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Abstracts

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ACUTE MYOCARDIAL INFARCTION IN PATIENTS WITH DIABETES MELLITUS

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Aim: Diabetes mellitus (DM) is one of the major risk factors of development of atherosclerosis and as well as acute myocardial infarction (AMI). It is known, that course of AMI with DM is more complicated and some authors even mention that mortality is more than twice higher in patients with DM and AMI. We compared clinical course and hospital mortality during AMI in patients with and without DM (NDM).

Patients and methods: All patients admitted to Coronary Care Unit of the Internal Cardiology Clinic of our University Hospital with AMI were analyzed retrospectively within the period of the years 2003 and 2004. Common statistical tests were used for analyses.

Results: 889 patients with AMI were admitted in this period. There were 281 patients (32%) with DM among them. Five of that have I. type of DM. 75 (26.7%) patients with DM were treated only by diet and 145 (51.6%) of them were treated by PO antidiabetics and 61 (21.7%) by insulin. The mean age of all the patients with AMI and DM was 70 ± 10 years (40 – 96), and in NDM 66 ± 12 years (26 – 94), ($p < 0.001$). Among DM patients were 154 (54.8%) men, among NDM patients were 419 (68.9%) men ($p < 0.001$). 85 (9.6%) patients with AMI expired as well as 33 (11.7%) in the DM group and 52 (8.6%) NDM ($p = 0.13$). There were on admission in the Killip I class 142 patients with DM (50.5%) and 425 NDM (69.9%). In the Killip II – IV class were 139 (49.5%) patients with DM and 183 (30.1%) NDM ($p < 0.001$). Selective coronarography and ventriculography (RLVG) were performed in 247 (87.9%) patients with DM and in 568 (93.4%) NDM ($p = 0.002$). The mean ejection fraction (EF) of left ventricle (LV) by RLVG on admission was in DM $44 \pm 14\%$ ($n = 190$), in NDM $48 \pm 13\%$ ($n = 476$; $p < 0.001$).

Conclusion: Patients with DM were statistically significantly older and they were predominantly men. The higher rate of heart failure on admission was noticed in patients with DM. In the DM group there was lower EF of LV by RLVG than NDM. In the group of patients with DM was found non-significant trend to higher hospitalization mortality.

HOW IMPORTANT ARE DIFFERENT MARKERS OF MYOCARDIAL DAMAGE AND INFLAMMATION IN PATIENTS WITH ACUTE CORONARY SYNDROMES?

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Introduction: The most widely used myocardial damage markers, such as troponin T and CK and markers of inflammation, such as C-reactive protein (CRP) and fibrinogen, have been proven to be reliable and important markers of risk in ischemic heart disease. The aim of this study was comparison of predictive values of those variables of necrosis and inflammation in acute coronary syndromes (ACS).

Methods: After prospective collection of data, authors compared peak values of troponin T, CK, CRP and fibrinogen with ECG changes, echocardiography and coronarography findings, early and late complications, number of days of hospitalization, and in-hospital mortality among 120 patients who suffered ACS (STEMI, NSTEMI, UA). All investigated patients were hospitalized in CCU, Department of Cardiovascular Diseases, Clinical Hospital "Sestre milosrdnice", Zagreb, Croatia.

Results: The levels of troponin T, CK and CRP were significantly higher in STEMI group of patients compared to two other groups of patients ($p < 0.01$) and in NSTEMI patients compared to patients with UA ($p < 0.01$). The values of troponin T and CK were directly proportional with level of ST-changes, wall motion abnormalities and duration of hospitalization ($p < 0.01$) and inversely proportional with LVEF and number of affected coronary arteries ($p < 0.01$). On the other hand, the level of CK was directly proportional with the number of performed PCI ($p < 0.01$). The level of CRP was directly proportional with the level of ST-changes ($p < 0.05$) and wall motion abnormalities ($p < 0.01$) and inversely proportional with LVEF ($p < 0.05$). Fibrinogen level indicated no statistically significant differences.

Conclusion: According to this results, myocardial damage markers troponin T and CK were the most predictive markers in patients with ACS, while predictive value of CRP was lower. In this investigation, fibrinogen indicated no predictive value in patients with ACS.

IMPORTANCE OF OVERWEIGHT AND PHYSICAL ACTIVITY LEVEL IN PATIENTS WITH ACUTE CORONARY SYNDROMES

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Introduction: Exact data on the relationship between the level of overweight and obesity and physical activity on the one hand, and the appearance and seriousness of the acute coronary syndrome (ACS), on the other still missing in the literature.

Methods: Authors prospectively investigated 200 patients who had suffered from ACS (STEMI, NSTEMI, UA) and were hospitalized in the CCU, Department of Cardiovascular Diseases, Clinical Hospital "Sestre milosrdnice", Zagreb, Croatia. Different anthropometric parameters (body mass, body height, waist and hip circumferences) and indexes (BMI, WHR) were used in estimation of overweight and obesity, Baecke and LRC PA questionnaires were used in estimation of physical activity level. Data were compared with data obtained by general population and with markers of seriousness of the ACS (cardioselective and inflammatory markers value, ECG changes, echocardiography and coronarography findings, early and late complications, number of days of hospitalization, and in-hospital mortality).

Results: Investigated patients had higher waist circumference and WHR (in age group 45 – 55 years, also body mass and BMI) in comparison with general population ($p < 0.01$) as well as lower leisure and sport indexes ($p < 0.05$), especially those who suffered STEMI and who had the highest WHR ($p < 0.05$). Body mass and BMI were directly proportional with the level of stenosis and number of occlusions of coronary arteries ($p < 0.01$) as well as with the number of performed PCI ($p < 0.01$). WHR was directly proportional with the values of troponin and the levels of ST-changes ($p < 0.01$). LRPCA questionnaire revealed inversely proportional connection between physical activity and number of affected coronary arteries and value of LVEF after coronary incident, while Baecke questionnaire revealed same connection among fibrinogen level and leisure time and total index.

Conclusion: The level of overweight and obesity, as well as of physical activity should be evaluated more common in risk stratification in patients hospitalized in CCU with diagnosis of ACS.

RADIOFREQUENCY ABLATION OF ISCHEMIC VENTRICULAR TACHYCARDIA

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Aim: The implantable cardioverter-defibrillator (ICD) is the treatment of choice in post-infarction ventricular tachycardia (VT). Frequent or incessant tachycardiac episodes can occur in patients after ICD implantation. Because of the ineffectivity of drug treatment and poor quality of life radiofrequency ablation can be an additional solution.

Patients and methods: 8 post-infarction ICD patients (7 male, 1 female, mean age 66.6 years) with frequent, symptomatic, sustained VT underwent RF ablation during a one-year period starting from September 2003. The previous ineffective drug treatment was beta-blocker and amiodarone in all cases. Using CARTO electroanatomical mapping system scar-, pace-, stimulus-QRS mapping was performed in sinus rhythm in all patients and entrainment mapping during VT in some cases. The parts of the reentrant circuits were identified during this procedure. The number of inducible VTs per patient with different morphology was between 1 and 3. Linear ablation lesions in the critical isthmus zones were created. The endpoint of the procedure was uninducibility of the clinical VT.

Results: The ablation endpoint was reached in 7 patients (88%). In 1 case the ablation was unsuccessful. Recurrent arrhythmic events after a successful ablation were recorded in 1 patient during the average 6.25 months follow-up period. The procedure time was between 4 and 8.5 hours, the fluoroscopic time between 28 and 90 minutes.

Conclusion: The RF ablation is an effective treatment in ICD patients with frequent and recurrent postinfarction VT with long-term success.

SLOW CORONARY FLOW PHENOMENON IS A NEW SUBTYPE OF ISCHEMIC HEART DISEASE

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Aim: Slow coronary flow phenomenon (SCF) diagnosed by TIMI 2 or less flow grade without any macroscopic alteration of the epicardial coronary arteries has been considered as a pure angiographic finding over decades. Our study aim was to describe the clinical relevance and possible pathomechanism of this phenomenon and to examine whether slow coronary flow is more than an angiographic abnormality.

Patients and methods: Clinical data, angiographic findings, serum marker levels of patients with SCF (n = 65) were compared to parameters of patients suffering from different forms of ischemic heart disease (IHD): angina patients with normal flow and normal coronary anatomy (NEG, n = 68), patients with stable angina (CAD, n = 96) or acute coronary syndrome (ACS, n = 23) with significant coronary stenosis.

Results: Among SCF patients, male gender was more frequent (69%) and 86% showed documented myocardial ischemia. Mean CTFC values were doubled (39.81 ± 13.99) compared to other groups (NEG: 16.99 ± 11.69 ; CAD: 14.00 ± 9.49 ; ACS: 18.12 ± 6.91 ; $p < 0.000005$). Despite common unstable clinical appearance (32%), acute phase protein levels (IL-6, hsCRP, vWF) in SCF were similar to other, non-acute IHD patient groups (NEG, CAD, $p = NS$). Therefore, SCF is not related to acute phase reaction. In comparison to healthy, age-matched blood donors, sICAM-1 levels were characteristically higher in all investigated clinical groups (SCF: 224.49 ± 69.75 ; NEG: 252.09 ± 74.69 ; CAD: 276.81 ± 68.79 ; ACS: 242.55 ± 86.37 ng/ml vs. 182.94 ± 71.97 ng/ml in blood donors $p < 0.005$), but sICAM-1 values were lower in SCF compared to other IHD patients (significantly compared to NEG, CAD, $p < 0.05$) indicating consequence of simultaneous endothelial dysfunction and low shear.

Conclusion: SCF, diagnosed in 0.8% of coronary angiograms, can be described as an independent clinical form of ischemic heart disease with distinct clinical, angiographic signs and biochemical serum markers.

SPECIFIC CASE OF SYSTEMIC CRYPTOCOCCOSIS AFFECTING PERICARDIUM. CASE REPORT.

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Aim: In our presentation we inform you about a case of a 27 year old man who was taken to our clinic for the two weeks lasting febrile state, loosing his weight, abdominal pains and icterus. According to anamnesis he didn't suffer of any serious disease in the past, six years ago he injected drugs intravenously and one year ago he spent 3 months in Egypt.

Patients and methods: On the basis of entry physical examination we state: temperature 38°C, icterus, tachycardia, resistance in epigastrium and hepatosplenomegaly. The rest of the physical examination is normal. The lab tests prove the elevation of liver tests and inflammatory markers. Other laboratory results are normal. Haemocultures are repeatedly negative. During the echocardiographic examination the pericardial effusion is evident with the separation of 6 mm circular with normal function and also normal wall motion of both ventricles with normal morphological status of valves. On the X-ray of the chest are visible the not sharp contours of the lung design bilaterally and the dilatation of heart. CT of chest and abdomen proves abdominal and mediastinal lymphadenopathy. On chest CT we see two small changes in the form of noduli in the right top lung lobe and a pericardial effusion. In differential diagnostics we consider lymphoma, TBC, another bacterial infection, AIDS, systemic mycosis or possibly a parasitic disease. The immunologic examination excludes HIV infection and doesn't prove any other immunodeficiency. The excision sample of lymphatic nodul during thoracoscopy proves cryptococcosis. Microscopic result proves *Cryptococcus neoformans*. We transfer the patient to further therapy at the ward of infectious diseases to be given systemic antimycotics.

Conclusion: In our poster we demonstrate a very rare case of systemic cryptococcosis the course of which was in disseminated form. Present was also the damage of pericardium, which is not typical for this kind of disease.

CABG NOT FRIENDLY WITH HIGH BMI

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Aim: The aim of this study is to show that high BMI is connected with more complications after CABG.

Patients and methods: The studied group consisted of 102 patients undergoing CABG in 2004. Subjects were divided into 2 groups according to the value of BMI, the postoperative period in these groups was compared. The first group aged 61.19 yrs consisted of 84 pts with average BMI 27.3, out of which there were 81% men, 87% with arterial hypertension, 89% with hyperlipoproteinaemia, 61.90% with prior MI, 39.2% with DM. The group had in average LVEF 54.7%. The second group aged 58.88 yrs consisted of 18 pts with average BMI 34.8, out of which were 72% men, 83% with arterial hypertension, 89% with hyperlipoproteinaemia, 61.1% with prior MI, 44.4% with DM. The group had in average LVEF 48%.

Results: In the group with BMI over 32 there was longer postoperative hospital care (8.97 days vs. 11.5 days), more problems with respiration (27% vs. 7%), more infection complications (12.5% vs. 4.76%). Some of the presented figures were of statistical significance.

Conclusion: BMI over 32 is associated with an increase of postoperative complications. The possibility to postpone the CABG after the weight reduction below 32 is realistic only in cases of elective operations.

POST-CARDIAC INJURY SYNDROME

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Introduction: Post-cardiac injury syndrome develops within days to months after cardiac and/or pericardial injury as an immunopathologic process. It is a common complication in cardiac surgery with an estimated incidence between 3% to 30%.

Aim: Based on the relatively high frequency of occurrence, nonspecific clinical symptoms (fever, chest pain, cough, dizziness) and non exact results of common examinations (ecg, x-ray, laboratory tests) echocardiography is the leading method in determination of post-cardiac injury syndrome. The aim of the study was to present the diagnostic algorithm and the therapeutic options.

Results: We have performed retrospective analysis of 1066 patients who underwent cardiac surgery at our Dept. of Heart Surgery in the year 2004. In the study group (156 pts) the incidence of post-cardiac injury syndrome was 14.6% and 1.3% (14 pts) surgical intervention was needed due to cardiac tamponade. In the other cases symptomatic treatment by peroral non-steroid antireumatics, or colchicine for several weeks or months was provided. In 56 pts (5.2%) parenteral hydrocortison in short duration was administered. In 4 pts (0.37%) long term therapy by oral corticoids was necessary and none of the patients was treated by intrapericardial instillation of corticoids. None of the patients was recommended for pericardiectomy due to refractory pericarditis or pericardial constriction. The mean prolongation of hospitalisation due to this cause was in our study group 4.6 days (from 1 to 10 days).

Conclusion: Post-cardiac injury syndrome which occurs in early postoperative period prolongs hospitalisation. In later periods in spite of nonspecific symptoms post-cardiac injury syndrome can cause huge pericardial effusion or even cardiac tamponade with haemodynamic failure. Transthoracic echocardiography is the golden standard in determination of accurate diagnosis. This disease has a very good prognosis.

THE RATE OF ACETYLCHOLINE AND BRADYKININ INDUCED HYPOTENSION AND RELAXATION OF REMODELLED ILIAC ARTERY DIFFER IN SPONTANEOUSLY HYPERTENSIVE RATS

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Aim: In nitric oxide deficient hypertension (NODH) is evidenced a discrepancy in enhancement of hypotension and attenuated relaxation of isolated vessels induced by activators of nitric oxide synthase. The aim of this study was to investigate whether acetylcholine (ACh) and bradykinin (Bk) – modulators of nitric oxide (NO) production – evoke a similar phenomenon in spontaneously hypertensive rats (SHR).

Methods: Wistar rats, SHR, and SHR administered NO donors: either molsidomine (SHR + Mols), or pentaerythrityl tetranitrate (SHR + Petn) were studied. Under anesthesia carotid artery was cannulated for systemic blood pressure (BP) registration, and jugular vein for administration of drugs. Iliac artery was used for in vitro studies and determination of geometry.

Results: After six weeks of the experimental regime the values of BP in controls and SHR were 132.5 ± 2.7 mmHg and 177.1 ± 5.4 mmHg ($p < 0.01$), respectively. There was no change of BP in SHR after administration of NO-donors. In SHR enhanced hypotensive response was found to both ACh ($1 \mu\text{g}$ and $10 \mu\text{g}$ 87.9 ± 6.9 mmHg and 108.1 ± 5.1 mmHg vs. 35.9 ± 4.7 mmHg and 64.0 ± 3.3 mmHg, $p < 0.01$, in controls), and Bk ($100 \mu\text{g}$ 106.7 ± 8.3 mmHg vs. 53.3 ± 5.2 mmHg, $p < 0.01$, in controls). Similar enhancement was found in SHR administered by NO donors. In contrast, maximum relaxation of SHR iliac artery to ACh was attenuated ($12.1 \pm 3.6\%$ vs. $74.2 \pm 8.6\%$, $p < 0.01$, in controls). Iliac artery inner diameter in SHR declined ($680 \pm 46 \mu\text{m}$ vs. $828 \pm 28 \mu\text{m}$, $p < 0.01$, in controls), and wall thickness ($54.1 \pm 2.0 \mu\text{m}$ vs. $29.0 \pm 2.1 \mu\text{m}$, $p < 0.01$, in controls), wall cross-section area ($123.0 \pm 6.3 \times 103 \mu\text{m}^2$ vs. $77.3 \pm 4.6 \times 103 \mu\text{m}^2$, $p < 0.01$, in controls), wall thickness/inner diameter ratio ($8.7 \pm 0.9 \times 10^{-2}$ vs. $3.6 \pm 0.4 \times 10^{-2}$, $p < 0.01$, in controls) increased. No differences were found among the experimental groups.

Conclusion: The results demonstrate the enhanced hypotension and attenuated relaxation of remodelled iliac artery to ACh and Bk in SHR, similarly to findings in NODH, in spite of different pathogenic mechanism.

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GEOMETRY OF THORACIC AORTA AND CORONARY ARTERY IN THE SPONTANEOUSLY HYPERTENSIVE RATS DURING ONTOGENY

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Aim: Geometry of the thoracic aorta (AT) and septal branch of the left descending coronary artery (RS) of Wistar rats and spontaneously hypertensive rats (SHR) was evaluated during ontogenic development.

Methods: Four groups of Wistar rats of the age: 3 weeks (3w), 9 weeks (9w), 17 weeks (17w) and 52 weeks (52w), and four groups of the age matched SHR were taken for the study. Blood pressure (BP) was measured non-invasively on the tail artery using pletismographic method. After sacrificing the rats were perfused with glutaraldehyde fixative under the pressure 90 mmHg (3w) and 120 mmHg (the rest of the groups). Middle part of AT and upper part of RS were excised and processed according to standard electron microscopy procedure. Wall thickness (WT) and inner diameter (ID) were measured on semithin sections using light microscopy, cross sectional area (CSA) and WT/ID ratio (WD) were calculated.

Results: BP of 3w old Wistar rats did not differ from the age matched SHR (83 ± 1.9 mmHg vs. 84 ± 1.4 mmHg). The differences ($p < 0.01$) were observed among the rest of groups (107 ± 1 mmHg vs. 154 ± 1.4 mmHg in 9w, 114 ± 1.4 mmHg vs. 214 ± 7.3 mmHg in 17w, 114.6 ± 3 mmHg vs. 189.7 ± 2.4 mmHg, respectively). Heart weight/body weight ratio was increased in all SHR groups ($p < 0.01$). WT of control arteries, contrary to arteries of SHR, did not differ during the whole ontogenic development. WT and CSA of RS in 3w old SHR did not differ from age matched controls, but from 9w they started to increase. WT and CSA of AT were in 3w and 9w old SHR decreased and increased in 17w and 52w old SHR. WD of SHR was increased in RS in all periods studied, in AT only in 17w and 52w old SHR.

Conclusion: The main finding of our study was revealing of some discrepancies in prehypertensive period of ontogenic development in SHR: cardiac hypertrophy, hypotrophy of arterial wall of AT, but not of RS. Concomitantly with BP elevation cardiac hypertrophy and hypertrophy of arterial wall of both arteries was observed in later ontogenic periods.

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CLINICAL, ELECTROCARDIOGRAPHIC, ELECTROPHYSIOLOGICAL FEATURES AND ABLATION OF LOCAL ATRIAL TACHYCARDIAS

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Aim: Focal atrial tachycardias (AT) are a relatively rare form of supraventricular arrhythmias. Most focal ATs originate from the right atrium, less often from the left and tend to cluster over certain areas. We analyzed clinical, electrocardiographic, and electrophysiological (EP) characteristics of AT cases and the efficacy of radiofrequency (RF) ablation.

Patients and methods: Between October 2003 and December 2004 we have made the diagnosis of focal AT in 14 cases. We reviewed clinical data retrospectively and tested the effectiveness of a surface P-wave algorithm used to distinguish between left and right atrial origin. We analyzed tachycardia features observed during invasive EP studies. In ten cases we used only conventional, in 4 additional electroanatomic mapping.

Results: Of the 14 patients (7 male, 7 female, mean age 54 years) 8 had paroxysmal and 6 had incessant (4 permanent, 2 repetitive) ATs. Patients had a history of symptoms ranging from one month to 40 years. 36% had structural heart disease (2 had valve disease, 2 ischemic cardiomyopathy, 1 after valve surgery). If the P-wave was discernible (12 patients) the surface ECG allowed to differentiate between left and right atrial origin in all cases. The mode of induction, cycle length, and catecholamine-sensitivity of ATs was variable during the EP studies. Foci were equally distributed between the right and left atrium, and two cases multifocal origin was proven. Of the six left ATs two came from the left atrial appendage, two from the pulmonary veins, one from the mitral annulus and one from the septum. Of the six right ATs two originated from the antero-septal area, three from the crista terminalis and one from the tricuspid annulus. RF ablation was acutely successful in 12 cases (86%). Of these one patient experienced a recurrence during follow-up (mean 5.4 months). Multifocal ATs were unsuccessfully treated with RF ablation.

Conclusion: Focal ATs constitute a heterogeneous group of arrhythmias regarding clinical and EP characteristics. Surface ECG can distinguish right from left AT. RF ablation is an effective method to treat ATs, except in cases with multifocal origin.

AMBULATORY BLOOD PRESSURE MONITORING IN THE MANAGEMENT OF ANTIHYPERTENSIVE THERAPY IN OLD INDIVIDUALS

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Aim: To verify the contribution of ambulatory blood pressure monitoring (ABPM) in the management of antihypertensive therapy in old individuals (age range 75 – 89 years).

Patients and methods: In 2004 we followed-up 315 patients with ABPM, oscillometric Meditech or Marquette – Hellige device. 47 of them (15%) was in old individuals. 5 (10.6%) of them where excluded from the study because of prematurely monitoring stop or device failure.

Results: Only 14 patients (33.3%) reached appropriate BP targets using multiple drugs, in mean 3 drug classes. 28 patients (66.6%) had elevated mean blood pressure values despite antihypertensive therapy. 9 patients (21.4%) had systolic and also diastolic hypertension and 19 (45.3%) only systolic hypertension although also used in mean 3 antihypertensive drug classes. The loss of diurnal pattern could be observed in 15 patients (35.7%) and in 3 patients (7.1%) was not estimated because of vigilance.

Conclusion: Only one third of hypertensives in our group of old individuals reached appropriate BP targets. Two thirds despite multiple antihypertensive therapy with in mean 3 drug class medication had elevated blood pressure values. Age is no limitation of ABPM examination, but it increase the number of diurnal pattern loss. This method can be used as compliance – promoting intervention to motivate some patients to prevent risk of complications e.g. hypertensive emergency or urgency. The results of ABPM allows to make antihypertensive therapy more precise, to follow its effectiveness in BP control and detect transient hypotension.

MITOCHONDRIAL COENZYME „Q10 CLOCK” IN RELATIONSHIP TO HEART ENERGY PRODUCTION

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Introduction: Physiological cardiac function is highly dependent on energy production in mitochondria which represent 20 – 40% of cellular volume. Damage of mitochondrial oxidative phosphorylation (OXPHOS) function and low mitochondrial coenzyme Q10 (CoQ10) concentration during heart failure could participate in triggering of acute myocardial infarction, sudden cardiac death and stroke. Round-the-clock changes of heart mitochondrial CoQ and OXPHOS may be important in the pathogenesis of altered heart function. The mechanisms of heart physiological and pathological function that shows circadians and ultradians are not fully known.

Aim: 1. to search for circadian (24-hours) and semicircadian (12-hours) rhythms of control rat heart mitochondria CoQ and OXPHOS steps, 2. to contribute to the understanding of their importance in normal heart function.

Material and methods: Three-month-old Wistar rats were synchronized during 60 days to 12 hours dark spans by Halberg's antiphasic lighting regimens. One regimen LD 12 : 12 was shifted by Halberg's cosinor. The point and 95% confidence estimates include MESOR, amplitude and acrophase for both rhythms. Student's t-test was used for evaluating the statistical significance of rhythm on the level $\alpha = 0.05$. In isolated mitochondria CoQ level was estimated by HPLC with UV detection. The activity of OXPHOS was determined using Clark oxygen electrode. Results: A statistically significant circadian rhythm was found for CoQ10 and OXPHOS. A statistically semicircadian rhythm was identified only for mitochondrial CoQ10 and some parameters of OXPHOS. The maximal concentration (PEAK) of CoQ10 was at 15,23 hour and 10,29 hour. Minimum concentration (NADIR) of CoQ10 was at 10,00 hour and 21,51 hour. A statistically significant circadian cascade for OXPHOS PEAK was founded between 9,02 and 14,22 hour. NADIR was founded between 16,29 and 19,31 hour.

Conclusion: This pilot study documented heart mitochondrial "Q10-clock" – statistically significant mitochondrial circadian and semicircadian rhythms for CoQ10 and circadian cascade for oxidative phosphorylation in control heart rat. Understanding of heart mitochondrial CoQ10 and ATP production during circadian and semicircadian rhythms can contribute to explanation of triggering acute heart attack.

ANOMALOUS “Y” SHAPE RADIAL ARTERY FOR MYOCARDIAL REVASCUARIZATION

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Anatomical variations of radial artery are very rare. Anomalous bifurcation of the vessel occurs with incidence of 1 – 1.5%. A case report presents a successful treatment of a patient in whom anomalous ("Y" shape) radial artery was used for "off pump" revascularization of circumflex artery and posterolateral branch of the right coronary artery. Left anterior descending and diagonal branch were grafted by left mammary artery as a sequence. Postoperative course of the patient was uneventful. Recoronarography performed four months after the procedure revealed good patency of all bypasses.

HEART RATE VARIABILITY CHANGES AFTER HEART TRANSPLANTATION

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Aim: The purpose of the study was to determine changes of time analysis of heart rate variability in two patients after heart transplantation and compare them with healthy controls.

Patients and methods: We examined totally 19 patients: 2 patients (6 and 15 years of age) were post heart transplantation, first control group consisted of 9 children at the age of 14 – 16 years and in the second control group there were 8 children at the age of 5 – 7 years. We measured 6 parameters of the time analysis of heart rate variability from 24-hours Holter record (NN int., SD, pNN50, rMSSD, triangular index, DsANN) by using Cardiete GiOtto Holter Monitor. Heart rate variability parameters were compared to the post transplant patient using percentile distribution from healthy controls (p10 – p90).

Results: Parameters of the time analysis of heart rate variability – SD, rMSSD, pNN50, triangular index – were in patients post heart transplantation below the 10th percentile of healthy controls.

Conclusion: Patients after heart transplantation had decreased total heart rate variability (SD, triangular index) and also parameters, reflecting parasympathetic activity (pNN50, rMSSD). We can conclude, that in patients after heart transplantation, the heart rate variability measured by time analysis at 24-hours Holter record was decreased.

IMPACT OF INFARCT RELATED ARTERY PATENCY ON THE INDUCIBILITY OF MALIGNANT VENTRICULAR TACHYARRHYTHMIAS

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Aim: Arrhythmic events are responsible for the majority of sudden cardiac death after myocardial infarction (MI). Patency of the infarct related artery (IRA), achieved by reperfusion therapies, is a predictor of survival rates irrespective of myocardial salvage. A favorable modification of the electrophysiologic post-MI milieu has been proposed to help explain the improved outcome. It was the aim of this retrospective study to analyze angiographic and clinical variables related to the propensity to malignant ventricular tachyarrhythmias in the chronic phase of MI.

Patients and methods: Among the 2500 pts admitted to our dept. in the years 2002 and 2004 we have identified 82 post-MI pts (mean age 61 ± 11 years, 69 men) who underwent coronary angiography and invasive electrophysiologic study (EPS) because of clinical occurrence of arrhythmia and/or syncope or pre-syncope and/or palpitations.

Results: Clinical and/or induced ventricular tachycardia (VT) or ventricular fibrillation (VF) was found in 58 and 7 pts, respectively, 17 pts were free of any VT/VF. An occluded infarct related artery (IRA) was documented in 38 pts with VT (66%). However, using multivariate analysis, patency of the IRA was not significantly associated with the occurrence of VT/VF. Such an association could neither be demonstrated for the other analyzed clinical (age) and angiographic variables (branch of occluded coronary artery – LAD vs. LCx vs. RCA, number of affected vessels – 1, 2 or 3- vessel disease, or localization of infarction – anterior vs. lateral vs. infero-posterior). Compared to the arrhythmia – free pt group, the 58 pts with VT were more frequently men ($p < 0.04$), had a lower left ventricular ejection fraction (LVEF) (0.35 vs. 0.44, $p < 0.03$) and longer time since the MI occurrence (8.3 vs. 4.3, $p < 0.04$).

Conclusion: Occurrence of malignant ventricular tachyarrhythmias in pts after MI was in our study strongly and independently associated with 3 clinical variables: male gender, degree of LV dysfunction and long time since the MI. The IRA was occluded in 66% of pts with VT, however, we could not identify the IRA patency as an independent risk factor for VT and this issue has to be addressed in a prospective study. The retrospective character and the limited number of pt are the major limitations of our analysis. Nevertheless, these results point out that in symptomatic post-MI pts relatively simple clinical variables identify pts with a high probability of occurrence of malignant ventricular tachyarrhythmias.

SYNCOPE IN OLD PEOPLE

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Aim: Syncope represent a frequent cause of falls in old age with all the consequences – injuries, fractures, longer immobilization. Whereas present proportion of people 65 years and older (out of the whole population) represent in the Czech Republic 13.9% (and population over 80 years 2.9%), greater change of the age structure of population, with increasing number of old people, is expected in few next years. According to the prognosis of the Czech Statistical Institution it can be expected that one third of the Czech population will be older than 65 years in 2050. Some other demographical changes can be also awaited till the middle of this century, such as decrease of the total number of people, increasing of life expectancy, faster increase of very old people (it is assume that every twentieth citizen in the Czech Republic will be older than 80 years in 2050).

Patients and methods: Vasovagal (neurocardiogenic) mechanism is stated as the most common cause of syncope (in 21.2% to 35%). Incidence of syncope in old age is about 6% per year. Orthostatic hypotenses, hyperreactivity of carotic sinus, neurally mediated symptomatology and arrhythmias are stated as the most common cause of syncope in old age. At our department we deal with diagnosing and therapy of syncopies in the long run (since 1992). Total number of 1169 patients were examined with TILT UP test by the end of 2003. We were concentrated on our old patients at this work. 191 people older than 70 years were examined in the followed period (which is 16.3% of all the patients that were examined at our department), 62 of them were older than 78 years (5.3% from the whole).

Results: More than 75% of examinations were diagnostical, the cause were explained and the therapy could be placed. No complication, even in the oldest, were documented. TILT UP test belongs to the safe and contributing examination even in older patients. There were diagnostic contribution at 1 of sick older than 70 years. With the help of TILT UP test the therapy of neurocardiogenic mechanism can be controlled and managed in indicated cases. Repeated examination were used in 10 people in the followed age category (in the whole group the examination were repeated in 90 people).

Conclusion: It is suitable to integrate TILT UP test into the diagnostical programme in old patients if neurological cause of syncope is not proved. Quite often the combination of neurocardiogenic (vasovagal) mechanism, influence of antihypertensive therapy and lower intake of fluids can be seen.

ANALYSES OF MORTALITY FROM DISEASES OF CIRCULATORY SYSTEM IN THE CZECH REPUBLIC COMPARED TO THE SITUATION IN EU AND EUROPE

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Aim: At this work we followed and analysed trends in standardised mortality from diseases of circulatory system (MKN 10, I00-I99) and from ischemic heart disease (I20-I25) and cerebrovascular disease (CVD) separately, over the period 1970 – 2003 in the Czech Republic. Data were compared with the situation in EU, Europe and the averages for Central and South European Countries (CSEC – 16 countries). Trends were followed according to gender.

Methods: Data were derived from the World Health Organization database and are standardised per 100 000 of European population.

Results: In the Czech Republic, mortality from diseases of circulatory system (DCS) in men rose from 795/100 000 in 1970 to 834/100 000 in 1990 and declined thereafter to 560/100 000 in 2002 (- 33%). In women, the fall was from 559/100 000 in 1970 to 380/100 000 in 2002 (- 32%). In 2003 after the previous decline increase of value of this indicator can be seen again in both gender, in men to the 569, in women to 383. Ischemic heart disease (IHD) mortality in Czech men slightly rose in the period between 1970 – 1990 and decreased to 237/100 000 in 2003 (- 40%), in Czech women IHD mortality decreased by 41% in the followed period and was 132/100 000 in 2003. A > 35% decline in cerebrovascular disease (CVD) mortality was registered in both sexes in Czech Republic. In European Union long term trends were favourable for mortality from all DCS as well as from IHD and CVD for both sexes. For the whole Europe only slight decrease in the followed mortality rates during period of 1970 – 2003 in both sexes is to be seen. Also only slight decrease in mortality from DCS in

both sexes is seen in CSEC during the followed period. What is concerning the IHD and CVD mortality in the CSEC countries, the situation was almost stable and did not change much during the followed period.

Conclusion: In the Czech Republic, the standardised mortality rates from DCS, IHD and CVD were the highest comparing to the situation in EU, Europe and CSEC at the beginning of the following period and mostly also in the period between 1970 – 1990. However, the situation has changed since 1990 and the trends in mortality from DCS, IHD and CVD are favourable. Still mortality rates from CVD, IHD and CVD are high comparing to the EU.

CONGENITAL HEART DISEASE AND SEVERE AIRWAY OBSTRUCTION

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Aim: To describe clinical presentation and optimal management of lower airway obstruction associated with congenital heart disease in neonates and infants.

Patients and Methods: Retrospective study of 20 patients with congenital heart disease and lower airway obstruction with respiratory failure, hospitalized at Pediatric Cardiac Intensive Care Unit in the period of 12 years (Jan 1993 – Jan 2005).

Results: Infants with significant airway obstruction constituted 1% of infants requiring surgery for congenital heart disease. Airway obstruction presented as severe respiratory distress preoperatively in 9 patients. After surgery all patients had ventilatory difficulties during mechanical ventilation and/or problems with weaning from ventilator. Duration of mechanical ventilation was 8 – 276 days, med. 40 days. Conservative management of airway obstruction (ventilatory management with PEEP 8 – 12 mmHg, I : E ratio 1 : 4 – 1 : 6, extubation to N-CPAP, prone position) was successful in 8 patients. Invasive interventions were necessary in 12 patients (surgery in 9 pts, placement of airway stents in 3 pts). In-hospital mortality in our series was 10% (2 patients), 5 patients (25%) died after discharge from the hospital.

Conclusion: Despite complex intensive therapy prognosis of severe airway obstruction associated with congenital heart disease is poor.

INFLUENCE OF DIABETES ON PRIMARY PERCUTANEOUS CORONARY INTERVENTIONS IN PATIENTS WITH STEMI (ST-ELEVATION MYOCARDIAL INFARCTION)

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The aim of our work was the evaluation of differences in primary percutaneous coronary interventions (PPCI) in diabetic and non-diabetic patients.

Methods: During the year 2003 there were 93 patients with STEMI treated with PPCI, 24 (9 women) of them were diabetics (6 on insulin therapy), and 69 (17 women) non-diabetics. Characteristics of patients are in **table 1**.

Table 1

	non-diabetics (n = 69)	diabetics (n = 24)
Age	65.3 ± 9.2 y	61.6 ± 12.0 y
Obesity	28 (40%)	12 (50%)
Smoking	33 (48%)	3 (12%)
Hypertension	46 (67%)	14 (58%)
Hyperlipoproteinemia	34 (49%)	11 (46%)
Ejection fraction	41.74 ± 8.24%	42.89 ± 9.17%
Coronary lesion (Left main) (Vessel = V)	1 (1.5%)	1 (4%)
	1V 23 (33%),	8 (33%),
	2V 25 (36%),	13 (54%),
	3V 20 (29%)	2 (8%)

Results PPCI are in **table 2**.

Conclusion: Diabetics with STEMI did not differ in success of PPCI, but had non-significant higher mortality and longer procedure (P < 0.20), and similarly the longer stay in hospital (P < 0.10) in opposite of non-diabetics.

Table 2

	non-diabetics (n = 69)	diabetics (n = 24)
Successful/		
Nonsuccessful PPCI	58 (84%)/11 (16%)	20 (83%)/4 (17%)
Stents/Direct stents	49 (71%)/7 (10%)	16 (67%)/2 (8%)
Mortality (in hospital)	2 (3%)	3 (12%)
Brain attack/bleeding	0/0	0/0
Re-PCI	4 (6%)	4 (17%)
CABG	3 (4%)	1 (4%)
Use of IIb/		
IIIa GP antagonists	5 (7%)	1 (4%)
Duration of PPCI (min)	52.9 ± 25.9	57.4 ± 20.9 P < 0.20
Stay in hospital (days)	4.1 ± 1.9	5.2 ± 4.2 P < 0.10

ANOMALOUS ORIGIN OF THE LEFT CORONARY ARTERY IN CHILDREN

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Aim: Origin of the left coronary artery from pulmonary artery (ALCA) is a rare but important anomaly because early death is often the natural outcome. At present with early diagnosis and surgery it appears that the child may be completely cured. Authors analysed 5 own cases of ALCA retrospectively. On the basis of the own practical experiences and literature research authors try to improve noninvasive diagnostic criteria for ALCA.

Patients and methods: Authors during 8 last years observed 5 cases of ALCA. Children age varied from 4 months to 4 years.

Results: Authors analysed clinical pictures, electrocardiographic and echocardiographic findings. Myocardial scintigraphy was evaluated in 3 cases. Once the diagnosis of ALCA has been recognized in all 5 cases, surgery was undertaken to correct this anomaly. One patient died 1.5 year after surgical treatment. In 4 survival cases, the heart size returned to normal, patients have become asymptomatic, and measures of myocardial function have improved.

Conclusion: Authors in their presentation refer to the importance of the early diagnosis of ALCA. They described differential diagnostic criteria between ALCA and the dilatation forms of cardiomyopathy.

THE CRITICAL CONGENITAL HEART DISEASE IN OUR HOSPITAL

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Aim: Centralization of specialized care is necessary for some complicated cases in order to improve survival rates and quality of life for the patients. Our purpose was to evaluate taking care of newborn infants with critical congenital heart disease in our hospital.

Patients and methods: 23 of newborn infants with congenital heart defects were prospectively documented and evaluated during a 3-year period from January 2002 to December 2004.

Results: From all 23 admitted newborn infants fifteen (65%) were transferred from local smaller general hospitals and eight (35%) were born in Martin Faculty Hospital. Incidence of high risk newborn infants with congenital heart defects was 2.3/1000 live – born infants. Newborn infants were born mostly in the spring and autumn months, probably due to a higher occurrence of viral infections during the first three months of pregnancy. From the total number of 23 newborns critical heart disease was manifested after birth: in 18 within the first day, in 3 within 7 days and in 2 newborns with PDA after 14 days. 20 newborn infants (87%) were transported to the Children cardiocenter by ambulance, 1 by helicopter and 2 newborns were in really serious clinical state and that is why the transport was impossible. In 19 (83%) cases preliminary our diagnosis was identical with diagnosis stated by national cardiac center, in 3 cases (13%) was almost identical and in 1 case (4%) diagnosis was completely different. From the total number of 21 newborns with high risk newborn infants with congenital heart defects transported to the national cardiac center in 6 (30%) the urgent operation was realized and in 9 (43%) the planned operation was done, another 2 newborns died just before operation, and in 2 (9%) cases the operation was contraindicated.

Conclusion: Authors refer on importance for a determination of exact diagnosis before a long distance transport. Development of national and regional guidelines and quality assurance programs, as well as development of regional transport teams may further increase the chances for healthy survival in newborn infants with cardiac malformations.

IMPROVEMENT OF REGIONAL CONTRACTILITY AFTER AUTOLOGOUS BONE MARROW CELL TRANSPLANTATION IN PATIENTS WITH LEFT VENTRICULAR DYSFUNCTION DUE TO ACUTE MYOCARDIAL INFARCTION

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Aim: The purpose of this study was to determine the impact of autologous transplantation of mononuclear bone marrow cells on regional contractility in patients with an irreversible left ventricular dysfunction due to acute myocardial infarction.

Patients and methods: The randomized, multicentric study included 23 patients with a first acute myocardial infarction treated with primary coronary angioplasty with a stent implantation, ejection fraction < 40% and the irreversible damage of at least 2 (mean 7.6 ± 1.7) akinetic or dyskinetic myocardial segments identified by dobutamine echocardiography (DE), single photon emission computed tomography (SPECT) and positron emission tomography (PET). Patients were randomized into the Group A (n = 14) to receive autologous mononuclear bone marrow cells in addition to standard therapy and into the control Group B (n = 9) treated with only standard therapy. Cells were transplanted into the infarct-related artery on day 5 – 9 after infarction. The Doppler tissue imaging and SPECT were performed before cell transplantation and repeated 3 month later. The changes of following parameters were assessed: left ventricle ejection fraction (EF), the peak systolic velocity of the myocardium adjacent to mitral anulus of infarcted wall (SaMI) and the size of perfusion defect (PD).

Results: In the Group A, EF improved from 35 ± 5% to 40 ± 5% (p < 0.05), SaMI improved from 4.17 ± 1.01 to 4.48 ± 0.87 cm/s (p = 0.05) and PD was reduced from 56.6 ± 11.0% to 48.3 ± 14.5% (p < 0.01). In the Group B, EF changed from 35 ± 6% to 37 ± 9% (p = NS), SaMI from 4.64 ± 1.36 to 4.41 ± 1.30 cm/s (p = NS) and PD from 53.9 ± 21.0% to 45.3 ± 21.9% (p < 0.05).

Conclusion: In patients with an irreversible left ventricular dysfunction due to acute myocardial infarction, autologous transplantation of mononuclear bone marrow cells induced an improvement of regional, as well as global left ventricle function.

CHRONIC HEART FAILURE IMPROVEMENT INITIATIVE: WITH NEW OR STANDARD QUALITY MARKERS?

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Aim: There is still a substantial gap between guidelines and usual clinical practice for pharmacotherapy of congestive heart failure (CHF). We aimed to improve it by one-shot educational intervention.

Patients and methods: 263 consecutive pts (m: 165, f: 98) with systolic CHF, NYHA II – IV, age (53 – 85 years). From III. to X. 2003 an interventional survey in four 2 months periods was performed: baseline (B, 54 pts), interventional (I, 72 pts) and two follow-ups (FU1, 68 pts; FU2, 70 pts). For ACE-inhibitors (ACE-I) and beta-blockers (BB) we analysed and compared in all time periods: 1. new quality markers: a) appropriate use (use; pts with drug including pts without drug because of contraindications or adverse events) and b) appropriate dose (dose; pts with target dose and pts with lower than target dose due to objective reasons); 2. standard quality markers: a) prescription rate (Rx; pts with drug) and b) target dose rate (target; pts with drug in target dose).

Results: 1. ACEi use was 76 – 94 – 87 – 78% (in B – I – FU1 – FU2 time period); ACEi Rx 63 – 82 – 70 – 59%; ACEi dose 74 – 86 – 60 – 75%; ACEi target 35 – 31 – 21 – 28%; BB use 83 – 96 – 87 – 88%; BB Rx 57 – 67 – 48 – 69%; BB dose 71 – 90 – 82 – 70%; BB target 0 – 6 – 12 – 2%. 2. ACEi use vs. ACEi Rx (NS), ACEi dose vs. ACEi target ($p < 0.05$), BB use vs. BB Rx ($p < 0.05$), BB dose vs. BB target ($p < 0.001$). ACEi prescription and target dose rates are higher (ACEi target vs. BB target, $p < 0.001$), but BB are more appropriately used and dosed.

Conclusion: 1. Intervention had transient impact on quality of CHF pharmacotherapy. We recommend more aggressive, continuous and multiple intervention to achieve and sustain full compliance with guidelines. 2. New markers of quality represented significantly more objectively physician's compliance with guidelines, especially for BB. Standard quality markers are more favourable for ACEi.

DEVELOPMENT OF DIABETES MELLITUS IN PATIENTS WITH HEART FAILURE

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Aim: Diabetes mellitus is a well recognized risk factor for the development of heart failure, although the reciprocal interrelationship between the heart failure and the glucose abnormalities are still unclear. The aim of this study was to evaluate the development of new diabetes in patients with heart failure.

Patients and methods: The study involved 122 patients with coronary artery disease divided into three groups: 1) New York Heart Association (NYHA) I group: 68 patients, 2) NYHA II group: 32 patients, 3) NYHA III group: 22 patients. Hyperglycemia was diagnosed if glucose level was ≥ 7 mmol/l. Mean follow up was 30 months. The three groups were similar with respect to age, gender, therapy and the prevalence of the most relevant cardiovascular diseases and the risk factors.

Results: During the follow up period, development of diabetes mellitus was observed in 6 (9%) of the patients from the NYHA I group; 4 (13%) of the patients from the NYHA II group and 4 (18%) from NYHA III.

Conclusion: Among patients with coronary disease, the presence of advanced heart failure (NYHA III) is associated with increased risk for development of new diabetes mellitus.

EUROPEAN SYSTEM FOR CARDIAC OPERATIVE RISK EVALUATION (EUROSCORE) PREDICTS SHORT-TERM SURVIVAL IN PATIENTS WITH CARDIOVASCULAR DISEASE

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Aim: European System for Cardiac Operative Risk Evaluation (EuroSCORE) is the most accurate risk scoring system, valid for patients undergoing cardiac surgery. The aim of this study is to estimate the short-term correlation between the predictive value of the additive and logistic model of EuroSCORE and the mortality rate in a cardiac patient.

Patients and methods: Data were prospectively collected from a total of 266 consecutive patients presented to the cardiac surgeon as cardiac surgery candidates between September 2004 and January 2005 at the Cardiocenter, University Hospital Vinohrady, Prague. Out of them, 59% patients were indicated for cardiac surgery, 18% for percutaneous coronary intervention and 23% for conservative treatment. Patients contraindicated for cardiac surgery were rejected due to: diffuse coronary atherosclerosis too extensive for surgery (19%), high operative risks (42%) or other reasons (39%). To assess the risk factors for mortality in patients candidates for cardiac surgery, both additive and logistic model of the EuroSCORE were used. The mean follow up was 42 days.

Results: Combined end-point of death/infarction/stroke occurred in 11 patients (4%). 7 patients (2.6%) died during the follow up period. The mortality among patients with additive EuroSCORE > 5 was 6%, while with additive EuroSCORE ≤ 5 it was 0.6% ($p < 0.01$). The combined end-point among patients with Logistic EuroSCORE > 5 was 8%, while with Logistic EuroSCORE ≤ 5 it was 2% ($p < 0.02$). The mortality among the patients with Logistic EuroSCORE > 5 was 7% while among the patients with Logistic EuroSCORE ≤ 5 it was 0.5% ($p < 0.002$).

Conclusion: The short-term prognosis of the cardiac patients correlates with the level of both additive and logistic model of the EuroSCORE system in patients presented as cardiac surgery candidates. The study is in progress.

LONG-TERM EFFECT OF AT₁ RECEPTOR BLOCKADE ON GEOMETRY OF CAROTID ARTERY IN SHR

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Introduction: The aim of the study was to evaluate the effect of AT₁ receptor blockade of losartan on blood pressure (BP), cardiac hypertrophy and on geometry of carotid artery of Wistar rats and spontaneously hypertensive rats (SHR).

Methods: Four groups of 4 week old male rats were used: 1) Control Wistar rats, 2) SHR, 3) Wistar rats treated by losartan, 4) SHR treated by losartan. Losartan was administered by a gavage in a total daily dose of 20 mg.kg⁻¹ day⁻¹ b. w., for 5 weeks. BP was measured by the tail plethysmographic method. After sacrificing rats were perfused (120 mmHg) by glutaraldehyde fixative, and processed for standard electron microscopy. Wall thickness (WT) and inner diameter (ID) of carotid artery (AC) were measured in light microscopy. Cross sectional area (CSA) and wall thickness/inner diameter (WD) were calculated.

Results:

Parameter	Wistar	Wistar + Los	SHR	SHR + Los
BP (mmHg)	109 ± 1.7	101 ± 2.3 *	149 ± 2.1 **	135 ± 1.0 +***
HW/BW	4.6 ± 0.3	3.0 ± 0.1 **	5.8 ± 0.2 **	4.2 ± 0.1 **
Carotid artery				
WT (µm)	27.0 ± 1.2	21.3 ± 0.6 **	33.8 ± 0.7 **	31.9 ± 0.7 **
ID (µm)	743 ± 23.7	825 ± 23.1 *	714 ± 21.2	792 ± 18.1 **
CSA x 10 ³ µm ²	64.8 ± 2.3	56.4 ± 1.8 **	79.1 ± 1.5 **	82.2 ± 2.2 **
WD x 10 ⁻²	3.7 ± 0.3	2.6 ± 0.1 **	4.8 ± 0.2 **	4.1 ± 0.2 *

*vs. Wistar rats, +SHR + Los vs. SHR

Conclusion: Administration of AT₁ receptor blocker losartan evoked decrease of BP and cardiac hypertrophy in Wistar rats. In SHR, losartan administration prevented BP elevation and evoked beneficial effect on both regression of cardiac hypertrophy and remodelling of the vessel wall.

The study was supported by VEGA grant 2/3145/23, Slovakia.

EFFECT OF NITRIC OXIDE DONORS ON GEOMETRY AND REACTIVITY OF CONDUIT ARTERIES IN SHR AND RATS TREATED BY NO SYNTHASE INHIBITOR

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Introduction: We studied effect of NO donors, pentaerythryl tetranitrate (PETN) and molsidomine (Mols), on reactivity and structure of thoracic aorta

(TA) and carotid artery (CA) of SHR and rats in which hypertension was induced by N^o-nitro-L-arginine methyl ester (L-NAME) treatment (50 mg/kg/day in tap water).

Methods: We used 10-week old rats: Wistar, Wistar + L-NAME, Wistar + L-NAME + PETN, Wistar + L-NAME + Mols, SHR, SHR + PETN, SHR + Mols. PETN (2 x 50 mg/kg/day) and Mols (2 x 100 mg/kg/day) were administered by a gavage for 6 weeks. Systolic blood pressure (BP) was measured by plethysmographic method. For morphological study the rats were perfused with fixative (120 mmHg) and TA and CA were processed for electron microscopy. Wall thickness (WT), cross sectional area (CSA), inner diameter (ID), and WT/ID ratio were measured in light microscopy. For functional study isolated rings of TA and CA were used.

Results: BP (mmHg) in L-NAME + PETN group (163 ± 1) and L-NAME + Mols (144 ± 2) were lower than in L-NAME group (172 ± 2) but higher than in controls (126 ± 2). BP in SHR + PETN (220 ± 3) and SHR + Mols (224 ± 5) groups did not differ from BP of SHR (214 ± 7) group. Morphometry of the TA and CA revealed increase of WT, CSA and WT/ID in both models of hypertension. Endothelium-dependent relaxations of aorta from L-NAME treated rats were impaired regardless of whether noradrenaline or phenylephrine were used to contract the isolated arteries. In aorta and carotid artery from SHRs, the endothelium-dependent relaxations to acetylcholine were not attenuated. The relaxation of arteries from SHRs, as well as the residual relaxations of arteries from L-NAME treated rats, were abolished by addition L-NAME to incubation medium. In NO-deficient hypertension effect of L-NAME was prevented by PETN and Mols administration. No effect of both donors was observed in SHR groups.

Conclusion: These results suggest that elevated blood pressure and accompanying functional and structural changes in SHR, contrary to NO-dependent hypertension, are not primarily evoked by deficiency of NO.

The study was supported by VEGA grant 2/3145/25 and 2/3145/25 Slovakia.

MANAGEMENT IN HEART FAILURE CLINIC IMPROVES SURVIVAL AND REDUCES HEART FAILURE REHOSPITALIZATIONS IN HEART FAILURE PATIENTS

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Aim: Heart failure (HF) is associated to grim prognosis. Disease management programmes can reduce HF rehospitalizations and mortality but the applicability to the general population remains limited. We aimed to compare the number of HF rehospitalizations, survival, pharmacological therapy, patients knowledge and quality of life in patients from community hospital area managed either in the HF clinic or receiving the usual care.

Patients and methods: We followed 50 patients receiving care in the HF clinic for at least twelve months. The control group receiving the usual care (N = 65) was formed retrospectively and was matched for age and gender. The hospitalizations and survival were recorded throughout the follow-up while we assessed the pharmacological treatment and patients knowledge (using Patients knowledge questionnaire – PKQ, score 0 – 10 points) at baseline and at the end of the follow-up.

Results: During the follow-up of 532 (214) days significantly less patients from the HF clinic group were rehospitalized due to HF (34% vs. 55%, p = 0.023) or died (16% vs. 38%, p = 0.008). After first twelve months the risk of HF rehospitalization (p = 0.002) or death (p = 0.004) was significantly lower in the HF clinic group. Assignment to the HF clinic independently predicted occurrence of HF rehospitalizations (hazard ratio 0.33, 95% CI 0.12 – 0.87) or death (hazard ratio 0.12, 95% CI 0.02 – 0.54). At the end of follow-up more patients from the HF clinic received ACE inhibitors (98% vs. 80%) and beta-blockers (93% vs. 48%), demonstrated better knowledge [PKQ score 7.9 (1.3) vs. 5.7 (2.2), p < 0.001], and were in lower NYHA class [2.3 (0.7) vs. 3.0 (0.7)]. After applying the Cox proportional hazard model for the patients from the HF clinic, treatment with eⁿ 50% of beta-blockers target daily dose (HR 0.3, 95% CI 0.10 – 0.95) and PKQ score < 7 (HR 3.92, CI 95% 1.39 – 11.03) independently predicted occurrence of death or HF rehospitalization in these patients.

Conclusion: Management in the HF clinic improved survival and reduced number of HF rehospitalizations in heart failure patients. In HF clinic patients adverse prognosis was predicted by poor patient knowledge and suboptimal beta-blockers treatment.

CIRCULATORY AND NEUROHORMONAL RESPONSE TO LEVOSIMENDAN

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Aim: To present our experiences with levosimendan administration and assess the circulatory and neurohormonal response to treatment in pts with acutely decompensated chronic HF.

Patients and methods: The group consisted of 10 pts (7 males) with acutely decompensated chronic HF. The average age of pts was 52 ± 10 yrs, left ventricular ejection fraction was 19 ± 6 %. The underlying disorder was dilatative cardiomyopathy in 6 pts and coronary heart disease in 4 pts. Levosimendan was administered intravenously. The initial dose of 24 ug.kg⁻¹ during the first 10 minutes was followed by continuous infusion by 0.1 ug.kg⁻¹.min⁻¹ during the next 24 hours. In 7 pts, levosimendan was a primary inotropic treatment. In 3 pts we switched to levosimendan after an unsatisfactory effect of dobutamine dose of 5 ug.kg⁻¹.min⁻¹. The average dose of furosemide was 380 mg intravenously and remained unchanged during the levosimendan use. We followed a change in diuresis, blood pressure, heart rate, basic biochemical parameters, and B-type natriuretic peptide (BNP).

Results: Daily diuresis increased from 1790 ± 660 ml to 3330 ± 930 ml (p < 0.001). The average daily diuresis from day 2 to day 6 after levosimendan administration was 3100 ± 1260 ml. In 3 pts with the unsatisfactory response to a standard dose of dobutamine, the diuresis increased from 1980 ± 450 ml to 3500 ± 830ml after levosimendan administration. BNP dropped from 1563 ± 693 pg/ml to 1224 ± 702 pg/ml (p = 0.05). No significant changes in blood pressure, heart rate and biochemical parameters were observed.

Conclusion: Levosimendan significantly promoted diuresis in pts with acutely worsened chronic HF, even in case of poor previous dobutamine effect. The favourable circulatory effect of levosimendan remained at least 6 days after its administration.

SIGNIFICANT BRADYCARDIA AFTER HEART TRANSPLANTATION – STILL HERE?

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Aim: Severe bradycardia can have a negative impact on the fate of patients after heart transplantation (HTx). After introduction of the bicaval surgical technique, the incidence of bradycardia has dropped but this condition continues to be one of significant causes of cardiac morbidity after HTx. The aim was to describe incidence and analyze causes and related variables of severe bradycardia requiring permanent pacemaker (PM) implantation in pts after HTx.

Patients and methods: 48 pts (46 males) who underwent HTx at the Slovak Institute of Cardiovascular Diseases from 1998 to 2005, survived the early post-operative period and were discharged from the hospital were followed up. The average age of the pts was 46.6 ± 10.5 yrs. The bicaval surgical technique was used in all of the pts. Evolution of intrinsic cardiac activity in the early post-operative period and the type of bradycardia was evaluated. The presence of bradycardia was correlated to some intervening factors (donor age, graft ischemic time, pre-operative amiodarone administration). The need for the long-term dependence on pacing therapy and rate of PM-related complications of endomyocardial biopsy (EMB) was assessed.

Results: On the first post-operative day, significant bradycardia requiring cardiac pacing was observed in 11 (22.9%) pts [complete atrioventricular block (AVB) in 8, asystole with none cardiac electrical activity in 3 pts]. On day 7 after surgery, severe bradycardia was present in 9 (18.8%) pts. At hospital discharge, bradycardia persisted and required PM implantation in 7 (14.6%) pts. After 3 months, all of the patients were PM-dependent and in all of them, the intrinsic heart activity was complete AVB. Donor age was higher in patients requiring pacemaker implantation (36.9 vs. 29.5 yrs, p < 0.01), the incidence of bradycardia had no relation to graft ischemic time (157.3 ± 40.5 min vs. 186.7 ± 51.3 min, n.s.). Lead dislodgement occurred in 2 (1.7%) out of total 117 EMBs executed in patients with PM.

Conclusion: Significant, PM implantation-requiring bradycardia was present in our group of pts. AVB represented the major portion of bradycardiac disorders. The incidence of bradycardia was related to donor age, not to ischemic time. Determination of causes of severe bradycardia in our pts needs further analysis.

THROMBOLYTIC THERAPY IN PATIENTS WITH MYOCARDIAL INFARCTION OLDER THAN 75 YEARS: THE IMPACT ON INFARCT COURSE AND IN-HOSPITAL MORTALITY

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Aim: The aim of this study was to investigate the impact of thrombolytic therapy on hospital course and outcome in patients with ST elevation myocardial infarction (STEMI) older than 75 years.

Patients and methods: We analyzed infarct course in 159 patients older than 75 years with STEMI (96 or 60.4% male, mean age 80.3 ± 5.9 years), admitted to our Coronary Care Unit during the year 2000 – 2001.

Results: In 159 patients older than 75 years with STEMI, 18 (11.3%) were treated with streptokinase. In comparison with patients who were not treated with thrombolytic therapy, they had less frequently signs of heart failure (Killip II – IV) (27.8% vs. 53.9%, $p = \text{NS}$). Mortality rate in thrombolytic group was lower (11.1% vs. 24.8%, $p = \text{NS}$), hospitalisation days were similar (14 ± 9 vs. 12 ± 8 days, $p = \text{NS}$). After thrombolytic treatment major bleeding complications did not occur, and they were present in only 0.45% of patients who were not treated with streptokinase.

Conclusion: The results indicate that patients older than 75 years with STEMI treated with thrombolytic therapy had better infarct course and lower mortality, without major bleeding complications.

SUCCESSFUL NON-SURGICAL THERAPY OF BACTERIAL ENDOCARDITIS WITH MASSIVE VEGETATIONS ON PACEMAKER ELECTRODES

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Background: Bacterial endocarditis (BE) on permanent pacemaker (PM) electrodes is a rare (0.8 – 5.7%) but potentially life threatening complication. In the absence of local spread of infection from PM pocket, secondary infection of lead thrombi during bacteraemia and subsequent bacteria seeding is the presumed etiopathological mechanism. Lead extraction in combination with targeted aggressive antibiotic therapy is the therapy of choice. However, vegetations/thrombi with size > 15 mm are considered contraindicated for percutaneous extraction and necessitate surgical removal with open heart approach. Thrombolysis – otherwise a powerful tool for achieving thrombus dissolution – has generally been considered contraindicated in this setting due to risk of dissemination of the infected thrombi fragments throughout the body.

Patients and methods: Within a time period of 2 years 3 male patients (39, 70 and 72 years old) were treated in our dept. because of BE on PM electrodes. All 3 pts underwent PM implantation for sinus node dysfunction 4 – 7 years ago. Since all pts refused surgical removal of the PM system, we have attempted a novel non-surgical staged approach consisting of: 1. targeted antibiotics, 2. thrombolysis and, eventually, 3. percutaneous lead extraction.

Results: After individual pretreatment with intravenous (IV) antibiotics all 3 pts received a prolonged low-dose thrombolytic therapy with t-PA (Actilyse 40 mg/24 h for 5 days) along with full dose unfractionated heparin IV. The thrombotic masses were closely monitored by transesophageal echocardiography which revealed a gradual progressive reduction of size in all 3 pts (from 30×21 to 15×12 mm, from 27×13 to 15×6 and from 37×18 to 12×8 mm, respectively). No hemorrhagic, septicemic or embolic complications occurred. In all 3 pts percutaneous extraction of the PM system was successfully performed. Patients were discharged home with oral antibiotics. During the 2-year follow-up BE did not recur and, interestingly, PM implantation was not necessary in any of the 3 pts.

Conclusion: Our experience shows that prolonged low-dose thrombolysis in conjunction with antibiotics followed by percutaneous PM system extraction appears to be a safe and highly effective alternative to surgical removal in carefully selected patients with PM endocarditis.

IMPORTANCE OF ATRIAL FIBRILLATION IN HOSPITAL MORTALITY OF PATIENTS WITH ACUTE MYOCARDIAL INFARCTION

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Introduction: Atrial fibrillation (AF) is the most common supraventricular arrhythmia in patients with acute myocardial infarction (AMI).

Objective: To assess the incidence and prognosis of atrial fibrillation complicating myocardial infarction in a large population of patients receiving optimal treatment.

Materials and methods: From 18 January 1999 to 31 December 2004 1.726 pts with AMI with sinus rhythm at enrollment were admitted to the CCU, 135 later (first 48 hours) had AF and 1.591 did not. We compared outcomes between these 2 groups, adjusting for differences in baseline characteristics, pre-fibrillation complications and current therapy.

Results: The incidence of in-hospital atrial fibrillation was 7.8%. Atrial fibrillation was associated with indicators of a worse prognosis (age > 70 years, higher Killip class* previous myocardial infarction, treated hypertension, insulin dependent diabetes, signs or symptoms of heart failure) and with some adverse clinical events (reinfarction, sustained ventricular tachycardia, ventricular fibrillation). We noticed lower incidence of AF in pts who underwent reperfusion therapy (4.9%). After adjustment for other prognostic factors, atrial fibrillation remained an independent predictor of increased in-hospital mortality: 17% vs. 5%.

Conclusions: Atrial fibrillation is an indicator of worse prognosis in the short term after acute myocardial infarction. Prevention and management may improve outcome. Recent advances in pharmacological treatment of myocardial infarction may have changed the impact of this arrhythmia.

PATIENTS WITH ACUTE CORONARY SYNDROMES IN CORONARY CARE UNIT OF SESTRE MILOSRDNICE UNIVERSITY HOSPITAL 1999 – 2003

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Introduction: Acute coronary syndromes (ACS) comprises three clinical entities unstable pectoral angina (UA), myocardial infarction with ST elevation (STEMI) and myocardial infarction without ST elevation (NSTEMI), which are linked by common pathoanatomical substrate, atherosclerotic plaque rupture with diverse degree of superimposed thrombosis.

Materials and methods: From January 1st 1999 to December 31st 2004 2.743 pts with ACS were admitted to the CCU: 1.289 (47%) with STEMI, 1.102 (40%) with UA and 352 (13%) with NSTEMI, with obviously increasing pts with DA (from 34% in 1999 to 47% in 2004). Majority of pts were male (64%) but number of female were increasing from 32% in 1W to 38% in 2004.

Results and conclusion: The most significant risk factors in our pts were hypertension (56%) and smoking (53%) and, than as follows hyperlipidaemia (31%) and diabetes mellitus (26%). The analysis of therapeutic approach reveals that ASK is most frequently used drug (86%), followed by nitrates (82%), heparin (73%), ACE inhibitors (54%), beta-blockers (46%) and calcium antagonists (11%). Thrombolytic therapy with streptokinase was performed in 10% of pts with STEMI. Primary PCI was done in 44% of all pts with STEMI but primary PCI was performed in 91% of pts who came to hospital inside 12 hours of the beginning of symptoms. Majority of these pts were male (71%) in average age 63.7 ± 11.3 years, PTCA was performed in 16%; PTCA followed by STENT implantation was performed in 66% and primary stenting was performed in 6% of these pts. The average time from beginning of the symptoms was 182 ± 85 minutes and "door to balloon" time was 78 ± 32 minutes. Primary success in all pts who underwent emergency PCI was 90%. Thirty day mortality of these pts was 6%, majority of pts who died were in cardiogenic shock, and the mortality in cardiogenic shock was 35%. The most common complications of MI were acute HI-, (36%), arrhythmias (26%, mainly 46% PA), then cardiogenic shock (7%), pulmonary edema (6%). Death rate in pts with ACS was 82%. By comparing our results with those published in other European countries, we conclude that in our population (300.000 habitants of Zagreb) the ratio UA/MI is 0.96 (increasing from 0.88 in 1999 to 1.1 in 2004), in contrast to 1.2 in the European countries. Prevalence of smoking unci hypertension is higher in our pts, while administration of heparin, beta-blockers and thrombolytic therapy in lower than in other European countries. The rate of thrombolysis decreased from 20% in 1999 to only 5% in 2002 but

the rate of acute is markedly increasing from 9% in 2000 to 58% in 2004. Emergency PCI is the optimal treatment in pts with AMI in an institution with organised 24-hours service by experienced team of interventional cardiologist and trained nurses particularly in those with concomitant cardiogenic shock. Mortality rates in our pts is still higher than in other European countries but with significantly decreasing from 13% in 1999 to 8.2% in 2004.

FIVE YEARS EXPERIENCE IN PRIMARY ANGIOPLASTY

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Introduction: Primary angioplasty (PA) is the most effective reperfusion strategy in the treatment of the patients (pts) with acute myocardial infarction (STEMI).

Materials and methods: Since October 1st 2000 when we organised 24-hours service by experienced team of interventional cardiologist to October 1st 2004 we performed PA in 415 pts with STEMI within the first 12 hours of the onset the symptoms. Majority of pts were male (70%) and mean age was 61.6 ± 11.4 (36 to 39 years old).

Results and conclusion: In 64 (15.4%) pts we performed PTCA. In 278 (66.9%) PTCA was followed by stent implantation while primary stenting without predilatation was done in 25 (6%) of our pts. Right coronary artery (RCA) was found as a culprit lesion in 192 pts (46.2%) left descending artery (LAD) in 165 pts (39.7%) and circumflex artery (ACx) in 58 pts (13.9%). The average time from beginning of the symptoms was 182 ± 85 minutes and "door to balloon" time was 78 ± 32 minutes. Overall primary success was 88.3%. Cardiogenic shock was found in 40 pts (9.6%); In hospital mortality was 8.4%, majority of pts who died were in cardiogenic shock, and the mortality in cardiogenic shock was 36%. PTCA, PTCA followed by stenting and even more primary stenting is the most effective reperfusion strategy in pts with STEMI, specially in an institution with organised 24-hours service by experienced team of interventional cardiologist and trained nurses. Despite advances in pharmacological reperfusion with thrombolytics alone or in combination with GP IIb/IIIa, TIMI 3 flow was established in 75% of pts. In contrast PA improved TIMI 3 epicardial flow in 90% of our pts. Despite reestablishment of epicardial flow, swelling of endothelial cells, perivascular edema, capillary plugging and small vessel spasm in the infarct territory may persist and it is associated with poor recover in the left ventricular function, combination of I > A and GP IIb/IIIa inhibitors may enhance microvascular reperfusion and increase myocardial salvage. In hospital mortality of 8.4% is significantly lower than mortality in other pts with STEMI (11%) particularly in pts with cardiogenic shock because the mortality in cardiogenic shock in group with PA was 36% vs 80.6% in conservative treated group. That mortality can be further reduced by shortening time delay between chest pain onset and initiation of PA.

PROFILE OF THE PATIENT WITH CHRONIC HEART FAILURE (CHF) HOSPITALIZED AT CARDIOLOGICAL DEPARTMENT

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Aim: To assess abiding guidelines of the Czech Society of Cardiology (CKS) in diagnosing and treating patients with chronic heart failure.

Patients and methods: Selected data from medical records of the patients released from the internal cardiological department in Oct – Dec 2004. Database: 898 hospitalized (506 men, 392 women). Diagnosis of CHF set by criteria of CKS satisfied 165 hospitalized (18.4%). Group A – patients with dyspnoea < NYHA III, Group B – NYHA III – IV.

Results: 106 men (64.2%) – 68.4 ± 12.5 years, 59 women (35.8%) – 68.4 ± 12.1 years. In group A there were 96 patients (68 men, 28 women), in group B 69 patients (38 men, 31 women). During hospitalization 3 died in group A and 6 in group B ($p = 0.06$). CHF in anamnesis had 65 diseased, 100 were diagnosed de novo, 10 re-hospitalized. Average hospitalization length in group A was 7 days, while in group B 10 days ($p < 0.01$). Among comorbidities the most frequent were IHD – 74% and 78.3%, hypertension in 66.7% patients, dilated cardiomyopathy in 16.7% individuals of group A and 10.1% of group B, atrial fibrillation in 25% and 40.6% patients, resynchronization therapy in 3.1% and 10.1%. Ejection fraction of LV was known in 91% diseased, average EF in patients with systolic dysfunction ($EF < 40\%$) was 30.8% in group A and 28% in group B ($p < 0.05$). ACE-I in medication when released had 72.1% diseased (which is $+ 10.5\%$ when compared to admission), ARB 8.5% (- 1.2%), beta-blockers 75.1% (+ 13.9%), diuretics 82.4% (+ 16.3%), spironolactone 52.7% (+ 10.3%), digitalis 32.1% (+ 1.2%), combination of ACE-I or ARB with BB was not found at release in 23.0% (- 9.7%);

neither ACE-I, nor ARB nor BB had 10.9% (- 6.7%). Level of NT-proBNP was set in 33 diseased (A – 19, B – 14), average value was 450.5 pmol/l, in group A 439, in group B 444.7 (NS).

Conclusion: Almost two-times more men were hospitalized with diagnosis of CHF than women. Mortality was 5.5%. Among co-morbidities the most significant are IHD, followed by hypertension, dilated CMP. EF of LV was known in 91% patients. During hospitalization the medication of patients with CHF was significantly enhanced.

INTRAOPERATIVE ABLATION OF ATRIAL FIBRILLATION

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Objective: The surgical treatment of atrial fibrillation requires a specific partition of the atria (Maze operation). The replacement of surgical incisions by means of various sources of energy (microwaves, radiofrequency or ultrasounds) allows a rapid, safe and reliable procedure even in beating heart surgery.

Methods: From January 1998 to March 2005, 112 patients with chronic atrial fibrillation underwent a modified Maze operation by means of microwaves, radiofrequency or ultrasound applied intraoperatively on endocardium during aortic cross clamp (group A), or on epicardium on a beating heart (group B). All the patients had chronic atrial fibrillation (average duration 34 month) and a left atrium diameter lower than 70 mm. Patients had mitral valve disease (71 pts) or both mitral and aortic (25 pts), coronary artery disease (8 pts), aortic valve disease (6 pts), or atrial septal defect (2 pts). Patients underwent mitral valve replacement (50 pts) or repair (pts); Mitral and aortic valve replacement (25 pts), coronary artery by-pass (8 pts), aortic valve replacement (6 pts) ASD closure (2 pts). We performed Maze operation by means of microwaves application in 66 cases, continuous radiofrequency in 39, ultrasounds in 7. Amputation of left atrial appendage and cryo ablation on mitral and tricuspid valve annuli were added in all cases.

Results: Hospital mortality rate was 6%. Two patients died due to a MOF syndrome. Seven patients required prolonged inotropic support. There was immediate recovery of sinus rhythm in 75 out of 105 surviving patients. Five pts needed pacemaker implantation (5.4%). The follow up (2 to 56 months) showed sinus rhythm in 72 patients (68%).

Conclusions: Various sources of energy can be used intraoperatively for a rapid and safe treatment of chronic atrial fibrillation in a significant percentage of pts. Our current investigations are directed towards the "optimal" source of energy and approach required for a fast and safer procedure.

SHOULD WE MEASURE RETROGRADE CONDUCTION IN PATIENTS WITH DUAL-CHAMBER PACEMAKER?

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Introduction: Pacemaker mediated tachycardia (PMT) could be an important complication of permanent pacing. Its introduction is dependent on presence of retrograde conduction (RC) from ventricle to atria through AV node. Retrograde P' wave when sensed by atrial lead after the end of atrial refractory period (ARP) (especially after ventricular premature beat) triggers ventricular stimulation that is conducted back through AV node to atria causing retrograde P' wave and leading to PMT.

Aim: To detect the presence and measure parameters of RC and test inducibility of PMT in patients with dual chamber pacemakers – DDD(R) in prospective study.

Methods: 84 consecutive patients with PM DDD(R) – Biotronik Actros (22x), Axios (47x), Philos (15x) during regular follow-up (in period of March to November 2004) were tested to RC presence. Via programmer we measured the RC time in ms, capacity of RC in range of pacing of 80 – 160 ppm. When RC was detected, the inducibility of PMT was tested by programming the PM as follows: DDD, 60 ppm, atrial output 0.1 V, AV delay 300 ms, ARP 475 ms.

Results: We detected RC presence in 31 patients out of 84, measured RC time average of 243.2 ± 42.7 ms (ranging 188 – 355 ms). The PMT was inducible in 15 patients and its frequency was 114.5 ± 11.3 bpm (ranging 85 – 130 bpm).

Discussion: In patients with RC presence, in intend to prevent PMT, the RC time should be measured for adequate programming of total ARP or post-ventricular ARP, and algorithms for diagnostics and resolving PMT should be programmed ON when incorporated in PM [Philos D(R)].

Conclusion: The RC presence was relatively frequent – 31 (37%) in our group of patients, RC time is very individual – average of 243.2 ± 42.7 ms (ranging 188 – 355 ms). PMT was inducible in 48.4% patients with RC presence. It is possible to prevent PMT appearance by proper programming of PM.

CROATIAN PRIMARY PERCUTANEOUS CORONARY INTERVENTION NETWORK: HOW TO EQUALIZE THE PROSPECTS OF ALL PATIENTS SUFFERING FROM ACUTE MYOCARDIAL INFARCTION?

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The quality of healthcare for patients with AMI, especially for the acute ST-elevation myocardial infarction (STEMI), depends on availability of health-care facilities, time of arrival to hospital, hospital equipment, type of reperfusion therapy, experience and education of the medical team.

Croatian Primary Percutaneous Coronary Intervention Network is a system that is about to provide an increasing number of patients suffering from acute coronary syndrome, especially ST-elevation myocardial infarction (STEMI), with the treatment in the existing high volume centers supplied with rich experience in the primary percutaneous coronary intervention (PCI). Furthermore, another aim is not only to increase but also to proportionally allocate such centers in all parts of Croatia. It is worth mentioning the fact that Croatia, a country with land area 56.542 sq. km, territorial sea area 31.067 sq. km and 4.437.460 inhabitants, despite its relatively low gross domestic product (6.377 US \$) can organize and implement the up-to-date acute myocardial infarction treatment concept practically throughout the entire region.

According to the results achieved through the evidence based medicine so far, providing all the patients suffering from acute STEMI with equal health protection based on the early PCI, would result in an increased saving of people's lives, the decrease in the invalidity and complications, complete and quicker recovery of the working ability and longer and better quality of life. Such a system requires additional investments in the health services and infrastructure, but it will also prove economically justified in the short and long run.

UNUSUAL THERAPY IN ACUTE MYOCARDIAL INFARCTION

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Introduction: Repeated defibrillations are the likely cause of cardiac injury and post-shock myocardial dysfunction. Potentially important pathways include production of free radicals, mitochondria dysfunction, changes in adenosine metabolism, activation of potassium ATP-channels and reperfusion injury. Current studies report impairment of the systolic and, especially, the diastolic function of the left ventricle which compromise resuscitability and survival.

Case report: We report the case of a 61-year-old male, who was admitted to our emergency room in cardio-respiratory arrest caused by ventricular fibrillation. He was immediately resuscitated and admitted to the Coronary Care Unit, where laboratory findings, ECG and echocardiographic changes suggested acute anteroseptolateral myocardial infarction without ST elevation. The early postresuscitatory period was complicated by repeated "torsade de pointes" and ventricular fibrillation. Urgent defibrillation was performed in total 71 times, despite medical treatment. Because of prolonged deep coma (Glasgow Coma Score 3) primary PCI was not performed at that time. Finally, 16 hours after arrival in hospital, improvement of the patient's neurological condition allowed us to perform coronary angiography. An occlusion of the left anterior descending artery was established and PCI was done. After the procedure, the patient showed significant clinical and further neurological improvement, without additional ventricular arrhythmias. Renal impairment (because of high levels of CK-13000 U/l) was avoided by forced diuresis. On the 5th day after the procedure the patient developed clinical signs of heart failure, atrial fibrillation with rapid ventricular rate and ST elevation in precordial leads, but without clinical and laboratory findings of myocardial infarction. Neither medical nor electrical attempts (four electroshocks) of conversion proved successful. Bedside echocardiography revealed global hypokinesia, with concentric thickening, oedema and diffuse high intensity "speckling" of the myocardium and pericardial reaction. Systolic and, especially, diastolic dysfunction of the left (EFLV 40%, PHT 38 ms) and right ventricles with normal cavity dimensions were found. Acute echocardiographic changes and acute elevation of CRP, ESR, fibrinogen and BNP suggested "aseptic myo-pericarditis" as the leading process at this time. After i.v. administration of methyl-prednisolon, conversion in sinus rhythm occurred and significant clinical improvement was observed. Control echocardiography

(10th and 24th day) showed regression of myo-pericarditis and significant improvement of both systolic and diastolic function (EF LV 60%, PHT 55).

Conclusion: Repeated defibrillations can lead to "aseptic myo-pericarditis" causing both systolic and diastolic dysfunction. Echocardiography plays a pivotal role in the diagnosis of this condition. Corticosteroid therapy may be of clinical benefit, despite the fact that it is contraindicated in acute myocardial infarction.

DEPRESSIVE SYMPTOMS AND QUALITY OF LIFE AFTER HEART TRANSPLANTATION

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Purpose: The evaluation of quality of life (QOL) after heart transplantation (HTx) and analysis of psychological and psychosocial factors participating in the emotional experiencing, especially occurrence of depressive symptoms.

Background: The QOL late after HTx is reported to be comparable with general population. The depressive symptoms are associated with worse compliance, adaptability and cooperation in the later period after HTx. The QOL after HTx is associated with: physical and mental status, functional ability, psychological well-being (emotional stability), social interactions (social support).

Methods: We examined 58 patients (49M and 9F), average age was 48,6y. The employment status analysis showed that 31% of patients were employed, 76% were retired (but 69% were medically disabled). Data were collected from the following tools: STAI (Spielberger's Questionnaire of anxiety), BDIII (Beck Depressive Inventory), QOLq (Quality of Life Questionnaire-author Oldrige, adapted by Lim 1993, 23 item self-evaluated instrument) and SI (Structured Interview-data deals with social, vocational, economic, hobbies status), and Visual Analogue Scale (evaluated life satisfaction).

Results: 60% of patients evaluated QOL as very good, 33% as good and 7% as satisfying. Depressive symptoms was present in 13% of patients. 11% of patients demonstrated moderate levels (BDI >10) and 2% demonstrated high intensity of depressive symptoms. 24% of patients presented increasing levels of anxiety. QOL score was significantly correlated to lower age ($r = 0,3, p < 0,05$), functional class NYHA I ($r = 0,37, p < 0,005$), lower levels of depression ($r = 0,6, p < 0,01$), life satisfaction ($r = 0,5, p < 0,01$). The very good QOL was associated with lower levels of anxiety ($p < 0,01$), hobbies activity ($p < 0,05$) and satisfying with sexual activity ($p < 0,01$). In our sample QOL score was closely correlated to employment status, education, economic status and social support.

Conclusion: The results of our pilot study stressed the importance of psychological and psychosocial factors in concept of quality of life after heart transplantation. The better QOL after HTx is related to younger patients, without depression and anxiety, satisfied with health and sexual status and with rich hobbies activities. The depressive symptoms after HTx are associated with poor QOL. It is important to improve management of depression by education, counseling and adequate treatment (by psychotherapy and psychopharmacology).

MORTALITY INCIDENCE AND CLINICAL PRESENTATION OF DYING IN PATIENTS WITH ST ELEVATION MYOCARDIAL INFARCTION REGARDING FIBRINOLYTIC THERAPY AND GENDER

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Coronary artery disease incidence in patients younger than 55 years seems to be lower in women. In population older than 70 years there is no difference within gender. Aim of this study is to determine whether there is difference in mortality rate and clinical settings of dying in patients with acute ST myocardial infarction (STEMI), regarding fibrinolytic therapy and sex, as well. We analyzed, retrospectively for last seven years, patients who died within two weeks after STEMI. Three groups of patients were formed regarding gender, fibrinolytic therapy and mode of dying. Four clinical settings of dying were defined: cardiogenic shock, asystole, ventricular fibrillation and electromechanical dissociation.

We found, in that time period, 1608 STEMI patients, 996 men (61.9%) and 612 women (38.1%). Women were significantly older than men (71.2 ± 11.4 years vs. 64.2 ± 12.4 years; $P < 0.001$). Streptokinase (1.500.000 U, within 60 minutes) received 265 (16.5%) patients; 163 (61.5%) men and 102 (38.5%)

women, ($P > 0.05$). Within first two weeks after thrombolytic treatment 274 patients died (17%), 130 (47.4%) women and 144 (52.6%) men. Mortality rate in women population was significantly higher than in men ($\chi^2 = 13.0$; $P < 0.001$). Within men population incidence of electromechanical dissociation was higher, with or without fibrinolytic therapy (59 : 26; $\chi^2 = 6.52$; $P < 0.05$). Cardiogenic shock was most often mode of dying in women (90 : 78; $\chi^2 = 6.12$; $P < 0.05$).

We conclude that STEMI incidence is higher in men than in women. Women with STEMI are older than men. Mortality rate in this population is higher, even when fibrinolytic therapy was given. Cardiogenic shock is the most often mode of dying in women, and electromechanical dissociation in men.

PAIN TO NEEDLE TIME IN PATIENTS WITH ACUTE MYOCARDIAL INFARCTION IN SPLIT REGION

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Pain to needle time (PNT) is crucial measurable parameter in efficacy of thrombolytic therapy. The aim of this study was to determine time from beginning of pain to administration of thrombolytic therapy, and hospital mortality in patients with acute myocardial infarction (AIM), as well.

In this farsighted clinical research were included adult patients, both sexes, with electrocardiographical and biochemical patterns of AIM, according to the Criteria of the European Cardiology Society.

The patients were divided in three groups, depending on the place of residence. The first group included patients from city of Split and its suburbs, not far than 15 km from the city; the second group were patients from suburbs, more than 15 km far from Split, and the third one consisted of the patients from Dalmatia's islands.

During the one year (between January and December 1999) 409 patients were admitted to Split University Hospital suffering from AIM, 245 men and 155 women. In first group were 207 patients, in second group were 163 patients, and 39 patients were from the Dalmatia's islands. There were significant more AIM patients from Split and its suburbs than those from the Islands (245 : 39; 60% : 9.5%; $p < 0.001$). The average PNT for all patients with AIM was 7.3 hours. PNT for patients from the islands was 13.0 hours and for those from places more than 15 km far from Split was 5.3 hours ($p < 0.001$). Unexpected findings in this study were low mortality rate in patients from islands in comparison with those in the city and residents living 15 km far from Split (21.7% : 16.0% : 15.4%; $p = 0.46$). This low hospital mortality in islands is probably due to dieing of AIM patients within first hours, before arriving to hospital.

We conclude that PNT is inadmissible long in Split region. That is why we need to improve patient's knowledge about coronary disease, to improve efficacy of Emergency medicine to shorten this long PNT.

CARDIOVASCULAR RISK PROFILE IN THE ELDERLY: ARE THERE ANY DIFFERENCES BETWEEN INHABITANTS LIVING IN INSTITUTIONAL CARE AND AT HOME?

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Aim: Evaluation and comparing cardiovascular risk profile (RP) of the elderly, living in institutional care in the village (group A), with the elderly living at home (group B).

Patients and methods: The authors present analysis of 267 examined people living at home in the village (Gabcikovo) and one retirement home, which is also situated in the same place. The group A has 100 inhabitants of retirement home (41 males, mean age 72.2 years and 59 females, mean age 78.3 years). The group B consists of (77 males – m, mean age 55.7 years, and 190 females – f, mean age 55.5 years). The questionnaire was focused on family history, risk factors of atherosclerosis (RF), the index of daily physical activities was assessed, cognitive functions were investigated. Physical examination included also the height and weight measuring, repeated blood pressure measuring in reference conditions and body mass index assessment. The levels of cholesterol, LDL, HDL cholesterol, triglyceride, glycaemia, uricaemia, haemoglobin were assessed in each proband together with resting electrocardiogram. We were also interested in leisure time and smoking.

Results: The risk factors were presented frequently high in both groups: In the males of group B higher incidence of hypertension (63% vs. 27%), of elevated level of LDL cholesterol (90% vs. 83%) and hypertriglyceridaemia (29% vs. 25%) was found, in the males of group A more smokers (43% vs. 18%), were discovered. The intake of alcohol was higher in males of group B

(91% vs. 63%). Combined RF were higher in the elderly living in institutional care (51% vs. 42%). Females of group B had higher incidence level of LDL cholesterol (91% vs. 86%), but lower level of HDL cholesterol (55% vs. 50%) and incidence of diabetes mellitus (12% vs. 50%). In these group was higher incidence of obesity (36% vs. 27%).

Conclusion: The results show unfavourable cardiovascular RP in both groups of population. The worse cardiovascular RP of elderly population explains higher mortality in this age group. The modification and reduction of RP are necessary and will have an important medical and social impact.

REPERFUSION, AUTONOMIC DYSFUNCTION AND PROGNOSIS OF THE POST-AMI PATIENTS IN THE PRE-PCI ERA

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Aim: Early reperfusion as well as autonomic dysfunction has shown a strong predictive power in the sudden cardiac death (SCD) stratification. Spontaneous fluctuations in arterial pressure and heart rate provide information on cardiovascular autonomic control mechanisms – heart rate variability (HRV) and baroreflex sensitivity (BRS). The purpose of the presented study was to evaluate the prognostic power and efficacy of the „breathing controlled protocol“ – a new method for BRS calculation and compare it with the results obtained by standard BRS techniques. Another aim of the study was to determine the importance of autonomic dysfunction and thrombolysis on sudden cardiac mortality during the follow-up period as well as investigate the influence of reperfusion on autonomic tone post AMI in the pre-PCI era.

Patients and methods: Study enrolled 126 consecutive AMI survivors (99 men/27 women, mean age 64 ± 13 years). Q-AMI was documented in 73%, STEMI in 74%, thrombolysis (streptokinase) was administered in 35% of included patients, no primary PCI was performed. During follow-up 7 pts underwent coronarangiography, in 4 stent implantation, in 1 CABG followed. Combined endpoint of sudden cardiac death, cardiac mortality or documented life-threatening arrhythmic events (sustained ventricular tachycardias) were recorded during the 1 year of follow-up period. Mean EF calculated echocardiographically was $44 \pm 10\%$. Autonomic parameters – HRV and BRS calculation by both „slope“ (BRSSlope) and breathing controlled (BRSresp) protocols was performed on day 7 ± 4 .

Results: 12 patients (10%) died suddenly during the follow-up. Streptokinase was administered in 33% in the group of SCD victims vs. 65% in survivors ($p < 0.05$). Mean values of autonomic markers – HRVindex, HF/LF ratio and both BRSresp and BRSSlope between these two groups differed significantly. In the Wilcoxon mortality analysis showed fibrinolysis sufficient predictive power – 85% vs. 91% 1-year survival for SCD victims vs. survivors. From autonomic tone markers only BRS revealed significant prognostic value – patients with BRSresp < 3 ms/mmHg showed 82% 1-year survival compared to 90% in the group with higher BRS. When combined with depressed EF ($< 40\%$), reduced BRSresp showed even higher predictive power – 30% 1-year mortality. Age, sex, IM location, EF, diabetes, fibrinolysis and other medication showed no significant correlation to BRS values in Multivariate Cox regression and Step tree test.

Conclusion: In contrast to previous data no relation between depressed BRS and thrombolysis could be found. Thrombolytic therapy similary to autonomic dysfunction expressed predominantly as depressed BRS showed sufficient predictive power in the prediction of major cardiac events and increased arrhythmic mortality in the studied group.

LEFT VENTRICULAR FREE WALL RUPTURE AFTER ACUTE MYOCARDIAL INFARCTION

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Aim: Left ventricular (LV) free wall rupture, a well-known complication of myocardial infarction, typically results in immediate collapse of the patient, electromechanical dissociation and death, but approximately 30 percent of patients have a subacute form of rupture that may allow enough time for diagnosis and immediate life-saving surgical intervention. In these cases, time needed for the correct diagnosis plays a decisive role in patient's survival prognosis.

Patients and methods: This report describes 8 patients with left ventricular free wall rupture occurring within the few days after myocardial infarction.

Results: It illustrates various, usually dramatic and rapid course of this clinical situation and crucial role of echocardiography in the diagnostic algorithm, enabling fast therapeutic solution.

Conclusion: Postinfarct LV free wall rupture is a rare but very dangerous and life-threatening mechanical complication. Only immediate action resulting in prompt and correct diagnosis followed by surgical treatment increase the survival chances.

HEMODYNAMIC PARAMETERS AFTER BIVENTRICULAR PACING IN CHRONIC HEART FAILURE PATIENTS

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Aim: Biventricular (BiV) pacing is a promising method of the treatment for selected group of patients with chronic heart failure (CHF).

Patients and methods: We evaluated a group of 45 patients with CHF treated by BiV pacing. Control group consisted of 30 patients referred to our department as candidates for heart transplantation. Those patients were treated pharmacologically. Hemodynamic changes were assessed using right heart catheterisation before and 3 months after BiV pacemaker (PM) implantation or by two consecutive examinations in 3 month distance in the control group, respectively.

Results: Cardiac output (CO) before BiV PM implantation was 4.2 ± 1.0 l/min, cardiac index (CI) 2.2 ± 0.5 l/min/m², stroke volume (SV) 59 ± 16 ml, mean pulmonary artery pressure (MPA) 29 ± 12 mmHg, pulmonary capillary wedge pressure (PCW) 19 ± 9 mmHg. Results three month after BiV PM implantation: CO 4.3 ± 0.9 l/min, CI 2.2 ± 0.4 l/min/m², SV 60 ± 16 ml (all $p = n.s.$); MPA 21 ± 11 mmHg, PCW 13 ± 10 mmHg (both $p < 0.001$). Decrease of MPA and PCW was greater after BiV pacing in comparison with pharmacological treatment (8 ± 12 vs. 1 ± 8 mmHg; $p < 0.01$, resp. 6 ± 11 vs. 0 ± 7 mmHg; $p < 0.05$).

Conclusion: BiV pacing was associated with nonsignificant changes of CO, CI and SV in three month follow-up after implantation. MPA and PCW decreased significantly after BiV implantation. Comparison of the changes in BiV pacing group and the control group showed significantly more pronounced decrease of MPA and PCW after BiV pacing.

RAPID REVERSAL PULMONARY VEIN VELOCITY – THE MARK OF PULMONARY EMBOLISM

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Aim: Pulmonary veins reversal flow (PVa) are accepted how marker of diastolic dysfunction of left ventricle if left atrium systolic function is maintained. Characteristics the flow are obtain during cardiac surgery or catheterization of left heart and did not reflect clinical mode of the flow. Based on these results has been accepted maximal reversal pulmonary wave velocity from $-22 - 32 (\pm 10)$ cm/s, the is one from another characteristics of left ventricle diastolic function physiology. Maximal velocity PV a increase dramatically with rise impaired relaxation pattern of left ventricular filling. However, similar changes we observed by pulsed Doppler TTE examination of the superior medial pulmonary vein of patients with submassive pulmonary embolism. Aim: estimate relationship between clinically determined pulmonary embolization and reversal velocity PVa.

Patients and methods: 51 pts of active group had been share by GPO or another specialists because of ECG change (down slope ST with negative T V2-V4, shift SEO QRS to the right), 46 pts and/or idiopathic sinus tachycardia, 18. Clinically was confirmed pulmonary embolism (PE) by ECG, 42 pts, CT, 11, X-ray chest, 7, nuclear isotopy pulmonary perfusion scan, 39, and posit. FDP or D-dimers 24, and related clinical symptomatology. There performed comparisons between the group and control subjects 27 pts with established pulmonary malignance (CT, surgery, fibrobronchoscopy), without right ventricular systolic strain on ECG. All pts undergone TTE with Doppler examination during sinus rhythm, LV systolic function preservation or mild systolic function reduction, and/or the mild diastolic dysfunction without diastolic failure. Differences in baseline variables for patients assigned to active or control group were compared with the unpaired Student t-test.

Results: The active group pts (clinically documented PE) was seen statistically different increase pulmonary vein reversal flow $PVa \geq 0.43 \pm 0.11$ m/s vs. $PVa \leq 0.35 \pm 0.13$ m/s, $p < 0.05$ at control group. Another examined results were not statistically different (duration PVa, ATAP, long and short axis RV diastolic diameter). Despite of persists of the repolarization change ECG 13 pts of active group have got estimated $PVa \leq 0.37$ m/s. Because they missed the clinical signs of PE, anticoagulation therapy was disrupted. Over three months follow up repeat pulmonary embolization has not been registered.

Conclusion: Speed reversal PVa seems to be a specific diagnostic sign of pulmonary embolization in condition of systolic function LV duration and sinus rhythm. Recovery of physiology reversal flow PVa vs. allows disruption anticoagulation therapy without risk of repeat pulmonary embolization. Limitation of our study is few patients and short time study duration, further investigations are required.

COMPARISON OF CONTROLLED AND UNCONTROLLED AEROBIC PHYSICAL TRAINING OF PATIENTS WITH CHRONIC CORONARY HEART DISEASE

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Aim: The purpose of this study was to compare the effect of the controlled or uncontrolled aerobic physical training in patients with stable coronary artery disease (CAD).

Patients and methods: 64 patients with stable CAD were divided into 4 groups according to the intensity and form of aerobic training. The group A comprised 17 patients, who had taken part in a conducted training program for 3 months and had continued with individual training. 22 patients (group B) had participated in the training program without follow-up individual exercise. Patients in groups C and D had not taken part in the controlled training program. 10 group C patients had intensively exercised at home (cycling, running, etc.), whereas 15 group D patients had not exercised at all. ECG (electrocardiogram) stress tests on a bicycle ergometer were performed before the training and 1 year later. The changes of following parameters were assessed: the total exercise duration, total work load, exercise capacity, exercise tolerance, the time to onset of angina and ST-segment depressions at the lead V5 in the maximal load.

Results: Patients in the group C exhibited a trends to improve in all parameters, with the exception of ST-segment depression at the lead V5 in the maximal exercise load. Patients in the group A exhibited a trends to reach longer exercise duration, higher total work load and higher exercise capacity comparing with the basal stress test. Patients in the group B and D exhibited trends to worsen all parameters. Differences in groups and between groups were not statistically significant.

Conclusion: In patients with stable CAD and different types of aerobic physical training, exercise parameters did not statistically differ. The trend toward improving stress parameters was identified only in patients, who had intensively exercised at home, independently of participating in the conducted training program.

CYTOKINES AS MARKERS OF SYSTEMIC INFLAMMATORY RESPONSE IN CARDIAC SURGERY

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Background: Cardiac surgery performed using cardiopulmonary bypass (CPB) is associated with more or less expressive systemic inflammatory response syndrome (SIRS). Several authors have proposed that this phenomenon is caused predominantly by CPB.

Aim: Therefore, we tried to estimate the induction of SIRS in a group of patients undergoing the coronary artery bypass grafting (CABG) on beating heart by a technique performed without CPB (off-pump-surgery). These patients were compared with a group of patients undergoing CABG using CPB.

Patients and methods: Forty-two patients undergoing CABG were divided in two groups: patients operated by on-pump (group A) and patients undergoing CABG without using CPB (group B). Before and then during the early postoperative period the venous plasma levels of some soluble proinflammatory (TNF, IL-6, IL-8) and antiinflammatory (IL-10) cytokines as markers of SIRS were estimated.

Results: In both groups of patients the cytokine levels significantly increased especially at the first postoperative day and – after a gradual decline – they did not reach the preoperative levels even in the further six days. Generally, the plasma levels of these cytokines - with exception of IL-10 - were markedly higher in the group A.

Conclusions: We suggest that the different peak levels of estimated cytokines (especially of the proinflammatory cytokines) are the evidence of various degree of evolved SIRS in patients undergoing cardiac surgery. It can be concluded that the benefit of surgery performed on beating heart without using of CPB may be also based on attenuation of SIRS evoked in the operated patients.

TREATMENT TO TARGET - COMPARISON OF STATINS EFFICACY AND SAFETY

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Rationale: Current guidelines in both the USA and Europe have maintained LDL-C as the primary goal of therapy. Statins are the most effective class of drugs in reducing LDL-C levels and have also been shown to be very effective in improving the overall lipid profiles in patients with dyslipidaemia.

Aim: To compare efficacy and safety of different statins in recommended dosages in achieving US NCEP ATP III LDL-C goals and ability to modify lipid parameters in patients at high risk of developing a cardiovascular event.

Subjects: After at last 4-week dietary period included were statin naive subjects, males and females aged from 46 – 74 years indicated to lipid lowering therapy following US NCEP ATP III guidelines. 275 patients were evaluated.

Methods: Retrospective analysis of statin treated patients who had been consecutively examined at our outpatient clinic. Initial dose of each statin was doubled after each 6 weeks if target level of LDL-C was not achieved. Compared were atorvastatin (10 – 80 mg, n = 82), fluvastatin (20 – 80 mg, n = 46), pravastatin (20 – 40 mg, n = 53), rosuvastatin (10 – 20 mg, n = 28) and simvastatin (20 – 80 mg, n = 66). Following investigations were performed in each subject at every scheduled visit: lipid profile (LDL-C, T-C, HDL-C, triglycerides), glycaemia, liver enzymes, CPK activity and uric acid. Possible side effects of the therapy were evaluated by simple questionnaire as well.

Results: The highest potency was shown in atorvastatin group in which 80 patients (97.56%) achieved target levels for LDL-C and no serious adverse event of the therapy was observed. In rosuvastatin group 22 pts (78.57%), simvastatin 44 pts (66.66%), fluvastatin 24 pts (52.17%) and 21 pts (39.62%) in pravastatin group respectively achieved target level for LDL-C. These results were statistically significant in favour of atorvastatin versus all the other used statins. Therapy was interrupted in 6 cases. There was one case of headache in atorvastatin patient, dyspepsia in one fluvastatin and one simvastatin patient. In one patient treated with simvastatin elevation of CPK 5 times over upper limit was observed. The next one from rosuvastatin group discontinued therapy due to muscle pain but no CPK elevation was present. Significant elevation of ALT and GMT (more than three times over upper limit) was observed in one of simvastatin treated patients.

Conclusion: Statins are not the same in their ability of lowering LDL-C. Atorvastatin was the most potent statin in this retrospective analysis in achieving target levels of LDL-C. Generally, tolerability and safety of all studied statins was very high without statistically significant differences among them.

ANTIARRHYTHMIC DRUG THERAPY IN ICD PATIENTS

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Last years the ICD has become the treatment of choice for the patients at risk of life-threatening ventricular arrhythmias. This has largely relegated antiarrhythmic drug therapy to a secondary role for this indication. In spite of this, many patients with an ICD may require additional antiarrhythmic drug therapy for several clinical reasons: 1. to reduce the occurrence of ventricular tachyarrhythmias episodes and the number of delivered shocks in order to extend the battery life and to improve patients life, 2. to slow the rate of ventricular tachycardia (VT) in order to enhance tachycardia termination by antitachycardia pacing or by low energy cardioversion, 3. to prevent supra-ventricular tachyarrhythmias that are the main cause of inappropriate ICD shocks, 4. to decrease the frequency of symptomatic nonsustained VT episodes, 5. to decrease excessive sympathetic discharge leading to continuously recurring VT, and 6. to prevent and/or improve treatment of electrical storm.

The choice of the antiarrhythmic drug mostly depends on the underlying heart disease and left ventricular function. Since the majority of patients requiring an ICD have moderate to severe left ventricular dysfunction with low or very low left ventricular ejection fraction, this choice is usually limited to amiodarone, or beta-blockers with careful dose titration.

To date, only a few randomized studies evaluated the effects of antiarrhythmic drugs for optimizing ICD therapy. In a prospective placebo-controlled study, D,L-sotalol was associated with significant risk reduction in death for all causes or delivery of first shock for any reason, but this drug can not be larger used because many of ICD patients have poor ventricular function. The preliminary results of the pilot study has shown that azimilide, a class III agent, can reduce the number ICD shocks in patients with such conditions. The Optimal Pharmacological Therapy in Implantable Cardioverter is another randomized study in progress to evaluate the efficacy of beta-blockers alone, sotalol, and amiodarone and beta-blockers for preventing shocks in patients with an ICD.

Because antiarrhythmic drugs may change characteristics of VT and affect ICD function (increase in defibrillation or pacing threshold), the efficacy of device should be routinely assessed in patients after the institution or modification of antiarrhythmic drug therapy.

NTPRO-BNP LEVEL OF THE HEART DONOR AND GRAFT FUNCTION IN EARLY POSTOPERATIVE PERIOD

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Aim: Graft failure in early postoperative period is serious complication after heart transplantation (Htx). Poor quality of graft is a frequent reason of graft failure. The most reliable marker of the donor heart function is echocardiography. This has some limitation and in case of boundary finding it does not give final information. Therefore, a new method for detection of graft dysfunction, is sought. The aim of our study was to assess if the level of NTpro-BNP corresponds with graft function in early postoperative period.

Patients and methods: We analysed a group of 16 heart graft recipients (av. age 30y) and their donors (av. age 53y) undergoing Htx in our hospital between April 2003 and May 2004. Blood samples were drawn at the time of organ retrieval. In all patients echocardiography was used to document global ventricular function. We assessed early graft failure, higher catecholamines support, and rejection episodes first 30 days after Htx.

Results: We detected one early graft failure, seven patients required higher catecholamine support, five of them had higher level of NT-proBNP in time of organ harvest. On the contrary, out of seven patients without higher catecholamine support, NT-proBNP level was higher only in two patients. No relation between elevation of NT-pro BNP level and incidence of acute rejection was found.

Conclusion: NT-proBNP level may be a valuable, simple, objective and rapid screening method to assess donor heart function and can be used as a point-of-care assay at the donor hospital. Further studies are indicated to determine it's role in donor assessment and the response to treatment.

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ASSESSMENT OF VIABLE MYOCARDIUM BY DOBUTAMINE ECHOCARDIOGRAPHY IN PATIENTS WITH CORONARY ARTERY DISEASE AND SEVERE LEFT VENTRICULAR DYSFUNCTION

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Background: Patients suffered of coronary artery disease and severe left ventricular dysfunction have poor prognosis. Revascularisation (CABG/PTCA) is an alternative treatment. However, this procedure has in this population relatively high perioperative complication rate compared to patients with normal LVEF. The increased risk can only be justified when viable myocardium is present and improvement can be expected. It was shown that expensive non-invasive techniques (nuclear test) could be replaced by echocardiography (dobutamine-atropine stress echocardiography – DASE).

Aim of the study: 1. to evaluate the predicting value of DASE in contractile recovery after revascularisation in patients with LV ischemic dysfunction, 2. to evaluate the predicting value of DASE in symptomatic improvement.

Patients and methods: We studied 80 patients with ischemic LV dysfunction, EF < 35% (Simpson's method). All patients underwent coronary angiography and had occluded or severe stenosed (> 70%) at least one epicardial coronary artery. All patients underwent dobutamine stress echocardiography. Patients were classified into two groups:

– with viable myocardium: 38 pts, mean age 58 y., 35 male pts, 24 pts underwent CABG, 8 pts PTCA, 6 pts was treated conservatively.

- no viable myocardium: 42 pts, mean age 57 y., 33 male pts (5 pts CABG, 1 pt PTCA, 36 pts conservative therapy). Patients were followed-up for 12 ± 5 months, then they underwent clinical examination and echocardiography.

Results:

- patients with viable myocardium, managed conservatively or by revascularization, show improvement on systolic function and NYHA class (25 ± 28% resp. 27 ± 31%, 2.5 ± 1.75 resp. 2.9 ± 2.1)
- patients with non-viable myocardium show no benefit from revascularization in LVEF or clinical status (EF 28 ± 27%, NYHA class 2.3 ± 2.3).

RECONSTRUCTION OF MITRAL AND TRICUSPIDE VALVES IN PATIENTS WITH PRIMARY DILATED CARDIOMYOPATHY

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Aim: Mitral and tricuspid regurgitation are unavoidable complications of the end-stage primary dilated cardiomyopathy (PDCM), significantly contributing to cardiac failure and predicting early lethal outcome.

Patients and methods: From July 1991 to December 2004, 149 patients (119 males and 30 females) underwent reductive annuloplasty of double (mitral and tricuspid) orifices (RADO) for end-stage PDCM. The mean ejection fraction was 25.4 ± 6.5%. The average time of duration of illness was 24.5 months and the average number of preoperative decompensations was 2.9 (range 1 – 18) per patients. 35 patients were dependent on inotropic agents stimulation (intravenous administration) at the time of operation. In order to evaluate the viability of myocytes the perioperative immunohistological analyses were done in 56 pts: apoptosis (Ap), volume density of interstitial tissue (VVi), myofibrillar volume fraction (Mvf), Bcl-2 marker expression (Bcl-2).

Results: The immediate postoperative results obtained by the analysis of the hemodynamic and morphological parameters (Swan-Ganz catheter and transesophageal echocardiography) indicated a significant improvements. The postoperative mortality – 30 day was 2.7% (4/149). The cumulative survival at 3 years was 51.4 ± 4.4% and fell to 30.6 ± 4.8% at 7 years. Survival was significantly higher in patient with lower Ap, VVi and higher Mvf and Bcl-2.

Conclusion: RADO correct remodeling of the fibrous skeleton of the heart, changes the spherical geometry of the left ventricle, improves hemodynamic action of both ventricles and slows down the progression of heart failure. We recommend this procedure as a new surgical alternative or a bridge to heart transplantation in the early stage of PDCM. The preoperative immunohistological analyses might be useful in predicting the prognosis and the optimal surgical treatment.

RUPTURE OF SINUS OF VALSALVA ANEURYSM INTO THE RIGHT ATRIUM IN A BOY WITH BICUSPID AORTIC VALVE – CASE REPORT

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Introduction: Congenital aneurysm of sinus of Valsalva is not very common entity in everyday cardiologists clinical practice. It makes only 0.31 to 3.56% of all congenital heart malformations. Most frequently it occurs in the right coronary cusp (70.3%) probably because the cusp abuts the largest portion of the septum. It occurs less frequently in the non-coronary cusp (29.7%) and extremely rarely in the left coronary cusp.

Case report: K. B. (17) was admitted to our hospital in January 2005 with severe global cardiac decompensation. He was born as a first child from a healthy parents. First symptoms of the heart disease appeared at the age of 10, when he started having syncopal attacks and loss of consciousness for few times in the school and during daily activities. During that first hospitalization (1997) echocardiography showed bicuspid aortic valve with minimal, insignificant regurgitation. No aneurysm of Valsalva sinus was detected at that time. ECG: sinus bradycardia. 24-hour ECG: sinus rhythm exchanging with nodal rhythm, followed by periodical salvos of atrial extrasystoles, minimal heart rate 40/min. That was considered to be the reasons for his symptoms, and he was discharged, advised to go to regular cardiologist control checkups. Since then, he had no serious symptoms anymore. Two months

ago the patients condition suddenly worsened; he had chest pain, heart palpitations and severe dyspnea on exertion, feeling weakness and fatigue all the time. He was admitted to the local hospital, where echocardiography detected an aneurysm of the right coronary sinus of Valsalva communicating with the right atrium with severe regurgitation during entire diastole (significant left-right shunt). Also, for the first time an atrial septal defect in the fossa ovalis area was observed, but the defect was minimal and produced insignificant left-right shunt. The boy was immediately transferred to our hospital to undergo invasive cardiologist exams, and after that a surgical treatment. A loud continuous systolic and diastolic murmur was auscultable. ECG: sinus rhythm 97/min, rightward axis, intermittent preexcitation (syndrome WPW type B). Transthoracic and transesophageal echocardiography and also cardiac catheterisation confirmed the latter finding: aneurysm of the right coronary sinus 2.1 x 3.0 cm large, with the rupture on its base and significant diastolic "jet" directed from aortic root to the right atrium and partly to the right ventricle. According to the blood oxygen saturation, the shunt is significant. Small atrial septal defect present (foramen ovale aperitum). Patient underwent the operation 24-hours following the diagnostic procedure. Mattress sutures are placed on the both aortic and atrial sides of ruptured aneurysm. The small defect of the atrial septum also closed by direct suture. Partly stenotic, partly insufficient calcified aortic valve was excised and replaced with mechanical aortic prosthesis. The surgical procedure was completely successful; postoperative course and patient recovery were uneventful, and 8 days after the operation patient was discharged.

Conclusion: The diagnosis of rupture should be made immediately, followed by urgent surgical treatment if possible.

EXPERIENCES WITH THERAPEUTIC MILD HYPOTHERMIA AFTER CARDIAC ARREST

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Aim: Cardiac arrest can result in severe neurological injury very frequently. The results of randomized clinical trials showed that induction of mild hypothermia (MH) in patients resuscitated from cardiac arrest to 32 – 34°C for 12 – 24 hours can improve neurological outcome and even reduce mortality. We have applied this treatment in our Intensive Coronary Care Unit (ICCU) since November 2002 and we refer about our first experiences.

Patients and methods: We performed retrospective analysis of all patients indicated to therapeutic MH in our ICU from November 2002 to July 2004. MH was initiated as soon as possible after the return of spontaneous circulation (ROSC) and patients were cooled to temperature 32 – 34 °C for 12 hours.

Results: A total of 28 patients were indicated to MH treatment. The procedure was initiated in 27 patients. Target temperature was reached in 25 patients. Average age of all successfully cooled 25 patients was 66.8 ± 12.1 years, 64% were men. The most frequent reason of cardiac arrest was acute myocardial infarction (56%). Initial rhythm was ventricular fibrillation in 16 patients, pulseless electrical activity in 6 patients, asystole in 1 patient and unknown rhythm in 2 patients. Interval from collapse to the first resuscitation attempt was 3.0 ± 3.2 minutes and an interval from resuscitation initiation to ROSC was 14.6 ± 13.6 minutes. Cooling was initiated 31.6 ± 51.1 minutes after ROSC and target temperature under 34 °C was achieved in 228.6 ± 157.4 minutes. Target temperature 32 – 34 °C persisted 841.5 ± 157.4 minutes. Mean temperature during this cooling period was 33.1 ± 0.4 °C. In-hospital mortality was 52%. 44% patients have been discharged at home and the rest are still hospitalized. Favorable neurological outcome was found in 68% patients. The most frequent complication was hypothermia induced relative hypovolemia, hypotension, bradycardia and decrease of cardiac output.

Conclusion: Therapeutic mild hypothermia in patients successfully resuscitated from cardiac arrest is safe, simple and effective method reducing risk of neurological injury and, probably, reducing mortality.

COMPARISON OF RISKS OF PULMONARY EMBOLISM FOR AMBULATORY TREATMENT OF DEEP VENOUS THROMBOSIS AND TREATMENT OF PATIENTS WITH DEEP VENOUS THROMBOSIS IN ST. ANN'S UNIVERSITY HOSPITAL BRNO, CZECH REPUBLIC

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Aim: To compare risks of pulmonary embolism (PE) for ambulatory treatment of deep venous thrombosis (DVT) and treatment of patients with DVT in St. Ann's University Hospital Brno, Czech Republic.

Patients and methods: We compared two groups of patients with DVT: first group of them were treated from XI/1993 to XII/2003 by ambulatory treatment (LMWH in average for 11 days with transition to warfarin, INR 2-3, total 457 patients). The second group was formed by 100 patients hospitalised from I/2003 to XII/2004 in Cardioangiological Department with DVT. Every patient had signs of DVT on duplex ultrasound and positive D-dimers.

Results: In the first group, formed by 457 patients with mainly distal DVT (distal DVT-under knee had 318 of them), occurred 15 pulmonary embolism, no one was submassive or massive. In the second group of 100 hospitalised patients, pulmonary embolism (verified by CT or scintigraphy) occurred in 10 cases, no one was lethal. Every PE was detected following anamnesis and clinical symptoms at admission at hospital (always with pain or dyspnea in medical records), except 2 asymptomatic patients included in study requiring pulmonary scintigraphy. One patient with DVT died on bronchopneumonia.

Conclusion: Only 3% our ambulatory patients with DVT suffered of pulmonary embolism. Among hospitalised patients with DVT, we observed 10% of PE. The reason of this difference is probably evident selection of patients at the first contact, age of these patients, their co-morbidity and mobility.

SERUM ALBUMIN COBALT BINDING TEST IN PATIENTS WITH CHEST PAIN

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The aim of the study was to verify the usefulness of albumin cobalt binding (ACB) test for diagnosis of myocardial ischaemia in Department of Medicine emergency unit patients in the early time periode (2 – 6 hours after chest pain). Albumin in serum of patients with myocardial ischaemia has lower binding capacity for cobalt in comparison with healthy controls. ACB was determined on the Cobas MIRA plus (ROCHE) in serum samples of 30 patients with medical history of chest pain and in the serum samples of 32 healthy controls by Bhagavana method (cobalt solution is added to serum sample, unbound cobalt is detected by dithionite – DTT, sera of healthy controls have lower intensity of colorimetric reaction in comparison with sera of patient with myocardial ischaemia, the results are absorbance differences against blank). Activities of CK, CKMB (immunoinhibition) were measured on the Olympus AU400 analyser, cTnT on the Elecsys 2010 (Roche). Intra-assay CV (n = 20) was 3.17%, $x = 0.3655$, $\delta n-1 = 0.116$; interassay CV (n = 20) was 7.81%, $x = 0.351$, $\delta n-1 = 0.27$. Absorbance differences of ACB in control group (n = 32) were in interval from 0.157 to 0.359. Absorbance differences of ACB in patient group (n = 30) were in interval from 0.302 to 0.599. Serum samples of 2 patients had absorbance the positive cut-off (0.50) in the early time periode. During hospitalisation these 2 patients developed acute electrocardiography changes and had diagnosis of acute myocardial infarction (AIM). The other patients (n = 28) did not have diagnosis of myocardial infarction. CK and CKMB activities and levels of cTnT were normal in all but one patient who had arrhythmia. Specificity of ACB test was 70% and sensitivity was 100% for the diagnosis of AIM. We can confirm that ACB is a good predictor for myocardial ischaemia in our group of patients. Disadvantage of the test is a long TAT (1.5 – 2 hours) and narrow range of absorbance differences between positive and negative samples.

RISK FACTORS OF ATHEROSCLEROSIS IN PATIENTS WITH OBSTRUCTIVE SLEEP APNOE

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Obstructive sleep apnoe (OSA) is associated with increased cardiovascular (CV) mortality and morbidity. OSA also carries an increased risk for occlusive vascular disease, i.e. coronary artery and cerebrovascular disease.

Aim: To evaluate the presence of risk factors of atherosclerosis (ATS) in OSA vs. non-OSA patients.

Design and method: 52 patients with OSA (46 males, 6 females, mean age 53 ± 9 y, with apnoe-hypopnoe index – AHI 29.9 ± 18) were compared with 28 patients without OSA (18 males, 10 females, mean age 50 ± 12 y, AHI 3.47 ± 2) according to presence of risk factors of ATS (family history, snoring habit, arterial hypertension – AH, diabetes mellitus – DM, cholesterol – total, HDL, LDL, serum glucose, triacylglycerol and uric acid levels, BI, WHR).

Results: Patients with/without OSA were subdivided into 3 groups: 1. without CV pathology, 2. with AH, 3. with coronary artery disease (CAD). In group without CV pathology patients with OSA had significantly higher WHR (0.92 ± 0.07 , $p = 0.03$). Patients with AH and OSA had significantly higher level of LDL cholesterol (3.92 ± 1.17) vs. non-OSA patients with AH (3 ± 0.61 , $p = 0.01$). Patients with CAD and with/without OSA had comparable risk profile.

Conclusion: According to evidence – based therapy of AH, CAD in patients with/without OSA and almost comparable ATS risk profile there is an strong argument for OSA being a risk factor on its own for vascular diseases.

CLINICAL AND ECHOCARDIOGRAPHIC PREDICTORS OF OUTCOME IN SURGICALLY TREATED ELDERLY PATIENTS WITH AORTIC STENOSIS

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Background: The number of elderly patients with degenerative aortic valve stenosis (AS) is increasing due to the ageing of the population. Advances in preoperative and postoperative care are reflected in a growing number of patients aged > 70 years undergoing aortic valve replacement (AVR).

Aim: The current study was undertaken to determine the significance of clinical, echocardiographic, invasive and surgical preoperative predictors of early and late postoperative mortality and of poor functional outcomes after AVR.

Hypothesis: Poor postoperative outcome depends on the stage of AS, co-morbidity and the complexity of surgical procedure.

Methods: Data were reviewed for 235 consecutive patients, 120 women and 115 men, aged 70 to 89 years (mean age 74.7 ± 3.3) who underwent AVR. Patient age, gender, symptoms, New York Heart Association (NYHA) functional class, signs of congestive heart failure, concurrent diseases, cardiac rhythm, left ventricular hypertrophy, echocardiographic characteristics of native valve disease, left ventricular and left atrial dimensions, left ventricular ejection fraction, presence of mitral regurgitation and pulmonary hypertension, preoperative catheterization data, urgency and type of the surgical procedure were analysed as possible predictors of outcome. The influence of preoperative and operative variables on outcomes was determined using the bivariate χ^2 tests and multivariate logistic regression. The survival rates were determined by the Kaplan-Meier method.

Results: Early postoperative (< 30 days) mortality was 11.5%. Multivariate logistic regression showed that chronic renal failure ($p = 0.023$), poor left ventricular ejection fraction ($p = 0.039$), pulmonary hypertension ($p = 0.001$) and combined surgery ($p = 0.005$) were independent predictors of early mortality. Late postoperative mortality was 8.5%. Multivariate predictors included chronic renal failure ($p = 0.011$) and urgent procedure ($p = 0.043$). Poor long-term outcome was established in 27.2% of cases. Multivariate logistic regression showed that signs of congestive heart failure ($p = 0.032$), pulmonary hypertension ($p = 0.001$) and combined surgery ($p = 0.023$) were independent predictors of poor outcome after AVR. The overall actual survival rates at 1 and 3 years were 83% and 79%, respectively. Significant prognostic factors of poor preoperative survival included: NYHA class III – IV, signs of congestive heart failure, chronic renal failure, chronic atrial fibrillation, left ventricular hypertrophy, decreased left ventricular ejection fraction, enlarged left atrium, mitral regurgitation, pulmonary hypertension, ischemic heart disease and combined surgical procedure.

Conclusions: AVR done in selected elderly patients is associated with acceptable mortality and results in functional improvement in the majority of patients. The results of this study stress the importance of performing AVR at an early stage of AS. Combined surgery and severe co-morbidity are unfavourable predictors of postoperative outcome, and they should be taken into consideration when considering AVR in older patients.

GENDER DIFFERENCES IN PATIENTS WITH ACUTE MYOCARDIAL INFARCTION

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Aim: The gender is one of important risk factors of atherosclerosis and also its influence on epidemiology of acute myocardial infarction (AMI) is indisputable. Moreover some of previous studies showed that women with AMI are managed less aggressively than man. Aim of this study is to find basic differences in epidemiology, clinical features, management and outcomes between men and women with AMI.

Patients and methods: We analyzed retrospectively the data of all patients admitted in Coronary Care Unit of University Hospital Brno within years 2003 and 2004 with diagnosis of AMI.

Results: There were 889 patients, 573 (64.5%) men and 316 (35.5%) women ($p < 0.001$), with the mean age 66 ± 12 years (64 ± 12 in men and 71 ± 11 years in women, $p < 0.001$). From the risk factors hypertension was present in 309 (54%) men and 223 (70.5%) women ($p < 0.001$), 216 (37.7%) men and 47 (14.9%) women were smokers ($p < 0.001$), diabetes was found in 152 (26.5%) men and 127 (40.2%) women ($p < 0.001$). On ECG record on admission ST elevation were found in 284 (49.6%) men and 143 (45.3%) women ($p = \text{NS}$), Q wave developed in 182 (31.8%) men and 100 (31.6%) women ($p = \text{NS}$). By acute percutaneous coronary intervention (PCI) were treated 348 (60.7%) men and 181 (57.3%) women ($p = \text{NS}$). The coronarography was performed during hospitalization in 531 (92.7%) men and 284 (89.9%) women ($p = 0.07$). 85 (9.6%) patients died, 47 (8.2%) men and 38 (12%) women ($p = 0.064$). From 492 patients younger than 70 years died 4% (15/374) men and 5.9% (7/118) women ($p = \text{NS}$). 397 patients were older than 70 years, their mortality was 16.1% (32/199) in men and 15.7% (31/198) in women ($p = \text{NS}$).

Conclusion: The majority of patients with AMI were men. Women were on admission significantly older than men. From risk factors in women there were more frequently present hypertension and diabetes, however men were more often smokers. We did not find any significant differences in management of AMI in our patients including the rate of coronary interventions. The strong trend to higher mortality in women could be simply explained by their older age.

POLY-ADP-RIBOSE-POLYMERASE-1 (PARP-1) IS ACTIVATED BY ACUTE MYOCARDIAL INFARCTION AND PRIMARY PERCUTANEOUS CORONARY INTERVENTION (PCI). NEW POSSIBILITY TO PROTECT THE MYOCARDIAL TISSUE?

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Aim: Reactive free radical and oxidant production leads to DNA damage during myocardial ischemia/infarction-related reperfusion. As previously observed in animal models, PARP-1 is activated in circulating leucocytes and myocardial muscle cells in response to oxidative stress and DNA breaks. PARP-1 regulates cell survival and DNA repair in physiological conditions. Pathological overactivation of PARP, induced by reperfusion, depletes the intracellular ATP and NAD⁺ pool, leading to energy deficit and finally necrotic cell death. The above mechanism might represent a key pathway of the primary PCI-induced reperfusion myocardial injury.

Patients and methods: Therefore, in 12 patients with ST segment elevation acute myocardial infarction (STEMI) and primary PCI we determined the serum peroxide concentration (H₂O₂), the level of tyrosine nitration and PARP-1 activation in circulating leucocytes by ELISA, immunohistochemistry and Western blotting. All parameters were measured before, immediately after, 24 and 96 hours later PCI.

Results: Serum (H₂O₂) before (363.6 ± 245 $\mu\text{mol/l}$) and after PCI (353.4 ± 254.2 $\mu\text{mol/l}$) were elevated compared to (H₂O₂) stable angina patients (332.5 ± 235.3 $\mu\text{mol/l}$; $n = 11$; $p > 0.05$). Immunohistochemical analysis of circulating leucocytes revealed increased tyrosine nitration before PCI. Moreover, immediately after the intervention, high intensity nitration was observed, remaining detectable until 96 hours. PAR (poly-ADP ribose, the enzymatic product of PARP-1) immunostaining was visible before PCI and increased dramatically in leucocytes isolated shortly after PCI. In contrast to nitration, PAR staining was considerably decreased at 24 and 96 hours. Similarly, Western blots performed by using PAR antibody, indicated pre-PCI 32 ± 8 ,

post-PCI the highest, 61 ± 8 , at 24 hours 35 ± 8 and at 96 hours 43 ± 9 densitometry units of PARP-1 activity.

Conclusion: In conclusion, STEMI leads to DNA damage in circulating leucocytes, and subsequently, PARP-1 activation occurs. Pathological PARP-1 activation was significantly increased by the PCI-related coronary reperfusion. In the future, pre-PCI inhibition of the PARP-1 pathway, by preventing DNA damage-dependent necrotic myocardial cell death may represent a new therapeutic approach in percutaneous interventions and myocardial infarction.

STATIN THERAPY HAS AN ANTIPLATELET EFFECT AND DOES NOT INTERFERE WITH THE LOADING DOSE OF CLOPIDOGREL IN PATIENTS WITH ISCHEMIC HEART DISEASE

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Aim: Clopidogrel (CLO) is a prodrug which is -like atorva- and simvastatin-metabolized through the hepatic CYP3A4 enzyme, producing the active antiplatelet metabolite. Since patients undergoing percutaneous coronary intervention (PCI) are often on statin therapy, statins might diminish the antiplatelet effect of CLO.

Patients and methods: We measured ADP (0.32; 0.64; 1.25; 2.5; 5; 10 μM) and collagen (1; 2 $\mu\text{g/ml}$)-induced platelet aggregation (PA) of 48 patients with stable coronary disease undergoing coronary angioplasty in citrated platelet rich plasma. Patients received 300 mg CLO loading dose, followed by 75 mg/day. Out of the 28 patients, who had previously been on statin therapy, 20 received 40 mg simvastatin and CLO loading at the same time, 8 received 40 mg atorvastatin and CLO loading; 20 patients received CLO loading without statins as a control. We assessed PA before taking the drugs and 4, 24, and 96 hours later.

Results: In every group, compared to the baseline, there was a significant PA decrease 4 hours after taking CLO (ADP 0.32 μM : 6.71% vs. 0.72%, 0.64 μM : 18.37% vs. 11.28%, 1.25 μM : 47.1% vs. 32.4%, 2.5 μM : 59.2% vs. 45.5%, 5 μM : 63.1% vs. 50.8%, 10 μM : 74.4% vs. 64.8%, Collagen 1 $\mu\text{g/ml}$: 39.3% vs. 28.9%, 2 $\mu\text{g/ml}$: 57.2% vs. 43.9%; p values < 0.005). Importantly, the average baseline ADP EC50 value of these 48 patients was 1.44 ± 0.52 μM explaining, that the inhibitory effect of clopidogrel is more predominant at low ADP concentrations, close to the EC50 value of the platelet P2Y12 ADP receptor.

There was no significant difference in PA levels 4 hours after taking CLO between the three patient groups (ADP EC50 values: CLO group: 2.37 ± 0.62 μM , CLO + simvastatin group: 2.25 ± 0.5 μM , CLO + atorvastatin group: 1.84 ± 0.84 μM ; p values > 0.15 , NS). Stimulated by low ADP concentrations, the initial level of PA in the statin-treated group was significantly lower than in the control group (0.32 μM : control 8.6% vs. statin group 5.9%; $p = 0.037$; 1.25 μM : 57.3% vs. 42.4%; $p = 0.012$).

Conclusion: Atorva- or simvastatin does not reduce the antiplatelet effect of loading dose clopidogrel, routinely administered before PCI. Statin therapy has an autonomous antiplatelet effect, which is independent from CLO's and may be in correlation with the long-term pleiotropic effect of statins. Platelet aggregation measurements, performed routinely by high ADP concentrations (≥ 5 μM) in citrated plasma give limited information about functionality of the clopidogrel-target P2Y12 ADP receptor and seemingly useless in assessing clopidogrel resistance.

EFFECT OF LOSARTAN ON SYSTOLIC BLOOD PRESSURE AND ENDOTHELIAL FUNCTION IN YOUNG SHR

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Introduction: The renin-angiotensin-aldosterone system plays a central role in blood pressure regulation. The purpose of this study was to examine the effect of losartan, an angiotensin II (AT₁) receptor antagonist, on blood pressure and functional and structural changes in thoracic aorta in young spontaneously hypertensive rats (SHR).

Method: Losartan was administered to 4-week-old spontaneously hypertensive rats, in a dose of 20 mg/kg/day for 5 weeks. Systolic blood pressure (SBP) was measured weekly by tail-cuff method. Rings of thoracic aorta isolated from 9-week-old rats were mounted in organ baths for measurement of

isometric contractile force. Morphological changes of thoracic aorta were measured using light microscopy.

Results: SBP in SHR (149 ± 2 mmHg) was higher than in age-matched controls (109 ± 2 mmHg). The increase in SBP was accompanied by higher heart weight/body weight (HW/BW) ratio, indicating hypertrophy of the heart. In losartan-treated SHR systolic blood pressure and HW/BW ratio were lowered. In control Wistar rats acetylcholine caused an endothelium-dependent relaxation of phenylephrine-precontracted aortic rings. In vascular preparations from SHR relaxation was slightly reduced. Long-term administration of losartan to SHR completely prevented the reduction of acetylcholine-induced relaxation. The wall thickness (WT) and cross-sectional area (CSA) of aorta in SHR were increased in comparison to control group. The inner diameter (ID) and the ratio of wall thickness to inner diameter (WD) were not changed. In losartan-treated SHR group ID was increased and WD slightly decreased; WT and CSA were not changed.

Conclusion: Results showed that losartan markedly reduced SBP in SHR and prevented impairment of endothelium-dependent relaxation and reduced structural changes in aortic wall.

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EFFECT OF DIABETES AND THYROID HORMONES ON INTERCELLULAR COUPLING PROTEIN AND SUSCEPTIBILITY OF RAT HEART TO VENTRICULAR FIBRILLATION

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Aim: Alterations in cell-to-cell coupling due to structural remodeling have been shown involved in the development of ventricular fibrillation (VF) in both experimental and clinical setting. Since hyperthyroidism and diabetes result in myocardial remodeling, the aim of the study was to examine whether intercellular coupling protein, connexin-43 (Cx43) and its functional phosphorylated isoforms are altered due to diabetes (D) or triiodothyronine (T_3).

Patients and methods: D was induced in Wistar Kyoto rats by streptozotocine (50 mg/kg, bolus i.v.). Ventricular tissues were examined 4 and 9 w thereafter. T_3 was applied orally in dose 10 μ g/100 g/day during 10 days to non-D and one part of D rats. Western blot analysis of Cx43 expression and its phosphorylated state were performed using mouse monoclonal anti-Cx43 antibodies. PES was performed for VF susceptibility in isolated heart preparation.

Results: Results showed decreased Cx43 expression and marked suppression of its phospho-isoforms in T_3 -treated both nonD and D rat ventricles. Moreover, these hearts were much prone to VF. In contrast, Cx43 expression and its phosphorylation were significantly increased in D rat ventricles. In parallel, D rat hearts were resistant to inducible VF.

Conclusion: In conclusion, results indicate down-regulation of intercellular coupling protein, Cx43, by T_3 that was linked with increased susceptibility of the heart to VF, while its up-regulation due to diabetes was associated with increased resistance to VF.

PREVALENCE OF UNRECOGNISED CAD IN LOW RISK PATIENTS BEFORE KIDNEY TRANSPLANTATION

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Introduction: Patients with end stage renal disease have significantly worse prognosis and survival not only due to renal disease but we know that the cause of death in 50% of them cardiovascular disease. Mostly coronary artery disease and heart failure. On the other hand unrecognised coronary artery disease worsen outcome of kidney transplantation and complicates most Clinical situation. Immunosuppression after kidney transplantation influence cardiovascular surgery. Chronic end stage renal disease patients are actively withdrawn from most of clinical trails and studies and therefore evidence based medicine in this field of medicine is not strong enough. So we need to extrapolate, improvise and use not evidence base but opinion based medicine. There are many reasons why there is so high incidence and prevalence of coronary artery and other cardiovascular disease in end stage renal disease (ESRD) patients. First of all similar risk factors mainly hypertension and diabetes, ESRD produces dyslipidemia, secondary hypertension, chronic anemia influences coagulation, etc.

Aim: To recognize asymptomatic coronary artery disease in patients on waiting list for kidney transplantation.

Patients and methods: In patients with no evidence of coronary artery disease, low risk score of risk factors and normal transthoracic echocardiography we performed stress echocardiography (bicycle and/or dobutamine). According to the quality of image we use transthoracic or transesophageal approach. In patients who failed to achieve maximal heart rate on bicycle we use dobutamine with transthoracic approach. We perform coronary angiogram in positive and nondiagnostic stress tests as well as in patients with regional wall motion abnormalities at rest.

Results: From september 2001 to july 2004 we investigate 225 patients, 1/3 were woman, average age 55.8 ± 20.2 years. 140 (62.2%) stress tests were negative, 79 (35.1%) nondiagnostic, 6 (2.7%) positive. In 21 (9.2%) we have found rest regional wall motion abnormalities. In 6 positive stress tests we have performed 5 coronary angiograms (one refused). According to angiographic findings 2 patients were indicated to myocardial revascularisation (1 percutaneous + 1 surgical) 3 normal angiograms or minimal changes. In 21 patients with rest regional wall motion abnormalities we performed until now 10 coronary angiograms. 6 (60%) were positive and carried to 5 revascularisation (3 percutaneous and 2 surgical).

EFFECT OF THE ANGIOTENSIN-CONVERTING ENZYME INHIBITOR ENALAPRIL ON BLOOD PRESSURE VARIABILITY IN DIABETIC AND NON-DIABETIC PATIENTS WITH ARTERIAL HYPERTENSION

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Aim: Effect of enalapril on 24-hour blood pressure (BP) control was evaluated in 3 months opened multicentre prospective clinical trial in diabetic and non-diabetic patients with arterial hypertension. Diabetes mellitus patients are known for higher cardiovascular risk, however, BP variability response to ACEI therapy has not been studied.

Patients and methods: 148 patients [diabetics (N = 27) and non-diabetic (N = 121)] with moderate to severe hypertension was involved in the study. Patients underwent 24-hour BP monitoring before and after 12-week therapy with enalapril.

Results: Similar significant BP reduction was reached by casual measurements in both groups. Reduction of BP parameters was recorded by 24-hour ambulatory BP monitoring in non-diabetics, in diabetic patients reduction of diastolic BP (from 79.8 ± 9.8 to 74.6 ± 13.2 mmHg, $p < 0.05$), mean arterial pressure (from 100.8 ± 9.7 to 95.2 ± 13.5 mmHg, $p < 0.05$) and trend to reduction in systolic BP (SBP, from 143.1 ± 13.9 to 136.8 ± 18.6 mmHg) were shown. In non-diabetics the treatment reduced standard deviation of SBP (from 15.9 ± 3.3 to 14.8 ± 4.0 mmHg, $p < 0.005$) and standard deviation of pulse pressure (from 10.0 ± 2.0 to 9.6 ± 2.3 mmHg, $p < 0.05$) values, other parameters of circadian variability of BP showed with exception of standard deviation of heart rate non-significant trend towards reduction. 43% of non-diabetics and 40% of diabetics were considered as non-dippers at the beginning of the study, after 12 weeks of treatment with enalapril 39.5% out of non-diabetic non-dippers were evaluated as dippers, and 50% of diabetics, respectively.

Conclusion: Similar effect of enalapril on BP reduction was shown regardless of presence of diabetes, however, a positive effect on prognostic parameters of BP variability was recorded only in non-diabetic hypertensive patients.

RELATIONSHIP OF CALCULATED LDL-C WITH APOB LEVELS IN SUBJECTS WITH NORMAL AND ELEVATED LEVELS OF TRIGLYCERIDES

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Aim: Calculated LDL-C (c-LDL-C) is used as a standard method in clinical practice. However, the Friedewald formula multiplies the errors derived from total cholesterol (TC), triglycerides (Tg) and HDL-C.

Patients and methods: Moreover, in hypertriglyceridemia, c-LDL-C may not be accurate reflection of LDL particles, due to increased number of small dense LDL particles. ApoB is a close reflection of the number of LDL particles. We therefore evaluated a relation between c-LDL-C and apoB and TC in patients with normal and elevated (2 – 4.5 mmol/l) Tg levels in 433 subjects (201 males, 232 females).

Results: Main characteristic of subjects and Pearson's correlations is in table. C-LDL-C highly significantly correlated with TC and apoB in both Tg groups.

However, even that the LDL-C levels were identical in both groups, apoB level in hypertriglyceridemic subjects was higher than in normotriglyceridemic.

	Tg ≤ 2 mmol/l	Tg > 2 mmol/l and < 4.5 mmol/l
TC/LDL-C	R = 0.96	R = 0.96
ApoB/LDL-C	R = 0.87	R = 0.86
TC (mmol/l)	5.87 ± 1.09	6.29 ± 1.30
ApoB (g/l)	1.03 ± 0.19	1.17 ± 0.23
LDL-C (mmol/l)	3.95 ± 0.96	3.94 ± 1.2
N =	344	89

P value for all correlations was < 0.001

Conclusion: In hypertriglyceridemic subjects, c-LDL-C can underestimate the LDL concentration, because of presence of small dense LDL particles.

KINETICS AND VIABILITY OF CIRCULATING ENDOTHELIAL CELLS IN PATIENTS WITH ACUTE ST-ELEVATION MYOCARDIAL INFARCTION AND PERCUTANEOUS CORONARY INTERVENTION

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Aim: In patients with coronary artery disease, endothelial dysfunction has been demonstrated. Circulating endothelial cell (CEC) count can serve as a useful marker of endothelial injury in various pathological conditions, involving acute coronary syndrome. The aim of our study was to assess the kinetics of endothelial damage in patients with acute ST-segment elevation myocardial infarction (STEMI) and subsequent percutaneous coronary intervention (PCI). Since little is known about the viability of the CECs isolated from patients with STEMI, analysis of CEC viability was the further aim.

Patients and methods: CECs were isolated from whole blood (anti-CD-146, magnetic beads) of patients suffering from cardiovascular diseases. The endothelial origin of the CECs was confirmed by von Willebrand factor (vWF) staining. Second, CEC count and viability was determined in 14 patients with acute myocardial infarction (STEMI) and 12 with stable angina (SA) before and immediately after PCI, 24 hours and 72 hours later with acridineorange-propidiumiodide (AO-PI) staining.

Results: In stable angina group (SA), the number of CECs before PCI was significantly higher [M(median): 3.25/ml; IQR (interquartile range): 1.3 – 10.5/ml] compared to healthy controls (M: 0.85/ml; IQR: 0.5 – 1.8/ml, p = 0.034). On the first day after PCI, CEC count rose (M: 8.22/1ml; IQR: 4.0 – 12.0/ml); on the third day after coronary intervention decrease of CECs was detected (M: 3.75/ml; IQR: 1.33 – 6.0/ml). In STEMI group, the level of CECs determined before PCI was significantly higher (M: 9.1/ml; IQR: 4.75 – 19.0, p = 0.0008) compared to SA group. The CEC count rose after PCI (M: 12.0/ml; IQR: 6.5 – 23.0/ml) and peaked (M: 18.0/ml; IQR: 6.5 – 53.0/ml, p = 0.043) 24 hours after coronary intervention. Comparing to baseline, the number of CECs in 72 hour samples was lower (M: 5.01/ml; IQR: 1.25 – 34.0/ml). In STEMI group, more than 80% of the CECs isolated pre- (mean: 88.49%), post- (mean: 86.6%), 24 hours (mean: 85.3%) and 72 hours (mean: 80.24%) after PCI were viable. In SA group, the number of viable CECs isolated pre- (mean: 85.3%) and 24 hours (mean: 88.4%) after PCI was very similar to those in STEMI group. 72 hours after PCI decrease of viable CECs (mean: 56.2%) was detected in the SA group.

Conclusion: In conclusion, we have confirmed elevated CEC count in STEMI and in SA patients; percutaneous coronary intervention leads to further explicit PCI-dependent damage and shedding of the vascular endothelium. Notably, the endothelial injury was more prominent in the STEMI group, indicating that CEC count might reflect the cardiovascular risk. Unexpectedly, CEC count peaked 24 hours after PCI, indicating continuous detaching of endothelial cells from the subendothelial matrix. Pathomechanism of the late PCI-dependent CEC count elevation in STEMI patients deserves further investigation.

CALCULATED LDL-C UNDERESTIMATES TRUE LDL-C LEVELS IN BOTH NORMOTRIGLYCERIDEMIC AND HYPERTRIGLYCERIDEMIC SUBJECTS

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Aim: Because direct measurement of LDL-C is costly method and Friedewald formula for calculation of LDL-C is applicable in majority of populations, except of persons with triglycerides (Tg) levels > 4.5 mmol/l, calculated LDL-C (cLDL) is used as a standard method in clinical practice. However, the formula multiplies the errors derived from total cholesterol, Tg and HDL-C formula. Moreover, in state of hypertriglyceridemia, cLDL may be even less accurate reflection of LDL-C. Therefore, we evaluated relation of cLDL with directly measured LDL-C (LDL-C) in normotriglyceridemic and hypertriglyceridemic subjects.

Patients and methods: We have examined 93 patients (18 – 75 years old) with normal and elevated (1.7 – 4.5 mmol/l) Tg levels involved in a cross-sectional Homocystein Slovakia study. Plasma levels of total cholesterol (TC) and triglycerides (TG) were measured enzymatically, ApoB levels were measured by an immunoturbidimetric method, HDL cholesterol (HDL-C) was determined directly by commercial kit (Genzyme) on autoanalyser, LDL-C was both evaluated by direct method for LDL-C measurement (Randox, UK) and calculated using the Friedewald formula only if TG concentration was below 4.5 mmol/l. Pearson's correlation was used to estimated relation between the measured variables, Student's T-test or nonparametric Wilcoxon test where appropriate were used to compare means.

Results: Main characteristic of subjects and correlations according the Tg status (Tg < 1.7 mmol/l and Tg ≥ 1.7 mmol/l and < 4.5 mmol/l) is shown in table. Calculated LDL-C highly significantly correlated with directly measured LDL-C in both Tg groups. However, in both groups cLDL significantly underestimated true LDL-C levels (p < 0.001 for cLDL vs. LDL-C levels in both groups).

Variable	Tg < 1.7 mmol/l	Tg ≥ 1.7 mmol/l and < 4.5 mmol/l
LDL-C (mmol/l)	4.08 ± 1.01	5.30 ± 1.02
cLDL (mmol/l)	3.79 ± 0.98	4.79 ± 0.99
TC (mmol/l)	5.74 ± 1.07	7.08 ± 0.97
ApoB (g/l)	0.95 ± 0.20	1.25 ± 0.17
cLDL/LDL-C	R = 0.927*	R = 0.907*
N =	77	16

*P value for correlation < 0.001

Conclusion: The data has shown high significant correlation between calculated LDL-C and directly measured LDL-C levels. However, despite of this, calculated LDL-C underestimated true LDL-C level in both normotriglyceridemic and hypertriglyceridemic subjects.

THROMBOLYTIC THERAPY IN PEDIATRIC CARDIOLOGY – OUR EXPERIENCE

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Aim: To determine the efficacy, safety and outcomes of thrombolysis with tissue plasminogen activator (tPA) in the population of children with congenital and acquired heart disease.

Patients and methods: One-center, retrospective study of 16 children (median age of 3.5 years) treated with thrombolysis for clinically significant thrombi (confirmed by ultrasonography or angiography) in pediatric cardiac intensive care unit between January 1999 and December 2004. tPA was administered with a median dose of 1.6 mg/kg (range 0.2 – 18.6 mg/kg) and a median duration of 8 hours (range 2 – 62 hours).

Results: Clot resolution was complete with no clinical sequelae in 7 (44%) patients, partial in 7 (44%), and there was no effect in 2 (12%) children with one death related to thrombolysis. There were major complications (bleeding, intracerebral embolisation) in 31%, minor bleeding in 31% and no complications in 38% patients.

Conclusion: Thrombolysis with tPA can be effective in children, but is associated with a low margin of safety and an unknown risk-benefit ratio.

THE ANOMALOUS ORIGIN OF THE LEFT CORONARY ARTERY FROM THE RIGHT AORTIC SINUS: IS THE CORONARY ANGIOGRAPHY STILL A „GOLD STANDARD“?

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Aim: Coronary artery anomalies are mostly benign prognostic value. But some of them are potentially associated with cardiac symptoms (including sudden cardiac death). The origin of the left coronary artery or left anterior descending artery (LAD) from the right coronary sinus belongs to them. The recognition of the anatomy is necessary for the ultimate decision about its therapy, because only one variant of the course is potentially malignant. The coronary angiography (CAG) has been the „gold standard“ for long time, but it provides only 2-dimensional view. The further methods with 3-dimensional view are available in the last decade, such as multi-slice computer tomography or magnetic resonance imaging.

Patients and methods: We analysed retrospectively our CAG examinations performed from 15. April 1997 to 1. December 2004. There were 13.407 examinations performed in this period. We want to analyze these anomalies, if the CAG was not sufficient for the ultimate reason. The dubious results were compared with 3-dimensional examination.

Results: We found 8 patients with this coronary anomalies (0.0597%). In 7 patient we could establish diagnosis just from the CAG due to the typical angiographic signs of the benign course or significant coronary artery disease indicating patient to cardiac surgery. The decision for last patient was more difficult. The CAG gave an ambiguous result about proximal course of the LAD. The multi-slice computer tomography appeared as an elegant solution. It confirmed the prepulmonary path of the LAD.

Conclusion: In our opinion coronary angiography is still sufficient in most patients for the imaging coronary artery anomalies, but the „gold standard“ are the other modern methods with 3-dimensional examination, such as multi-slice spiral computer tomography.

Editorial comments: *Summaries of lectures from scientific events are not subjects to editor's proof as to the language or contents and thus the editorial board is not responsible for their correctness.*

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