 40 mg*</th>
<th>Gross National Income /Capita*</th>
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*All number are in US Dollars.
Are NCDs a real priority for people in Africa? Realities, people’s perceptions and perspectives on essential health services in Africa: a Kenyan perspective

Kenyan perspective

Jared Odhiambo Owuor 1,* Mary Amuyunzu-Nyamongo 2 and a 12-country study being coordinated by the World Health Organization, Africa Regional Office (WHO-AFRO) and the African Programme for Onchocerciasis Control (APOC).

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. Objectives: 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; 79% rural-U; 93% urban-P; 79% rural-P; 93% urban-R; 79% rural-R), followed by respiratory problems (26% P; 33% R; 32% P; 34% R) and hypertension (13% P; 19% R; 21% P; 23% R). Respiratory problems was identified by 23% of respondents on average in all the regions view risk avoidance, exercise and prompt health seeking as strategies for good health. Image/graph I:

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 cost factors for risk factors for NCDs with more priority being given to infectious diseases, despite recent data indicating NCDs to be on the rise. Community members expect to be engaged more in the running and management of the health services.

Reference: WHO, Framework for the implementation of the Ouagadougou Declaration on PHC and health Systems in Africa: Achieving better Health for Africa in the new millennium, 2009

Urban social development index as determinant of cardiovascular risk in India

Introduction: To determine social development index as determinant of these variations we performed a nationwide study. Objectives: To determine social development index as determinant of these variations we performed a nationwide study. Methods: Study was performed at eleven medium sized cities in India using simple cluster sampling. Study subjects (n=6198, men 3426, women 2772) were grouped according to urban social development index (SDI) into high (Chandigarh, Nagpur, Madurai, Bikaner n=1734), intermediate (Ahmadabad, Dibrugarh, Jaipur, Jammu, n=2634) and low (Bikaner Lucknow, Patna, n=1825). Subjects were evaluated for demographic, physical and biochemical risk factors using uniform protocol. Risk factors were defined according to current guidelines. SDI-based differences in risk factors were evaluated using multivariate logistic regression. Results: Study was performed at eleven medium sized cities in India using simple cluster sampling. Study subjects (n=6198, men 3426, women 2772) were grouped according to urban social development index (SDI) into high (Chandigarh, Nagpur, Madurai, Bikaner n=1734), intermediate (Ahmadabad, Dibrugarh, Jaipur, Jammu, n=2634) and low (Bikaner Lucknow, Patna, n=1825). Subjects were evaluated for demographic, physical and biochemical risk factors using uniform protocol. Risk factors were defined according to current guidelines. SDI-based differences in risk factors were evaluated using multivariate logistic regression. Conclusion: Indian cities with low social development index have greater lifestyle risk factors while those with high index have greater cardiometabolic risk factors. This indicates different stages of epidemiological transition in these populations.

Combined thermal and electrical muscle stimulation reduce visceral fat and improve lipid profile during weight loss

Introduction: Visceral fat accumulation is closely linked to obesity, the metabolic syndrome and cardiovascular risk. Efficient methods for reducing visceral fat may contribute in the prevention of cardiovascular events. Objectives: The purpose of this study was to investigate the potential effects of prolonged combined thermal and electrical muscle stimulation (cTEMS) on the reduction of visceral fat, when used as a supplement to a dietary intervention. Methods: 22 obese (BMI ≥ 28 kg/m2; fat percentage >20% for men and 28% for women) and sedentary, but otherwise healthy individuals were randomized to either a low carbohydrate diet (LCD) or LCD supplemented with cTEMS (LCD + cTEMS). The intervention period was 10 weeks during which physical activity level was kept unchanged and controlled with accelerometer. cTEMS was given in three 45 min sessions per week. Body composition was assessed by
Gene expression was assessed by real-time RT-PCR and Western blot techniques. Intracellular 
Ca²⁺ current was reduced across a wide range of test potentials (-30 to 40 mV) in ZDF 
myocytes compared to controls. Sarcoplasmic reticulum Ca²⁺ current was unaltered however, TPK Ca²⁺ 
signaling and expression of genes encoding Ca²⁺ transport and cardiac muscle proteins in aged ZDF 
rat hearts were reduced by 50% of wild type content. Real-time RT-PCR and Western blot 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 area to half (THALF) relaxation of shortening were unaltered in ZDF myocytes compared to age-matched controls. Amplitude and THALF decay of the Ca²⁺ transient was unaltered however, TPK Ca²⁺ transient was prolonged in ZDF myocytes (70.0 ± 3.2 ms) compared to controls (58.4 ± 2.3 ms). Amplitude of the L-type Ca²⁺ current was reduced across a wide range of test potentials (-30 to +40 mV) in ZDF 
myocytes compared to controls. Sarco(pleu)reticulum Ca²⁺ content was unaltered. The gradient of the fura-2 ratio compared to cell length during late relaxation of the twitches contraction was less steep in ZDF myocytes compared to controls. Expression of genes encoding cardiac muscle proteins, membrane proteins, membrane channels and cell membrane transport proteins was unaltered. Intracellular and extracellular Ca²⁺ transport proteins were variously altered. MyH6, Tmtn2, Cacna2d3, Stc1a1 and Atp2a2 were downregulated whilst My2, Cacna1g, Cacna1h and Atp2a1 were upregulated in ZDF ventricle compared to controls. Conclusion: Preserved ventricular myocyte shortening was associated with a changed pattern of mRNA expression in ZDF rat hearts. Further studies need to be done.

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

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Introduction: High prevalence of childhood obesity is associated with increased health risks. 
Intensive and longer lasting intervention will be needed to prevent or treat childhood obesity. 
Objectives: To review the evidence on the effectiveness of physical activity interventions for childhood 
obesity and to determine the most effective intervention type of higher effectiveness. Methods: 
A systematic literature review of randomized clinical trials (RCTs) and meta-analyses was performed. 
Search: PubMed, EMBASE, Cochrane CENTRAL and citations of systematic reviews were searched from 1990 until 2011. Study Selection: Studies were randomized clinical trials (RCTs) that included children aged 5 to 18 years old. Interventions: Physical activity and exercise interventions were compared to either usual care or a control intervention. Results: 19 randomized clinical trials (RCTs) were included. Conclusions: Physical activity interventions lasted 6 months or longer and were compared to usual care or a control intervention. Physical activity interventions were effective in improving physical activity and quality of life, but not in reducing body mass index (BMI), waist circumference or waist-to-hip ratio. However, some interventions were effective in improving physical activity, quality of life, and physical fitness. Conclusion: Physical activity and exercise interventions are effective in improving physical activity and quality of life, but not in reducing body mass index (BMI), waist circumference or waist-to-hip ratio. Further studies are needed to assess the long-term effectiveness of these interventions.

Contractional dysfunction 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 from young and aged ZDF rats. Real-time RT-PCR and Western blot 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 area to half (THALF) relaxation of shortening were unaltered in ZDF myocytes compared to age-matched controls. Amplitude and THALF decay of the Ca²⁺ transient was unaltered however, TPK Ca²⁺ transient was prolonged in ZDF myocytes (70.0 ± 3.2 ms) compared to controls (58.4 ± 2.3 ms). Amplitude of the L-type Ca²⁺ current was reduced across a wide range of test potentials (-30 to +40 mV) in ZDF myocytes compared to controls. Sarco(pleu)reticulum Ca²⁺ content was unaltered. The gradient of the fura-2 ratio compared to cell length during late relaxation of the twitches contraction was less steep in ZDF myocytes compared to controls. Expression of genes encoding cardiac muscle proteins, membrane proteins, membrane channels and cell membrane transport proteins was reduced in ZDF rats compared to controls. Conclusion: Preserved ventricular myocyte shortening was associated with a changed pattern of mRNA expression in ZDF rat hearts. Further studies need to be done.
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) activity in hypertension induced by N6-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 seven weeks. From the fourth week of L-NAME treatment, the NF-κB inhibitor lactacyctin (1mg/kg) was applied once a week. Furthermore, age-matched WKY received L-NAME or lactacyctin alone for 7 or 3 weeks, respectively. Total NOX activity, expressions of eNOS mRNA and protein were determined in the left ventricle (LV). NF-κB (IκBα) 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.

Results: L-NAME treatment increased BP significantly (145±2 mmHg vs. 110±3 mmHg in controls), whereas no changes in BP were noted in other treatments (in BP (161±3 mmHg). L-NAME treatment led to increased NF-κB (IκBα) expression followed by elevation of both eNOS mRNA and eNOS protein expressions. Addition of lactacyctin blocked, however, elevated eNOS protein expression followed by decreased NOS activity. Furthermore, lactacyctin attenuated the increased conjugated diene concentration and fibrotic process induced by L-NAME. The addition of lactacyctin, 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 lactacyctin treatment. Thus, nitric oxide could represent a regulatory factor responsible for different NF-κB-dependent growth responses. Supported by grants APVV-0536-07, APVV-0742-10 and VEGA: 20190110, 20178/09.

NHE-1 dependent calcineurin activation is a kind of mechanisms of ginsenosides-Rg1 improving cardiomyocyte 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 used widely in Asia, and is a kind of activity element playing a crucial role in maintaining health. Gs-Rg1 is considered as a multi-functional component of Ginsenosides, inhibiting proliferation and inducing apoptosis of various cancer cells. However, whether Gs-Rg1 exerts a direct anti-hypertrophic effect on cardiac cells, ex vivo, and whether inhibition of the heart failure process, in vivo in addition, we 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, an α1 adrenoceptor agonist) and Gs-Rg1 group (200umol/L Gs-Rg1 and 10 umol/L PE) for 36 hours; Cell surface area, Na+–K+ ATPase activity, GATA-4 and NFAT3 were analyzed. Male Sprague-Dawley rats (270 to 300 g) were treated with L-NAME (40mg/kg/day) for seven weeks. From the fourth week of L-NAME treatment, the NF-κB inhibitor lactacyctin (1mg/kg) was applied once a week. From the fifth week of L-NAME treatment, the NF-κB inhibitor lactacyctin (1mg/kg) was applied once a week. Furthermore, age-matched WKY received L-NAME or lactacyctin alone for 7 or 3 weeks, respectively. Total NOX activity, expressions of eNOS mRNA and protein were determined in the left ventricle (LV). NF-κB (IκBα) 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.

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PKD2 mutations lead to impaired calcium cycling in the heart and predispose to heart failure

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Introduction: Mutations in PKD1 and PKD2, the genes encoding the proteins polycystin-1 (PC1) and polycystin-2 (PC2), cause autosomal dominant polycystic kidney disease (ADPKD). 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 (Pkd2−/−). 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 regions of PKD1 and PKD2 were screened for mutations by direct sequencing, and PKD2 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.

Posttranslational myofibrillar 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: Miocardcyocytes 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 Ca2+–activated active force was measured. Posttranslational myofibrillar protein alterations contribute to contractile dysfunction.
force (F<sub>n</sub>), Ca<sup>2+</sup>-independent passive force (F<sub>passive</sub>), and Ca<sup>2+</sup>-sensitivity of force production (P<sub>Ca</sub>) were determined at 1.9 and 2.3 μm sarcomere 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 SLs, P<sub>Ca</sub> was significantly lower at Mi Ant site than at Cont. Ant or Inf sites of Mi or Cont. P<sub>Ca</sub> (1.9 μm): Cont. Ant/n=20: 5.8±0.03; Cont. Inf/n=7: 5.8±0.03; Mi Ant/n=23: 5.7±0.03; Mi Inf/n=6: 5.8±0.03 (mean±SEM). However, no significant differences could be found in F<sub>n</sub> at none of the different SLs (F<sub>n</sub> (1.9 μm) ~ 10.7 kN/m<sup>2</sup>; F<sub>n</sub> (2.3 μm) ~ 16.3 kN/m<sup>2</sup>). In contrast, F<sub>p<sub>passive</sub></sub> values were significantly higher of the Mi Ant cardiomyocytes at 1.9 μm SL than of the other groups (Cont. 0.4±0.1 kN/m<sup>2</sup>; Cont. Inf: 0.2±0.1 kN/m<sup>2</sup>; Mi Ant: 0.7±0.1 kN/m<sup>2</sup>; Mi Inf: 0.3±0.1 kN/m<sup>2</sup>). The increase in P<sub>Ca</sub> by stretching the sarcomeres was identical (ΔP<sub>Ca</sub>/ΔSL: ~6 kN/m<sup>2</sup>) in all groups indicating the preservation of the Frank-Starling mechanism. A decreased level of P<sub>Ca</sub> 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.:33.9±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 P<sub>Ca</sub> values which could not be reverted by antioxidant treatment. Conclusion: In conclusion, post-infarction remodeling resulted in a decrease of Ca<sup>2+</sup>-sensitivity of force production and an increase in 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.
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. Some reports show the association between LGE by cardiac MRI and hard cardiac end points. There is little report about MRI findings in patients with cardiopulmonary arrest. Objectives: To assess the MRI findings in patients with cardiopulmonary arrest. Methods: We performed an analysis using cardiac MRI to assess patients with out-of-hospital cardiac arrest (OHCA), and retrospectively examined the findings of cardiac MRI. Results: Between October 2003 and August 2011, 148 patients with out-of-hospital cardiac arrest were admitted to St Luke’s international hospital in Japan. 50 patients was administered cardiac MRI. In these cases, 10 patients were suspected of acute coronary syndrome (ACS), other causes were idiopathic ventricular fibrillation, vasospasm, Brugada syndrome, hypertrophic cardiomyopathy (HCM), dilated cardiomyopathy and ischemic cardiomyopathy. All patients with ACS and HCM had LGE. 3 patients with vasospasm (43%) had 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. Ejection fraction, myocardial mass was measured of both ventricles. Maximal end diastolic wall thickness to left ventricular end diastolic index ratio was calculated. Regional wall motion abnormalities and delayed enhancement were ruled out. Results: Left and right ventricular volumes and left ventricular mass were elevated in male and female athletes compared to normals. Male (102.2±13.3) g, (86.1±11.4 g and female (88.0±9.3) g tends to have higher amount of left ventricular hypertrophy compared to normals (63.6±10.0 g) and water-polo players (86.0±15.3 g). Professional sport activity and heart rate turned out to be significant independent factors for increased volumetric indices. Late gadolinium enhancement reflecting scar/fibrosis in top athletes free of compliant was not detected. In athletes with severe signs and symptoms arrhythmogenic right ventricular cardiomyopathy (ARVC) and hypertrophic cardiomyopathy (HCM) could be diagnosed in 5 and one athlete, respectively. Conclusion: Cardiac MR workup of athletes can be carried out only using established normal values. The amount of left ventricular hypertrophy appeared to be different according to the sport the athletes were engaged in. ARVC and HCM listed amongst the top 10 reasons for sudden cardiac death in sportsmen. Normal cardiac values caused by different sport activities can help to differentiate physiological adaptation of athletes’ heart from ARVC and HCM.

Compliance with ethical standards: All Patients were give Beta-blockers and Glyceryl trinitrate spray just prior to scanning. An ECG triggering, 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 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 tanshoraichechocardiography 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 0.79 (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 < .0001). 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 0.96 (95% confidence interval, 0.84 – 0.99).

Dose vasopressors compared to Pulse Pressure Variation, Aortic Blood Velocity Variation is a more sensitive and specific dynamic marker of volume responsiveness in patients receiving high dose vasopressors, mechanical ventilation.

References:

Conclusion: Compared to Pulse Pressure Variation, Aortic Blood Velocity Variation is a more sensitive and specific dynamic marker of volume responsiveness in patients receiving high dose vasopressors, mechanical ventilation.

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do 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 (8–10%) on CT Coronary Angiography that 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.

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 mortality and morbidity 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 arteries 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), while mixed plaque in CCTA, calcified plaque in IVUS, and lipid rich plaque in OFDI were associated with advanced lesions (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 noninvasive 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.

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 lifetime 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 they had 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 6,586. 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 = 108) were female, and 46% (n = 92) were male. The mean total radiation dose per patient over six years was 75.2 mSv corresponding to a LAR for cancer of 1 in 133. The median radiation dose per patient over six years was 62.6 mSv corresponding to a LAR for cancer of 1 in 160. The mean dose per patient per year was calculated as 12.5 mSv corresponding to a LAR for cancer of 1 in 789. The median dose per patient per year would be 10.4 mSv corresponding to a LAR for cancer of 1 in 1,973. Fifty one percent of patients in this study received greater than 10 mSv per year over a six year period. Conclusion: Patients admitted to hospital with chest pain are being exposed to a significant amount of ionizing radiation. Perhaps including in the patient’s clinical history the estimated exposure to ionizing radiation in millisieverts may heighten the level of awareness of the potential cancer risks and thus modulate radiation exposure to the individual patient.

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 D/M (median follow-up 1.7 years). Multivariable Cox regression was used to determine the independent predictors D/M. 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.

0106

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: 78 patients (mean age 54.9 ± 13; 42% females; 13% prior coronary revascularisation 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 septemabi 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 89%, and negative predictive value (NPV) of 96% and 96% on a per-patient and per-segment basis, respectively. The intermodality agreement of CTP to SPECT-MPI was kappa = 0.62 (p < 0.001). CTA showed an accuracy of 92%, sensitivity of 70.4%, specificity of 95.5%, PPV 67.8%, 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 estimation 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.

0107

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 athrombotic coronary plaque. Objectives: In this study, we compare the prevalence of coronary calcification 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 driven 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 58.9 (± SD: 10.8). There were 719 males and 302 females (M:F). 47.7% M is positive, 62.2% of CACS performed are positive (p = 0.001). There is no difference in the prevalence of coronary calcification and in 15.9% of these cases, the calcium scores are >400. In patients with negative MIBI (389, 66.4% have positive calcium scores. 15.4% of these cases have calcium score >400. Conclusion: In our study, even though a MIBI score is negative, it does not mean that there is no coronary atherosclerosis. Here, 62.2% of cases showed the presence of coronary calcification and in 15.9% 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 false, as noted in previous studies, in the presence of balanced ischaemia. In such patients, performing a CACS using the MSCT may be a good alternative.

0108

The interaction between determinants of exercise capacity, physical activity and self-perceived health status in adult patients with atrial switch repair for transposition of the great arteries

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Introduction: Patients with Mustard/Senning repair for transposition of the great arteries (d-TGA) have an impaired exercise capacity, but information about physical activity levels is scarce. Objectives: The aim of the study was to come to a better understanding of the interaction between determinants of exercise capacity, physical activity and self-perceived health status. Methods: We studied 39 d-TGA patients who underwent echocardiography and exercise testing, and who completed questionnaires about physical activity and self-reported health status. All results were compared with normal values. Stepwise multiple regression analysis was used to assess the determinants of peak VO2% and exercise duration. Results: Peak VO2 averaged 64 ± 14.1% of predicted normal values, which is significantly lower than expected (p < 0.0001). Physical activity measures as well as perceived general health were significantly lower compared to a reference population (p < 0.05). Peak heart rate and peak oxygen pulse explained together 90% of the variability in exercise duration (model F = 162.72; p < 0.0001). Type of surgery, total energy expenditure and right ventricle contractility were independent predictors of peak VO2 explaining 43% of the variability (model F = 8.72; p < 0.0001). Conclusion: Improved peak exercise performance in d-TGA patients results mainly from the inability to increase stroke volume and heart rate at higher exercise intensities. Senning repair and a well preserved right ventricular function are related to a better peak VO2. Furthermore, an active lifestyle has a positive effect on exercise capacity and perceived physical functioning. Therefore it might be indicated to encourage d-TGA patients to adopt a more physically active lifestyle.

0109

Transcatheter interventions for multiple lesions in adults with congenital heart disease

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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 39.2 ± 20 years. Demographic characteristics and procedural details are shown in Table 1. Images are shown as figure 1 and Figure 2.
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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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), Psychometric 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 49 CHD patients, 57 males, aged from 12 to 26 years old (M=18.12 ± 3.65), SS 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 (SADS-L) and completed self-report questionnaires on QOL (WHOQOL-BREF) and PSA (YSR and ASR). Observational versions of the same questionnaires (CBCL, ABLQ) 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=−2.171; 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=452.000; p=0.000) QOL and poorer SS resulted in more withdrawn (u=499.000; p=0.003) and social problems (u=577.500; p=0.002). Patients with more PL showed worse physical (t=−2.088; p=0.039), psychological (t=−2.607; p=0.011), SR (t=−2.367; 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=905.200;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 8 years of life. All pts underwent echocardiography examination and cardiopulmonary exercise treadmill test (ETT). Right ventricle diameter (long parasternal view) and function by evaluation of tricuspid annular plane systolic excursion (TAPSE), pulmonary valve function with evaluation of pulmonic valve regurgitation fraction (PRVF), tricuspid regurgitation gradient (TRG), left ventricle function, ETT duration and workload, and max oxygen uptake (VO2max) and anerobic 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 PRVF 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 (29.3 vs 20.8 mm; p<0.03) and lower values of PRVF (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/ml/min), 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 moderate to mild 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 right ventricle.
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 are the rule. Mechanical prostheses have less favorable reputation due to lifetime anticoagulation therapy and higher risk of thrombosis , but the chance of re-operations be expected to be low. Additionally, some patients wishing no re-operations or have significant right ventricular (RV) dysfunction which makes them high risk for frequent operation. Objectives: We aimed to evaluate the mid-term results of 38 mechanical valve replacement in the pulmonary position. Methods: Between 2003 to July 2008, 122 patients underwent PVR. TOF was the common basic lesion. Thirty-eight patients underwent mechan- ical pulmonary prosthesis. The choice of valves’ type was selected based on the RV function, patient and physician preference. Median age of prosthesis in 31 patients (81.6%) were between 0.5–5 years. Results: Thirty-eight patients with bileaflet mechanical pulmonary prostheses mean ± SD of age was 25 ± 8 years (range 14 to 60 years) and female/male was 13/25 were enrolled. Seven patients (18.4%) had malfunctioning pulmonary prostheses. Both echocardiography and fluoroscopy confirmed diagnosis and two of them underwent redo PVR. Five years longevity of pulmonary valve prostheses was 94.7%. Fibromyolysis therapy tried for all 7 patients and 5 patients responded it. Mean of INR in all 7 patients was 2.1, which was significantly lower than the recommended values. There was no significant association between severity of RV dysfunction, patients age and age of prostheses in patients with prostheses malfunction.

Table1.Prosthesis malfunction in association with patients findings

<table>
<thead>
<tr>
<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>
<td>MRA</td>
<td>1.000</td>
</tr>
<tr>
<td>Mortality</td>
<td>0.100</td>
</tr>
<tr>
<td>Stroke</td>
<td>0.100</td>
</tr>
<tr>
<td>Peak Pressure Gradient (mmHg)</td>
<td>0.001</td>
</tr>
<tr>
<td>Mean Pressure Gradient (mmHg)</td>
<td>0.001</td>
</tr>
</tbody>
</table>

Conclusion: Pulmonary valve mechanical prostheses can be performed with promising midterm results. Most of prostheses malfunction respond to fibromyolysis therapy. We suggest intense anticoagulant therapy in these patients.

Arrhythmia symptoms with and without arrhythmias in patients monitored with transtelephonic 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. Objectives: We investigated the correlation between symptoms and rhythm following AF-ablation using transtelephonic 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, The registration is directly stored in a centralized, encrypted database, device and a single lead ECG is recorded (lead I). The recorded ECG can then be sent from any telephone at any time, The registration is directly stored in a centralized, encrypted database, and can be reached and analyzed over the internet by any user with access. Pts were instructed to record twice daily and every 14 days. Recordings and symptom diaries were analyzed for: AF, atrial tachycardia (AT), sinus rhythm (SR) or noise and for concomitant symptoms. Results: 170 pts (124 male, 59.7±8.5yrs, 13 % structural heart disease, 34 % hypertension) were analyzed. Encircling of the pulmonary veins with PVI isolation confirmed by Lasso catheter was achieving a mean of 37±15 min of RF delivery. 2467 ECG’s were recorded and analyzed. Rhythmic could be determined in 2200 (89.2%) with SR present in 1999, AF in 160 and AT in 41. When analyzing pts we found that 135 (79%) showed SR in all their recordings, while 34 pts showed AF/AT in at least one recording. 47 % of the pts with confirmed AF/AT in their scheduled recordings were classified as asymptomatic. Conclusion: Thumb-ECG (Zenicor®) used as a follow-up tool after AF ablation works in a clinical setting and the recordings are to a high degree possible to analyze. The system is helpful in the process of determining correlation between symptoms and rhythm following AF ablation. Importantly, lack of symptoms does not exclude occurrence of AF, whereas symptoms suggestive of AF relapse are more precisely assessed.

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

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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. Objectives: To evaluate the impact of the ablation of fragmented potentials in the ablation of persistent/permanent atrial fibrillation (AF). Methods: We prospectively included patients (p) undergoing catheter ablation for persistent/permanent AF. The PV isolation was performed by continuous circular lesions around ipsilateral PV, checking for conduction block with a circular multipolar catheter within the veins. Subsequently, p were randomized to no further ablation (CPVA-NoF) versus additional ablation of fragmented potentials (CPVA-F). These fragmented potentials were defined as any continuous and fractionated activity of low voltage, sustained over > 10 seconds over time. Follow-up was performed at 1, 3, 6 months after the procedure and every 6 months thereafter. After a 3 month blanking period, recurrence was defined as the occurrence of any arrhythmia of ≥30 seconds. Results: 110 patients (53 ± 10 years, 81% male, 36% hypertension, LA diameter 45 ± 6 mm, LVEF 54 ± 12%, 26% structural cardiomyopathy) undergoing AF ablation, were randomized (52% persistent AF, 16% perma- nent AF). No significant differences were observed between the CPVA-NoF vs. CPVA-F groups in terms of LA diameter, presence of hypertension, structural cardiomyopathy nor any other arrhythmia predictor. After a first procedure of AF ablation, there was no significant difference in the arrhythmia-free survival curve between the two groups (56% en CPVA-F vs. 85% en CPVA-NoF at 12-months, log-rank p = 0.434).

LA flutter as a complications of the maze procedure using cryoablation for treatment of paroxysmal and permanent AF in patients undergoing concomitant cardiac surgery

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Introduction: The left atrial flutter is a known complication of both surgical and catheter based therapies for AF. Originally reported in association with left atrial scar following mitral valve or MAZE surgical procedures there is more data suggesting incomplete lesion set and transmurality as a main culprit. Objectives: The objective of this study was to evaluate the incidence of LA flutter as one of the complications of the MAZE procedure using cryoablation for treatment of paroxysmal and permanent atrial fibrillation (AF) in patients undergoing
concomitant cardiac surgery. We sought to identify the predictors of failure for this particular tachyarrhythmia and recognize the patterns in order to avoid this complication. Methods: From July 2003 to Dec 2010 178 consecutive patients (mean age 73.1 years) who underwent cryoablation for AF were evaluated and divided into 2 groups. Group A the left sided cryo Maze for paroxysmal AF (n = 96) and Group bilateral cryo Maze for paroximal AF (n = 80). 12.6% (4) patients were eliminated for the field based mapping. Methods: 10 consecutive patients (6 male, 4 female; aged 30–73 years) who underwent left atrial radiofrequency catheter ablation due to atrial fibrillation were included. Electroanatomical mapping was performed with CARTOS System using a Navistar catheter ( Biosense Webster). Respiratory gating was achieved with the novel CARTOS system after the end of the procedure requiring respiratory occlusion occurred, respectively. After a shorter procedure (hence 100 minutes) in all pts Cardiac troponin I release began earlier than those usually founded in the setting of ischemic heart disease, as the ablation creates an immediate myocardial necrosis. The rate of increase is faster up to 6–8 hours and slower from 6th to 18th hours. The analysis of variance between the three groups (AF recurrence, occurrence, SRI persistence) detect a significant difference of cTrnI released after RA ablation (F = 5.57; P = 0.005). Concerning more specifically the relation between the extent of the Tm I release and the outcome: all pts in whom AF recurrent present a cTrnI release < 4 ng/mL and the risk of AT I release was higher for cTrnI release > 4.5 ng/mL. Conclusion: The extent of cTrnI release following the ablation procedure was directly related to the risk of AT. The strongly inversely related to AF recurrence supporting the equation: “more extent of cTrnI release = less AF recurrence”, as testified by our results: “cTrnI > 4 ng/mL → none AF recurrence”. Reference: 1) Carlo Pappone, Salvatore Rosano, Giuseppe Oreo, Monica Tocchi, Filippo Gugliotta, Gabriele Veicordomini, Adriano Salvato, Cosimo Dicamina, Patrizio Mazzone, Vincenzo Santi-selli, Simone Galletta, and Sergio Chierchia: Cerebral perfusional ablation of pulmonary vein ostia. Circulation 102:2619–2628, 2000

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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1Coronary Disease Department, Institute of Cardiology, Medical School of Jagiellonian University, John Paul II Hospital, Department of Cardiologic Biochemistry, Children University Hospital, Medical School of Jagiellonian University, Cracow, Poland

Introduction: Syncope is an effect of transient, global hypoperfusion of brain, which may lead to brain injury. Objectives: Evaluation of injury influence of vaso-vagal syncope (WS) 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 18–74yrs (mean age 35.8), with VVS, referred to HUTT. Other then reflex reasons of syncope were previously excluded in all pts. All pts underwent HUTT according to Westminster protocols. During HUTT regional saturation (rSO2) of frontal lobes of brain was measured using INVS cerebral oximeter in all pts. Changes of rSO2 during HUTT was expressed as a relative decrease (in%) of 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 the test. An increased level of NSE and SRI after HUTT was calculated. All results were analyzed in relation to the type of vaso-vagal response to orthostatic stress during HUTT (acc. to VASS scale). Results: HUTT was positive in 51 pts (85%). Mixed type of VVS was noticed in 28 pts (46%), cardio-depressive in 17 pts (28,3%), vasodepressive in 6 pts (10%). Significant desaturation preceded syncope during HUTT. NSE concentrations before HUTT was in normal range. We observed the significant increase of serum NSE 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%) the preceded normal range (12 ng/ml) 1 hour after HUTT. There were no significant increase of NSE serum levels in pts with negative results of HUTT (respectively: 6; 4,1 and 2,7 ng/ml; p=0,027) NSE increase did not differ significantly between different types of vaso-vagal response. Increase of serum concentration of NSE during HUTT significantly correlated 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: 1) Vasovagal syncope due to head-up tilt test induced syncope, leads to significant desaturation of the brain as well as to mild release of biochemical markers of brain injury. 2. Vaso-vagal syncope, provoking cerebral hypoperfusion, may lead to discrete brain injury.
The 24-hours excretion of cyclic AMP and the type of vaso-vagal response during head-up tilt test in patients with vaso-vagal syncope

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1Coronary Disease Dept., John Paul II Hospital, 2Coronary Disease Dept., Medical School of Jagiellonian University, John Paul II Hospital, Cracow, Poland

Introduction: The pathophysiology of vaso-vagal syncope is still unclear. Neural reflex is a basal mechanism leading to this kind of syncope, but the role of circulating vasoactive substances is also important. We try to analyze a role of serum concentration of cyclic AMP (cAMP) – as a second messenger of calcitoninogens, in pathogenesis of vaso-vagal response to orthostatic stress. Objectives: The aim of study: analysis of circulation excretion of cyclic AMP (cAMP) in patients with vaso-vagal syncope in relation to the type of vaso-vagal response during head-up tilt test (HUTT). Methods: We observed 35 pts (38 women, 22 men) aged 17–72 yrs (mean age 34.5 ± 10.7 yrs), with history of vaso-vagal syncope (VVS) who were referred to HUTT. Cardio- and neurogenic syncope were excluded in all patients HUTT was performed according standard protocol in all pts. Blood samples were collected to determine circulation excretion of cyclic AMP (cAMP). It was evaluated in relation to vaso-vagal response during HUTT according VASS classification. Results: HUTT was positive in 51 pts (85.0%). Mixed type of vaso-vagal response was noticed in 28 pts (46.7%), cardiodepressive in 17 pts (26.3%), and vasodepressive – in 6 pts (9.4%). Circulation excretion of cAMP was significantly lower in patient with cardiodepressive response in relation to the subjects with negative HUTT (0.74 vs. 3.35 μM, p < 0.05). Circulation excretion of cAMP did not differ significantly between vasodepressive (1.89 vs. 3.58 μM, p = 0.10) and mixed types of response (2.73 vs 3.58 μM, p = 0.35) of response for orthostatic stress during HUTT in relation to patients with negative HUTT results. Lower 24-hours cAMP excretion in patients with cardiodepressive response during HUTT suggests diminished sympathetic activation and vasodilatation in patients with vaso-vagal syncope.

Conclusion: 1. Sympathectomy induced by orthostatic stress during head-up tilt test lead to activation clotting and fibrinolysis processes in patients with vaso-vagal faints. 2. Orthostatic stress lead to endothelium-related induce fibrinolytic process by increase of IPA activity as well as diminish of plasmogen activator inhibitor (PAI) – activity in patients with vaso-vagal syncope.
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).

Methods: In NTUH HF center database, we select 116 consecutive HF outpatients. 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 patient was 733 ± 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 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>Hazard 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>
</tr>
<tr>
<td>Resisten</td>
<td>0.612 (1.000; 1.032)</td>
<td>0.336</td>
</tr>
<tr>
<td>BNP</td>
<td>1.294 (1.377; 5.068)</td>
<td>0.019</td>
</tr>
</tbody>
</table>

Exclude variable: Cre and BMI

Table 2: Multivariate analysis of Cox regression to predict mortality

<table>
<thead>
<tr>
<th>Variable</th>
<th>Hazard ratio (95% CI)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>1.057 (1.017; 1.099)</td>
<td>0.005</td>
</tr>
<tr>
<td>MMP-2</td>
<td>1.944 (1.000; 1.000)</td>
<td>0.033</td>
</tr>
<tr>
<td>Resistin</td>
<td>1.044 (0.884; 1.226)</td>
<td>0.518</td>
</tr>
</tbody>
</table>

Exclude variable: Cre and BMI

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

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

Yen-Hung Lin1,2, Xue-Ming Wu3, Tse-Pin Hsu1, Yen-Hsein Chen1, Yen-Wen Wu1, Yi-Lwan Ho1,3, Ming-Fong Chen1
1Internal Medicine, National Taiwan University Hospital and National Taiwan University College of Medicine, 2Graduate Institute of Clinical Medicine, National Taiwan University College of Medicine, Taipei, 3Internal Medicine, Taoyuan General Hospital, Taoyuan, Taiwan, China

Introduction: Galectin-3 (Gal-3) is one of the 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 galectin-3 and serum markers of cardiac ECM turnover 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 aminoterminal propeptide of procollagen (PINP and PIIINP), 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 years and LVEF was 37 ± 10%. Their mean NYHA functional class was 2.1. Log Gal-3 is significantly correlated with log TIMP-2 (p < 0.001), and log TIMP-1 (p < 0.003), and log PINP (p < 0.003), and log BNP (p = 0.004). Seventeen patients died between 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 = 516.537, p < 0.001), and log PINP (HR = 17.882, p = 0.038) are strongly correlated with mortality. The LVEF is borderline correlated with mortality (HR = 9.812, p = 0.054). log PINP 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 outcomes (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.

O130 Plasma hemoglobinase-1 depends on left ventricle dilatation in chronic heart failure patients

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Introduction: Heme oxygenase-1 (HO-1) is a stress protein that catalyzes the degradation of heme into iron, carbon monoxide and biliverdin and is involved in protection of cardiac disease from different noxious stimuli. No information is available on peripheral levels of HO-1 in patients with chronic heart failure (CHF) and whether raised or lowered levels are associated with dilated/contractile heart disease, and if such levels correlate with the parameters of CHF, bilirubin and other plasma biomarkers. Objectives: We investigated whether systemic HO-1 regulation is deranged in CHF patients and whether plasma HO-1 measurements provide a peripheral biomarker of the disease. Methods: Plasma HO-1 was measured in 20 normal elderly controls and in 53 patients with dilated CHF (defined left ventricular end-systolic diameter > 40 mm, LVEF < 40%). Plasma HO-1 and Brain natriuretic peptide (BNP) were measured with immunoassays. Normally distributed variables are reported with mean and skewed variables with median. Results: In CHF patients, HO-1 was significantly lower in CHF patients (median 2.59, range 0.5–7.3) compared with NGD (median 5.2 range 1.2–12.0) (p < 0.01). Circulating BNP levels were not significantly correlated with plasma HO-1 levels. There was a significant negative correlation between HO1 and total serum bilirubin (p < 0.05). A negative weak correlation were also observed with functional class (p < 0.05) and atrial fibrillation (p < 0.05). Plasma levels of HO-1 showed significant considerable positive correlation with left ventricle (LV) dimensions values. Independent predictive effects on HO-1 levels in multiple regression analysis (F = 2.8, p < 0.01) were explored for the values of the LV end-diastolic volume and atrial fibrillation. Conclusion: CONCLUSIONS: Plasma HO-1 are decreased in patients with CHF. Levels of HO-1 are independently correlated to the degree of cardiac enlargement. Further studies are needed on the concrete mechanisms of the deranged HO-1 regulation in CHF patients.

Genetic variation of osteopontin G-156Del effectively predicts mortality and responsiveness to carvedilol: Japanese chronic heart failure (J-HF) study

Hiroshi Okamoto1,*, Yasuaki Fujio2, Shinpei Nonen3, Jyunichi Azuma4, Masatsugu Hori5 and, whether raised or lowered levels are present in cardiovascular disease, and if such levels correlate

Introduction: Dilated cardiomyopathy in Sub-saharan Africa: data from the Abekouta heart failure registry

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Introduction: Dilated cardiomyopathy is one of the common causes of Heart failure in Sub-Saharan Africa. It is responsible for 17–48% 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 feature of this disease has been scarcely studied. Objectives: We therefore used data from the Abekouta 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 Abekouta. 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 proforma 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 with an overall mean age of 47.0 ± 16.9 yrs (range 14–89). 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 thrombus, pulmonary embolism, stroke and arrhythmia. Intra hospital mortality was low. Conclusion: DCM was a common cause of death in Abekouta patients 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.


1O133 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 income’s community’s level. 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 8.29% (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 achieved by p < 0.05. Results: The median age was 1.45 years (interquartiles 0.19 to 10.03 years). 51.5% boys; etiologies: congenital heart disease (CHD) (57.2%), secondary to systemic diseases (secondary) (36.5%), myocarditis (2.7%), dilated cardiomyopathy (DCM) (1.6%), rheumatic fever (RF) (1.5%), and arrhythmia (0.5%). The overall survival rates were 87.2% at 1, 85.4% at 2 and 82.3% in Year 7. There was no difference in survival between gender (p = 0.359), but the patients with RF (61.4%, 54.9% and 36.6%) and DCM (50.3%, 41.3% and 31.8%) in 1, 2 and 7 years respectively, had the worst survival (p < 0.001). In Cox analysis the addition of 1 year in age increased HR in the secondary (1.052, 1.040-1.06), arrhythmia (1.081, 1.052-1.110), RF (1.110, 1.082-1.139) and CMD (1.044, 1.031-1.057) (all < 0.001) etiologies. However, the increase in the HR of 0.01 point reduced the HR in the secondary (0.978, 0.969 - 0.986), congenital (0.986, 0.985 - 0.991), arrhythmia (0.959, 0.934 - 0.985). RF (0.959, 0.949 - 0.970) and CMD (0.984, 0.974 - 0.995) (all < 0.001).

Conclusion: Pediatric patients with rheumatic fever or dilated cardiomyopathy that were hospitalized for heart failure are at increased risk of death. The increase of 1 year in age augments and the elevation of 0.01 point in HR reduce the risk for death in the majority of HF etiologies.

Introduction: Blacks and Hispanic populations are at increased risk for developing heart failure (HF) at younger age and differential morbidity and mortality compared to whites. Data on the clinical risk factors, management and outcome of Middle-eastern and South Asian patients (pts) hospitalized with HF are lacking. Objectives: The aim of the study is to compare the clinical characteristics and outcome of South Asian (SA) patients compared to Middle Eastern pts hospitalized with HF. Methods: We conducted retrospective analysis of a prospectively collected data of all patients hospitalized with HF in the State of Qatar during the last ten years. 2945 pts had a mean age of 76.3 (SD ± 10.1), being 53.9% female. Stratified into four periods (30 months each), according to the time of admission, we observed a significant increase in patients over 75 years (54.8% vs. 70.7%, p < 0.001) and an increase of the prescription of beta blockers at discharge (12.5 vs. 34.4%, p < 0.001), statins (8.5 vs. 31.2%, p < 0.001), calcium antagonist (11.7 vs. 7.7%, p < 0.001) and oral anticoagulants (12.9 vs. 25.5%, p < 0.001). In-hospital mortality significantly decreased from 12.7% to 8.5% (p < 0.01) and 30.4% to 23.9% (p < 0.01) at one year follow-up. Age (HR per year = 1.04 [95% CI 1.02 to 1.05]) and diabetes (HR = 1.35 [95% CI 1.11 to 1.65]) and chronic renal failure (HR = 1.49 [1.18 to 1.87]) were identified as independent predictors of all-cause mortality at one year of follow up. Conclusion: Total mortality in patients with decompensated heart failure has decreased significantly over the last decade despite the increasing age. Age, diabetes and chronic renal failure were independent predictors of total mortality at one year.

Factors associated with hospitalization of elderly patients with heart failure

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Introduction: Heart failure is a clinical syndrome exceedingly prevalent among elderly individuals. However the factors affecting heart failure exacerbation and hospitalization in outpatients with chronic heart failure are largely understood. Objectives: The aim of this study was therefore to describe the prevalence of hospitalization rate in outpatients aged 60 and older with heart failure and to identify factors related to hospitalization in this group. Methods: Data were collected on 330 individuals aged 39−65 yrs with clinically stable CHF (in NYHA NYHA), which were studied between 2001−2010 years. The etiology of CHF was ischemic heart disease in 78.5% of cases. All patients had clinical, laboratorial evaluation, ECG, EchoCG measurements and quality of life (QoL) assessment using Minnesota living with heart failure questionnaire. Patients were categorized according to the age into two groups. Group 1 consisted of 248 patients (83.2%) were 49 ± 12 yrs, group 2 − 102 patients (16.8%), aged 65 ± 12 yrs. Results: Patients did not differ with regards to demographics characteristics (p = 0.145), etiology of CHF (p = 0.246), heart failure course (p = 0.458), QoL (p = 0.156). The hospitalization rate for group of 1 was 76.9% and of group 2 − 70.4% for during time of period 1, 4 (1.77) yrs. Univariate variables associated with heart failure progression and hospitalization were low LVEF (p = 0.011, OR 0.17, 95% CI 0.08 − 0.38), II-IV NYHA FC (p = 0.001, OR 4.096 [95% CI 1.83 - 8.3]), Hemoglobin < 12 g/l (p = 0.003, OR 0.15, 95% CI 0.04 - 0.52), GFR < 60 ml/min (p = 0.013, OR 0.44, 95% CI 0.25 - 0.84), therapy adherence (p = 0.006, OR 0.71, 95% CI 0.55 - 0.91) and family absence (p = 0.028, OR 0.31 95% CI 1.07 - 1.92), NYHA FC (p = 0.001, OR 2.57, 95% CI 1.78 - 3.68) and low therapy adherence (p = 0.001, R 1.86, 95% CI 1.33 - 2.6) were the only independent variables at multivariate analysis to predict hospitalization. At Kaplan-Meier analysis, hospitalization anamnesis (p = 0.018) was associated with a worse prognosis among elderly heart failure patients. Conclusion: These findings revealed some specific heart failure syndromes and life-style patterns associated with heart failure patient’s hospitalizations. Further research is needed on factors related to hospitalization in elderly patients with heart failure including a larger battery of lifestyle factors.
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.

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 procedure (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.

Methods: Group I: TAVI was put through in 264 patients with logistic EuroSCORE 15 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). 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. In spite 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 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 influence of several factors of poor prognosis in in-hospital mortality was evaluated; these factors were related to patient characteristics (age, prosthetic valve endocarditis, diabetes mellitus), identified microorganism, 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 = 0.003 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 Chrome-Cobalt Alloy with Occluder of biocompatible Ultra High Molecular 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, 155 males and 110 females, age 12 to 78 years (Mean 38.7), had 249 TTK-CHITRA Prosthetic Valve Implantations at our centre. MVR 112, AVR 92, AVR and MVR 34, AVR with Mitral Valve Repair 18. Concomitant procedures were done in 17 cases, CABG 12, VSD 1, RSOV 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 left ventricle and cultured in pericardial fat. HCM and controls patients were randomized to receive a 48-hour treatment with ranolazine, or placebo. Results: Cardiomyocytes isolated from HCM patients showed a lower transversal cell size, a lower transversal cell area, a lower cytoskeleton area, and a higher diastolic Ca2+ transient. Ranolazine treatment increased the diameter of the sarcomeres, increased the cell area, increased the cytoskeleton area, and reduced diastolic Ca2+. Conclusion: Ranolazine improves contractility and diastolic function in HCM patients. The findings support the feasibility of a possible novel pharmacological target in HCM patients. This approach might lead to the development of a new strategy for the treatment of HCM.

Diverse morphologic spectrum of stress-induced cardiomyopathy
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Introduction: 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: A multicenter, retrospective study. We enrolled 234 patients who were diagnosed as SCMP from 1998 to 2016 admitted to 6 referral centers in Korea. Diagnosis of SCMP was performed according to 'Proposed Mayo Clinic criteria'. At inclusion, patients underwent coronary angiography. Morphologic features of LV were determined by echocardiography, and categorized as follows: apical ballooning as 'typical' and the others as 'atypical' types, which were subdivided into 1) mid-LV ballooning, 2) apical reverse, 3) apical tip sparing, 4) global hypokinesia, and 5) unclassified types. Results: Among the 234 patients, apical ballooning type showed predominance (59.4%) of SCMP followed by mid-LV ballooning (24.4%), unclassified (8.6%), apical tip sparing (4.3%), and global hypokinesia (3.1%). Conclusion: These findings indicate that SCMP shows a diverse morphologic spectrum and might be considered as a distinct clinical entity.

A multimarker 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 attractive from a pathophysiologic concept, they haven’t been investigated as an integrative multimarker 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 (6MW), 2D and 3D echocardiography at baseline. Blood levels of ET-1, MR-proADM, MR-proANP, copeptin, NT-proBNP, troponin I and function of wall strain by speckle strain echocardiography (SW) were also measured at baseline. Patients were clinically followed for the occurrence of events at 3 months of follow-up. An event was defined as death, cardiac transplantation, renal replacement therapy, or worsening of the NYHA classification. Results: Among the 22 patients, 17 (77.3%) were Group 1 and 5 (22.7%) Group 4. Mean age was 54.9±13.8 years, and 15 (68.2%) were female. The main cause of PH was IPAH (45.5%), PAH associated with asthma (31.8%) and PH secondary to connective tissue disease (18.2%). At baseline, the mean of 6MW was 319.5±124.1 meters. After 3 months of follow-up, 3 (13.6%) patients died, 1 (4.5%) underwent cardiac transplantation, 2 (9.1%) were hospitalized for decompensation, and 1 (4.5%) for worsening of the NYHA classification. Conclusion: These findings indicate that a multimarker approach adds useful information to the clinical assessment of patients with PH.
as clinical worsening requiring hospitalization. **Results:** Patients aged 54 ± 17 years, 82% were female. Most were in WHO functional class II (69%) and 32% were in class III. Mean walked distance in 6MWT was 397 ± 90m. Mean tricuspid annular systolic plan excursion was of 19 ± 6mm, systolic pulmonary arterial pressure was 82 ± 25mmHg and 3D LVEF was 58 ± 17%. During a mean follow-up of 68 days 25% of the patients (n = 5) were hospitalized due to functional worsening. Blood levels of copeptin (p < 0.05), ET-1 (p < 0.02), MR-proANP (p = 0.04), and vWF (p < 0.05) were significantly increased in hospitalized patients. Neither baseline NT-proBNP nor troponin I could discriminate patients requiring hospitalization. In a Cox regression analysis MR-proANP, vWF and MR-proADM were the only independent predictors of hospitalization. **Conclusion:** In our pivotal study MR-proANP, vWF 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. 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 multifocal 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 abdencard in 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 surgery (on pump or off pump) is highly effective and should be recommended in all cases with cardiopericardial hydatid disease except for very extensive, multivesicular disease with small cysts less 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 situations such as ventricular tachycardia and LV dysfunctin. Objectives: We had conducted surgery on end-stage sarcoidosis-induced dilated cardiomyopathy (DCM) with functional MR and retrospectively reviewed our surgical outcome. **Methods:** Consecutive 12 patients (2 males and 10 females; 57 ± 11 years) were being treated in 2 surgical centers (2 patients were operated on without referral). HOCM was being diagnosed in 4 patients. LV was the most frequently affected chambers. Echocardiographic examination was done in 10 patients. Echocardiographic Doppler was used in 9 patients. To determine the lesions of sarcoidosis, surgical ventricular restoration was performed in 9 patients (3 for posterior restoration procedure, 3 for septal anterior ventricular exclusion, and 3 for linear resection). LV incision line and ablation are being used to prevent from postoperative ventricular arrhythmia. **Results:** Ventricular arrhythmia occurred in 5 patients (ventricular arrhythmia occurred in 4 patients). Notably, LV dysfunction improved in 7 patients (5 in class II and 2 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 ± 5 vs 28 ± 7 %; n.s), severity of MR was significantly improved (5.3 ± 0.3 vs 1.0 ± 0.8; p < 0.05). LVdL was significantly decreased by operation (76 ± 10 vs 48 ± 6 mm; p < 0.05). LVdL was significantly decreased after operation (43 ± 45 vs 64 ± 40 mm/gm; p < 0.05). In emergent 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 (PAP) 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 94% (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: (1) ECG, (2) 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 ≥ 31 mmHg and MPAP ≥ 45 mmHg. Vasoreactivity test in 37, which 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 conducted, the clinical profile showed a delayed diagnosis.

**Pulmonary arterial hypertension in Argentina: insights from HINPULSAR registry**

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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. Diagnosing PE had been confirmed in all pts by spiral CT and/or 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%) 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 (9,8%) vs 5 (9,3%) 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 rules group. **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 been shown to improve diagnostic accuracy in patients presenting with symptoms suggestive of an acute coronary syndrome (ACS). However, no unequivocal data are available on the exact release kinetic 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 cardiac troponin T (TnT), hsTnT and cTnT in patients with hypertrophic obstructive cardiomyopathy (HOCM) undergoing transcoronary ablation of septal hypertrophy (TASH) as a method uniquely offering a clearly defined onset of myocardial infarction.

Methods: We analyzed the release kinetics of conventional troponin T (TnT), hsTnT, and creatine kinase (CK-MB) levels in patients with hypertrophic obstructive cardiomyopathy (HOCM) undergoing transcoronary ablation of septal hypertrophy (TASH) as a method uniquely offering a clearly defined onset of myocardial infarction. Consecutive patients (n=21) undergoing TASH were included. Plasma samples were collected prior to and at 15, 30, 45, 60, 75, 90, 105 min, and 2, 4, 8, and 24 h after myocardial infarction induction. Results: TnT levels significantly increased already at 15 min (21 ± 4 ng/L [13–39 ng/L] vs. 11 ± 3 ng/L [8–18 ng/L], P<0.003). cTnT levels had increased significantly only at 60 min 0.03 ng/ml [0.018 – 0.03] vs. <0.01 ng/ml [<0.01], P<0.01). CK-MB levels increased significantly with a constant rise over the normal upper limit at 105 min (0.05 (0.03–0.43) vs. 0.01 (0.01–0.03), P<0.01认). CK before and at 12 h after TASH differed significantly (0.05 (0.09–0.05) vs. 0.01 (0.01–0.01), P<0.01). Conclusion: hsTnT showed a first significant increase at 60 min. Thus, acute myocardial infarction can be detected significantly earlier with hsTnT compared to cTnT.


Cytostatin C: a new long-term prognostic biomarker in 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: Prospective study of consecutive patients admitted for STEMI, undergoing primary angioplasty. The primary endpoint was: death or reinfection. The prognosis of C cystatin was evaluated by the Kaplan-Meier survival curve and Cox regression, with stratification for EF (C Cox hazard ratio: 2.95, P<0.05). Conclusion: C Cystatin is useful in long-term prognostic stratification of patients with STEMI. Cystatin C greater than 0.80 mg/dL identifies the subgroup of patients with impaired EF and increased long term risk of death or reinfection.

Risk stratification for cardiogenic shock and death in patients with acute myocardial infarction using N-terminal pro-brain natriuretic peptide and creatinine kinase

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Introduction: Recent years have witnessed the increasing role of NT-proBNP as a prognostic tool in acute coronary syndromes. The present study aimed to evaluate the prognostic value of N-terminal pro-brain natriuretic peptide (NT-proBNP) in addition to known biomarkers [e.g., creatinine kinase] for predicting cardiogenic shock and death in patients with acute myocardial infarction.

Methods: A cohort of 573 patients aged 64 ± 14 hospitalized with acute myocardial infarction, NT-proBNP (Elastogel® Rocha) and creatinine kinase were measured in a serial specimen collected early after symptom onset. We used the peak biomarker concentrations within 48 hours after admission for risk stratification. NT-proBNP or creatinine kinase was categorized by its blood concentration (lower concentration, <4538 ng/L of NT-proBNP or <0.12 L/U of creatinine kinase, upper concentration, ≥ 4538 ng/L of NT-proBNP or ≥ 0.12 L/U of creatinine kinase). Results: Forty-four patients died and eighteen patients had cardiogenic shock during the 30-day period. The cardiogenic shock and death did not significantly differ in both men and women patients. An increase in both NT-proBNP and creatinine kinase was observed early after pain onset. Kaplan–Meier analysis demonstrated that individuals with increased NT-proBNP (>4538 ng/L) or creatinine kinase >592.1 ud/L of creatinine kinase showed a greater probability of death or cardiogenic shock in the following 30 days (P<0.001). In a Cox proportional hazard model adjusted for age, blood creatinine/megoglobin and neutrophil count, increased creatinine kinase and NT-proBNP remained significant risk factors (baseline quartile: adjusted odds ratio, 3.09 or 2.11; 95% confidence interval, 1.58 to 6.07 or 1.11 to 4.00; P<0.01 or P<0.022 for trend). Combining 2 biomarkers resulted in a higher likelihood ratio for death or cardiogenic shock than models restricted to single of these biomarkers.

Conclusion: Creatinine kinase and NT-proBNP are independent predictors of 30-day risk of death or cardiogenic shock in patients with acute myocardial infarction.

The additive value of baseline N-terminal pro-BNP assessment in the evaluation of patients treated with primary PCI, eligible for early discharge

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Introduction: In patients with ST-elevation myocardial infarction treated with primary PCI, the Zwolle Risk Score (ZRS) has been developed as a practical score for risk stratification to assess including MDA-LDL, polyunsaturated fatty acids (PUFAs), DGLA, AA, EPA and DHA in the day of admission or clinical visit within one month before PCI. All of them received successful PCI with an assistance of NH-MUS (Kanaco®) using an auto-pull-back unit at 1mm/s. The components of the plaque were classified into four classes; Fibrous, Fibrofatty, NC and Calcified. We analyzed 1cm width of the culprit plaque, and total volume and percentage of NC was compared between MDA-LDL, MDA-LDL/LDL-C and other risk factors by Pearson’s correlation analysis. Results: Significant relation was observed between MDA-LDL, MDA-LDL/LDL-C and APEA and volume of NC, with r value of 0.45 (P<0.01), 0.40 (P<0.01), 0.33 (P<0.04) and 0.42 (P<0.01), respectively. Other factors including total, LDL and HDL cholesterol, TG, HbA1C and renal function had no significant relation to the volume of NC. Only MDA-LDL/LDL-C ratio had a significant relation to NC with r value of 0.58 (P<0.001). No significant relation between MDA-LDL/LDL-C to APEA were found, indicating both were independent. These results suggested that relative ratio of MDA-LDL in LDL-C fraction, a indicator of oxidative stress to LDL-C, is the strongest factor influencing plaque vulnerability. Omega-6 to omega-3 ratio might be the second influencing factor. Conclusion: The ratio of both MDA-LDL/LDL-C and APEA significantly related to NC, and could indicate plaque vulnerability.
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 = 881). 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 the ZRS and baseline NT-proBNP were available. The P25 and P75 values were 60.0 pg/ml and 343.4 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 < 0.0001). On multivariate analyses, after adjusting for the ZRS, NT-proBNP independently predicted cardiac death at 30 days (ln NT-proBNP HR 2.01, 95% CI 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 a 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 primary PCI; we compared clinical outcome of 4 current treatment strategies.

Methods: Of 1191 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. ≥ 80%). Scheduled 2-stage PCI was done in 122 pts (60yrs. ≥ 78%), 114 pts (65yrs. ≥ 76%) had planned CABG and 533 pts (65yrs. ≥ 71%) had medical treatment (MT). During follow up (FU) mortality, MACCE (mortality, re-AMI, repeat revascularization, cerebrovascular accidents) and admittance for heart failure in 4 groups was evaluated. Results: In the 2-stage PCI group pts were younger (p = 0.00) and hypercholesterolemia = 0.02 was more frequent. At median follow up of 3.2yrs (9–5.5yrs) overall mortality was 9% (74/833). Mortality was 10.1% in 1-stage PCI, 4.1% in 2-stage PCI, 7% 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 1. 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.

Short and long-term major adverse cardiac events in patients undergoing percutaneous coronary intervention with stenting for acute myocardial infarction complicated by cardiogenic shock

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Introduction: Cardiogenic shock (CS) affects 5 to 10% of acute myocardial infarction (AMI) patients. Rates of mortality, although somewhat improved over recent decades in parallel to the increasing use of revascularization, remain unacceptable high. In several studies, primary percutaneous coronary intervention (PCI) with stenting has shown to be an independent predictor of improved hospital survival in AMI patients complicated by CS, but stent implantation was infrequent in these studies, which hamper the extrapolation of the results to current clinical practice. Objectives: To determine the risk of short- and long-term mortality and major adverse cardiac events (MACE) in AMI patients complicated by CS in the contemporary practice of primary PCI with routine intracoronary stenting. Methods: 1749 consecutive AMI patients undergoing PCI with stenting were enrolled, of whom 98 had CS at admission. Primary endpoints were early mortality (within thirty days after the index event) and late mortality (from day 31 to 4-years). Secondary endpoints included MACE (composite of all-cause death, AMI or target vessel revascularization (TVR), AMI, TVR and stent thrombosis at 4-year follow-up. Results: 30-day mortality was higher among CS patients when compared to patients without CS, and CS was a strong independent predictor of a higher risk of early death (adjusted HR 2.98, 95% CI 1.97–4.50). Among 30-day survivors, mortality rate was significantly higher in CS patients at four-year follow-up (Figure 1). CS was a predictor of a higher risk of death at four-year follow-up, but it did not reach statistical significance (adjusted HR 1.53, 95% CI 0.84–2.79). Recurrent AMI, TVR and stent thrombosis rates were similar between patients with and without CS (Figure 2). Patients with CS had higher incidence rates of MACE (54.0% vs. 22.3%, Log Rank p < 0.001), and this difference was mainly driven by differences in mortality. CS was not an independent predictor of a new myocardial infarction, target vessel revascularization and stent thrombosis at 4 years, but it was an independent predictor for MACE. Conclusion: Despite the benefit of PCI and stent implantation in reducing mortality, this study suggests that CS complicating AMI is still a severe clinical event, mainly with respect to a significant higher risk of early mortality, but also by bearing adverse prognostic implications with respect to mortality during longer-term follow-up in patients who survived the first 30 days.

Survival analysis of 18,521 cases after primary coronary angioplasty in the real world between 2001 and 2007 in a developing country using probabilistic databases linkage

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Introduction: Primary angioplasty has been an effective alternative to thrombolytic therapy for patients with acute myocardial infarction (AMI). However, most reported studies have been compromised by small sample sizes and short observation times, besides that they were performed in trials environment and not in the real world. Objectives: The purpose of this study was to evaluate the survival after primary angioplasty for acute myocardial infarction. Methods: We carried out a probabilistic linkage of 18,521 individual data files from all patients who underwent Primary Percutaneous Transluminal Coronary Angioplasty (PTCA) in Brazil, during the period of 2001 until 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 90.6% and specificity 100%. For univariate analysis, it was employed chi square and Student t 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 the 18,521 patients who underwent PTCA, 12,305 were male (66.4%) which were younger (59.6 years old) compared to women (63.4 years old) (p < 0.0005). The mortality rate was 14.7% for men against 17.5% for women (p < 0.0005). A Cox proportional-hazards model, adjusted for age and gender, showed a significant association between age and poor survival (hazard ratio = 1.0493, 95%CI 1.0458 to 1.0529; p < 0.003). The median time of event was 17.27 months (95%CI 17.09 to 17.45). The unadjusted survival time was 86.2% at 1 year of follow-up, decreasing progressively to 78.4% at 3.5 years.
Introduction: Response to aspirin has been reported widely variable. Elevated urinary levels of 11-dehydrothromboxane B2 (11-dHTxB2), a stable metabolite of thromboxane A2, identify patients who are resistant to aspirin. Additional antplatelet strategy should be followed for these patients. Objectives: We aimed to investigate the effect of aspirin resistance and clopidogrel loading time on clinical outcome among patients with drug eluting stents (DES).

Methods: Forty four patients (mean age 58±11, male 75%) who were already under aspirin therapy and scheduled for DES implantation enrolled to this trial. Urinary levels of 11-dHTxB2 were measured in the morning and clopidogrel was loaded. Patients were divided into two groups according to the loading time of clopidogrel (early and late loaded groups, clopidogrel was loaded more or less than 2 hours before coronary intervention, respectively). One year follow up 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) features.

Results: Obese patients have a more favorable long term outcome compared with non-obese patients. The 30-day all-cause mortality was 9.5% and it achieved 16.9% (N=55) at the end of follow-up. Mortality was significantly lower in obese patients [6.7% vs. 16.9%; hazard ratio (HR): 0.39, 95%CI 0.16–0.94; P=0.037]. In the multivariate analysis, were identified as independent prognostic risks: non-obesity (HR: 3.99, 95%CI 1.22–13.03; P=0.022), cardiogenic shock at admission (HR: 4.85, 95%CI 1.63–14.80; P=0.006), coronary multivessel disease (HR: 3.83, 95%CI 1.55–9.47; P=0.004) and LVEF below 30% (HR: 3.83, 95%CI 1.55–9.47; P<0.001) 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) characteristics. Results: In the studied population, 33.7% were obese, 66% had hypertension, 31.3% were diabetics, 37.5% 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 [6.7% vs. 16.9%; hazard ratio (HR): 0.39, 95%CI 0.16–0.94; P=0.037]. In the multivariate analysis, were identified as independent prognostic risks: non-obesity (HR: 3.99, 95%CI 1.22–13.03; P=0.022), cardiogenic shock at admission (HR: 4.85, 95%CI 1.63–14.80; P=0.006), coronary multivessel disease (HR: 3.83, 95%CI 1.55–9.47; P=0.004) and LVEF below 30% (HR: 3.83, 95%CI 1.55–9.47; P<0.001).

Conclusion: 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.

Methods: 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) characteristics.

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Conclusion: Does obesity influence the clinical outcome in primary PCI?
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 without 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, and 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 ratios of 1.91 (1.05 – 3.53, p = 0.026) and 1.08 (1.00 – 1.16, p = 0.028) at 30 days and 31 days to 12 months, respectively. 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.

Conclusion: Patients with both diabetes and anemia have a significantly higher mortality than those with either diabetes or anemia alone. Anemia remained independent risk factors for mortality with odds ratios of 1.91 (1.05 – 3.53, p = 0.026) and 1.08 (1.00 – 1.16, p = 0.028) at 30 days and 31 days to 12 months, respectively. Anemia remained independent risk factors for mortality with odds ratios of 1.91 (1.05 – 3.53, p = 0.026) and 1.08 (1.00 – 1.16, p = 0.028) at 30 days and 31 days to 12 months, respectively. Anemia remained independent risk factors for mortality with odds ratios of 1.91 (1.05 – 3.53, p = 0.026) and 1.08 (1.00 – 1.16, p = 0.028) at 30 days and 31 days to 12 months, respectively. Anemia remained independent risk factors for mortality with odds ratios of 1.91 (1.05 – 3.53, p = 0.026) and 1.08 (1.00 – 1.16, p = 0.028) at 30 days and 31 days to 12 months, respectively.
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.

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

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Introduction: There is a lack of 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 infract size were higher in Gypsy group (p = 0.0241). There were more VF (p = 0.0116) and AV block rhythm disturbances (p = 0.0039) in Control group of pts, ln-hospital mortality was similar (p = 0.367). Approximately 2 years after discharge, Gypsy pts had more new coronary events (p = 0.0248), heart failure (p = 0.0369), reinfarction (p = 0.0155), 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 = 0.0088), smoking (p = 0.0024) and age (p = 0.0342) were independent predictors of survival. Use of digitalis and diuretics, together with previous angina influenced on survival too (p = 0.0162) as well as male gender, older pts and diabetes together (p = 0.0366). Conclusion: Gypsy patients with AMI had bigger infract and more reinfarction, heart failure, angina and deaths. Previous angina, diabetes, smoking and age undeniable as well as use of digitalis, diuretic and angina 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 and prevalence, mortality and loss of disability adjusted years lived (DALY) for 21 world regions by age and sex from 1990 and 2005. Methods: The study is a part of the Global Burden of Disease Program and is based on a systematic review of the world literature. We searched MEDLINE (1966-2007), EMBASE (1980-2007), AMED (1985-2007), CANMED (1982-2002) and LILACS (2008-) using epidemiological and clinical sequelae terms. Studies were excluded if minimum criteria of population representativeness and methods of measurement were not met. Data were extracted from papers, checked independently, and statistical analyses performed using standard DISMOD programs. Results: Seventy 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 epidemiologic transition of peripheral artery diseases has been largely ignored. This study provides some estimates of burden which will be usefull 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. Image/graph 1:

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.

Atorvastatin improves endothelial function independently of metabolic and inflammatory status in patients with a cerebrovascular event

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Introduction: Statin treatment has emerged as a first-line therapy for primary and secondary stroke prevention because of its beneficial effects on cholesterol levels and on vascular inflammation. Both these effects are associated with a significant improvement of endothelial function, which can help to explain the long-term reduction of clinical events related to statin use. However, the impact of statin treatment on endothelial function in patients with an acute cerebrovascular event (CVE) has poorly been investigated. Objectives: To assess the effect of statin treatment on endothelial function in patients with an acute CVE. Methods: We studied 29 consecutive patients (age 67 < = 12, 17 M admitted to the Stroke Unit of our hospital with a diagnosis of an ischemic CVE (transient ischemic attack or minor ischemic stroke), who were divided in two groups: those treated with atorvastatin 40 mg or atorvastatin 20 mg daily. FMD assessment was repeated at 3-month follow-up. Results: FMD showed significant improvement at follow-up both in patients treated with atorvastatin 40 mg (5.24% < = 2.4% vs. 7.21% < = 3.8%) and in those treated with atorvastatin 20 mg (3.79% < = 1.1% to 5.96% < = 2.8%, p = 0.86 for changes vs. atorvastatin 40 mg). FMD on admission was lower in patients with CRP levels ≥ 3 mg/dL than in those with CRP values < 3 mg/dL (2.8% < = 3.7% vs. 5.71% < = 2.9%, p < 0.01), whereas it was similar in patients with cholesterol levels ≥ 200 mg/dL and in those with cholesterol levels < 200 mg/dL (2.5% < = 2.7% vs. 2.6% < = 2.4%, p = 0.86). Conclusion: Our results show that early statin administration after a CVE results in a significant improvement of endothelial function at short-term follow-up. This effect was independent of cholesterol serum levels and inflammation status, thus suggesting that other factors contribute to their pharmacological effect.
Apollipoprotein 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 of coronary artery disease and stroke. Apollipoprotein A5 (ApoA5) gene polymorphism may contribute to dyslipidemia 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. Methods: A total of 184 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 differences between stroke patients and control group (p < 0.01). The –1131C allele was significantly higher in ischemic stroke patients than in healthy subjects (44.1% vs 33.2%, P < 0.01). C carriers got higher TG levels than that of non-C carriers (1.73 ± 1.50 mmol/L vs 1.36 ± 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 still associated significantly with ischemic stroke (OR 1.09, 95%CI 1.05–1.532, P = 0.032). 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 (87–72 kg), the multicool sampler was positioned to isolate the right or left common carotid artery. Blood was withdrawn from the artery via one lumen, cooled extra corporeally, 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 20–180 minutes, while lying on a heated circulating water blanket and covered with heated blankets. Two burr holes allowed access to thermists 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 directly to the cerebral cortex. Results: The animals could be cooled 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 (87–72 kg), the multicool sampler was positioned to isolate the right or left common carotid artery. Blood was withdrawn from the artery via one lumen, cooled extra corporeally, 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 20–180 minutes, while lying on a heated circulating water blanket and covered with heated blankets. Two burr holes allowed access to thermists 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 directly to the cerebral cortex. Results: The animals could be cooled rapidly and deeply without serious detrimental effects. Treatment and control rates we performed at eleven medium sized cities in India using cluster sampler (n = 6516 subjects and men 2727) were evaluated for demographic, biophysical and biochemical risk factors using uniform protocol. Descriptive statistics are presented. Logistic regression was performed to determine association of hypertension and its awareness, treatment and control with socioeconomic factors. Results: Hypertension prevalence (known or BP <140/90 mm Hg) was in 31.5% (age-adjusted n = 1957) (men 32.5%, women 30.4%). Significant Determinants of hypertension were male sex, high dietary fat, low physical activity, obesity and trunch obesity (p < 0.01). Hypertension awareness was in 56.9%, more in women (59.3%) as compared to men (55.1%). Of these, 77.4% were on treatment, and of those treated controlled BP (<140 and <90 mm Hg) was in 41.5%. Among hypertensive subjects, treatment was in 43.9% (men 42.4%, women 44.4%) and control in 25.3% (men 24.3, women 26.3%). On multivariate analysis male sex and better educational status were associated with better awareness, treatment and control (p < 0.01). Conclusion: There is high prevalence hypertension in urban Indian subjects. There is low awareness and treatment and control rates are very low. Better education is associated with better awareness, treatment and control.
Hypertensive heart failure in Nigerians: insights from the Abeokuta heart failure registry

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Introduction: Hypertensive heart failure is the commonest cardiovascular disease in Nigeria and the foundation of heart disease in the country. It is also the commonest risk factor for heart failure, chronic renal failure and stroke. A detailed clinical and echocardiographic 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 demographic 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 years range 22–85) vs (68.1±15.1) years range 32–85. The mean SBP was 138.3±69.9 and DBP 83.9±19.0. There is associated diabetes mellitus in 8 subjects, COPD in 4, stroke in 3 and renal insufficiency in 7 subjects. The mean LA diameter, LVID in systole and LV ejection function were 4.6cm, 4.7cm and 35.2% respectively. There was associated degenerative AVD in 16 (8.1%) and MVD in 21 (10.7%), MR in 12 (6.1%), AR in 19 (9.6%), and AI in 24 (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: Hypertensive is the foundation of heart disease in the country. Most present in their prime of life with severe HF, secondary valvular insufficiency and significant readmission rate within six months after discharge from hospital.

References:

Knowledge and attitude of general medical practitioners regarding diagnosis and treatment of hypertensive heart failure in a Nigerian city

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Introduction: Hypertension is highly prevalent in sub-Saharan Africa. It is also known to underlie many of the fatal and non-fatal cardiovascular events in this region. Objectives: To examine the level of knowledge of the diagnosis and treatment of hypertension by primary care physicians in urban Nigeria. Methods: A cross sectional survey of general medical practitioners in Lagos Mainland was undertaken in the months of July and August 2011, using self examination methods. Results: There were 46 respondents, 65.2% of whom were men and the bulk of the subjects, 39.1% were in the 30–39 years age range. Duration since graduation of 0–5 years, 41.3% and ≥7years, 23.9% had the highest respondents. The bulk of the respondents, 91.3% were aware of the existence of guidelines on hypertension but only 54.3% were familiar with the details of any guideline. Majority, 95.7% agreed to the usefulness of guidelines and correctly identified cut off values for hypertension. All agreed to the need of referral of complicated cases to hypertension experts and all but one (99.6%) agreed to the usefulness of guidelines and correctly identified cut off values for hypertension. Exposure to alcohol in popular Bollywood movies and its impact on alcohol use among urban Indian adolescents

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Introduction: Prevalence of alcohol use has increased from 2% to more than 14% among youth under 21 years in India over the past 15 years. Studies from developed countries suggest that exposure to alcohol use depictions in Hollywood movies are associated with alcohol use among adolescents. Objectives: To determine whether Indian adolescents are exposed to alcohol use in Bollywood movies and whether such exposure is associated with alcohol use among them. Methods: A cross-sectional sample of 3956 adolescents (eighth and ninth grades, ages 12–16 years) from 12 randomly selected New Delhi schools was surveyed in 2009, assessing alcohol use status, and exposure to alcohol use in movies. Quartiles of exposure to alcohol use in popular Bollywood movies released from 2006–2008 (n=59) were determined by content coding them for alcohol use and querying the adolescents whether they had seen each movie. Logistic regression was used to control for covariates including age, gender, school performance, sensation-seeking propensity, family and peer alcohol use, and authoritative parenting. Results: Overall prevalence of ever use of alcohol among the students was 10.11% (95% CI 9.15–11.07). Mean exposure of alcohol among students from the 59 movies was 1022 (median =1047, inter-quartile range 730–1353). Students who were in the fourth quartile of exposure were 2.78 times more likely (95% CI 2.02–3.84) to consume alcohol as compared to those in first quartile. When demographic, variables, social influences and characteristics of child & parenting were adjusted, the odd ratio changed to 1.49 (95% CI 1.02–2.18). Among 1351 students who failed to respond to one or more movie questions were removed from the analyses to account for the missing data, this relation was still significant (OR 1.90, 95% CI 1.23–3.08).

Image/graph I: 

Table: Association of ever alcohol use with exposure to alcohol consumption in movies among Indian students (n=3956).

<table>
<thead>
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<th>Quartiles</th>
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<td>1st quartile</td>
<td>1.19 (0.22–7.11)</td>
<td>1.56* (1.92–22.11)</td>
<td>0.98 (0.40–2.37)</td>
<td>0.96 (0.33–2.15)</td>
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<td>2nd quartile</td>
<td>2.03* (1.45–2.81)</td>
<td>1.89* (1.31–2.72)</td>
<td>1.44 (1.00–2.01)</td>
<td>1.37 (1.00–1.90)</td>
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<td>3rd quartile</td>
<td>2.70* (1.84–4.01)</td>
<td>1.75* (1.00–2.76)</td>
<td>1.65* (1.04–2.60)</td>
<td>1.49* (1.12–2.44)</td>
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Kähkö towards healthy eating and living an active lifestyle. Methods: We conducted a cluster, randomized, controlled trial, and randomly assigned 14 PF in Colombia to a five month educational and playful intervention (7 PF) to or usual curriculum (7 PF). The intervention included classroom activities and use of printed material (books, posters, teacher’s guides, games) and videos. A total of 1216 pre-school children 3 to 5 years of age, 928 parents, and 120 teachers participated. A structured survey was used at baseline and end of study to evaluate changes in KÄH. The authors a priori gave differential weights to KÄH scores to compose a weighted total score (WTS). Change in children’s WTS was the primary outcome and the secondary outcomes was the change in parents and teachers’ WTS. The control PF was provided with the intervention after the initial 5 month study ended. To assess longer change of the study population we again evaluated them 12 months after the intervention ended. Results: Initially, children in the intervention group showed 10.9% increase in WTS compared to only 5.3% in controls. The absolute difference was 3.90 units (p<0.001), after adjustment for cluster, sex, age and teachers’ educational level. Amongst parents, the equivalent statistics were 5.89 and 3.1% respectively, (adjusted difference 4.08 units: p<0.001) and amongst teachers 9.4% and 2.5% , (absolute difference 5.36 units; p<0.06). One year after the intervention, the group children showed a significant increase in WTS, absolute difference of 6.38 units. p<0.001 and 10.3 units, p<0.001 respectively. Conclusion: A preschool based intervention, aimed at changing KÄH related to healthy diet and active lifestyle, is feasible, efficacious and sustainable up to one year in very young children, parents and teachers. Preschool programs are feasible, as they reach virtually all children at a relatively low cost with existing infrastructure.

A randomized preschool trial to promote cardiovascular health in Colombia: 12 month follow up

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Introduction: School programs can be effective in reducing the burden of diseases associated with sedentary lifestyles. As part of long-term research strategy we conducted an educational intervention in preschool facilities (PF) in an economically underprivileged community in Colombia. Objectives: To assess changes in preschooler’s knowledge, attitudes and habits
Conclusion: Advertising of alcohol is completely banned in all media and scenes which have the effect of justifying or glorifying drinking are not to 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 to 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 Abu Dhabi (n=312) to study the prevalence of vitamin D deficiency among adolescents in UAE. Participants were recruited from 10 public and private schools in Abu Dhabi Emirate. Blood samples were collected following an overnight fast. Serum 25(OH)D levels were determined using the high-performance liquid chromatography. Statistical analysis was performed using the Statistical Package for Social Science (SPSS 16.0) for Microsoft Window. Results: Of the 312 participants, 253 (81%) were females. The prevalence of vitamin D deficiency (serum 25(OH)D levels <30 ng/mL) was 51.8% in all participants and 57.7% in females. In a multiple logistic regression analysis, female gender (OR: 1.93, p=0.01), high body mass index (BMI) (OR: 2.15, p<0.01), and physical activity level (OR: 1.84, p=0.01) were found to be significantly associated with vitamin D deficiency. Conclusion: Substantial number of adolescents, females in particular, have 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 - 98% registrants were female Of the six goals available 50% registrants chose the ‘Be active every day goal 27.5% chose ‘Improving every day nutrition’ 5.6% chose ‘Increasing knowledge of heart health’ 1.8% 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. 54.9, p<0.01), had higher prevalence of diabetes (59% 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=0.004) compared with men (67% vs. 33%, p=0.05). A trend of insignificant higher in-hospital mortality was observed in women than men (4.9% vs. 3.0%, p=0.17). The use of aspirin (95% vs. 96%), beta blockers (55% vs. 58%), ACE/angiotensin II inhibitors (40% vs. 44%), and statins (66% vs. 81%) was similar in women and men (p=NS), but women received less clopidogrel (58.7% vs. 66.2%, p<0.0002), and less glycoprotein IIb/IIIa inhibitors (12.9% vs. 41.6%, p<0.0001). Despite using reperfusion for STEMI in the majority of men and women (>80%), the rate of utilization was less in women than in men (80% vs. 89%, p<0.001) including less primary coronary intervention procedures (21% vs. 44%, p<0.001). Women had less overall use of percutaneous revasularization during index hospitalization than men (51% vs. 64%, p=0.022) but had similar rates of utilizing coronary bypass surgery (6.2% vs. 7.3%, p=0.32). 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 revasularization 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 adiposity1 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

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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 group 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 regardless of 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:***

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**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 elastic 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 13.3%. 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 its 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.

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**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 were opened across the Russian Federation. Each HC, equipped equally, provides preventive service for 200 thousands of population on free of charge basis. **Methods:** The standard health status study in the HC includes measurement of height, weight (body mass index), ankle brachial index, total cholesterol and glucose, spirometry, determination of CO in the exhaled air, 2 leads electrocardiogram, prophylactic dental examination and ophthalmometry. Based on the results of the standard health status study visitors of HCs are given personal recommendations on lifestyle modification. HCs provide educational programs and supervised exercise training. **Results:** In 2010–2011 more than 2.5 million people have visited HCs. Less than 500 000 who came for a visit were considered to be healthy. Hypertension was diagnosed in 60 % (prevalence of hypertension in population is about 45%), 68% of I´Cs visitors were overweight, 58% has low level of physical activity, 45% - hypercholesterolemia, 2% - hyperglycemia. These data correspond with the results of previous epidemiologic studies. 92 % of smokers who have visited HCs are willing to quit smoking. **Conclusion:** The algorithm of health status study in CHs aimed to identify risk factors of NCDs is highly effective. The methodology of risk factors reduction need further improvement.

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**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 practising in Bangladesh. However involvement of cardiologists in tobacco control was not strong.

Objectives: National Heart Foundation of Bangladesh (NHFF), a non-profit organization led by cardiologists, took an initiative to form a network of physicians for tobacco control. Methods: NHFF has been involved in providing modern cardiac care as well as taking program for prevention of CVD. The leaderships 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: NHFF 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 Honorable 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 NHFF. 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. Methods: The figures referred to in this presentation reflect the information and data reported by the Parties. The analysis was prepared by using an analytical software which allows and stores retrieved information from a database of Parties’ reports. The information available can be presented by Party, WHO region, article of the Convention and indicators deriving from each article of the treaty. Results: The presentation will be based on the information from the Parties’ reports received by early 2012. Conclusion: Conclusions on overall progress, challenges and opportunities will be based on the analysis of Parties’ reports received by early 2012.

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 steps 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 leisure-time physical activity was investigated using multivariable ordinal logistic 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 63.3% 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=0.83 psychosocial, p=0.62 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 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 cardio-vascular disease (CVD) mortality, adjusted for 10 confounders, were calculated. Results: Smokers were
found to exercise less (22.9%) than ex-smokers (37.4%) and non-smokers (24.2%). When compared to inactive smokers, low-active or active smokers had significantly lower CVD mortality risk, 0.85 (0.68–1.06) and 0.66 (0.54–0.79) respectively. If smokers quit, their all-cause mortality risks further decreased to 0.53 (0.43–0.66) for active ex-smokers. For ischemic heart disease and stroke mortality, physical activity and quit smoking can also significantly lower the mortality risk.

**Image/graph 1:**

**Conclusion:** Physical activity reduced mortality risks of smokers for CVD, including ischemic heart disease and stroke, by 34%, by 46% and by 27%, respectively, in contrast to quitting smoking by ex-smokers, 47%, 49% and 51%. In addition, increasing exercise made smokers more likely to quit, resulting in ex-smokers, with a major reduction in mortality.

**References:**

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; 20–84 y; mean 48 y) and 2,316 with diabetes mellitus (DM; 21–99 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.

**Image/graph 1:**

**Conclusion:** 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 (0.68–2.76) 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.

School based physical activity program in adolescent girls (9–11 years); a feasibility trial in Karachi, Pakistan

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**Introduction:** Rates of childhood obesity are rising globally including in Pakistan. Effective strategies to combat this problem are challenging in developing country settings, especially among girls with cultural barriers. Objectives: We conducted a pilot cluster trial of a school-based physical activity program delivered during regular school time to adolescent girls to determine the feasibility of recruitment and retention of students in a school environment in Karachi Methods: This two arm parallel cluster intervention trial (Clinical trial ID NCT 00533819) was conducted in 4 public sector schools in Karachi over a 24 weeks period. All girls aged 9–11 years were included. The intervention was physical activity program of 30 minutes duration 4-times a week, for a period of 20 weeks, delivered by expert physical trainers Results: A total of 360 participants and their parents were invited to participate, 338 girls were eligible, mean (SD) age was 10.2(1.1) years. The recruitment rate n (%) (Enrolled out of all invited) was 276(76.6) [146(81.1) in intervention arm and (130(72.2) in control arm]. At follow-up of 20 weeks retention rate of participants was 232(84); (123(84.2) in intervention arm and (109(83.8) in the control arm.

**Conclusion:** School based physical activity program inclusive of a variety of activities in public sector girls’ school of urban Pakistan is feasible and culturally acceptable with good recruitment and retention rate A larger trial to assess the impact of such interventions on clinical outcomes should now be planned.
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 cross sectional surveys (random Computer Assisted Telephone Interviews (CATI) baseline and post-test) and self-reporting campaign media waves. 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 size, eat less sugar, eat less fat, be more active and sit less. Impact evaluation included baseline and post-campaign wave cross-sectional telephone surveys of WA adults conducted from January 2009 to March 2011. Results: Campaign awareness was high at 62.9% at Post 1, decreasing to 57.9% at Post 2, 55.5% at Post 3 and increasing back to 63.8% at Post 4. A decrease in media presence is reflected in lower levels of awareness at Post 2 and Post 3. Among those aware of the campaign, a high level of comprehension and acceptance of the campaign message was achieved. Overall females were 1.8 times more likely to be aware of the campaign than males. The cues to action promoted in the campaign are reflected in the reasonably high rates of intention (31.4% at Post 4) and action (21.4% at Post 4) reported after seeing the campaign advertising. Conclusion: Results indicate that this inter-agency healthy weight campaign resonates with the target audience and has been successful in motivating some behaviour change. Future interventions should aim to strengthen aspects that encourage trial and adoption of healthy weight related behaviours and focus on reaching males. This research adds to the developing international body of evidence regarding the effectiveness of health campaign interventions.

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 and/or increased health problem were selected. When all the 14 studies with a total of 2532 persons were combined, the overall prevalence of dyslipidaemia was 32.66% (95% confidence interval [CI] 20.95 – 47.03%). The prevalence of dyslipidaemia was higher among those with IHD (544/1165; 46.7%) than among those with stroke (79/383; 20.6%) (Odds Ratio (OR) 3.37; 95% CI 2.57– 4.53; p<0.0001) and lower levels for baseline). When compared with rosuvastatin, those subjects treated with simvastatin plus ezetimibe had lower level for CAMPESTEROL (p<0.01 vs. baseline), and decreased campesterol and sitosterol/desmosterol ratios at the end of study (p<0.003). Both therapies similarly decreased total cholesterol, LDL-cholesterol, triglycerides and apolipoprotein B (p<0.0001 vs. baseline), increased apolipoprotein A1 (p<0.02 vs. baseline), and did not modify HDL-cholesterol. However, treatment with simvastatin plus ezetimibe increased desmosterol (p<0.01 vs. baseline), and decreased campesterol and β-sitosterol plasma levels (p<0.001 for both vs. baseline). When compared with rosuvastatin, those subjects treated with simvastatin plus ezetimibe had lower level for campesterol and β-sitosterol (p<0.001 for both). Simvastatin plus ezetimibe decreased campesterol/desmosterol and β-sitosterol/desmosterol ratios at the end of study (p<0.001 vs. baseline for both), and these ratios were not modified by treatment with rosuvastatin. Conclusion: When combined with ezetimibe, simvastatin was insufficient to avert the increase in endogenous cholesterol synthesis. Differences in cholesterol homeostasis between these strategies may account for some unexpected results of the combined therapy on cardiovascular disease prevention.

Burden of dyslipidemia in hospitalized patients with cardiovascular disease in Sub-Saharan Africa: a systematic review
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Introduction: Dyslipidaemia has been recognized as a major risk factor for Cardiovascular Diseases (CVD), but its clinic (CAF) at baseline and for a series of post-test surveys was not established. Objectives: Primarily to conduct a systematic review of published studies to determine the prevalence of dyslipidaemia among hospitalised adult patients with CVD in SSA. We also aimed at comparing the burden of dyslipidaemia between the various CVD types in SSA. Methods: We searched Medline, Cochrane and Google Scholar Databases, as well as books and peer-reviewed articles. Literature searches included all studies on dyslipidaemia among hospitalized adult patients with established CVD in SSA, up to May 2011. Studies reporting data on dyslipidaemia or hypercholesterolaemia and established CVD, defined as ischemic heart disease (IHD), heart failure (HF), stroke or chronic kidney disease (CKD) were included in the systematic review. We then performed either random-effects or fixed-effects meta-analysis based on presence of heterogeneity as assessed by the Q-test. Results: A total of 420 studies were screened, and 14 were eventually selected. When all the 14 studies with a total of 2532 persons were combined, the overall prevalence of dyslipidaemia was 32.66% (95% confidence interval [CI] 20.95 – 47.03%). The prevalence of dyslipidaemia was higher among those with IHD (544/1165; 46.7%) than among those with stroke (79/383; 20.6%) (Odds Ratio (OR) 3.37; 95% CI 2.57– 4.53; p<0.0001) and lower levels for baseline (p<0.0001). The prevalence was also higher among stroke patients than among those with heart failure (OR=1.99; 95% CI=1.36– 1.36; p<0.0001). The two studies on CVD were excluded from further analysis because of relatively small sample sizes (total population=99 subjects; prevalence of dyslipidaemia=54.55%). Conclusion: Prevalence of dyslipidaemia was high in hospitalised adult patients with established CVD relative to the estimated prevalence in the general population in Africa. The burden in SSA was highest in patients with IHD, followed by those with stroke and HF.

Comparison between two highly effective lipid-lowering therapies on markers of cholesterol synthesis and absorption
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Introduction: Highly effective statin therapy is related to marked reduction on cardiovascular events. However, the impact of similar LDL-cholesterol levels achieved by combined lipid-lowering therapy on cardiovascular events is not established. Objectives: The study aimed to compare the effects of two equally effective lipid-lowering strategies on markers of cholesterol synthesis and absorption. Methods: A prospective, open-label, randomized, parallel design study, with blinded endpoints, included 116 subjects. The effects of rosuvastatin 40 mg or the combination of simvastatin 40 mg with ezetimibe 10 mg, given daily for 12 weeks were compared on two markers of cholesterol absorption (campesterol and β-sitosterol) and one marker of endogenous cholesterol synthesis (desmosterol). Results: Both therapies similarly decreased total cholesterol, LDL-cholesterol, triglycerides and apolipoprotein B (p<0.0001 vs. baseline), and increased apolipoprotein A1 (p<0.02 vs. baseline), and did not modify HDL-cholesterol. However, treatment with simvastatin plus ezetimibe decreased desmosterol (p<0.01 vs. baseline), and decreased campesterol and β-sitosterol plasma levels (p<0.001 for both vs. baseline). When compared with rosuvastatin, those subjects treated with simvastatin plus ezetimibe had lower level for campesterol and β-sitosterol (p<0.001 for both). Simvastatin plus ezetimibe decreased campesterol/desmosterol and β-sitosterol/desmosterol ratios at the end of study (p<0.001 vs. baseline for both), and these ratios were not modified by treatment with rosuvastatin. Conclusion: When combined with ezetimibe, simvastatin was insufficient to avert the increase in endogenous cholesterol synthesis. Differences in cholesterol homeostasis between these strategies may account for some unexpected results of the combined therapy on cardiovascular disease prevention.

High prevalence and low awareness and treatment of lipid abnormalities in urban Asian Indian subjects
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Introduction: Lipid abnormalities are the most important cardiovascular risk factor. Objectives: To identify presence of various lipid abnormalities and their awareness and treatment in urban Indian subjects we performed a national study. Methods was performed present among males and women ≥20 years were performed at eleven medium sized cities in India using cluster sampling. In the study, 6198 subjects (men 3426, women 2772) were evaluated for demographic, biophysical and biochemical risk factors using uniform protocol. Fasting lipids were established at an accredited central laboratory. Criteria for diagnosis of high cholesterol was ≥200 mg/dl, high LDL cholesterol ≥100 and ≥130 mg/dl, low HDL cholesterol <40 mg/dl and triglycerides ≥150 mg/dl. Descriptive statistics are presented. Results: Age-adjusted mean lipoprotein cholesterol levels in men and women respectively were 166±39 mg/dl and 106±33 mg/dl, HDL cholesterol 103±33 and 106±33 mg/dl, HDL cholesterol 45±11 and 51±11 mg/dl and triglycerides 163±82 and 144±83 mg/dl. There was significant age-associated increase in total and LDL cholesterol and triglycerides while HDL cholesterol levels declined (ANOVA p<0.001). Age-adjusted prevalence of lipid abnormalities in men and women show that the most prevalent dyslipidemias were high LDL cholesterol ≥100 mg/dl (men 37.4, women 48.5, total 42.4%), high triglycerides (men 44.1, women 31.8, total 38.5%) and low HDL cholesterol (men 33.6, women 34.7, total 34.1%).
women 35.1, total 34.3%). Hypertencholesterolemia was in 26.2% subjects (men 27.1, women 26.1%), of these overweight in only 15.9% (men 17.7, women 13.8) and treatment in 7.3% (men 7.5, women 7.0). Conclusion: There is high prevalence of atherogenic dyslipidemias in urban Asian Indians. Very low awareness and treatment rates are observed.

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 relationship with coronary artery disease has not been established conclusively. Objectives: The objective of this study was to find out if there is any correlation between Lp(a) levels and the extent of angiographically documented coronary artery disease (CAD) in Asian Indians. Methods: 937 patients who underwent coronary angiogram at Jayadeva Institute of Cardiovascular Sciences and Research, Bangalore, India were classified into 4 groups (absent/significant CAD, Single vessel disease, Double vessel disease and Triple vessel disease) based on the number of coronary arteries with ≥75% narrowing. Data regarding all 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=278 pts) 47.1 (54.7) mg/dl, Group 1 (N=240) 53.1 (57), Group 2 (N=210) 57.3 (41), Group 3 (N=106) 66.9 (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) protects against Ang II–induced cardiac fibrosis, however, the underlied 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 developed more severe cardiac fibrosis and inflammation compared to that of the WT mice, demonstrated as up-regulation of collagen I, α-smooth muscle actin,LC3 and TNF-α and increased mRNA expression levels of inflammatory cytokines including IL-1β, IL-6, IL-8. In contrast, APN-induced autophagy and anti-inflammatory cytokine expression were diminished in macrophages isolated from ATG5 knockout mice or treated by Compound C, an inhibitor of AMPK. Conclusion: Our study indicates that APN activates macrophages autophagy through AMPK signaling pathway and suppresses Ang II-induced inflammatory response, thereby leading to reduced cardiac fibrosis.

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 included in 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 I² statistic. Results: In 5 trials including 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<0.0001) but no difference with other antihypertensives (ARBs, CCBs, b-blockers and diuretics) (n=220) versus placebo (n=216) with insignificant heterogeneity (I²=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<0.0007, I²=68%, p for heterogeneity<0.0001). In 6 trials, treatment with ACEIs significantly reduced AIx when compared with other antihypertensives (ARBs, CCBs, b-blockers and diuretics) (n=220) versus placebo (n=216) with insignificant heterogeneity (pooled mean change difference -3.81%, 95% CI. -6.0, -1.61, p=0.0007, F=0.25%, p for heterogeneity<0.19). Mean BP differences between baseline and end of treatment did not predict the treatment (ACEI) induced changes in PWV (Systolic BP, n=12, beta=-0.13, p=0.17 and diastolic BP, n=12, beta=-0.37, p=0.03) and changes in AIx (Systolic BP, n=7, beta=-1.0, I²=0.18 and diastolic BP, n=6, beta=-1.05, p=0.01). 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. Elastotic cytosine proteases, including cathespin 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–induced aortic aneurysm formation in mice. Methods: AAs were induced in apolipoprotein E (ApoE) and Cat S compound mutant (ApoE–/– Cat S–/–) mice and ApoE–/– 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-parametric 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 advanced vascular remodeling. 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 data provide direct evidence that cysteiny1 cathepsin S plays an important role in AAA formation and suggest that Cat S is a new target for human AAA.

Grelmin 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 are 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 control, C57/Bl6, were fed with regular (low fat) or western (fat) diet for 8 and 16 weeks. After that, animals were sacrificed, aortas 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, Verhoff and Oil-reds. Immunohistochemistry (IHC) for Gremlin 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 had already accumulated in cultured VSMC 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 Systemic Lupus Erythematosus (SLE) or Primary Antiphospholipid Syndrome (PAPS) without other Coroary Artery Disease (CAD) risk factors by 13N-ammonia PET. 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 pharmacochemical stress) 13N-Ammonia PET on a 6 slice PET/CT scanner. Endothelial dysfunction was evaluated with Myocardial Blood Flow Quantification (MBF, mL/g/min) from the Dynamic images, the Endothelium-dependent Vasodilation Index (ENDEVI, CPT MBF/rest MBF, normal = 1.5, %ΔMBF (normal) = 50%) and Coronary Flow Reserve (CFR, stress MBF/rest MBF, normal = 2.5) were calculated as Endothelial function parameters. Coronary 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 ENDEVI (1.18 ± 0.55 vs 1.55 ± 0.37, p = 0.015), %ΔMBF (18.5 ± 43 vs 55 ± 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 14/34 patients (41%) 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 or 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
risk of developing CAD from the earliest stages of the disease and intervene before the development of overt myocardial ischemia.

Positron emission tomography myocardial perfusion imaging in heart transplant recipients can predict long term prognosis

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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 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.

Cardiac scintigraphy fails to identify patients with single-vessel coronary artery disease and end-stage renal disease: potential impact on cardiovascular morbidity

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Introduction: Patients (pt) with end-stage renal disease (ESRD) are at increased risk for CAD and major adverse cardiovascular events. Cardiac scintigraphy is regarded as a non-invasive, useful screening tool for risk stratification and to exclude significant CAD in the general population. Invasive coronary angiography is usually performed following a positive result in the non-invasive assessment. Objectives: To determine the accuracy of such approach in pt with ESRD being considered as renal transplant candidates. Methods: 482 pt with ESRD (56±9 years; 69% men) underwent cardiac scintigraphy (99mTc MIBI-SPECT with dipyridamole) and coronary angiography, regardless of symptoms. Myocardial perfusion scans were categorized as normal or abnormal (fixed and/or transient perfusion defects); significant CAD was defined by visual 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.

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 radioisotope in a segment that did not
appears in the previous study and negative when no change in uptake between both studies existed. We conducted a follow-up of 67 months and analyzed the following cardiovascular events: cardiac death, nonfatal myocardial infarction, myocardial revascularization procedures in p who were admitted with a diagnosis of unstable angina. 87.6% (p) were followed up to 87 months. The mean follow-up was 40 months. The mean age was 59 ± 10 years with a male prevalence of 55%. Risk factors were: diabetes 12%, positive family history 56%, dyslipidemia 71%, hypertension 63%, Obesity 24% and current smokers 21%. Results: 38.2% of (p) had a positive CPT, 3.4 % did not tolerate the CPT and 2.7% had to suspend the study due to a vasal reaction. The male subjects and hypertensive p were more likely to have a positive CPT. Through-out the 67 months follow-up we observed event-free survival of 98% and 90% in the groups of a negative CPT and positive respectively (P<0.0001). If we consider only the incidence of hard events (cardiac death and nonfatal myocardial infarction) event-free survival in p with negative CPT was 99% as there were two cardiovascular events after thirty months follow up while in individuals with positive CPT was 95.5% due to seven events (P<0.02).

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.

2017

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

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Introduction: Pre-test probability of coronary artery disease (CAD) from clinical information is important for assessing diagnosis 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 undergone 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, familial history and body mass index; low / intermediate pre-test probability = 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, coronary revascularization and congestive heart failure requiring hospitalization. Results: Cardiovascular events occurred in 37 of 328 patients (11.3%). Among patients with intermediate pre-test probability (11% vs. 13%, p = 0.71). In univariate Cox regression analysis, peripheral artery disease, diabetes, CKD, pharmacological stress test results and parameters of stress MPI were significant predictors of cardiovascular events. In multivariate Cox regression analysis, only CKD (Hazard ratio = 2.2, P = 0.044) and summed stress score > 3 of stress MPI (Hazard ratio = 13, P = 0.001) were independent and significant predictors for cardiovascular events. Conclusions: CKD and stress MPI are independent predictors of cardiovascular events from pretest probability of CAD in patients with no history of CAD.

2018

National pediatric cardiology quality improvement collaborative improves care of infants between stage 1 and 2 surgery for HLHS

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Objectives: The National Pediatric Cardiology Quality Improvement Collaborative (NPC-QIC) uses formal quality improvement methods and a registry database to collect longitudinal care process and outcomes data, with a goal of identifying best practices and strategies for “best” practices have been identified and shared, and centers are now focusing to reduce mortality by 50%, reduce admissions by 50% and increase number of infants with normal growth.

Introduction: The National Pediatric Cardiology Quality Improvement Collaborative (NPC-QIC) was established by the Joint Council on Congenital Heart Disease to improve outcomes of care for children with CHD through a collaborative network of multidisciplinary clinical teams and families. NPC-QIC uses formal quality improvement methods and a registry database to collect longitudinal care process and outcomes data, with a goal of identifying best practices and rapidly translating new knowledge into practice. Objectives: The initial project chosen by NPC-QIC aims to improve survival and quality of life during the interstage period between discharge after the Norwood procedure and admission for bidirectional Glenn. Specific aims to reduce mortality by 50%, reduce admissions by 50% and increase number of infants with normal growth.

Methods: Currently, 43 pediatric cardiology programs participate in the quality collaborative and registry database. During semi-annual face-to-face Learning Sessions strategies for “best” practices identified and shared among centers are noted on decreasing variability and improving patient outcomes. The key drivers include: standardized discharge protocol, optimization of nutrition and care coordination with providers and family including home surveillance monitoring. Results: As of August 2011, 377 infants surviving stage 1 palliation and 328 from the hospital have been entered into the registry. There have been 1,667 interstage clinic visits, 421 re-admissions (median 1 re-admissions/infant, range 0–11), and 24 interstage deaths (6.4%); 102 infants are in the interstage. NPC-QIC has documented improvement and reduced variation in clinical care processes. As of April 2011 marked the first statistically significant decrease in the occurrence of hospital readmissions associated with major events. (Figure 2). There is variability among centers but no significant change in interstage growth or deaths to date.

Conclusion: Through interdisciplinary Learning Sessions involving cardiologists, nurses, dieticians, pediatricians and families, best practices for discharge communication, nutritional planning and home surveillance can be identified, tested and spread. It is expected that as improved clinical processes are identified and implemented, there will be further reduction in care process variation and ultimately improvement in patient outcomes. With increasing enrollment, ability to identify risk factors for mortality in the inter-stage will be possible.

2019

Successful transcatheter pulmonary valve implantation in patients with patched right ventricular outflow tracts

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Introduction: Transcatheter pulmonary valve implantation (TPVI) is a relatively new method of treatment for patients with pulmonary conduit dysfunction after surgical correction of congenital heart disease. Objectives: There are only few reports of TPVI in patients in whom a surgical correction of the right ventricular outflow tract (RVOT) was performed with a patch instead of a full homograft. Methods: We present 8 patients after surgical tetralogy of Fallot (n = 6) or pulmonary atresia (n = 2) correction of RVOT with a pericardial patch, pulmonary or aortic monocusp (7 female, 1 male, mean age 24.6 ± 4.5 y). Seven patients had severe pulmonary regurgitation (PR) (mean pulmonary regurgitation fraction 43.3±10.9%) and 3 patients (including 2 patients with severe PR) had significant pulmonary stenosis (PS) (max. pulmonary gradient 39–76 mmHg). Melody Medtronic valve was implanted in 3 pts and Sapien-Edwards valve in 5 pts. The choice of the valve depended on RVOT dimensions. The procedure was performed in general anesthesia. The deployment of a valve in the pulmonary position was preceded by a metal stent implantation. In one case the initial pre-stenting was performed 2 months earlier to allow fixation of the stent. Results were evaluated by echocardiography two days after the procedure (n = 8) and by echocardiography and CMR 1 month later (n = 5). Results: TPVI was successfully performed in all pts without complications. Time of the procedure varied from 80 to 225 min, mean 135 ± 38.8 min, fluoro time was 36.2 ± 7.8 min. In all cases the implanted valve was competent, with mean pulmonary gradient 19.4 ± 8.7 mmHg. Reduction of the pulmonary gradient in 3 pts with PS was achieved (11–26 mmHg). The effect was stable after one month observation. Conclusion: TPVI may be successfully performed in selected patients with patched RVOT.
Radiation exposure in children with congenital heart disease: comparative study between 64 multislice CT scan and diagnostic cardiac catheterization

Alaa M. Roushdy, Mohamed A. Ghazy, Ahmed El Shirbini, Mais El Sayed

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. Results: Radiation exposure parameters were recorded in each group including the mean 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 ± 0.6 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.

Detection of critical congenital heart disease by pulse oximetry: preliminary data from the United Arab Emirates

Mohamed A. Hamdan, Ines Haddad

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. Results: 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.

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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). Conclusion: POx was sensitive and highly specific in detecting CCHD in newborns after 24 hours of age, at an acceptable cost, and minimal additional burden on the cardiac services. Fetal echocardiography may decrease the number of cases detected by POx.

Safety and usefulness of outreach clinic conducted by pediatric echocardiographers

Bader Al Heri, Abdulrahman Al Mehood, Ali Al Akhfaish, Abdullah Al Ghamdi

Introduction: Due to the limited number of consultant pediatric cardiologists and the busy service in tertiary cardiac centers, adoption of a cardiology technician led echocardiographic outreach service is a proposed program to help district general hospitals in the diagnosis of patients suspected to have cardiac anomalies. It may also help reducing the workload in pediatric cardiology clinic and reducing the unnecessary waiting time for cardiology evaluation. Objectives: To report our experience in providing cardiac technician led pediatric echocardiography services in district general hospitals (DGH) in the Kingdom of Saudi Arabia. Methods: We have collected prospectively the number of patients seen in the outreach visits by the
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: To assess the effects of calcium supplement during pregnancy on hypertensive disorders of pregnancy and related maternal and child outcomes. Selection criteria. Nulliparous women without hypertension, diabetes mellitus or renal disease. Multicenter randomized trials comparing at least 10 daily of calcium supplementation during pregnancy with placebo. Data collection and analysis: We assessed eligibility and trial quality by 3 researchers, did clinical trials. 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 1.09). 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) 0.60 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 the reduce the risk of severe gestational hypertension, preeclampsia, severe preeclampsia, preterm birth and low birth-weight. 

Prevalence of cardiovascular risk factors in a population doing exercise

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Objectives: To learn about the prevalence of cardiovascular risk factors (CVRF) in people attending an outdoor event held on Sunday 20th March, 2011 at the Rosedale in Palermo, organized by the Undersecretary of Sports of the Government of Buenos Aires within the framework of the “Doing exercise” program. Methods: The nursing staff of the Educational Program for Prevention and Cardiovascular and Pulmonary Rehabilitation designed a survey about CVRFs to collect data provided by the individuals attending the event. Nursing interventions included the following: surveys, exhaled carbon monoxide (CO) measurements, anthropometric measurements and vital signs recording. After each survey and measurement, the nursing staff gave educational recommendations as deemed convenient. Special emphasis was made on a sedentary lifestyle since it has been proven that regular exercise helps control risk factors (smoking, obesity, stress, etc.). Finally, printed material about general prevention was given out. Results: 120 persons were interviewed (females 67%, males 33%, age range 13–82 years. Seventy eight percent of the population walks; 40% more than three times a week. Sixty five percent does exercise regularly, the most popular activities being aerobicics, gym, cycling, yoga, swimming, tango and salsa dancing. Eighty eight per cent pointed out that fruit and vegetables were included in their diet. Forty four per cent had a BMI over 25. Forty two per cent had hypertension (controlled hypertension). Sixteen per cent smoked, and the CO measurement evidenced that 20% were heavy smokers (CO between 16 and 25). Conclusion: Hypertension, smoking and a BMI over 25 were observed even in a population doing aerobic exercise, which shows that an effort must be made to create awareness in terms of education to modify all cardiovascular risk factors.
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 hospitalization rates. Objectives: To provide a comprehensive description of clinical and psychosocial factors precipitating admission for exacerbation of HF. Methods: All admissions for 2008 to a regional referral tertiary 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%), dysrhythmia (13.1%), anxiety/depression/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 the care 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. Eighty-one percent of all patients were Wells risk for AF score ≥ 2. Patients were assigned 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 more correct distribution of patients: Class I (54%), Class II (31%) and Class III (15%). Hospital admissions into Class I or II were intubations (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%), arrhythmia (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 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 major factor that affects treatment adherence. It seems important that the information provided meets the patient's needs to improve their satisfaction. Objectives: information provided about therapy and treatment adherence. Method: 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 consultation at Health Centers in Viseu, Portugal, 61.2% are men with aged between 37 and 90 years (62.39 ± 12.67). The majority (66.3%) is "Married", 57.1% live in "rural" and 75.5% had "highly familiar 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% have "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 in MAT is explained by SIMS (β = 0.18, t = 1.76, p = 0.090), age (β = 0.001, t = 0.01, p = 0.001), year (β = 0.12, t = 1.29, p = 0.004) 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. REFERENCES: Weimann, J. (1997). Doctor-patient communication. In A. Baum; S. Newman; J. Weimann; R. West. C. McManus (Eds). Cambridge Handbook of Psychology, Health and Medicine. Cambridge, UK: Cambridge University Press, 284–287. World Health Organization (2003). Adherence to Long-term Therapies: Evidence for Action. World Health Organization. XIII, 4, 11, 98–100, 137–142.
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 after sinus rhythm (SR) recovery (SR-r). On the other hand, although aortic sclerosis (AS) is 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 >57; 77% hypertensive; 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 a 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 LVEF ≥50%, no left ventricular hypertrophy and no significant valvular disease. AF recurrence was defined as any AF of duration of at least 1 day.

Results: At 1 year follow up, 27% of the patients had AF recurrence (AF-r). AS was more frequent in patients with AF-r (46% vs. 35% at discharge; p=0.002). AS was associated with a higher incidence of recurrence in those patients with left atrium area ≥20 cm² (72% vs. 40%-p=0.03).

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 CHADS 2 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 doubles 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 and to compare the accuracy of these two scores in the prediction of acute myocardial infarction (MI), acute heart failure (HF) or ischemic stroke. Methods: Observational study of patients admitted due to MI, HF or stroke from 2000 to 2009 in a General Hospital in Spain. For each patient the CHADS2 and CHA2DS2VASC risk scores were calculated. The follow-up protocol included daily patient pulse monitoring, weekly medical visit and monthly 24 hours Holter ECG recording. CHADS2 and CHA2DS2VASC were validated tool with regard to risk stratification; recently the CHA2DS2VASC has been presented as a new score that might potentially improve risk stratification. Results: We recruited 6542 patients (2157 MI, 2138 HF and 2247 strokes) of whom 1705 (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 (85.6%) with MI; 904 (96.7%) with HF and 408 (76.8%) showed a CHADS2 ≥ 2, thus with AS 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%, 38.1 and 38.3% respectively. Between the four study-periods there was a reduction in the prescription of antplatelets (47.9 vs.33%; 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 CHADS2/VASC risk score is conflicting 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 AF adult 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. 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 dilatation) 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 (6.68±1.62% vs 14.29±2.33%, p<0.001). In patients who remained in sinus rhythm, FMD increased to 18.71±2.81% (p=0.001) and 14.28±3.49% (p<0.001) after one and two months respectively. 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.

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 alternative treatment modality for bradycardia. 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 HMCN2/pcDNA3. 2. Total RNA was extracted from control MSCs and those transfected with HCN2, and RT-PCR was performed. 4. Membrane proteins were extracted from control MSCs and those transfected with HCN2. Western blot analysis was performed. 5. Whole-cell patch clamp was used to study membrane currents. After the iKr was recorded, cells were superfused with extracellular solution containing 4 mM cesium chloride and the currents were measured accordingly. E. MSCs transfected with either GSP 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...
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 developed (PICD) with a right ventricular (RV) single coil lead and titanium electrodes in the superior vena cava (SVC) and the inferior vena cava (IVC). Objectives: 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 dogs (age 30-56 kg) 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.

Conclusion: In patients with pacemaker, a paced QRS duration ≥160 ms is associated with an increased risk of cardiovascular death and heart failure in long term follow up.
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 hematoma was observed which resolved spontaneously within 3 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 canines. Spontaneous removal of all devices occurred within 10 days. All canines recovered from the surgical procedure without serious adverse event. One post-op hematoma was observed which resolved spontaneously within 3 days.

Conclusion: The PICD can be rapidly and safely implanted in animals. Long-term intravascular defibrillator placement is feasible in a canine model.

Current in mesenchymal stem cells transfected with HCN4 genes

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Introduction: Both gene and stem cell therapies represent new and promising strategies for the treatment of heart failure. This paper will focus on hyperpolarization-activated cyclic nucleotide-gated channel HCN4 gene lentiviral transfection to create biological-pacemaker cells in vitro. Objectives: To test if the pacemaker current can be elicited from mesenchymal stem cells (MSCs) transfected with HCN4 genes by Lentiv. Methods: 1.MSCs of rabbit from the posterior iliac crest of rabbit were cultured at 37°C in a humidified atmosphere of 5% CO2. 2. The self-inactivating HIV-1-based lentiviral vector (Lentiv) was used as transgene delivery, which was constructed with plasmid pHClN4/cpc0NA3. 3. Total RNA was extracted from control MSCs and those transfected with HHCN4, and RT-PCR was performed. 4. Whole-cell patch clamp was used to study membrane currents. i_HCN4 were elicited in the whole cell configuration by holding cells at -40 mV for 50 ms followed by 10 -mV steps (2 s) to -130 mV and returned to -40 mV (50 ms) after each step. After the i_HCN4 was recorded, cells were superfused with extracellular solution containing 4 mM cesium chloride and the currents were measured accordingly. Results: 1. In addition to expressing characteristic HHCN4 protein, HCN4-transfected hMSCs also express an anticipated high level of HHCN4 gene by RT-PCR and Western blot analysis. And immunofluorescence image is shown for GFP. Control MSCs were negative. 2. With the use of the whole cell configuration of the patch-clamp technique, i_HCN4 was elicited using hyperpolarizing steps in 10-mV increments from -40 mV to -140 mV from a holding potential of -40 mV and was voltage-dependent. The threshold of voltage for activation of i_HCN4 is around -80 mV. Remarkably, all HCN4 positive cells exhibit a large cesium-sensitive i_HCN4, and it was significantly inhibited by 4 mM cesium chloride. Conclusion: The pacemaker current of i_HCN4 can be elicited from the mesenchymal stem cells transfected with HCN4 genes by Lentiv. The genetically engineered MSC expressing hHCN4 is a demonstration of feasibility of preparing MSC-based biological pacemaker cells. References:
2. Ya-Feng Zhou, Xiang-Jun Yang, Hong-Xia Li, et al. Mesenchymal stem cells transfected with HCN2 genes can be modified to be cardiac pacemaker cells. Med Myopathies 2007;6(5):1093–7.

Quality of life in acute heart failure

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Introduction: Acute heart failure (AHF) is amongst the most common causes of hospitalisation in the U.S. with direct costs for the year 2010 estimated to be $33.9 billion [1]. Reducing the duration of hospitalisation for such conditions can have a significant impact on resource use and may also have substantial benefit for individual patients. This study was designed to capture health related quality of life (HRQoL) data expressed as a utility score between 0 [dead] and 1.0 [full health] for patients admitted to hospital due to AHF. These data could be used to support the cost effectiveness of an intervention in AHF. Objectives: The aim of this study was to estimate quality of life (utilities) for patients hospitalised with AHF. Methods: Prognostic Instruments of HRQoL were collected from 50 experienced cardiac nurses (formal caregivers) and 50 family caregivers of individuals who had experienced AHF events leading to hospitalisation (informal caregivers). Data were collected retrospectively for four time points (day 1, 3, 5 and 7 post cardiac event) using the EQ-5D health status instrument. Reference: 1. Lloyd-Jones D, Adams RJ, Brown TM, et al. Heart disease and stroke statistics–2010 update: a report from the American Heart Association. Circulation 2010;121:e66–e215.

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

<table>
<thead>
<tr>
<th>Caregivers</th>
<th>Day 1</th>
<th>Day 3</th>
<th>Day 5</th>
<th>Day 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formal</td>
<td>0.769</td>
<td>0.769</td>
<td>0.769</td>
<td>0.769</td>
</tr>
<tr>
<td>Informal</td>
<td>0.769</td>
<td>0.769</td>
<td>0.769</td>
<td>0.769</td>
</tr>
</tbody>
</table>

Conclusion: Collection of utility data in severe acute conditions is challenging. This study represents an attempt to capture such values through the use of proxy assessment. The data suggest that hospitalization due to AHF is associated with very poor HRQoL, at least in the short term. Utility values for early assessments approximate those for conditions such as advanced cancers or major stroke. By day 7 however these values demonstrate significant improvement and a return to near normal general population levels. Further research may help us to better understand why ratings vary from the two caregiver groups diverge.

Reference:

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 cardiac 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 WHOQOL-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 questionnaires (self-administered), the KCCQ and the WHOQOL-BREF. The four main domains in the WHOQOL-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 18% 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 WHOQOL-BREF. There was significant positive correlation, r = 0.001, between the KCCQ instrument and the four domains of the WHOQOL-BREF. The physical health (r = –0.28), psychological (r = –0.31), social relationships (r = –0.47), environment (r = –0.42, Conclusion: Over 25% of HF patients in environment have unacceptable level of quality of life which has to be addressed in their management. The generic WHOQOL-BREF would suffice in our environment if the specific HRQoL instruments are not available.

References:
Conclusion: Regular, individually tailored trainings significantly reduced level of depression symptoms and sleep disturbances in patients with advanced CHF (NYHA III). Rehabilitation activities reduced limitations in all spheres of life. Lack of physical activity potentiated restrictions in hobby and house activities, leisure and sexual life.

0248

New model of home telemonitored cardiac rehabilitation based on nordic walking training in patients with heart failure: safety, effectiveness and compliance

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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 = 50 (TG), or to a control group, n = 14 (CG). In order to perform CR, a special device was created which made it possible to: (1) do the training according to a preprogrammed 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 (pg/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, necessity for hospitalization because of HF decompensation. Effectiveness of CR Within-group analysis. The distance in 6-MWT increased significantly only in TG pts: from 409.6 ± 489.8 to 845.7 ± 635.3 (p < 0.0001), NT-pro-BNP level tended to be lower only in TG pts 1362 ± 1628 vs 1143 ± 1359 (p = 0.118). In the untrained CG the unfavourable results were observed: 6-MWT 486 ± 83 vs 458.91 (p = 0.3507); NT-pro-BNP 705.6 ± 853.7 ± 754.8 (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.

0249

Improving cardiac effort tolerance in chronic heart failure: role of noninvasive 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 among Indian people who belong 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-pronged intervention of Shani (oil massage to reduce vascular tone), Swadhan and Hrid Dhara (thermal therapy to reduce salt and water retention), and Dast (rectal herbs to increase cardiac contractility) was used in each patient who received twice daily sessions of 90 min each for six 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 > 180 mm Hg and diastolic blood pressure >110 mm Hg), Evaluation parameters used were exercise tolerance capacity (measured by the standard 6-min walk test [6MW]) and improvement in stress test (ST), improvement in grade of symptoms (GOS), improvement in maximum oxygen uptake (V̇O₂max), and improvement in metabolic equivalents (METs) taken on day 1 (preintervention) and on day 6 (postintervention). Results: A total of 500 patients were evaluated. Mean age = 57.6 ± years; mean BMI = 23.5 ± 3.5 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 6MW and ST postintervention was 72.6 ± 6 m in 6 min and 136.1 ± 52.5 in 9 min (p < 0.01), respectively. The corresponding improvement in VO₂max and METs was 3.8 ± 2.84 L/min and 2.53 ± 1.03 METs. Patient symptoms also improved. Vital parameters were stable. No significant adverse events were seen in any patient. Conclusion: Sampurna Hriday Shuddhikaran using a novel MCRC 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.

Table 1. Properties of pts with limitations in various spheres of life according to NIH before and after program termination.

<table>
<thead>
<tr>
<th>Group</th>
<th>No at baseline</th>
<th>No at 6 months</th>
</tr>
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<tbody>
<tr>
<td>Pre-Con</td>
<td>28</td>
<td>14</td>
</tr>
<tr>
<td>Post-Con</td>
<td>14</td>
<td>7</td>
</tr>
</tbody>
</table>

Image/graph I:
Clinical characteristics of non-responders and super-responders

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Introduction: Though patients all receive cardiac resynchronization therapy according to the international guideline, their response to this treatment varies to a large extent. If non-responders and super-responders could be identified before implantation, we will be able to recommend cardiac resynchronization therapy to patients who probably benefit more for this treatment. Objectives: Our current study was designed to identify the clinical characteristics of both non-responders and super-responders to cardiac resynchronization therapy. Methods: We included 92 patients who received cardiac resynchronization therapy in our hospital. All patients were divided into 3 groups. Group A was defined as the group of all non-responders. Group B was defined as the group of super-responders. And Group B was the group of all responders exclusive of super-responders. We search the characteristics of non-responders and super-responders among patients’ demographic information, disease diagnosis, electrocardiographic data and echocardiographic data before and after device implantation. Results: Non responders had more severe left ventricular systolic dysfunction, longer pre-implant left ventricular end-diastolic dimension and lowest 3-month left ventricular ejection fraction. Super-responders had smallest pre-implant left ventricular end-diastolic dimension, shortest post-implant QRS duration, largest change of QRS duration, smallest left ventricular end-diastolic dimension and highest 3-month left ventricular ejection fraction. Compared with non-responders, super-responders had smaller post-implant QRS dispersion. However, only pre-implant mitral regurgitation no less than moderate independently related to non-response. Only pre-implant left-ventricular dimension and change of QRS duration independently related to CRT super-response. Furthermore, pre-implant left ventricular end-diastolic dimension no larger than 68.5 mm identified super-responders with a sensitivity of 0.889 and a specificity of 0.781. And change of QRS duration no less than 30ms identified super-responders with a sensitivity of 0.647 and a specificity of 0.732. Conclusion: Pre-implant mitral regurgitation no less than moderate was the independent predictor of cardiac resynchronization therapy. While pre-implant left ventricular end-diastolic dimension and change of QRS duration were independent predictors of super-response to cardiac resynchronization therapy.

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Introduction: With the new updates in the guidelines, Cardiac resynchronization therapy (CRT) has become one of the core treatments of heart failure. Given that the heart failure population is predominantly older, it is vital to assess the benefit of CRT in this particular cohort of patients. Objectives: We aimed to assess the benefits of CRT in the older population (aged more than 75 years at time of implant) and compare that to the younger patients that received the same treatment. Methods: This is an observational retrospective study that looked at our 10-year registry data that we compiled in a single center in Dublin and categorized the patients into two groups based on their ages at the time of implant. Those aged 75 or more were in a separate category than those younger than 75. We looked at the improvement of ejection fraction and mortality outcomes in both cohorts of patients. Results: There were a total of 242 patients in our study. The average age of the patients in our registry. 46.7% of the patients had ischemic cardiomyopathy. Average Ejection Fraction(EF) in this group of patients prior to CRT implant was 30.7% and was improved to an average of 38.1% after CRT therapy. There were 15 deaths in this group, comprising 17.4% of the population. With view to the remainder 156 patients, the average age was 64.1 years, 46.7% of those patients had ischemic cardiomyopathy. Average EF prior to CRT was 28.2%, which improved to an EF of 36.5% post implant. There were 39 deaths in this group, which comprises 19.2% of this population. Overall, 71% of the patients were on Aspirin, 82% on beta-blocker therapy, 74% on ACE-inhibitor or ARB therapy, and 84% were on diuretics. There was no significant difference in the EF improvement or the mortalities in both arms. Conclusion: From our retrospective observational study, we note that the elderly respond to CRT treatment in a comparable fashion to the younger heart failure patient.

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Left ventricular reverse remodelling in response to cardiac resynchronization therapy: characterization of the temporal progression

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Introduction: Our current study was designed to reveal the clinical characteristics of non-responders and super-responders among patients’ demographic information, disease diagnosis, electrocardiographic data and echocardiographic data before and after device implantation. Results: Non responders had more severe left ventricular systolic dysfunction, longer pre-implant left ventricular end-diastolic dimension and lowest 3-month left ventricular ejection fraction. Super-responders had smallest pre-implant left ventricular end-diastolic dimension, shortest post-implant QRS duration, largest change of QRS duration, smallest left ventricular end-diastolic dimension and highest 3-month left ventricular ejection fraction. Compared with non-responders, super-responders had smaller post-implant QRS dispersion. However, only pre-implant mitral regurgitation no less than moderate independently related to non-response. Only pre-implant left-ventricular dimension and change of QRS duration independently related to CRT super-response. Furthermore, pre-implant left ventricular end-diastolic dimension no larger than 68.5 mm identified super-responders with a sensitivity of 0.889 and a specificity of 0.781. And change of QRS duration no less than 30ms identified super-responders with a sensitivity of 0.647 and a specificity of 0.732. Conclusion: Pre-implant mitral regurgitation no less than moderate was the independent predictor of cardiac resynchronization therapy. While pre-implant left ventricular end-diastolic dimension and change of QRS duration were independent predictors of super-response to cardiac resynchronization therapy.

Usefulness of acoustic cardiography parameters to predict outcome after cardiac resynchronization therapy

Intuition: We sought to assess the predictive value of acoustic cardiography parameters on outcomes of CRT.

Methods: Consecutive patients were studied immediately prior to CRT implant. Patients were assessed awake and semirecumbent using a previously validated system that records EKG and heart sounds and derives systolic time intervals (innove, USA). Patients were followed for CRT response, heart failure hospitalization (HFr) and combined HFr or death. Response to CRT was assessed by echocardiography and the global assessment scale. We assessed previously validated acoustic cardiography parameters of left ventricular systolic dysfunction S3 strength > 5 and electromechanical activation time (EMAT: QRS onset to mitral S1) left ventricular systolic time (LVSST: EMAT-QRS)/ LVSST: S1 ratio > 0.55. Results: 100% male, 86% Caucasians, 75% ischemic, age 65 ± 9 years, NYHA class 2.8 ± 0.5. EF 0.21 ± 0.06, LVEDD 62 ± 10 mm, 153 ± 34 msec, 97% on beta blocker and 86% on ACE/VARB. Median follow-up was 17.9 months. There were 5 deaths and 27 HFr. No patients were lost to follow-up. There was no significant difference in the baseline demographic, co-morbidities, echocardiographic and echocardiographic characteristics among patients with S3 < 5 or S3 ≥ 5 and among patients with EMAT/LVST ratio < 0.35 or EMAT/LSVT > 0.35. Patients with an S3 ≥ 5 were more likely to respond to CRT (n = 58, log rank p < 0.001) but not those with an EMAT/LVST ratio < 0.35 (n = 35, p = 0.03) (Figure). Furthermore, patients with baseline S3 < 5 had less HFr as well as HFr or death compared to patients with S3 ≥ 5 (p < 0.001). Meanwhile, EMAT/LVST > 0.35 was not significantly associated with HFr (p = 0.18) or the
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 (MBVB) is the less expensive technique to perform MBV. Objectives: To evaluate long-term follow-up (FU) of MBVB and to determine independent predictors of survival (IPS) and event-free survival (EFS). Methods: From 1987 to 2010, 526 procedures (proc) of MBV was performed, 404 (77.1%) with MBVB Ball, being 256 proc with long-term FU. The balloon diameter was 25 mm in 5 proc and 20 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 (88.7%) female, 215 (84.0%) in sinus rhythm, echo score (ES) 7.2±1.5 (4 to 14) points and echo mitral valve area (MVA) pre-MBV 0.90±0.21 cm². Mean pre and post-MVA (Borders 0.05 to 0.02 and 2.02±0.37 cm²; p<0.0001) and success MVA ≥1.5 cm² in 241 (84.1%) improved mean pulmonary artery pressure pre and post MBV were 27.10 and 20.7±2.7 mmHg. Three (1%) patients (p) began the FU with severe mitral regurgitation (SMR). At the end of the FU 119 (46.5%) were in NYHA FC I, 70 (27.1%) in FC II, 52 (20.7%) in FC III, 3 (1.2%) in FC IV and there were 11 deaths (4.3%). There were 17 (8.2%) p with new SMR at the multivariate Cox analysis.

Conclusion: MBVB Ball was technically successful in 5,659 patients (99.28 %), but optimal result (MVA > 1.5 cm²) was achieved in only 85% of cases. The time interval from first valve replacement to first prosthetic valve thrombosis was 39 ± 24.3 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 8%, mitral valve replacement in 94%. Operative mortalities 20%, The 30-day operative mortality and total in-hospital mortality after prosthetic valve malfunction were 7% and 6.5%, respectively. Conclusion: Prosthetic mitral valve dysfunction 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.

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 (MVA > 1.5 cm² without severe complications) was achieved in 5036 (88.39%). The mitral valve area increased from 0.7 ± 0.2 to 1.7 ± 0.3 cm² (on 2D echocardiography) and from 0.8 ± 0.2 to 1.8 ± 0.3 cm² (on PHT) (p<0.001). The reduction in mean transmitral 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-commisurotomy, 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 – 6.5 years (range, 1 – 9 years) revealed MVA of 1.65 ± 0.30 cm². Mitral valve regurgitation 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 one (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 all 57 patients with stage II and III heart failure, and 100% of the patients 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.

World Congress of Cardiology 2012 Oral Presentations

Surgery 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. Regression testing was found to be more difficult than primary operations because of adhesions around the heart with an associated risk of reentry, the presence of more advanced cardiac pathology, and the existence of more frequent co morbidities such as pulmonary hypertension. Objectives: As a consequence of these and other factors, reparative 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 prosthesys 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 ± 24.3 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 8%, mitral valve replacement in 94%. Operative mortalities 20%, The 30-day operative mortality and total in-hospital mortality after prosthetic valve malfunction were 7% and 6.5%, respectively. Conclusion: Prosthetic mitral valve dysfunction 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.

Functional tricuspid regurgitation: echocardiographic determinants and mechanisms of severity

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Introduction: Functional tricuspid regurgitation (TR) is associated with significant cardiac mortality and morbidity. Mechanisms and determinants of functional TR severity have not been well established. Objectives: To analyze the mechanisms and factors potentially determining functional TR severity by transthoracic 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 artery 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-diastolic RA area (p=0.028) independently determined functional TR severity on multivariable analysis. Using ROC curve analyses, the sensitivity and specificity for predicting more than moderate TR were 96% & 95% with a TA end diastolic 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).
Mitrail valve prolapse 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 78 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, EchoPAC’08) 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>Global strain</td>
<td>-15.5±3.9</td>
<td>-20.6±4.0</td>
<td>-19.6±3.4*0.00001</td>
</tr>
<tr>
<td>Anterolateral ε</td>
<td>-15.7±2.8</td>
<td>-20.3±4.4</td>
<td>-17.3±4.2*0.0001</td>
</tr>
<tr>
<td>Inferolateral ε</td>
<td>-15.1±3.1</td>
<td>-20.7±3.8</td>
<td>-18.4±4.1*0.0013</td>
</tr>
<tr>
<td>Anterior ε</td>
<td>-16.5±2.4</td>
<td>-21.8±3.6</td>
<td>-19.9±3.3*0.00001</td>
</tr>
<tr>
<td>Anteroseptal ε</td>
<td>-15.5±2.2</td>
<td>-17.1±3.2</td>
<td>-18.7±3.4*0.07</td>
</tr>
<tr>
<td>Inferoseptal ε</td>
<td>-14.4±3.6</td>
<td>-19.5±3.6</td>
<td>-20.7±3.1*0.0003</td>
</tr>
<tr>
<td>Midventricle ε</td>
<td>-13.6±3.6</td>
<td>-19.0±3.6</td>
<td>-19.9±3.2*0.0002</td>
</tr>
</tbody>
</table>

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 for rheumatic valve disease. 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. The mean age was 30.7 years. 62% of patients were women. Preoperatively, 174 patients (28%) had TR Gr II, and 450 subjects (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 PAP >40 mmHg was revealed in 30%. Right ventricular dilatation was noted in 15% of patients (28%). 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.

Conclusion: The development of late TR is well known after mitral valve surgery. RV dilatation, Rheumatic leaflet involvement contributes to severe TR occurring long after mitral valve replacement.

During the k-means clustering we have identified two clusters of young subjects with MVP. In 1 cluster (17 subjects, 28% of the MVP group) observed a significant reduction in global and regional longitudinal systolic strain and diastolic SR compared with the control group and the second cluster (61 subjects, 72%). Global strain in the second cluster did not differ significantly from the control group, but there are significant decrease of local longitudinal systolic strain and diastolic SR in interventricular septum (see Table). Conclusion: These changes of...
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 followup 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 echo and clinical evaluation every 6 months for 5 years. Those echos were blindly reviewed by 3 cardiologists classifying disease likelihood as definite, probable, and possible, based on the 2008 WHO/NIDR Joint Consensus Statement. Children with probable and definite RHD began penicillin prophylaxis. Left ventricular strain analysis was performed offline on 6 month followup echos.

Results: Screening of 4869 of 5006 (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 penicillin prophylaxis were compliant. Adequate images for strain/strain rate calculations were available in 22/43 patients. There were no differences in strain but there was a trend towards lower strain in RHD than in controls.

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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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 ≥1.0cm and two had jets ≥2.0cm. There were no cases of mitral or aortic stenosis. Congential abnormalities were detected in 12 children (1%). No children fit the current NHMRC criteria for RHD. 1 child met the new proposed echocardiographic criteria for ‘definite’ RHD, and 3 children were in the ‘borderline’ category. Conclusion: Trivial MR is common 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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Introduction: Risk factors for long-term mortality in children who require cardiac surgery for Rheumatic Heart Disease (RHD) currently defined and currently current. Pre-operative screening of children 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 who underwent their first cardiac surgery between 2001 and 2006 at a tertiary referral centre. Results: Of 212, 127 patients were male and 85 were female. Median age at surgery was 10 years and 15 years was 92%, 74% 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 2.5 (p = 0.001), left ventricular hypertrophy Z score > 3.6 (p = 0.001) 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 Z score > 4.0 and the need for concomitant tricuspid valve surgery.

Reference:
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The Rheumatic Heart Disease Global Registry (REMEDY) study: preliminary report

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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 clinical, echocardiographic and demographic characteristics of RHD patients in 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 across a 10-month period, 41% had had surgery. Of the remaining 59%, 102 participants (29%) had mitral valve disease, 29 (8%) had aortic valve disease and 12 (3%) had involvement of both mitral and aortic valves. Twenty-four percent of patients were in atrial fibrillation (AF) and 56% (n=313) in congestive heart failure. 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, 71% 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 20% 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.

Reference:

A contemporary review of rheumatic heart disease in Borneon 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 people. Up to two-thirds of school-aged patients dropped out due to rheumatic fever (RF) or CRHD, a major burden in term of human capital development. In Malaysia, RHD is endemic in rural population, particularly in the rural Sabah and Sarawak region with high rates of rheumatic heart disease.
Prospective study of current of carditis in rheumatic fever in adult patients

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Introduction: Rheumatic fever (RF) and rheumatic heart disease (RHD) are frequent reason of mortality, including a sudden death and early invalidity of young generations, leading to economical damages in developing countries. Objectives: Study of peculiarities of carditis in RF, RHD and門to assess cardiac involvement. Methods: We have performed echocardiographic examination (ECHO) in 114 patients (68 men and 46 women) aged 18–70 years, divided into 3 groups according to their age: 20 (17.2%) cases of MVP, 11 (6.3%) of them in group I and in 24 (13.8%) in II. Thus, almost a 2.24 [1.08 to 4.63 (P = 0.034)] respectively. 30-day mortality risks of 30-day mortality were increased. Early verified and managed AMI patients who were under no 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.

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 inhomogeneous repolarization of myocardium and is used as an indicator of arrhythmogenicity. Abnormally high QTd has been correlated with risk of cardiac death in coronary patients. The aim of this study was 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 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 patients were randomly divided into 2 groups: training group and control group. In the 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 medications in same doses. From standard ECG corrected QT dispersion (QTd) and QTc was calculated. Results: After three weeks, we have found significant reduction of QTc from 0.80 to 0.79, p < 0.001 and QTd from 75.4 ± 28.7 to 64.7 ± 26.6 ms, p < 0.001 in the training group. Also, in the training group, we have found significant reduction of heart rate from 88 ± 0.001 ± 71.4 ± 12.9 beats/min, p < 0.001; of systolic blood pressure from 143.3 ± 18.4 to 128.2 ± 12.2 mmHg, p < 0.001 and of diastolic blood pressure from 80.1 ± 15.0 to 74.4 ± 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.

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: Patients with acute myocardial infarction (AMI) often develop a systemic inflammatory response syndrome that progresses to multiple organ dysfunction syndrome (MODS) and subsequent death caused by multiple organ failure. It is clinically important to identify these patients from among the spectrum of patients with AMI. Objectives: To determine the risk factors which can increase the risk of MODS complicated by AMI and the influence of MODS on the prognosis of AMI. Methods: We conducted a retrospective study in 6674 Chinese patients who were hospitalized with AMI. Clinical information collected from medical records, including age, sex, comorbidity disease, complication and clinical outcome, were statistically analyzed to determine the risk factors for MODS of patients with AMI. Then we evaluated the influence of MODS on the prognosis of AMI. Results: Of 6674 hospitalised AMI patients, 831 (1.24%) progressed to MODS. On the basis of logistic regression analysis with adjustment for confounding factors, age, pneumonia, shock and chronic renal failure (CRF) were independently risk factors for MODS complicated by AMI, with an adjusted OR (odds ratio) of 2.16 (95% CI confidence interval was 1.70 to 2.75) (p = 0.006), 3.97 (2.49 to 6.35) (P < 0.0001), 2.24(1.66 to 4.63 (P = 0.030)), and 2.03(1.66 to 3.89 (P = 0.034)) respectively. 30-day mortality was 49.40% and 8.13% in patients with MODS or without MODS respectively. Cox regression analysis indicated that MODS was independently associated with increased risk of 30-day mortality with an adjusted OR of 2.53 [1.68 to 3.24 (P < 0.0001)]. Conclusion: Our research demonstrated that age, pneumonia, shock and CRF were significantly associated with occurrence of MODS of patients with AMI and once AMI patients complicated with MODS, their risks of 30-day mortality were increased. Early verified and managed AMI patients who were prone to MODS may reduce mortality.

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

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Introduction: After myocardial infarction are at high risk of new cardiovascular and arrhythmic events. QT dispersion (QTd) is a measure of inhomogeneous repolarization of myocardium and is used as an indicator of arrhythmogenicity. Abnormally high QTd has been correlated with risk of cardiac death in coronary patients. 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 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 patients were randomly divided into 2 groups: training group and control group. In the 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 medications in same doses. From standard ECG corrected QT dispersion (QTd) and QTc was calculated. Results: After three weeks, we have found significant reduction of QTc from 69.8 ± 25.9 to 69.6 ± 24.8 ms, p < 0.001 and QTd from 75.4 ± 28.7 to 64.7 ± 26.6 ms, p < 0.001 in the training group. Also, in the training group, we have found significant reduction of heart rate from 88 ± 0.001 ± 71.4 ± 12.9 beats/min, p < 0.001; of systolic blood pressure from 143.3 ± 18.4 to 128.2 ± 12.2 mmHg, p < 0.001 and of diastolic blood pressure from 80.1 ± 15.0 to 74.4 ± 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.

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)
and effort perception (EP) by Borg’s Rating of Perceived Exertion. Results: Results: We evaluated 216 patients, mean age of [mean (SD): 54(10)] years. 195 (90%) male. MVW was significantly decreased in women (78.2±20L vs 121.3±34L, P<0.001), diabetic (101.0±31L vs 121.3±35L, P<0.05), dislipidemic (113.5±35L vs 122.3±35L, P=0.04) and hypertensive patients (106.3±34 vs 124.3±34, P<0.001). MVW was highly correlated with age (r=−0.47, P<0.001), percentage of fat mass (r=−0.27, P<0.001), number of pack years smoked (r=−0.17, P=0.04), functional status at CRP (peak MET level at exercise stress testing (r=−0.40, P<0.001); SF-36v2 physical component summary (r=−0.21, P=0.003); EP/MET (r=−0.39, P<0.001) and psychosocial profile at admission (HADS-depression (r=−0.21, P=0.05); HADS-anxiety (r=−0.21, P=0.05), MVW 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)]. After adjustment to age, gender and all the other factors correlated with MVW, this spiroometric 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, MVW lost its significance correlation with SF-36v2 physical component summary at CRP beginning (r=−0.07, P=0.44). Conclusion: A reduced lung function, assessed by lower MVW values, is associated to a worse cardiovascular, physical and psychosocial profile in patients after an acute coronary event. MVW was highly correlated with exercise capacity and effort perception at CRP, suggesting that ventilatory muscles performance directly influence exercise response. On the other hand, functional capacity assessed by SF-36v2 questionnaire seems to be more influenced by other factors, probably because it depends on other subjective individual characteristics.

0273

The prognostic impact of in-hospital worsening of renal function in patients with acute coronary syndrome

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Introduction: Renal impairment is strongly linked to adverse cardiovascular (CV) events. Baseline renal dysfunction is a strong predictor of CV mortality and morbidity in patients admitted with acute coronary syndrome (ACS). Objectives: To characterize the prognostic importance of worsening renal function (WRF) in patients with ACS. Methods: ACS patients enrolled in the SPACE (Saudi Project for Assessment of Coronary Events) registry who had baseline and pre-discharge serum Creatinine data available were eligible for this study. WRF was defined as a 25% reduction from admission estimated glomerular filtration rate (eGFR) within 7 days of hospitalization. Baseline demographics, clinical presentation, therapies, and in-hospital outcomes were compared. Results: Of the 3583 ACS patients, WRF occurred in 225 patients (6.3%), who were older, had more cardiovascular risk factors, were more likely to be female, have past vascular disease, and presented with more non-ST-segment elevation myocardial infarction than patients without WRF (39.5% vs. 32.8%, P=0.042). WRF was associated with an increased risk of in-hospital death, heart failure, cardiogenic shock, and stroke. After adjusting for potential confounders, WRF was an independent predictor of in-hospital death (adjusted OR 28.02, 95% CI 13.2–60.28, P=0.0001). Conclusion: These results indicate that WRF is a powerful predictor for in-hospital mortality and CV complications in ACS patients.

0274

Association of depression and coronary heart disease in the participants from the strategy of registry in acute coronary syndrome study (the ERICO study)

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Introduction: Depression is 3 times more common in patients after acute coronary syndrome (ACS). Further, depressive symptoms and clinical depression have an unfavorable impact on mortality in these patients. The Patient Health Questionnaire-9 (PHQ-9) is a brief depression screening instrument that has been shown reasonable sensitivity and specificity in this group. Objectives: To investigate the relation between initial T levels and the severity of coronary atherosclerosis as well as the severity of the disease. Cardiac function, and reoccurrence of angina pectoris during postinfarction period. Methods: 154 patients with AMI and 40 normal subjects were enrolled. Initial circulating CD4+CD25+CD127lo regulatory T cell in patients with acute myocardial infarction predict a high risk of recurrence of angina pectoris during postinfarction period

0275

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 M) without overt cardiovascular disease. Patients were randomized to receive 25x2 mg of atenolol (A-group, n=13), 5 mg of ivabradine (I-group, n=14) or 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 assessed by measuring 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±10 to 65±10 bpm vs. 89±13 to 73±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±5%) was significantly higher than the variation of FMD in P-group (−3±15%, P<0.001) and in I-group (2.5±37%, P=0.60). No changes were found in NMD between baseline and follow-up in the three groups.

0276

Reduced levels of circulating CD4+CD25+CD127lo regulatory T cell in patients with acute myocardial infarction predict a high risk of recurrence of angina pectoris during postinfarction period

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Introduction: Accumulating evidence suggests that regulatory T cells (Treg) plays an important role in development and progression of atherosclerosis. Objectives: We intended to investigate the dynamic of circulating Treg levels in patients with AMI. Furthermore we tried to determine the relation between initial T levels and the severity of coronary atherosclerosis as well as the severity of the disease, cardiac function, and reoccurrence of angina pectoris during postinfarction period. Methods: 154 patients with AMI and 40 normal subjects were enrolled. Initial circulating CD4+CD25+CD127lo Treg levels were measured using flow cytometry in all subjects at entry. Circulating Treg levels were measured at admission and 48hours as well as 72hours after attack of the disease in 40 patients with AMI. In 114 patients with AMI, concentration of serum C-reactive protein (CRP) and T3, T4, reverse T3, TSH were measured. Initial circulating CD4+CD25+CD127lo Treg levels were measured using flow cytometry in all subjects at entry. Circulating Treg levels were measured at admission and 48hours as well as 72hours after attack of the disease in 40 patients with AMI. In 114 patients with AMI, concentration of serum C-reactive protein (CRP) and T3, T4, reverse T3, TSH were measured. Heart function was evaluated by serum brain natriuretic peptide (BNP) and left ventricular ejection fraction (LVEF) determined by echocardiogram. Severity of the disease was evaluated by APACHE score and GRACE score. SYNTAX score was obtained to reflect the severity of coronary atherosclerosis. At one-month after discharge, serum concentration of angina pectoris and NYHA heart function classification was obtained by telephone enquiry. Spearman’s correlation, Pearson’s correlation and student’s T test were applied for analysis Results: Levels of circulating CD4+CD25+CD127lo Treg was lower in patients with AMI at admission in comparison with normal subject (21.2±10.89 vs 37.8±11.18, P<0.009). Treg levels were lower at admission(12±0.89) and significantly increased at 48h(30.00±9.00, P<0.05)and 72h(35.7±9.02, P<0.05) after AMI. Serum T3 levels significantly
correlated with BNP levels (r = 0.74, p < 0.03) as well as APACHE score (r = 0.03, p < 0.05) and GRACE score (r = 0.43, p < 0.01). Initial Teg levels had no correlation with serum CRP levels, BNP levels, LVEF, APACHE score, GRACE score, and SYNTAX score. But lower initial Teg levels predict a high risk of reoccurrence of angina pectoris during the first month after AMI. (1.47 vs 2.35; p = 0.14, p < 0.01). Conclusion: Levels of circulating CD4+ CD25+ CD127− Treg cells are reduced after MI and increased thereafter progressively. Lower initial Teg levels predict a high risk of reoccurrence of angina pectoris during the first month of Postinfarction Period. 0279

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. 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 (EPCs) 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 ischemic exercise training induced by electric stimulation (40% maximum current 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-mm 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 Flk-1 by fluorescence-activated cell sorter analysis and capillary densities were also evaluated by morphometry. Results: At the end of experiments, compared with the control group, CEPCs increased in Group B (383.53 ± 69.86%, p < 0.05), Group C (611.22 ± 280.42%, p < 0.05) and Group D (523.67 ± 167.52%, p < 0.05) significantly. 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 ± 75.77 (mm2) in Group A, 327.50 ± 123.95 (mm2) in Group B, 523.67 ± 43.74 (mm2) in Group C, and 824.06 ± 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.


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 disabled by symptoms of myocardial ischaemia but yet not amenable to conventional revascularization therapy. Extracorporeal shockwave myocardial revascularization (ESMR) therapy offers new hope in symptomatic CAD patients not amenable to medical therapy or coronary artery bypass surgery. ESMR is a shockwave therapy given to the area of ischaemic myocardium which theoretically induces angiogenesis and hence improve-ment in myocardial perfusion and clinical symptoms. 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 fulfilled 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 ischaemia 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<0.001), angina symptoms based on SAD (p-value = 0.023) 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 (4.85 vs 6.12, p-value < 0.0001). There was also improvement in mean defect 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 symptomatic CAD patients not amenable to conventional therapy.

The prognostic value of nonobstructive coronary plaques evaluated by multidetector computed tomography in patients with non-ST-elevation myocardial infarction

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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 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 calculated 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 delta value of change in serum 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 proforma 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 65%. If those with an initial TnT-Hs of < 100 ng/L, 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 < 0.003). 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 >100% (p = 0.008). 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 >100 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.


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 correlational study, encompassing 703 P with NSTEMI admitted in a CD between January

Use of GRACE score in risk stratification: is it safe to discharge the low score group after a NSTEMI?

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Introduction: With increasing demand on inpatient investigative investigations for patients presenting with Non ST Elevation Myocardial Infarction (NSTEMI), the use of risk stratification
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%. 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 >75% of the high-risk groups (n/H11005) performing cardiac catheterization were advanced age and significant co-morbidities.

Conclusion: The GRACE scoring has been shown to be an accurate predictor of death or MI at one year. However, despite being classified as ‘low risk’, there were a significant number of patients with severe CAD in this group. The GRACE score alone cannot reliably be used to safely discharge patients after a NSTEMI without performing an angiogram. Clinical judgement remains an important part in assessing patients with suspected CAD.


**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 share those mechanisms, but the role of NT-pro-BNP as a marker remains unclear in this setting. Objectives: Evaluate the correlation between NT-pro-BNP in Normotensive pregnant women (NPW) and HGS with the maternal and fetal clinical evolution, echocardiographic parameters, and established blood markers. 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. Results: The average maternal age was: NPW 33.7 years, HGS 33.4 years; average gestational age at delivery was: NPW 37.23 weeks, HGS 35.5 weeks; first pregnancy: NPW 45.7%, HGS 52%; About anti-hypertensive treatment: 42% needed 1 drug, 38% 2 drugs, 20% 3 drugs; 80% of the high-risk groups (p/H11005) had proteinuria (0.34 p/H11005), glutamic-pyruvic transaminase (0.24 p/H11005), and 244 (46.8%) were females. Their ages ranged from 42 to 92 years. Of the total, 296 (59.2%) and with average successive variability [ASV], risk of stroke was significantly elevated with 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.

**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.

**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) dilatation. 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 (46.8%) were females. Their ages ranged from 40 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 diluted LA, 160 (78.8%) 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 (VM), and average successive variability (ASV), 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:**

**Table1: 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=9502)</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>
</tr>
<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 + V/P 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>NT-pro BNP</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 mg</td>
<td>1.40 (1.28–1.54)</td>
<td>50.5</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>20 mg–80 mg</td>
<td>1.39 (1.26–1.53)</td>
<td>44.9</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>80 mg</td>
<td>1.37 (1.24–1.51)</td>
<td>40.2</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>NT-pro BNP</td>
<td></td>
<td></td>
<td></td>
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<tr>
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<td>40.2</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:**

**Table2: Treatment effects**

<table>
<thead>
<tr>
<th>Model</th>
<th>HR (95% CI)</th>
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<tr>
<td>TNT (N=5020)</td>
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<td></td>
<td></td>
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<tr>
<td>atorvastatin 80 mg versus atorvastatin 10 mg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stroke</td>
<td>0.77 (0.60–0.96)</td>
<td>4.4</td>
<td>&lt;0.031</td>
</tr>
<tr>
<td>Coronary events</td>
<td>0.80 (0.70–0.90)</td>
<td>12.3</td>
<td>&lt;0.005</td>
</tr>
<tr>
<td>IDEAL (N=5502)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>atorvastatin 60 mg versus simvastatin 20–40 mg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stroke</td>
<td>0.92 (0.74–1.16)</td>
<td>0.5</td>
<td>0.482</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.
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:

12.3 vs. -3.2% vs. -17.23%
2.34 % vs. -17.23%
12.3 vs. -3.2% vs. -17.23%
the mid (-11, 24)
2.23 %, p 0.01) and apical (- 7, 87 %)

The mid (-11, 24)
2.23 %, p 0.01) and apical (- 7, 87 %)

We compared echocardiographic measures in 75 patients with arterial hypertension and left ventricular hypertrophy (LVH). Objectives: We aim 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. Methods: We compared echocardiographic measures in 75 patients with arterial hypertension and left ventricular hypertrophy (LHV) group with 20 healthy control subjects. Of note, none of the hypertensive patients had symptomatic heart failure, Apical four-chamber images were acquired (frame rate 74–86 Hz) and analyzed to extract the strain(str) curves. From these strains, anterolateral systolic LV mass (PLS) and peak strain rate (SRS) on right and left ventricles were derived, using vector velocity imaging (VVi) software. Tricuspid annular plane systolic excursion (TAPSE) as well as mid-apical and basal peak ejection strain (S) and strain rate (SR) of the RV free wall were measured. Results: Body surface area, blood pressure, and heart rate were comparable between the hypertensive and control groups. PSS was lower in the LVH group than the control group in the mid (-11, 24) 3.22/3s vs. -17.23 ± 2.23 %, p < 0.01) and apical (-7, 87 ± 2.34 % vs. -12.3 ± 2.56 ± P < 0.05). RV free wall, whilst basal PSS was similar (-12, 31 ± 3, 87% vs.

Primary care-based lifestyle interventions on blood pressure and lipid profiles among Chinese subjects: a meta-analysis

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Introduction: Hypertension is one of the top 10 risk factors for disease worldwide and the second killer of urban Chinese. Less is known about the effectiveness of lifestyle interventions by primary care practitioners on reducing cardiovascular risk factors among Chinese subjects who account for one fifth of the total world population. Objectives: This study intended to systematically quantify the evidence on the effectiveness of lifestyle interventions on blood pressure and lipid profiles in Chinese adults with pre-hypertension and stage-1 hypertension in primary care setting. Methods: Three Chinese electronic databases and eleven international electronic databases were searched using a combination of MeSH and keywords from their inception to Apr 2011. Additional searches were conducted by reference lists from original articles, meta-analyses and review articles to identify potential studies. Only studies published in full-text and in either English or Chinese languages were considered. Methodological quality of each included study was assessed independently by two reviewers. Net change was calculated as the difference in mean in values. A random-effects model was used to combine net changes across studies. Results: A total of 4,067 potentially relevant publications were screened in databases and 26 controlled trials with 12,694 participants fulfilled all inclusion criteria. Eight studies were published in international journals. The pooled result showed that both blood pressure and LDL-cholesterol were reduced significantly (SBP by -8.50 mm Hg, 95% CI -10.98 to -6.02; DBP by -5.57 mm Hg, 95% CI -7.76 to -3.38; LDL-C by -0.69, 95% CI -0.90 to -0.47). However, Total cholesterol and triglycerides were not significantly changed (TC by -0.30, 95% CI -0.55 to 0.48; TG by -1.30 to 0.44). Conclusion: This meta-analysis suggested that the lifestyle interventions could be effective among Chinese adults in improving some but not all cardiovascular risk factors. Further investigation should be targeted towards evaluation of changes in other lipid profiles such as total cholesterol and total triglycerides in the long-term.

Prehypertension, risk factors clustering and subclinical inflammation by Brazilian adults

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Introduction: Hypertension represents a strong and independent risk factor for cardiovascular disease. The term prehypertension has been introduced to identify subjects with systolic blood pressure (SBP) levels of 120 to 140 mm Hg and diastolic blood pressure (DBP) levels of 80 to 90 mm Hg. However, although recognized as a step to hypertensive state, there’s still controversy about clinical significance and optimal approach of prehypertension as a clinical condition. Objectives: To assess metabolic and cardiovascular profile of prehypertensive individuals, specifically evaluating the association between prehypertension and -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: normotensive (-120 < 60 mmHg and LDL-cholesterol (≥ 120 < 60 mmHg but < 140 mg/dL 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%, 53.9% and 18.2%, respectively. When compared with normotensive subjects, prehypertensive individuals were older (mean age: 42.7 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 109mg/dL; p < 0.001); higher LDL-cholesterol levels (mean: 128 vs 117mg/dL; p < 0.001); higher gamma-glutamyl transpeptidase levels (mean: 38 vs 20mg/dL; p < 0.001) and lower HDL-cholesterol levels (mean: 46 vs 52mg/dL; 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 2mg/L: OR 1.52 (95% CI 1.35–1.71). We observed an increase in hs-CRP levels by 0.198 mg/L for each increase of 1 mmHg in SBP and by 0.252mg/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 ischemic heart disease burden profile in young Egyptian males

Harry Negm 1, Moazat Fayezi 1, Ahmed Saleh 1, Mohammed Haykal 2, Mohmed Shalaby 1, Ntwsoh Almadhy 1, *A Youssef 1

Cardiovascular and Ultrasonography Research Unit, Academy of Scientific Research and Technology, 1National Egyptian Center of Environmental & Toxicological Research, Cairo University, 2MEM – Health Maintenance Organization, Cairo, Egypt

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 as potentially modifiable risk factors. Objectives: To evaluate the impact of various working 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. Main risk factors analysis were collected from out-patient visits and investigations results, followed by multivariate in time on site monitoring on group records 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 hyper tension 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 events and critical events was observed as a result of 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 and chemical work environments might contribute to coronary artery diseases either directly or through augmented 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.

The influence of cultural and social factors on exercise, diet, and smoking of Arabic women living with cardiovascular diseases in the State of Qatar

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1Medicine, nursing, University of Calgary- Qatar, 2Medicine, Cardiology, 3Nursing, Hamad Medical Corporation, Doha, Qatar

Introduction: Cardiovascular diseases are the leading cause of mortality and morbidity globally. Similar to other Western and Gulf countries, the incidence of cardiovascular disease and coronary artery diseases such as acute myocardial infarction is rising rapidly in Qatar. Diabetes mellitus, smoking, and hypertension are the most common risk factors causing acute myocardial infarction, congestive heart failure, and stroke. Obesity as the result of physical inactivity and unhealthy diet can lead to metabolic challenges and risk factors for heart disease. Studies show that these health problems can be prevented and/or controlled by modifying lifestyle risk behaviours related to physical activity, diet, and smoking habits. Objectives: Funded by Qatar National Research Fund, the ultimate goal of this study was to find ways to effectively promote cardiovascular/coronary artery disease prevention and management activities among Qatari women (citizen and resident Arab women) by exploring factors affecting the ways in which Qatari women participate in physical activities, healthy diet and smoking. Methods: An exploratory, ethnography qualitative research approach was used in this study, with a semi-structured questionnaire using open ended questions to gather data. Individual in-depth interviews were conducted with 50 Arab women who are 30 years and over, have confirmed diagnosis of CVD/coronary artery diseases to investigate factors influence lifestyle risk behaviours associated with cardiovascular diseases amongst Qatari women (citizen and resident Arab women). Results: Social support networks; cultural knowledge, values, practices, and religion; changing environmental and social conditions as the result of rapid economic growth, and individual health status influence Qatari women participation in physical activities, healthy eating practices and abstain from smoking. Conclusion: Socio-cultural factors play a key role in Qatari women’s decisions to participate in healthy lifestyle. The promotion of healthy lifestyle which could lead to increased quality of life, prevention of and better management for cardiovascular diseases should facilitate women’s informal and formal social support networks, among culturally appropriate and acceptable public, educational programs and services; create healthy environment with more recreational facilities for women and children; consider women’s specific health condition and socio-economic status; and lastly, empower women to take charge of their health.

Effectiveness evaluation of a school program for obesity prevention

Rebesspieër Q. O. D. Ribeiro 1, *Alicia Guajardo1, Fernando Yanez1

1Noncommunicable Disease Surveillance Sector, Minas Gerais State Health Secretariat, Belo Horizonte, Brazil

Introduction: Due to rapid lifestyle changes in Brazil, we are now facing a childhood obesity epidemics. There is a need for effective programs to address this problem. Objectives: Adoption of healthy lifestyles by school children, through achieve health 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 10!) 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 transtheoretical stage of behavior change evaluation. 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 10! 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. This suggests a strong intervention intervention in context of cognitive-experiential and behavioral 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 10! 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.

From CVD epidemiology to public health: Finnish experience on sustained national CVD prevention

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1National Institute for Health and Welfare (THL), Helsinki, 2The North Karelia Centre for Public Health, Joensuu, Finland

Introduction: The presentation describes the background and the historical development in Finland for action in public health influencing 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 sustainable 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 collaboration. First, in the North Karelia area of North Karelia and later 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 sustained 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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1Division de enfermedades cardiovasculares, Pontificia Universidad Catolica de Chile, Santiago, Chile

Introduction: Phase III cardiac rehabilitation (CR) is a widespread 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. Phase II cardiac rehabilitation (CR) is a class I indication in secondary prevention (PREV-2). To evaluate the impact of CR on aerobic capacity and quality of life in subjects completing cardiac rehabilitation (CR) in Chilean university CR program in subjects with or without CHD, who completed 36 CR sessions between 2002 and 2009. All subjects presented a symptom-limited stress test and a 6-minute walking test (6MWT) at the beginning of CR. 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 212 (n = 220, age 58 ± 11 yo, 24% women) completed 36 CR sessions: 138 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 in both (physical and mental health dimensions) to the end of the CR program. No differences were 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.
Impact of contemporary cardiac rehabilitation and exercise training programs in secondary coronary prevention

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1Cardiology, Ochsner Health System, New Orleans, 2Internal Medicine, Cleveland Clinic, Weston, 3Internal Medicine, Ochsner Health System, New Orleans, 4Exercise Science and Epidemiology & Biostatistics, University of South Carolina, Columbia, 5Cardiology, Pennington Biomedical Research Center, Baton Rouge, United States

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 worldwide, 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 underutilized globally. Barriers to its utilization have been identified in high-income countries, including distance and lack of referral. Given the growing epidemic of non-communicable disease in low-to-middle income countries, the identification of barriers to use of these low-cost interventions is warranted. Objectives: To compare barriers to CR enrollment and participation in Brazilian (middle-income country with private & public healthcare system) and Canadian (high-income country with public healthcare system) cardiac patients. Methods: Two cardiac samples, consisting of 237 Brazilian (34% female;age=63±12) and 1343 Canadian outliers (24% female; age=68±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 across differences between countries. Results: Canadian respondents were significantly more likely to be older(<0.001), male(<0.01), obese(<0.001), have greater educational attainment(<0.001), hypertensio(<0.001), dyslipidemiap(<0.001), and ApEn analysis did not show statistical differences between the two groups. 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 outpatients care, and that different strategies would be required to promote enrolment in these countries.

Reference:
http://www.yorku.ca/ograve/crbarrrierscale.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 cardiac events during the postinfarction rehabilitation process. The standard methods were used for the DFA and ApEn analysis. The CD or named D2 were determined by the Skinner method (the "point" estimation (PD2). The MSE method incorporates two procedures: the "coarse-graining" process 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 telemedicine ECG equipment. Our internet telemedicine 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) telemedicine 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 84.2, 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 cardipulmonary exercise test (CPET) as a routine part of the cardiac rehabilitation (CR) program. 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 substantiate the importance of the CPET as a routine part of the CR. Methods: from April 2007 to December 2010, three hundred thirty coronary patients (pts), referred to physician-supervised outpatient CR, underwent a CPET at the moment of the enrolment to individuate the exercise prescription and at the end of 12 weeks CR program consisting in three weekly training sessions. The work load (WL) the oxygen uptake (V02) measured during CPET at anerobic threshold (WLAT, V02AT) and at the peak of exercise (WL peak, V02 peak) and the metabolic equivalents (METs) estimated from directly measured V02 and from WL were compared at baseline and after CR program. Results: as shown on the table, on the basis of the data collected from the initial and final CPET the pts were subdivided in two groups: 230 (69.7%) pts, in to whom the WL peak as well as the V02peak were both increased (group A); and 100 (30.3%) pts, in to whom WL peak did not increase or decrease whereas V02peak increase (group B).

Conclusion: on the basis of the above results we can conclude after cardiac rehabilitation the changes in functional capacity were consistently witnessed by both tests, respectively ET (V02peak and CPET (V02peak) in about seventy percent of the pts. However in the residual thirty percent of the patients, without the CPET, we could miss to detect any evidence of the actual
changes in functional capacity. In these pts the CPT will be irreplaceable to avoid misleading end points of the prognostic 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 Euroaspirin 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 code the standard of preventive cardiovascular care 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 in the protocol in is to assess the efficacy of treatment in Euroaspirin 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; 55.9±8.7 years old, 38.2% males, who took part in Euroaspirin 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±13.05 kg (p=0.016); the body mass index has decreased from 28.64±5.3 to 27.87±4.49 (p=0.054); the male waist circumference (cm) has decreased from 100.2±10.9 to 98.89±11.3 (p=0.033) the women’s waist circumference (cm) has decreased from 83.6±9.8 to 81.71±12.57 cm (p=0.19); the total cholesterol (mg/dl) has decreased from 214.39±47.17 to 203.8±42.26 (p<0.001) the LDL cholesterol (mg/dl) has decreased from 127.78±37.51 to 118.5±35.51 (p<0.001); the systolic blood pressure (BP/mmHg) has decreased from 146.10±16.16 to 138.30±13.35 (p=0.031), the diastolic BP has decreased from 84.94±10.70 to 87.83±9.18 (p=0.012), 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. Conclusions: Our results show the importance of lifestyle changes throw 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.

An evaluation of the LIVE (controL of coronary Risk factor initiatiVE) 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 cardiac 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 (MACCE) 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 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. Both groups were compared using logistic regression and propensity score matching. Results: A total of 4340 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 (95% CI: 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-infarction within 1 year was lower for program patients (OR=0.73, 95%CI=0.53-1.00). After 4 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 re-infarction as early as 1 year into the program. These findings demonstrate the potential of evidence-based multi-modal disease management strategies.

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 and QUIT Victoria, have consequently supported the mandatory introduction of plain packs, with the Australian Government announcing in June 2010 its intention to implement the measure by January 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 million dollar campaign opposing 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, accurate reports from other fields (regular tactical reviews) between tobacco control partners. Conclusion: The Joint Cancer Council/Heart Foundation Tobacco Issues Committee provides for a forum exceptionally close collaboration on core tobacco control activities including policy development and campaign management. This Australian case study highlights the way in which heart foundations/cardiology societies can make an important contribution to a collaborative tobacco control campaign, assisting with campaign management, message coordination, intelligence gathering, political engagement and media activity.

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 in the year im after year (im) for smokers (smokers and nonsmokers) diagnosed with ACS. Results: Smokers (n=859) accounted for 53.2% of the whole group and were younger than nonsmokers (mean age 50 vs 63 years, p<0.005). 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 than nonsmokers. However, the presence of hypertension and dyslipidemia were more prevalent among smokers (33.4% and 29.8%, respectively) than those in nonsmokers (54.2% and 50%, p=0.001). Incidence of anterior wall myocardial infarction (MI) was not significantly lower among smokers than those among nonsmokers (51.7% vs 53.9%, p=NS). High TIMI risk scores in patients with non 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 non smokers 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.

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...
Charaterisation 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 characterise and report on the prevalence and distribution of metabolic syndrome in a rural Ugandan population. Methods: We are conducting a cross-sectional population-based survey of cardiometabolic risk factors of approximately 8000 participants ages 13 years and older, in a rural population in Uganda. The study will be completed in November 2011. Data collection and analysis is ongoing. Trained field staff conduct a questionnaire based upon the WHO STEPS approach to Surveillance questionnaire; perform biochemical measurement and collect blood samples for biochemical analysis 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 (an indication of glucose tolerance), and lipids. Obesity measurements include body mass index and circumferences of the waist and hips. Lipids include total cholesterol, HDL-c, LDL-c and triglycerides. We will also report on these 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 urban and rural population with high cardiovascular and metabolic risk factors 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.

A cross-sectional study on chewing khat and tobacco smoking among doctors in Yemen

Sami A. Al-Dubai1,*, Gholamreza Heydari1

1Tobacco Prevention & Control Research Center, Tehran, Iran, Islamic Republic Of

Objectives: To determine the prevalence of chewing khat and tobacco smoking 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, behavioural and job characteristics. Data analysis included descriptive and chi-square tests. Results: The mean age of doctors was 33.3 years and the age ranged from 22 to 55 years. Three hundred and thirty five (59.5%) were males, 169 (30.0%) were specialists. Two hundred and eighty four (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 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.

Characterisation of metabolic syndrome in rural Uganda

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Significant differential metabolic effects of rosuvastatin and pravastatin in hypercholesterolemic patients

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Introduction: Rosuvastatin and pravastatin have differential hydrophilicity and potency to inhibit hydroxymethylglutaryl-CoA reductase that may be relevant to changes in adiponectin levels, insulin resistance and the rate of new onset type 2 diabetes in large clinical trials.

Objectives: We hypothesized that rosuvastatin and pravastatin may have differential metabolic effects in hypercholesterolemic patients. Methods: This was a randomized, single-blind, placebo-controlled, parallel study. Age, gender, and body mass index were matched. Fifty-four patients were given placebo, rosuvastatin 10 mg, or pravastatin 40 mg, respectively once daily for 2 months. Results: When compared with pravastatin therapy, rosuvastatin therapy significantly reduced total, LDL cholesterol, and apolipoprotein B levels (p<0.05 by post-hoc comparison), but comparably improved flow-mediated dilation after 2 months. Interestingly, rosuvastatin therapy significantly increased fasting insulin (mean % change: 28%, p=0.005, and HbA1c (1%, p=0.038) while decreasing plasma adiponectin levels (9%, p=0.010) and insulin sensitivity (assessed by QUICKI; 2%, p=0.007) when compared with baseline. By contrast, pravastatin therapy significantly decreased fasting insulin (8%, p=0.042), and HbA1c levels (1%, p=0.019) while increasing plasma adiponectin levels (38%, p=0.008) and insulin sensitivity (3%, p=0.005) when compared with baseline. Moreover, these differential effects were evident when outcomes of rosuvastatin and paravastatin therapy were directly compared (p=0.002 for insulin levels by ANOVA on Ranks, P=0.003 for adiponectin, P=0.003 for QUICKI, and P=0.010 for HbA1c by ANOVA). Conclusion: While significantly reducing lipoprotein profiles, rosuvastatin therapy had unwanted metabolic effects in hypercholesterolemic patients when compared with pravastatin therapy, that may be clinically relevant in patients prone to metabolic diseases.

Significant gender difference in the association between serum uric acid and insulin resistance in Chinese

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Introduction: It is well accepted clinically that the diagnostic criteria for elevated serum uric acid in men and women are different. As a proposed factor closely associated with metabolic disorders caused by insulin resistance, the different association with insulin resistance in men and women is unknown. Objectives: This observational study aims to identify any gender difference in the correlation between serum uric acid and insulin resistance in Chinese. Methods: A sample of 1,173 men and women aged 35–64 years was selected from about 200,000 residents of Beijing using stratified-random sampling method and the data of 1056 non-diabetes subjects from that sample were analyzed. The collected data included waist circumference, serum uric acid, fasting blood glucose, insulin and other metabolic parameters. And the homeostasis model assessment (HOMA) index was calculated. Insulin resistance was defined as HOMA index above the cutting value of top quartile of the study population. Results: Men had significant higher mean serum uric acid but the lower median of HOMA index than women did (6.0±1.7 mg/dL vs. 4.6±1.3 mg/dL, P<0.001 and 1.534 vs. 1.417, p=0.003). The HOMA index positively correlated with serum uric acid level in both sex (r=0.386 in men, p=0.001 and r=0.352, p=0.001 in women). After adjusting the effects of age and the main components of metabolic disorders by a logistic regression model, the odds ratio of per mg/dL increase in serum uric acid level for a status of insulin resistance was 1.05 (95% confidence interval (CI) 0.88 to 1.25, p=0.614) in men but 1.40 (95%CI 1.16 to 1.70, p<0.001) in women. Conclusion: The independent correlation between the serum uric acid and insulin resistance was observed only in women. The mechanism deserved further investigated.

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 hypothesized that glycosylated hemoglobin (HbA1c) and 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, CVA, 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. 5.36±0.07, p=0.001) and lower adiponectin levels (n=250) in patients without complications (HbA1c 0.010). Fasting plasma insulin 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 multivariate Cox regression analysis, after adjusting for body mass index, low density lipoprotein, glucose, insulin, leptin and adiponectin levels, glycosylated hemoglobin (HR =2.104, 95% CI =1.055–4.186, p<0.05) and age (HR =1.032, 95% CI =1.002–1.062, p<0.05) 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 older 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. EPC 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 after cardio vascular link factors measured 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. 0.030, p=0.001). Even after adjustment for age, sex, BMI, 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 kb vs. 5.1 kb, unadjusted p=0.009, adjusted p=0.05). The relative telomere activity was also lower in cases (1.41 UIC/cell vs.2.2 UIC/cell, adjusted p=0.044). Triglycerides correlated negatively with EPC number, telomere length and telomerase activity whereas HDL correlated positively with EPC 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 \underline{mode of action after intracoronary stem cell transfer}

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Introduction: Different mode of action has been alleged using suggested hypothermic (i.c.) 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 male New Zealand rabbits and followed by i.c. and i.m. delivery of MSC and autologous bone marrow cells. The allogeneic MSCs were transferred with lucferase. One week post-AMI, the animals were randomized, and received either 1:1.6±:2.1 x 10^6 transfected MSCs i.m. using the NCGA 3D.
technology (n=5), group IM, or 10.4±2.2 x106 in n=5, group IC), or served as controls (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 proteinase, thereby limiting homing), 2) CXCR4 (homing signal for HPC recruitment), 3) presence of HPC (CD34+), and 4) homing tissue and ischemic angiogenic factors (vascular endothelial and fibroblast growth factors) of the BLI-positive areas. Mobilization of the HPCs as a response to myocardial ischemia were measured by FACS. Results: Myocardial expression of MMP-2 was significantly elevated in group IC as compared with IC alone (0.99±0.42 vs. 6.46±2.76 pg/mL, p<0.05). Echocardiographic data revealed that the small area of transmural infarcts were significantly lower in both groups IM (0.07±0.01 vs 0.30±0.12 cm2) and IC (0.10±0.02 vs 0.33±0.13 cm2, p<0.05). Conversely, 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: Depending on the timing of delivery, the main mechanism of action of transmigrated and injected Luc-MSC seems to be paracrine via u. injections, or enhanced cross-talk between injected MSC and recruited endogenous HPC using the ic delivery.

0322
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-MSC group (received DMEM medium injection) and MI-MG group (received MSCs injection). GFP-labeled MSCs were injected into the viable myocardium bordering the infarcted region. Survival analysis was recorded by patch-clamp technique. The proarrhythmic effects of transplanted MSCs were recorded on Tissue Doppler at the tricuspid annulus). A comparison of data was done between survivors and non survivors. Results: One hundred twenty four patients were included in study, mean age 58 y. Twenty one patients (17%) died in the ICU. Comparison between survivors and non survivors did not show any difference on demographic, clinical and laboratory finding. RV diameter, systolic pulmonary artery pressure and right ventricle pressure and right ventricle parameters: TAPSE recorded on M Mode and Peak S and ITV S recorded on Tissue Doppler. A comparison of data was done between survivors and non survivors. Conclusions: The present study shows that TAPSE is simple robust measure of right function in patients with acute exacerbation of COPD which also has important prognostic implications for patients with AECOPD. Thus, TAPSE should be incorporated as routine echocardiographic assessment of patients with AECOPD.

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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 echocardiographic parameter recorded on M mode at the tricuspid annulus. Recent studies have suggested that RV function is associated with heart failure and patients with pulmonary hypertension. Objectives: To measure RV function in COPD patients admitted to ICU for acute exacerbation of COPD requiring mechanical ventilation assistance. Methods: Patients admitted to ICU for AECOPD requiring Non invasive Positive Pressure Ventilation (NPPV) during the study period were included in the study. Demographic data, clinical and laboratory parameters were recorded on admission. A Doppler echocardiography was done on admission, LVEF, diastolic function of LV, RV diameter, systolic pulmonary artery pressure and right ventricle pressure and right ventricle parameters: TAPSE recorded on M Mode and Peak S and ITV S recorded on Tissue Doppler. A comparison of data was done between survivors and non survivors. Results: Twenty one patients (17%) died in the ICU. Comparison between survivors and non survivors did not show any difference on demographic, clinical and laboratory finding. RV diameter, systolic pulmonary artery pressure and diastolic function of the LV did not differ between survivors and non survivors. Conclusions: The present study shows that TAPSE is simple robust measure of right function in patients with acute exacerbation of COPD which also has important prognostic implications for patients with AECOPD. Thus, TAPSE should be incorporated as routine echocardiographic assessment of patients with AECOPD.

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Age and ischemic heart disease: 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. Aging and ischemic heart disease lead to an increase in fibrosis, causing remodeling of atrial myocardium 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), II:41–60y; III:61–80y; I:41–60 years. Invasive Positive Pressure Ventilation (NPPV) during the study period were included in the study. For the contractile function of the left atrium we assessed by strain measurements the reservoir and ejector function.

0323
Engineering an electromechanically functional 3d biosynthetic tissue using embryonic or induced pluripotent stem cells

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Introduction: Cardiac tissue engineering primarily focuses on the development of successful functional 3D cardiac tissue constructs. Using a custom-build force measurement setup, we measured isometric twitch forces of 1.28±0.2 cm/s, which are significantly higher than those previously reported for cardiomyocytes derived from mouse or human embryonic stem cells. Using a custom-built force measurement setup, we measured isometric twitch amplitude and found that the tissue constructs exhibited positive force-length and negative force-frequency-relationships, characteristic of rodent tissue. Tissue constructs were capable of producing forces of 1.28±0.11N and exhibited a maximum capture rate of 5.5Hz. Although cardiomyocyte (Myh6 selection) containing constructs did not successfully organize addition of 3–15mg/ml TGF-β1 to medium for 4 days. Conclusion: We report the generation of highly functional, aligned 3D cardiac tissues patches made from a single cell source and conclude that the formation of functional stem cell-derived 3D cardiac tissue requires the support of non-myoctyes.

Conclusion: Using a custom-built force measurement setup, we measured isometric twitch amplitude and found that the tissue constructs exhibited positive force-length and negative force-frequency-relationships, characteristic of rodent tissue. Tissue constructs were capable of producing forces of 1.28±0.11N and exhibited a maximum capture rate of 5.5Hz. Although cardiomyocyte (Myh6 selection) containing constructs did not successfully organize addition of 3–15mg/ml TGF-β1 to medium for 4 days. Conclusion: We report the generation of highly functional, aligned 3D cardiac tissue patches made from a single cell source and conclude that the formation of functional stem cell-derived 3D cardiac tissue requires the support of non-myoctyes.

Reference: World Congress of Cardiology 2012 Oral Presentations
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 ventricle 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 non-invasive assessment of PAH. Results: With cut off value of 21 cm/s as the value with a best combination of sensitivity and specificity for PAH. Conclusion: The present study showed that right ventricular end-diastolic diameter (RVD) was measured in the apical 4 chamber view and TDI parameter such as lateral tricuspid annulus motion & time to reach the peak systolic velocity of lateral tricuspid annulus (Tpeak) were measured. Pulmonary artery systolic pressure (PASP) was measured from right heart catheterization and patients with right heart catheterization derived pulmonary artery systolic pressure (systolic 35 mmHg) were identified as PAH group (n = 45) and PASP >35 mmHg were identified as no PAH group (n = 35). The sensitivity and specificity of RVD, Tpeak, and RVD/Tpeak ratio for detection of PAH was estimated. The areas under the receiver-operator characteristic (ROC) curves for the PAH predictors were estimated. The correlation coefficients of RVD, Tpeak and RVD/Tpeak with PASP were 0.54, -0.46, and 0.70 (p <0.001). ROC, constructed using RVD/Tpeak of patients between two groups, gave an 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 cm/s, the sensitivity and specificity of RVD/Tpeak in diagnosing PAH was found to be 91% and 83%, respectively which correctly classified 89.7% of the patients. Conclusion: RVD/Tpeak 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 adjustments to prevent future cardiovascular events. These observations suggest that Ang(1–7) stimulates angiogenesis in the infarcted heart. A779 treatment significantly reduced vascular density in the infarcted myocardium; and (iv) Ang(1–7) promotes cardiac angiogenesis following myocardial infarction.

Objectives: The purpose of this study was to determine whether Ang(1–7) plays a role in cardiac angiotensin converting enzyme (ACE2), the major role for ACE2 is to cleave angiotensin (Ang)II and Ang(1–10) to Ang(1–7). The major role for ACE2 is to cleave angiotensin (Ang)II to 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 cardiac vascular density by immunohistochemical CD31 labeling and quantitated using image analysis 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.

Normotensive offspring 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 pathologic 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 offspring 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 (LVMi) and relative wall thickness (RWT) were significantly higher in the subjects than controls (p<0.001, 0.046, 0.03 and 0.004 respectively). LVMi correlated positively with systolic and diastolic blood pressure, waist circumference (WC), ECG voltage, and posterior wall diastolic diameter. Waist circumference was an independent predictor of LVM in OHP. Mean mital 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 mital A velocity and A/E ratio; deceleration time and isovolumic relaxation time were similar in both groups (p=0.2, 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 offspring 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 (AngII) to 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 cardiac vascular density by immunohistochemical CD31 labeling and quantitated using image analysis 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-satisfaction 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 and prevent disease 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 and prevent device failure. Methods: Out of 150 patients 45 patients received a pacemaker (PM) or defibrillator (ICD) at the Home Monitoring Introduction (Botron Medical, Germany). Patients’ 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

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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 males and the risk of cardiovascular diseases drastically increases in postmenopausal women. The molecular mechanisms by which estrogens exert this protective action 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 cell apoptosis induced by inflammatory agents (2). In estrogen receptor positive breast cancer cell lines, Notch signaling is inhibited by 17beta-estradiol through the estrogen receptor alfa (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 stir-plate-deated, red phenol-free medium and treated for 2, 4, 8 and 24 hours with 1 nM 17beta-estradiol or with or without fulvestrant (0.1 mM). Notch receptors were analyzed by western blot using antibodies specific for the carboxyl terminal of Notch 1 and 4.

Results: Treatment of HUVECs with 17beta-estradiol up to 8 hours resulted in a significant decrease of the Notch1 and Notch4 precursors. These results suggest that estrogen stimulates synthesis and maturation of both receptors. All effects were abolished in presence of fulvestrant indicating that estrogen action was estrogen receptor-mediated. All effects were abolished in presence of fulvestrant indicating that estrogen action was estrogen receptor-mediated.

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.
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DE examination and right heart catheterization were performed in 50 patients within one hour in patient with pulmonary hypertension secondary to ventricular septal defect (VSD).

The time–velocity integral (TVIRVOT, cm) obtained by Doppler echocardiography (DE) (TRV/TVI) allows for the noninvasive investigation of cardiopulmonary hemodynamics and thus is of value in the management of high PVR. Therefore, we aimed to develop new noninvasive methods to predict high PVR by utilizing regression analysis. The models {PVR echo 1 \( = 28.577 \times (TRV/TVIRVOT) \), PVR echo 2 \( = 5.139 + 14.754 \times (TRV/TVIRVOT) \), PVR echo 3 \( = 9.175 + 27.38 \times (TRV/TVIRVOT) \) } showed satisfactory agreement with a mean difference of (1.5 \pm 5.6, 0.6 \pm 5.5 and 0.6 \pm 4.8) for models 1, 2 and 3 respectively and standard error of estimation (0.56, 0.5 and 0.48 WU) in models 1, 2 and 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 \( \leq 0.6 \) ) were done with satisfactory agreement and standard error of estimation (3.8, 3.4 and 2.8 WU) in models 1, 2.6 and 3 respectively. Conclusion: The ratio of (TRV/TVIRVOT) 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 cardiomyopathy 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 PCR in the hypertrophic and failure mouse hearts induced by 2-week and 9-week thoracic aortic banding (TB) as well as in left ventricular in patients with hypertrophic cardiomyopathy. Primary cultured neonatal rat ventricular myocytes were transiently transfected with miR-221 mimics or antagonim. Myocardial hypertrophy was evaluated by morphometric analysis and reactivity 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 abolished 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.

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 (DE) provides a clinically reliable method to determine pulmonary vascular resistance (PVR) in patients 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) 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 \( = 4.7 + 28.577 \times (TRV/TVI) \), PVR echo 2 \( = 5.139 + 14.754 \times (TRV/TVI) \), PVR echo 3 \( = 9.175 + 27.38 \times (TRV/TVI) \) } to calculate PVR were compared with invasive PVR measurements using Bland–Altman analysis and T test for paired samples. Results: As calculated by DE, TRV/TVI correlated well (\( r = 0.480 \) & \( P < 0.001 \)) with invasive PVR measurements. The Bland–Altman analysis between PVR obtained invasively and that by DE, using the models {PVR echo 1 \( = 4.7 + 28.577 \times (TRV/TVI) \), PVR echo 2 \( = 5.139 + 14.754 \times (TRV/TVI) \), PVR echo 3 \( = 9.175 + 27.38 \times (TRV/TVI) \) } showed satisfactory agreement with a mean difference of (1.5 \pm 5.6, 0.6 \pm 5.5 and 0.6 \pm 4.8) for models 1, 2 and 3 respectively and standard error of estimation (0.56, 0.5 and 0.48 WU) in models 1, 2.6 and 3 respectively. Other Bland–Altman analysis between PVR obtained invasively and that by DE, using the models but in a subset of patients who were below 4 years of age (BSA \( \leq 0.6 \) ) were done with satisfactory agreement and standard error of estimation (3.8, 3.4 and 2.8 WU) in models 1, 2.6 and 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.

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Cardiac predictors of 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 surgery in infants and young children/years with congenital heart disease. 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-D-glucosaminidase (NAG), and α1-microglobulin (α1-M) Serum creatinine value were recorded before and after surgery. The cohort was divided into two groups according to whether AKI happened (AKI was defined as increase of serum creatinine \( \geq 0.3 \) mg/dl or 50% within 48 hours post cardiac surgery): AKI group, \( n = 29 \); non-AKI group, \( n = 29 \). Results: 1-MA) Ser Cretinine value were recorded before and after surgery. The cohort was divided into two groups according to whether AKI happened (AKI was defined as increase of serum creatinine \( \geq 0.3 \) mg/dl or 50% within 48 hours post cardiac surgery): AKI group, \( n = 29 \); non-AKI group, \( n = 29 \). Results: 1. In the enrolled patients, median age was 6 months (0.8–47.0 months) and weight (6.7 ± 2.9 Kg) \( [3–15] \) kg. Compared with non-AKI group, the AKI group had higher RACHS-1 score (3.1 ± 0.8 vs. 2.4 ± 0.6, \( P = 0.001 \) ), longer CPB duration (160.6 ± 6.6 min vs. 111.3 ± 44.4 min, \( P = 0.011 \)), longer aortic clamping time (ACT) (97.7 ± 6.6 vs. 87.6 ± 29.5 min, \( P = 0.011 \)) and ICU hospital stay (8.6 ± 5.1 min vs. 4.8 ± 3.8 d, \( P = 0.025 \)). Adjusted by age and weight, urinary creatinine concentration of all five urinary biomarkers rose and peaked at 4 hours after surgery in the AKI group, while increased slightly or had no significant changes in the non-AKI group. All five urine biomarkers had highest predictive values evaluated by receiver operating characteristic curve (AUC) at 4-hour after surgery, with maximum AUC for NGAL (0.857) and IL-18/UCr (0.855), followed by MA/UCr (0.820) and α1-M/UCr (0.839). Urinary NAG/UCr had minimum AUC.
(0.747), which was significantly lower than the other four biomarkers (P<0.05). Four children (4/29, 13.8%) who had CPB duration≥150min including one death in AKI group developed acute renal failure (ARF) while ARF did not happen 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.

Introduction: MicroRNAs 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 MAPKKK 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 myocardial remodeling and transcription regulatory role of miR-223. Methods: Neonatal rat cardiomyocytes (CMs) were cultured from 1–2 days old Sprague-Dawley rats. Cardiomyocyte 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. Power (TP) 124.12(26.85–292.34) vs 290.15(161.66 –743.18), P [0.048]. Co-transfection of a miR-223 expression vector with pMIR-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 an 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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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 epidemic. 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 cystic 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 database from September 2010 to February 2011. There were 3 deaths during the study period not related to RSV (Down Syndrome with AVSD, pulmonary stenosis and Down Syndrome). Twenty two patients completed 5 doses, 13 patients completed 4 doses, 7 patients received 3 doses, 8 patients received 2 doses and 2 received 1 dose. 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 repeat RV infection was negative. No ICU admission. No adverse side effects were reported. The compliance in our group is 96.5% (only 3 doses missed) Conclusion: Palivizumab is safe, well tolerated and effective in prophylaxis of cystic or complex congenital heart disease.
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.
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