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Abstracts

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DIABETES MELLITUS AND ADMISSION BLOOD GLUCOSE LEVEL AS RISK FACTORS IN PATIENTS AFTER ACUTE MYOCARDIAL INFARCTION

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Background: High admission blood glucose levels (BGL) after acute myocardial infarction (AMI) are common and associated with an increased risk of death in subjects with and without documented diabetes mellitus (DM). Recent data indicate a high prevalence of abnormal glucose metabolism in patients with unrecognized diabetes at the onset of AMI.

Aim: To estimate the predictive value of admission BGL after AMI for the mid-term prognosis in patients with and without previously diagnosed DM.

Methods and study group: The prognosis of all 870 consecutive patients (605 without and 265 with known diabetes) admitted to our coronary care unit in the years 2003 and 2004 with the diagnosis of AMI was followed up over 6 months.

Results: During this period, 78 nondiabetic patients (12.9%) and 53 diabetic patients (20.0%) died ($p = 0.007$). Of the 605 previously nondiabetic subjects, 66 (10.9%) had admission BGL of 11.1 mmol/l or more. Mortality in these patients was comparable to that in diabetics (30.3% vs. 20.0%).

Conclusions: Admission BGL after AMI is an independent predictor of mid-term mortality in patients with and without known DM. Subjects without DM and admission BGL of 11.1 mmol/l or more after AMI had mortality rates similar to those with established DM. Admission BGL could help to identify patients at high mid-term risk of mortality. The parameter could be particularly valuable in nondiabetics.

DIFFERENT WAYS OF SMOKING BUT THE SAME HAZARD TO THE CARDIOVASCULAR SYSTEM: SHISHA SMOKING COMPARED WITH CIGARETTE SMOKING REGARDING THEIR EFFECT ON BLOOD PRESSURE AND ITS CONTROL

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Introduction: Shisha smoking is an old method of tobacco smoking in which the smoke passes through water before being inhaled by smokers. The aim of the study was to investigate the acute effect of Shisha smoking on heart rate (HR), blood pressure (BP), and the baroreflex control of BP.

Methods: In healthy volunteers (males): 14 habitual Shisha smokers (HSS) aged 27 ± 3 years and 7 habitual cigarette smokers (HCS) aged 30 ± 2 years (controls), we used noninvasive methods for investigating inter-beat interval (IBI; ms), systolic, diastolic, and mean blood pressure (SBP, DBP and MBP; mmHg). The baroreflex sensitivity in ms/mmHg (BRS) was determined by spectral analysis. The measurements were taken twice for each group. The first measurement was taken before the Shisha or cigarette smoking session (after > 12 hr of smoking cessation with complete avoidance of alcohol, coffee or tea drinking). The second measurement was made during a 5-minute period immediately after the smoking session. During each session (45 min), HSS smoked 5 g of Maassel (fruit flavoured tobacco), or 5 cigarettes in HCS.

Results: I. After smoking: a) in HSS: the IBI decreased ($p < 0.001$), SBP, DBP and MBP increased ($p < 0.001$; $p < 0.01$ and $p < 0.001$) and BRS decreased ($p < 0.01$); b) in HCS: the IBI decreased ($p < 0.01$), SBP increased ($p < 0.07$ n.s.), DBP and MBP increased ($p < 0.05$), while BRS decreased nonsignificantly.

II. When comparing groups: a) Before smoking, all measured values show no significant differences; b) After smoking, the IBI of HSS became < that of HCS; $p = 0.097$ (non-sig). The SBP, DBP and MBP became higher in HSS ($p < 0.05$ for each); but the difference in BRS was not significant.

Conclusions: Shisha smoking induced higher increases in SBP, DBP, MBP and greater decreases in IBI and BRS than cigarette smoking did. We thus conclude that Shisha smoking is not safer, if not worse, than cigarette smoking with regard to cardiovascular risk factors.

AORTIC SURGERY IN NA HOMOLCE HOSPITAL – A BIG PROGRAM FOR A SMALL DEPARTMENT

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Introduction: We present a group of patients operated on due to an aortic pathology at our department from June 2002 through December 2006.

Material and methods: In this period, a total of 187 patients had surgery because of a thoracic aorta pathology at our department, with 48 of them undergoing an urgent procedure (aortic dissection type A). Ascending aorta replacement (AAR) with or without aortic root replacement (ARR) as a single procedure was performed in 107 cases; of this

number, in 58 cases together with aortic arch and in 22 with construction of elephant trunk (ET) or "Frozen ET". Thirty-three patients underwent an aortic valve-sparing procedure.

Results: Our group consisted of 130 male and 57 (44%) female patients with a mean age of 56.8 ± 16.2 (range 18–80 years). Thirty-day mortality was 7.5% (14 patients); of this number for an acute 16.6% (8 patients) and 4.3% (6 patients) for an elective procedure. Twelve patients had revision because of bleeding, three due to abdominal ischemia, 8 developed mediastinitis, 57 had periods of atrial fibrillation, 13 developed mild, and 10 severe neurological complications, of which only four have remain permanent. During follow--up (2 months to 4 years) another 16 patients died. Actuarial four-year survival rates were 87.1% for elective, and 75.0% for urgent procedures. Of From 36 long surviving acute patients 13 should be considered as cured, 9 received additional intervention (operation) and 14 are annually evaluated.

Conclusion: Elective surgery, except for cases with chronic dissections and endocarditis, is associated with good results with minimal recurrence of disease. For acute dissections and younger patients, simple ascending aorta replacement carries a potential risk of aortic arch dilatation requiring reoperation with a higher risk. The frozen ET technique seems to be a reasonable and technically feasible alternative for such patients. Careful postoperative evaluation of patients in an outpatient clinic is crucial for achieving good long-term results.

BNP IS A PREDICTOR IN LOW-FLOW AORTIC STENOSIS: RESULTS FROM THE MULTICENTER TOPAS* STUDY (*TRUE OR PSEUDO-SEVERE AORTIC STENOSIS)

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Background: B-type natriuretic peptide (BNP) has been studied in aortic stenosis (AS), but not in low-flow low--gradient AS. We studied the relationship of BNP with hemodynamics and clinical outcome.

Methods: BNP and NT-proBNP were measured in 78 patients undergoing dobutamine stress echocardiography (DSE). 69 patients had low-flow AS (indexed effective orifice area [EOA] < 0.6 cm^2/m^2, mean gradient [MG] < 40 mmHg, LV ejection fraction [EF] ≤ 40). 9 patients with AS and normal EF served as controls. Patients were classified as truly severe [TS] or pseudo-severe AS [PS] based on DSE (projected EOA at normal flow rate of 250 mL/s ≤ or >1.0 cm^2) as reported in TOPAS.

Results: BNP and NT-proBNP were markedly elevated in low-flow AS (BNP 890 ± 1105 vs controls 190 ± 183 pg/mL, $p = 0.001$; NT-proBNP 6131 ± 12213 vs 193 ± 199 pg/mL; $p = 0.006$), but varied widely. BNP was related to EF at rest (r = -0.59; $p < 0.0001$) and peak stress (r = -0.51; $p < 0.0001$), EOA at rest (r = -0.50, $p < 0.0001$) and peak stress (r = -0.46, p = 0.0002), stroke volume (r = -0.33, $p = 0.006$), mean transvalvular flow rate (r = -0.31, $p = 0.01$), valvular resistance (r = 0.42, $p = 0.0006$) and wall motion score index (r = 0.36, $p = 0.004$), with similar findings for NT-proBNP. BNP was significantly higher in 29 TS vs 40 PS patients (1081 ± 1159 vs 685 ± 850, $p = 0.01$). In 29 patients undergoing valve replacement, BNP was higher in 9 patients who died postoperatively vs 20 patients surviving (BNP 1605 ± 1873 vs 737 ± 493, NS). In the total cohort, 1-year survival of patients with BNP ≥ 550 pg/mL was significantly lower than that of patients with BNP < 550 (47 ± 9% vs 97 ± 3%, $p = 0.0001$). Postoperative survival was significantly lower in patients with BNP ≥ 550 (53 ± 13% vs 92 ± 7%, $p = 0.02$). BNP was an independent predictor of outcome.

Conclusion: In low-flow AS, BNP and NT-proBNP are related to EF and EOA at rest and peak DSE. BNP is higher in TS than PS AS. Overall 1-year survival is poor in patients with BNP ≥ 550 pg/mL.

PREDICTORS OF ELECTRICAL DYSSYNCHRONY WITH RIGHT VENTRICULAR APICAL PACING

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Background: Left ventricular (LV) electrical dyssynchrony reflected by prolonged paced QRS duration is a predictor of development of heart failure during right ventricular apical (RVA) pacing.

Methods: An electrophysiological study was performed in 50 patients. Multipolar catheters were placed in the His bundle region and in the right ventricular apex (RVA). The His bundle-ventricular activation (HV) interval during sinus rhythm, and QRS duration during both sinus rhythm (native QRS) and RVA pacing were measured. Left ventricular dimensions were obtained.

Results: Patients had normal to poor LV function (ejection fraction range: 20–75%) and a variable degree of His-Purkinje system disease (HV interval range: 40–153 ms). Left ventricular ejection fraction (EF), end-systolic diameter, and HV interval correlated with both native and paced QRS duration (r = -0.64, 0.62, 0.36 and -0.52, 0.48, 0.28 respectively, $p < 0.05$). Using multiple stepwise regression analysis, only native QRS duration was identified as an independent predictor of paced QRS width (r = 0.73, $p < 0.001$). In patients with normal systolic LV function (EF > 50%, n = 34), only the HV interval correlated with native QRS duration (r = 0.38, $p = 0.013$), which in turn predicted paced QRS width (r = 0.37, $p = 0.016$). In patients with reduced EF (n = 16), LV dimensions and HV interval both correlated with native QRS duration (r = 0.57, 0.47 and 0.48, respectively, $p < 0.05$). Using stepwise regression, the HV interval and native QRS width were identified as independent predictors of paced QRS duration (r = 0.72 and 0.74, respectively, $p < 0.01$).

Conclusion: The single best predictor of a prolonged paced QRS complex, reflecting electrical dyssynchrony, is baseline native QRS duration. This in turn is determined by His-Purkinje system function in patients with normal or reduced LVEF and LV dimensions in patients with reduced systolic LV function.

ACCURACY OF REAL-TIME 3D ECHOCARDIOGRAPHY IN ASSESSING THE ANATOMY OF THE MITRAL VALVE IN PATIENTS UNDERGOING SURGERY FOR SEVERE DEGENERATIVE MITRAL REGURGITATION

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Background: Accurate preoperative assessment of mitral valve (MV) morphology and function is essential to predict the likelihood of surgical repair and to plan the surgical approach. 2D transthoracic (2DE) and transesophageal echo require mental integration of MV leaflet morphology

and have spatial limitations that may be overcome by real-time 3D echo (RT3DE).

Method: We compared 2DE and RT3DE reconstruction procedures of MV anatomy with surgical findings in 61 consecutive patients (69 ± 10 yrs, 57% males) undergoing surgery for severe degenerative mitral regurgitation. 3D volume rendered en-face views of the MV from the atrium and the ventricles were reconstructed offline unaware of 2DE and surgical findings. Surgical findings: involved MV leaflet (63% single posterior leaflet, and 11% single anterior leaflet), individual scallop involvement (48% isolated P2 and 11% isolated A2), chordal rupture (72%), and presence of flail leaflet (28%).

Results: 25 patients were excluded: 17 for atrial fibrillation and 8 for poor quality of 3D reconstruction (feasibility = 59%). The table shows the diagnostic accuracy of 2DE and RT3DE in the remaining 36 patients. The accuracy of the 2 techniques was similar in identification of single leaflet lesions, particularly if P2 was involved. 3DE was more accurate in more complex MV lesions.

	2DE	RT3DE	*p*
Culprit leaflet	78%	96%	0.021
Involved scallop	63%	93%	0.016
Flail leaflet	82%	85%	NS
Chordal rupture	80%	67%	NS

Conclusions: RT3DE en-face views of the MV showed excellent concordance with surgical inspection in identifying the culprit leaflet and the involved scallops. The limited spatial resolution of RT3DE may explain the limited accuracy of the technique in identifying chordal rupture. In addition, RT3DE provides easily interpretable images that facilitate communication with surgeons and non-echocardiographers.

RISK FACTOR STRATIFICATION IN PATIENTS WITH ASYMPTOMATIC CALCIFIED AORTIC STENOSIS

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Background: The aim of the study was to evaluate established and possible risk factors for adverse short-term clinical outcome in patients with asymptomatic, calcified aortic stenosis.

Methods: 34 patients with asymptomatic aortic stenosis were examined prospectively concerning aortic valve calcium score as quantified with multislice CT, echocardiographic parameters (aortic valve area calculated by continuity equation, mean and maximal transvalvular pressure gradients) and plasma NT-proBNP levels.

Results: Within 18–24 months of follow-up, 11 out of the 34 (32%) patients developed a major adverse clinical outcome, reflecting the overall poor prognosis of asymptomatic aortic stenosis: Ten patients suffered from onset of symptoms accompanied by hemodynamic progression and one patient died of sudden cardiac death. Six of the 10 patients underwent aortic valve replacement, one patient refused operation, three patients were not accepted for surgery and one of them died of sudden death soon afterwards. The aortic valve calcium score was the strongest predictor of a major adverse clinical event (5111 ± 2409 versus 1928 ± 789; $p < 0.001$), and plasma levels of NT-proBNP (1518 ± 1509 versus 240 ± 207 ng/l, $p = 0.003$), mean transvalvular pressure gradient (36 ± 8 versus 26 ± 8 mmHg, $p = 0.002$), and AVA (0.74 ± 0.10, 0.92 ± 0.20 cm^2, $p = 0.003$) were also significant risk factors for adverse clinical outcome.

Conclusion: In addition to the well established hemodynamic parameters, both the aortic valve calcium score as quantified with multislice CT and plasma levels of NT-proBNP accurately predict adverse short-term clinical outcome in patients with asymptomatic aortic stenosis. In patients with severe aortic valve calcification and high NT-proBNP plasma levels, close follow-up examinations are mandatory and early elective surgery may be considered even in the absence of overt symptoms.

EFFICACY AND SAFETY OF COMBINED THERAPY WITH ATORVASTATIN AND TACROLIMUS IN HEART TRANSPLANT RECIPIENTS

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Introduction: HMG-CoA inhibitors are part of the standard medication after orthotopic heart transplantation (OHTx), but they could interact with cyclosporin A (CyA).

Aim: To evaluate the efficacy and safety of combined therapy with atorvastatin and tacrolimus (TAC) in heart transplant recipients with dyslipidemia in spite of fluvastatin therapy.

Method: We followed up a group of 23 OHTx patients (8 women, 15 men, age range 52,56 ± 11,78) with repeatedly detected levels of total cholesterol above 5.5 mmol/L in spite of fluvastatin therapy. CyA was the main immunosuppressive agent. Subsequently, the patients were switched to TAC and atorvastatin at a starting dose of 20 mg. Follow-up with blood tests was performed one month after conversion and then every three months for up to one year. At the time of writing this abstract, follow-up data controls one month and four month after conversion were being evaluated. Statistics: pair *t*-test, ANOVA test.

Results: TAC was tolerated by all patients, with no evidence of myalgia or creatine kinase elevation. Total cholesterol levels declined significantly after one month (6.21 ± 0.89 mmol/L before conversion; 4.86 ± 0.70 mmol/L after conversion; $p < 0.0001$), as did LDL cholesterol (3.66 ± 0.94 vs. 2.48 ± 0.78; $p < 0.0001$) and apolipoprotein-B (1.11 ± 0.02 vs. 0.78 ± 0.19 g/L; $p < 0.0001$). By contrast, the levels of HDL-cholesterol, apolipoprotein-A and creatinine changed only non-significantly. A subgroup of 16 patients underwent follow-up examinations after four months. Their levels of total cholesterol, LDL-cholesterol and apolipoprotein-B remained decreased compared with those before conversion, but they did not change significantly in accordance with the control after the first month.

Conclusion: Switching to TAC with subsequent atorvastatin therapy after OHTx resulted in significant decreases in cholesterol, LDL-cholesterol and apolipoprotein-B levels.

CONTRIBUTION OF TRANSTHORACIC IMPEDANCE CARDIOGRAPHY FOR DETERMINATION OF THE „OPTIMAL" DYNAMIC ATRIOVENTRICULAR INTERVAL IN PATIENTS WITH ADVANCED ATRIOVENTRICULAR BLOCK TREATED BY DUAL CHAMBER PM*

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Aim: To determine the atrioventricular intervals (AVI) providing maximal cardiac output (max CO) during sequential pacing 80 and 100 ppm by means of impedance cardiography (ICG).

Patients and methods: 19 patients, 15 males and 4 females, with a mean age of 75.0 ± 7.6 years, with a pacemaker (PM) implanted for advanced AV block – AVB (in 10 patients of ischemic, in 9 patients of non-ischemic etiology, left ventricular ejection fraction 50–65%, diastolic dysfunction in 14 patients), CO was determined by ICG (Task Force Monitor CN Systems, Austria) in the supine position during normal breathing. The PM was programmed at DDD 80 and 100 ppm (to achieve a stationary pacing frequency), AVI 100, 120, 140, 160, 180 ms (AVI in both frequencies settings programmed in random order). Equalizing phase 2 min, measurement phase 2 min.

Results: Range of optimal AVI (defined as providing max CO) in D00 pacing, was 100–160 ms in 80 ppm and 100–180 ms in 100 ppm. The optimal AVI in 100 ppm compared with 80 ppm was shorter in 4, identical in 9, and longer in 4 patients. Optimal AVI could not be determined in 2 patients (see *Table*).

Discussion: In case of max CO determined for limit AVI (100 or 180 ms), it is necessary to add measurement in AVI 75 and 200 ms at least. It is not sufficient to determine "optimal" AVI at settings of two pacing frequencies for optimizing dynamic AVI.

Conclusion: "Optimal" AVI defined as providing maximal CO by means of ICG in patients with advanced AVB shows a significant inter-individual variation. Unexpectedly, the AVI difference during D00 pacing 100 and 80 ppm in individual patients varied from minus 20 to plus 40 ms. ICG may help in programming base and dynamic AVI in patients with advanced AVB.

Table referring to abstract by doctor Dvořák

Pt No	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
80 ppm	120	160	100	100	120	140	*	140	160	140	160	100	160	100	100	100	100	160	140
100 ppm	120	160	100	140	100	120	*	140	160	120	140	100	160	120	*	100	100	180	180

*Undeterminable for fluctuation

CHRONIC HEART FAILURE – ONE-YEAR MORTALITY RATE ACCORDING TO RISK FACTORS

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Aims: To determine one-year mortality of patients with chronic heart failure (CHF) and to identify risk factors possibly contributing to the increase in the mortality rate.

Set: All patients with CHF hospitalized in the Cardiology Clinic of Faculty Hospital Brno in the period from October 2004 through December 2006. The mortality rate of patients dying before 31 December 2006 was validated.

Results: Total one-year mortality rate was 14.76%. Based on the cause of CHF, 91 patients died with coronary heart disease ($p = 0.87$), 11 patients with dilated cardiomyopathy ($p = 0.006$), 13 patients with valvular heart disease ($p = 0.02$). Overall, 15 patients died with isolated diastolic dysfunction ($p = 0.89$ compared to total number of the deceased), 32 patients with isolated systolic dysfunction ($p = 0.40$), and 56 patients with both systolic and diastolic dysfunction ($p = 0.78$). Patients in NYHA Class IV died in 39.02% compared to those in NYHA class I–III ($p < 0.001$). The mortality rate of patients with anemia was 25.19% compared with those without anemia (11.95%, $p < 0.001$). Hypotensive patients died in 21 cases ($p < 0.001$), patients with an associated diagnosis of hypertension in 103 cases ($p = 0.94$). Of the 367 diabetics, 71 compared with those without DM (70, $p < 0.001$). The mortality rate of patients with chronic renal failure (CRF) was 25.75% compared with that of patients with normal renal function (8.57%, $p < 0.001$). Patients with lower levels of total cholesterol (TC) died in 14 cases compared with those with normal TC (40 cases, $p < 0.001$).

Conclusion: The one-year mortality rate of patients with CHF was 14.76% and there were no significant differences in mortality according to causes of CHF as well as to type of dysfunction. Also hypertension did not increase risk of death of our patients. On the contrary, the one-year mortality was significantly higher in patients with anemia, lower blood pressure, NYHA class IV, DM, CRF and low TC.

EVALUATION OF CAROTID-FEMORAL ARTERIAL PULSE VELOCITY AND ITS RELATIONSHIP TO NATRIURETIC PEPTIDES LEVELS IN HYPERTENSIVE PATIENTS WITH METABOLIC SYNDROME OR TYPE 2 DIABETES MELLITUS

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Background: The incidence of asymptomatic left ventricular dysfunction is higher in hypertensive patients with type 2 diabetes mellitus (HT + DM) or in patients with the metabolic syndrome (MS). Use of plasma natriuretic peptide levels (BNP, NT-proBNP) for establishing the diagnosis this condition and its relation to arterial system damage is still a subject of controversial discussions.

Methods: We evaluated the plasma BNP and NT-proBNP levels in 48 patients with the MS, mean age of 45.5 ± 11.3 years, body mass index (BMI): 32.1, blood pressure (BP) 141 ± 15/93 ± 8 mmHg and in a group HT + DM of 48 patients with a mean age of 63.8 ± 10.6 years, BMI: 29.6 ± 4.61; BP 152 ± 10/96 ± 8 mmHg. Both groups of patients had normal renal function. The properties of peripheral arteries were evaluated by measuring pulse wave velocity (PWV) between the aorta and the femoral artery.

Results: All patients had normal left ventricular systolic function, patients with DM + HT had higher left ventricular mass index compared with those with MS (107.3 vs. 93.05 g/m^2). The plasma levels of BNP and NT-proBNP were increased in patients with HT + DM more than in the group with MS (44.2 to 15.0 pmol/l in BNP, 34.58 to 7,873 pmol/l in NT-proBNP, $p = 0.005$). Average PWV was lower in the group with MS than in the group with HT + DM (11.33 m/s to 13.09 m/s, $p = 0.005$).

Conclusions: A correlation between the properties of peripheral arteries, as characterized by PWV, on the one hand and plasma levels of BNP and NT-proBNP on the other hand was found.

Arterial stiffness in hypertensive patients revealed some relation to LV dysfunction. PWV measurement may contribute to the prediction of LV dysfunction in hypertensive patients with MS or DM. Both groups of patients will be further followed up.

VENTRICULOPHASIC MODULATION OF INTRAATRIAL CONDUCTION IN TYPICAL ATRIAL FLUTTER

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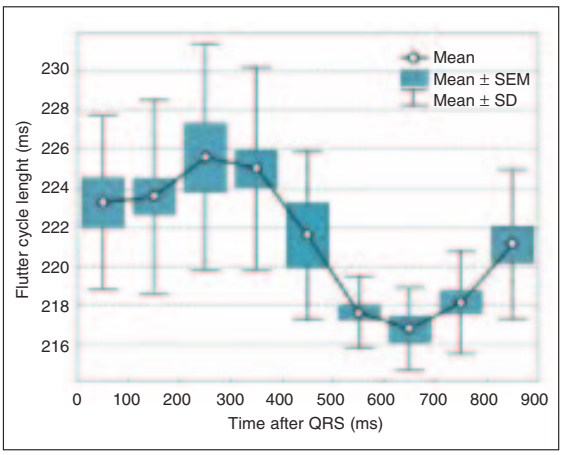
Introduction: Autonomic neural influence of ventricular contractions on sinus nodal discharge (ventriculophasic sinus arrhythmia) is present in the setting of a complete atrioventricular (AV) block.

Hypothesis: We investigated whether an analogous phenomenon can be observed in the case of atrial macroreentrant arrhythmia.

Methods: Digital recordings (1 min) of surface ECG, lateral right atrium, and coronary sinus electrograms were obtained in 22 patients before radiofrequency ablation of typical atrial flutter (AFL; 17 clockwise, 5 counterclockwise) with ≥ 3 : 1 AV block. Atrial electrograms (A) from right atrium duodecapolar catheter and coronary sinus decapolar catheter were obtained automatically, and the A-A intervals in different phases of the ventricular cycle were compared (paired *t*-test).

Results: Consistent shortening of the AFL cycle length was observed at ~400 ms after the QRS complex (Figure, representative sample). In all patients, the AFL cycle length at a lateral right atrium site was the longest (239.8 ± 33.2 ms) in the interval of 100–300 ms after QRS, and the shortest (232.9 ± 33.3 ms) in the interval of 500–700 ms after QRS with a mean difference of 6.9 ± 4.8 ms ($p < 0.00001$). Comparable modulation of intraatrial conduction was found for coronary sinus electrograms and for patients with counterclockwise and clockwise AFL.

Conclusions: Significant ventriculophasic oscillation of the AFL cycle length was documented. However, as vagal efferent action following each ventricular contraction is plausible, more investigation is necessary to uncover the exact physiological mechanism of this phenomenon, which could be useful for investigating atrial autonomic neural input.



ACUTE DYSFUNCTION OF CHRONIC CARDIAC RESYNCHRONIZATION THERAPY EVALUATED BY B-TYPE NATRIURETIC PEPTIDE

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Background: Although B-type natriuretic peptide (BNP) has been adopted in clinical practice, many of its pathophysiological properties are still unknown.

Aims: To assess the time required for a BNP change in response to pacemaker reprogramming from chronic biventricular pacing (BiVP) to the haemodynamically less effective right univentricular pacing (RVP) in humans with homogeneous chronic heart failure.

Methods: BNP examination was carried out in 10 patients (age 66.6 ± 6.5 years; left ventricular ejection fraction 23.0 ± 7.9%; QRS duration 168 ± 10 ms) who, despite initial stabilization, remained on chronic cardiac resynchronization therapy (21.4 ± 10.6 months on CRT) in New York Heart Association Class III. A series of 8 plasma BNP levels was obtained over a 6-hour period (8:00–14:00 hrs) on each of the consecutive days (D1; D2). After pacemaker switchover (D2 at 10:00 hrs), RVP was kept until 14:00 hrs.

Results: The reprogramming manoeuvre was followed by an increase in circulating BNP compared to the control day (D1), and first detected after 3 hours of RVP ($p = 0.043$).

Conclusion: Despite the harmony between the increase in BNP, thought to be induced by a simulated acute CRT failure, and our presumption, a reliable interpretation is not definite at this point.

METABOLIC LIVER FUNCTION IN PATIENTS WITH HEART FAILURE AND ARTERIAL HYPERTENSION

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Backround: Abnormalities in liver function tests have an impact on the prognosis of patients with chronic heart failure (CHF). The aim of the present study was to assess the functional liver mass in patients with systolic CHF and arterial hypertension using the 13C-methacetin breath test.

Patients and methods: Liver function was assessed using the 13C-methacetin breath test in 20 patients with systolic CHF and in 10 age- and sex-matched subjects with arterial hypertension and preserved left ventricular (LV) function. The cumulative dose of exhaled 13CO2 was measured with an infrared analyser. On the day of the breath test, routine liver function tests and echocardiographic studies were performed.

Results: Functional liver mass decreased significantly in 10 patients advanced heart failure (NYHA Class IV) compared to subjects with mild to moderate heart failure and to those with arterial hypertension. In the group of 20 patients with CHF, a weak correlation of the cumulative dose of 13CO2 with LV ejection fraction (EF) (r = 0.47) and a significant inverse correlation with the left atrial diameter (r = -0.80; $p < 0.0001$) was revealed, among other variables.

Conclusions: The metabolic liver function is significantly impaired in patients with advanced CHF. Liver function is not impaired in patients with mild to moderate CHF or in subjects with arterial hypertension and preserved systolic LV function. The functional liver mass in patients with systolic CHF does not correlate with LVEF, but correlates significantly with the left atrial diameter.

IMPACT OF HEMATOPOIETIC CELL TRANSPLANTATION FOR HEMATOLOGICAL DISEASE ON BLOOD PRESSURE AND HEART RATE*

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Aim: To monitor blood pressure and heart rate during hematopoietic cell (HC) graft infusion and to assess the effect of the cryopreservation agent dimethyl sulfoxide (DMSO).

Patients and methods: 153 HC graft infusions in 153 consecutive hematological patients were evaluated. The patients consisted of 80 males and 73 females with a mean age of 49.1 ± 12.6 years. Forty-two patients were treated for arterial hypertension and were well controlled before HC transplantation. Cryopreservation with DMSO was used in 133 grafts (DMSO group), 20 grafts were infused directly without cryopreservation (control group). 115 grafts were autologous and 38 allogeneic. Systolic blood pressure (SBP), diastolic blood pressure (DBP) and heart rate (HR) were measured immediately before and after HC graft infusion.

Results: SBP and DBP rose significantly after DMSO-cryopreserved graft infusion: SBP from 122.3 ± 17.9 mmHg to 127.7 ± 18.1 mmHg ($p < 0.0001$), DBP from 70.9 ± 12.3 mmHg to 74.1 ± 12.6 mmHg ($p < 0.01$). Changes in HR were not significant in the DMSO group. The increases in BP and HR correlated with increasing DMSO dose. In the control group, changes in SBP, DBP and HR were not significant. Changes in BP and HR were not significantly different between patients treated for arterial hypertension and other patients.

Conclusions: Our results show that infusion of HC grafts cryopreserved with DMSO caused statistically significant increases in SBP and DBP. Increases of more than 10 mmHg were seen in 31.6% and 23.3% patients, respectively. Changes in HR were not statistically significant. These changes were mostly transient and asymptomatic and did not require therapeutic intervention. However, they may cause complications, especially in patients with preexisting cardiovascular disease. These patients should be observed closely during HC transplantation.

COMPLEX MONITORING OF CARDIOTOXICITY IN HEMATOONCOLOGY*

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**Supported by Research Project MO 0FVZ 0000 503.*

Aim: Monitoring of cardiotoxicity of anthracyclines (ANT) with 3 diagnostic methods: biochemical markers – N-terminal pro brain natriuretic peptide (NT-proBNP), cardiac troponin T (cTnT); echocardiography (ECHO) and electrocardiography (ECG).

Patients and methods: 26 adult acute leukemia patients (mean age 46.2 ± 12.4 years, 15 males and 11 females) treated with 2–6 cycles of ANT-based chemotherapy (CT) were studied. Cardiac evaluation was performed at baseline (before CT), after the first CT cycle (cumulative ANT dose 136.3 ± 28.3 mg/m^2), after the last CT cycle (cumulative ANT dose 464.3 ± 117.5 mg/m^2) and approx. at 6 months after completion of CT (6 Mo after CT).

Results: The results are summarized in the *Table*. Six months after CT, NT-proBNP concentrations correlated with systolic and diastolic LV dysfunction on ECHO – (r = 0.514; $p < 0.01$) and (r = 0.587; $p < 0.01$). Decreased QRS voltage on ECG correlated with systolic and diastolic LV dysfunction on ECHO – (r = 0.660; $p < 0.001$) and (r = 0.592; $p < 0.01$).

Table referring to abstract by doctor Horáček: Complex monitoring...

Abnormal cardiac findings in patients treated for acute leukemia (n = 26)

Abnormal cardiac findings	Before CT	After first CT	After last CT	6 Mo after CT
NT-proBNP elevation	3 (11.5%)	23 (88.5%)	23 (88.5%)	16 (61.5%)
cTnT positivity	0	0	0	3 (11.5%)
Systolic LV dysfunction	0	1 (3.8%)	1 (3.8%)	2 (7.7%)
Diastolic LV dysfunction	1 (3.8%)	5 (19.2%)	6 (23.1%)	12 (46.2%)
QTc interval prolongation	1 (3.8%)	3 (11.5%)	7 (26.9%)	9 (34.6%)
QRS voltage lowering	–	3 (11.5%)	5 (19.2%)	6 (23.1%)

NT-proBNP elevation – NT-proBNP above 100 pg/ml for male, 150 pg/ml for female; cTnT positivity – cTnT above 0,01 ng/ml; systolic LV dysfunction – EF bellow 55%; diastolic LV dysfunction – E/A inversion, DT above 220 ms; QTc interval prolongation – QTc above 440 ms; QRS voltage lowering – decrease in QRS voltage more than 1,0 mV

Conclusions: Our results demonstrate acute and chronic cardiotoxicity of ANT. Clinical manifestations of cardiotoxicity in terms of heart failure developed in two (7.7%) patients. In asymptomatic patients, abnormal cardiac findings (NT-proBNP elevations, diastolic LV dysfunction, QTc prolongation) represent subclinical cardiotoxicity, suggesting a risk for developing heart failure and malignant ventricular arrhythmias. Given the late ANT cardiotoxicity, further cardiology follow-up is warranted in all acute leukemia survivors.

LONG-TERM HEALTH OUTCOMES OF PATIENTS AFTER COMPLETION OF DUAL ANTICLOTTING THERAPY USED IN PATIENTS WITH IMPLANTED DRUG-ELUTING STENT (HOMEDES REGISTRY, HEALTH OUTCOMES AND MORTALITY EVALUATIONS AFTER INVASIVE CORONARY TREATMENT USING DRUG-ELUTING STENTS)

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Aim: The aim of the observation study was to determine the occurrence of late (after more than 6 months) clinical events caused by late thrombosis of the drug-eluting stent (DES) in patients after completion of dual anticlotting therapy.

Methods: A total of 273 patients underwent PCI with DES implantation in the period from January 2004 to May 2006 and 171 patients of this cohort completed the 12- and 18-month observation study. Coronary stent thrombosis was defined as: 1. the angiographic demonstration of a thrombus; 2. repeated infarction at the site of the original intervention on the same coronary vessel; 3. sudden cardiac death of the study patient.

Results: Altogether, we noted 9 cases (5.2%) of late coronary stent thrombosis at 18 months' study visit following

DES implantation. Clinically documented sudden cardiac death occurred in 4 cases and non-fatal myocardial infarction involving the target vessel area was documented in 5 cases. The best part of clinically cases happened in 7–12 study window with an average 121 days occurrence after clopidogrel discontinuation. We noted 7 % cases with repeated target vessel intervention on the same artery. The incidence of cardiovascular events was 12.2%.

Conclusions: The incidence of cardiovascular events correlates with recent findings of the BASKET-LATE study. Our observation study supports a trend of increased incidence of late cardiovascular death and late non-fatal myocardial infarction after completion of dual anticlotting therapy in patients with drug-eluting stent implantation.

BENEFICIAL EFFECT OF COMBINED (INTRAMYOCARDIAL AND INTRACORONARY) BONE MARROW-DERIVED STEM CELL THERAPY IN PATIENTS WITH ISCHAEMIC HEART DISEASE AND SEVERELY DEPRESSED LEFT VENTRICULAR FUNCTION

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Background: Implantation of bone marrow-derived stem cells (BM-SCs) into the failing heart may be a promising approach for cardiac regeneration in heart failure secondary to severe coronary artery disease.

Aim: The aim of the present study was to determine the effects of the combined (intramyocardial and intracoronary) percutaneous administration of non-selected BM-SCs therapy on the size of ischaemia, clinical status, and left ventricular function in no-option patients with chronic myocardial ischaemia and severely depressed left ventricular function.

Methods: Eighteen patients (94% of men, mean age: 55.4 ± 10.5 years) with previous myocardial infarction and left ventricular ejection fraction less than 35% under optimal medical treatment received combined [NOGA-guided intramyocardial (4.0 ± 0.6 mL) plus intracoronary (30.2 ± 13.8 mL)] autologous BM-SCs therapy (total cell number: 2.82 10^9 ± 3.39 10^9; CD34+ cell number: 4.60 10^7 ± 4.41 10^7). Baseline and 6-month follow up 99m-Tc-MIBI-adenosin--perfusion scintigraphy for determination of size of resting and stress-induced perfusion defects, NOGA endocardial mapping for assessment of myocardial viability, and contrast ventriculography for calculating of global left ventricular ejection fraction (EF), left ventricular end-systolic (ESV) and end-diastolic volume (EDV) were performed in all patients.

Results: A positive trend toward smaller stress-induced perfusion defects (from 37.3 ± 12.0% to 32.9 ± 11.6%; $p = 0.07$) and a significant increase in mean unipolar voltage value of injected area measured by NOGA endocardial mapping (from 7.24 ± 2.33 mV to 8.43 ± 2.70 mV; $p = 0.007$) (normal value > 14 mV) were observed after 6-month combined application form of BM-SCs therapy. Accordingly, the clinical status of patients improved (NYHA functional class from 2.69 ± 0.96 to 1.74 ± 0.95; $p = 0.001$, CCS from 2.31 ± 1.10 to 1.43 ± 0.79; $p = 0.04$), global left ventricular EF increased (from 32.9 ± 5.4% to 41.0 ± 8.2%, $p = 0.01$) and ESV decreased (from 153.9 ± 37.6 mL to 145.7 ± 57.0 mL; $p = 0.05$) significantly. In addition, a significant decrease in heart rate (from 76.7 ± 15.7 min^{-1} to 64.5 ± 11.0 min^{-1}; $p = 0.005$) could be observed without any significant change of drug therapy.

Conclusion: Combined (intramyocardial and intracoronary) BM-SCs implantation induces reduction of the size of chronic ischaemia, significant improvement of clinical status and left ventricular function as well as a further decrease in the elevated sympathetic activation in patients with ischaemic heart disease and severely depressed left ventricular function.

PERIPHERAL FAT MASS HAS AN EFFECT ON CARDIOVASCULAR RISK FACTORS

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Aim: To investigate the effects of peripheral fat mass on the atherogenic risk profile.

Method: Data from a nationwide cross-sectional survey enrolling a 1% Czech population random sample aged 25–64 years were pooled in 2000/2001: 1513 men (respondence, 63.8%) and 1639 women (respondence, 64.8%).

Results: Peripheral fat mass related to diabetes mellitus and dyslipidemia. A large hip circumference (4.quartiles) compared with a low hip circumference (1. quartile).

Conclusion: In line with previous reports, our cross-sectional survey supports the independent anti-atherogenic effect of peripheral obesity.

WHAT CAN MEAN IF WE SAY "PALLIATIVE CARE ON PATIENTS WITH ADVANCED HEART FAILURE"?

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Advanced heart failure is a typical example of non-oncologic palliative care. The main challenge of managing a progressive disease is communication about prognosis and questions: how large use pharmacologic and invasive treatment? In countries such as England or United states have been giving number trials about needs of patients with progressive heart failure. Most of results talk about daily quality of personal life – first of all possibility to stay home (not in hospital), be without pain, dyspnea, anxiety (psychological--social support to both patient and family) and have good relationship with medical staff – based on empathy communication and reciprocal trust. But there is one question--how manage it best way in progressive and very dynamic symptoms of advanced cancer or non-cancer diseases? The response could we look for in the "community care model". This system of organization of medical care is based on home care nurses, specialized in palliative care commonly and closely for example in patients with advanced heart failure. The second important part of the model are doctors – specialists or consultants in closer medical specialization (cardiologists) and very important are general practitioners. The regional network, based on cardiologic centre with consulting and educational role, should cooperate with regional services of specialize palliative care (for example hospice) in situations of too difficult symptomatic care or need of larger support of multidisciplinary team (hospice, palliative care service in hospital etc.). The model like this significantly improve quality of care and at the same time quality of patient's and family's life. Also can present conditioning for terminal and bereavement care. Hospice home care could be foundation of the model.

THE OUTCOME OF PATIENTS UNDERGOING CARDIOPULMONARY RESUSCITATION FOLLOWING ACUTE MYOCARDIAL INFARCTION TREATED BY PCI: A PILOT STUDY

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Study background: Cardiac arrest following acute myocardial infarction (AMI) is associated with the most complicated treatment and most uncertain prognosis of all acute coronary syndromes.

Study purpose: To assess the outcome of all patients admitted to the coronary care unit (CCU) of a department of cardiology following AMI and subsequent cardiopulmonary resuscitation (CPR) due to cardiac arrest over a period of six months.

Patients and methods: 11 patients (9 males, 2 females, mean age 62 (SD = ± 7) years) admitted to the CCU due to AMI followed by cardiac arrest with CPR, were prospectively followed up (including telephone interviews) for a minimum of 6 months. Parametric statistical methods were used for assessment.

Results: The mean time (from onset of symptoms to the start of extended cardiopulmonary resuscitation by paramedics) was 6 (SD = ± 4) minutes. In 10 patients, the cause of cardiac arrest was ventricular fibrillation, and asystole in one patient. Defibrillation was undertaken during CPR in all patients. All patients also underwent coronary angiography. Ten patients were treated by coronary intervention with stent implantation. In nine patients, the intervention was acute. Three patients died in the CCU, one patient died 5 months later due to sepsis. Three patients are still hospitalized in county hospitals. Four patients are receiving home care, visiting an outpatient clinic of cardiology on a regular basis.

Conclusion: If current methods of pre-hospital and acute coronary care were used, over 40% of patients could survive retaining a good quality of life. This hypothesis should be tested in a much larger series.

RIGHT VENTRICULAR ISOVOLUMIC RELAXATION TIME AS ASSESSED BY TISSUE DOPPLER IMAGING IN THE RISK STRATIFICATION IN PATIENTS WITH CHRONIC HEART FAILURE

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Aim: Assessment of the prognostic significance of right ventricular isovolumic relaxation time (IVRT), as measured by tissue Doppler imaging (TDI) in patients with chronic heart failure, and its relation to parameters of invasive hemodynamics.

Patients and methods: One hundred and eight patients with chronic heart failure (NYHA II–IV) underwent, at study initiation, echocardiography with TDI of tricuspid annulus motion and right-heart catheterization. Patients were followed up with respect to cardiac mortality and non-fatal cardiac events related to heart failure such as hospitalization for cardiac decompensation or need for implantation of a cardioverter-defibrillator for malignant ventricular arrhythmias. The mean follow-up period was 18 months.

Results: Cardiac events were experienced by 31 patients; of this number, 12 patients died.

The value of IVRT was significantly lower in deceased patients (62 ms) compared with survivors (98 ms), $p < 0.05$ (Mann-Whitney U test). Cox regression analysis showed a significant predictive potential for overall survival in combination with other parameters (Tei index, IVA) (relative risk 0.98; $p < 0.05$).

Conclusion: Assessment of right ventricular isovolumic relaxation time by TDI is only an auxiliary instrumental method for risk stratification of patients with chronic heart failure at increased risk of cardiac-related death.

EFFECT OF SHORT-TERM SUPPLEMENTATION WITH MULTIVITAMIN-CONTAINING MARGARINE ON VITAMIN AND LIPID SPECTRUM STATUS IN ELDERLY PATIENTS WITH HYPERCHOLESTEROLEMIA

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Introduction: Functional food is expected to reduce the risk of cardiovascular mortality and morbidity, however, its effect is not documented in a satisfactory manner. Hypofolatemia is the most frequent recent hypovitaminosis, especially in elderly subjects. We evaluated the effect of Flora ProActive, a margarine supplemented with multivitamins (MSM), on folate, vitamin B12, homocysteine (Hcy) and lipid spectrum as risk factors modifiable by functional food.

Method: The intervention group (IG) consisted of 43 volunteers from a pension house, who consumed 250 g/week of MSM for 100 days in a short-term, open non-randomised controlled trial. Twenty volunteers from the same pension house with an identical diet except for MSM consumption served as controls (CG). IG was younger, 70.2 ± 12.8 vs 81.4 ± 7.9 yrs ($p < 0.001$) with a lower systolic blood pressure: 140.1 ± 26.0 vs 157,3 ± 29.4 mmHg ($p < 0.02$) as compared to CG. The range of the male/female ratio was the same, 25% to 75% vs 20% to 80%, respectively (NS), in both groups.

Results: After intervention, IG exhibited a profound increase in folate 17.3 ± 9.9 vs 30.8 ± 13.4 [pmol/L] ($p < 0.001$) and decrease in Hcy 18.9 ± 13.1 vs. 14,4 ± 4.31 mol/L ($p < 0.02$) compared to CG: folate: 7.8 ± 3.2 vs. 7.3 ± 3.8 [pmol/L] (NS), Hcy: 24.0 ± 4.1 vs. 21.4 ± 5.4 mol/L (NS), respectively. IG decreased triglycerides level: 2.03 ± 1.22 vs. 1.68 ± 1.05 mmol/L ($p < 0.05$) in contrast to CG 1.89 ± 0.79 vs.1.93 ± 0.94 mmol/L.

An adverse effect was a slight increase of weight in IG: 72.5 ± 16.1 vs 73.5 ± 15.8 kg ($p < 0.02$) compare to CG: 68.7 ± 14.5 vs 69.0 ± 12.4 kg (NS). Both groups increased TC while on the same diet, but the increase in IG was significantly smaller: – 6.0 ± 1.21 vs 7.3 ± 1.42 mmol/L ($p < 0.001$) vs CG: 5.6 ± 1.05 vs. 8.3 ± 1.4 mmol/L.

Conclusion: Flora ProActive, a margarine supplemented with vitamins, could favourably modify the hypofolatemia and hyperhomocysteinemia in elderly subjects; however, energetic intake should be considered.

IMPACT OF SPECIALIZED HEART FAILURE OUTPATIENT UNITS ON THE PREVALENCE OF HOSPITALISATIONS DUE TO CONGESTIVE HEART FAILURE IN DIFFERENT REGIONS OF AUSTRIA

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Background and Aim: Heart failure (HF) is one of the most important reasons for hospitalisation. Chronic HF patients characteristically present with multiple re-admissions for acute decompensation and represent a major burden on national healthcare costs. Special care, in the form of HF outpatient units, has been organized and their impact on the decrease of recurrent hospital readmissions was investigated.

Methods: Data from the Austrian Department for Statistics 2000 and 2004 concerning patients admitted to a hospital in Austria because of acutely decompensated HF (based on the ICD-10 Code) with a focus on regional differences were investigated.

Results: A total of 31,243 consecutive patients with congestive HF (CHF) were registered in the year 2000 compared to 26,030 patients in 2004 resulting in a total decline of 5,213 patients (17%). A decline in hospitalisations due to HF between 4–47% could be demonstrated in 8 out of 9 regions of Austria, while only one region in Austria showed an increase of hospitalisations (21%). Two regions showed a dramatic decrease (28% and 47%), while, in 6 regions, a moderate reduction of hospitalisations was seen (4–10%). The distribution of HF services in relation to the number of inhabitants is given in *Figure 2*.

Conclusion: A decline of hospitalisations due to HF was observed in all but one region in Austria. The prominent decrease in HF admissions in Vienna might be explained not only by the organisation of special care outpatient wards but, also, by a pilot project providing home nurse care, conducted in the years 2002-2004, while the wide range of inhabitant numbers/special HF care unit (105,000 to 279,000) had no influence on the quality of care. The provision of specialized HF services is an important contribution to increased quality of care of chronic HF patients ending up in a lower re-hospitalisation rate.

THERAPY OF ANGINA IN OUTPATIENTS – PERSISTENCE OF INTERSEXUAL DIFFERENCES

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I**ntroduction:** Pharmacological analysis of the 1990s demonstrated an inappropriate pattern of therapy of angina with a preponderance of trinitrate therapy and deficiency in therapy of females. Females were less frequently treated by betablockers, antiaggregants and nitrates.

Method: A cross-sectional multicentre screening was performed by 228 general practitioners and cardiologists in 98 centers of Slovakia in 2006. Of the 2,945 enrolled patients with angina (aged 68.7 ± 9.9 yrs [36–91 yrs) 41.9% were males and 58.1% females.

Patients: Females were older (70.0 ± 9.5 vs. 67.1 ± 10.0; $p < 0.001$) and more frequently obese (BMI ≥ 30: 38.8% vs. 28.2%; $p < 0.05$). Males had more frequently arterial hypertension (64.6% vs. 35.6%; $p < 0.001$), but the prevalence of dyslipidemia (79.6% vs. 83.6%; NS) and diabetes mellitus (47.5% vs. 54.8%; NS) was the same. Age at the onset of angina was similar in both genders 59.3 ± 14.2 vs. 61.2 ± 15.3 yrs; ($p = 0.07$; NS), however, initiation of antianginal therapy was delayed (2.0 vs 3.4 yrs; $p < 0.001$). Consumption of short-acting nitrates was equal: 4.8 ± 2.7 vs 5.1 ± 3.3 tbl (NS). The structure of therapy is presented in the *Table*.

Conclusion: Significant intersexual differences in the treatment of angina still persist. Betablocker therapy in females is less frequent and delayed by more than one year. Molsidomine therapy is delayed by more than three years compared to male patients.

Table referring to abstract by doctor Lietava

Therapy	% of treated			Onitiation of therapy [yrs]		
	Males	Females	Sign.	Males	Females	Sign.
Nitrates	51.9%	62.7%	0.01	60.5 ± 9.7	64.0 ± 9.1	0.01
NTG	54%	62.6	0.03	NK	NK	
Betablockers	78.1%	61.3%	0.01	60.2 ± 9.5	63.4 ± 10.9	0.02
Molsidomine	38.7%	40.9%	NS	62.9 ± 8.2	66.9 ± 8.2	0.01
Trimetazidine	8.6%	10.1%	NS	NK	NK	

BETTER CONTROL OF HYPERTENSION IN PATIENTS WITH A PACEMAKER?

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Aim: To evaluate the effect of pacing on blood pressure level (BP) in patients treated for hypertension.

Study Group and Methods: A retrospective analysis of data of a group of 259 patients with treated hypertension, undergoing pacemaker (PM) implantation in our department over the years 2004–2006. There were 134 men (52%), the mean age of the patients was 74 ± 9 years (median, 75 years). We investigated the BP before and after PM implantation and, also, other factors affecting BP. Good control of hypertension was defined as a BP < 140/90 mmHg, BP ≥ 140/90 mmHg as poorly controlled hypertension.

Results: Before PM implantation, mean systolic BP was 146 ± 25 mmHg (median, 145 mmHg) and mean diastolic BP 82 ± 14 mmHg (median, 80 mmHg); 79 (30.5%) patients had BP < 140/90 mmHg, while 80 (69.5%) patients had BP ≥ 140/90 mmHg. After PM implantation, mean systolic BP was 130 ± 16 mmHg (median, 130 mmHg) and mean diastolic BP 76 ± 11 mmHg (median, 80 mmHg); BP < 140/90 mmHg was determined in 135 (52%) patients and BP ≥ 140/90 mmHg in 124 (48%) patients. There was a significant decrease in the proportion of patients with poorly controlled hypertension ($p < 0.001$). We also found a significant increase in the proportion of patients treated by betablockers (BB) after PM implantation ($p < 0.001$). There were 128 (49%) patients treated by BB before PM implantation and 177 (68%) patients after the procedure.

Conclusion: We noted a significant decrease in BP levels after PM implantation in our patients. And it can be said, that pacing could also improve the control of hypertension, particularly due to possibility of treatment by BB in those patients, who could not use BB before, because of bradycardia.

STRUCTURE, EFFICACY AND ECONOMY OF THE THERAPY OF HYPERTENSION IN SLOVAK OUTPATIENTS WITH METABOLIC SYNDROME. NEMESYS PROJECT

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Introduction: Increased blood pressure is one of the discriminant criteria for the presence of the metabolic syndrome (MS). Despite of numerous analyses of antihypertensive therapy, its evaluation with respect to the MS is rare.

Method: A cross-sectional multicentric screening of the MS and structure of medication was performed in 8,679 consecutive outpatients over the whole territory of Slovakia. The MS was defined according to the 2005 IDF criteria.

Results: Outpatients aged 52.4 ± 16.1 yrs [17-96 yrs] exhibited a 25.6% prevalence of the MS (23.7% in males; 26.9% in females; $p < 0.01$). Hypertension (BP ≥ 140/90 mmHg) was present or antihypertensive therapy used in 65.8% patients. The target BP for the MS [BP < 130/85 mmHg] was seen in 13.3% of MS+ patients and in 14.7% of MS – of treated hypertensive patients (NS). MS+ patients were more often unsuccessfully treated (70.1% vs. 54.4%; $p < 0.001$). Both subgroups had a similar pattern of therapy; however, treatment of MS+ patients was more costly: antihypertensive therapy was 14.9 vs 13.1 SK of DDD ($p < 0.001$); lipid-lowering was 12.3 vs 10.7 SK of DDD ($p < 0.001$); and complex therapy was 34.7 vs 30.3 SK of DDD ($p < 0.01$).

Conclusion: The NEMESYS project found a 25.6% prevalence of the metabolic syndrome among outpatients. Their antihypertensive and lipid-lowering treatment was more costly and equally effective (or, alternatively, ineffective) compared with patients without MS. Only 14% of patients became normotensive.

INTERFERENCE OF IMPLANTED PACEMAKER AND CARDIOVERTER-DEFIBRILLATOR LEADING TO REPETITIVE ICD SHOCKS AND NON-EFFECTIVE PACING BY PM WITH ASYSTOLY AFTER SHOCKS*

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**MSMT-MSM 0021622402.*

Theory: In patients with pacemaker (PM) and cardioverter--defibrillator (ICD) implanted later, an interference of both devices can occur.

Case study: A 73-year-old man with implanted PM (Jan 2005, St. Jude Medical – SJM Verity ADx XL SR VVI, R due to atrial fibrillation with complete AV block) received a SJM Atlas+ VR ICD in January 2006 for syncope, nonsustained ventricular tachycardia and inducible malign arrhythmia (contralateral implantation). PM programmed for antibradycardia pacing and ICD programmed for antitachycardia therapy only.

Patient admitted to regional hospital in Jun 2006 for repetitive syncope and ICD shocks. Transferred to our center for arrhythmic storm suspicion. ECG shows pacing in frequency of 87 ppm (AutoCapture and Sensor set to ON) and couples of stimuli (first one noneffective and second one back-up pace, 4.5 V 0.4 ms, intermit. noneffective). Pacing threshold of PM was 4.5V 0.4 ms. Marker channel of ICD shows occurring of doublecounting of first stimulus and following sensed QRS after 125 ms. After 25 s the criterion for detection of ventricular fibrillation (VF) was fulfilled and shock emitted. After ICD shock the pacing threshold of PM increases temporarily leading to 7s asystoly due to non--effective pacing. ICD was inhibited by PM stimuli. During 11 days before admission the detection of VF occurred 42times causing 24 shocks. The situation was resolved by programming PM being permanently inhibited (VVI, 30 ppm, output 0.75 V at 0.05 ms, sensitivity 0.5 mV) and programming ICD for antibradycardia pacing with sufficient output.

Conclusion: In patients (patients) with coexisting PM and ICD, activity of both is risky since possible interference. In case of ICD implantation in patients with PM, it is feasible to consider PM explantation despite of underusing full PM longevity and saving of ICD generator in PM dependent patients.

THE ROLE OF BIOTRONIK HOME MONITORING FOR ATRIAL FIBRILLATION DETECTION BY IMPLANTABLE CARDIOVERTER-DEFIBRILLATORS (ICD) AND BIVENTRICULAR DEVICES (3 CASE STUDIES)*

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Introduction: The majority of patients with ICD and all with biventricular (biv) devices suffer from structural heart disease. The incidence of atrial fibrillation (AF) in this population is very high. A high percentage of episodes is without symptoms. Rapid ventricular response in patients with ICD can cause repetitive charging and inappropriate shocks, in patients with biv devices it competes with biv pacing. AF therapy is much easier when early diagnosed. Home Monitoring (HM) is now available for ICD and biventricular pacemakers (PM) and can help in early diagnostics.

Case study 1: A 62-year-old man with ICD Lexos DR-T. In Oct 2005, repetitive messaging of ventricular tachycardia (VT) and ventricular fibrillation (VF) detection. Antitachycardia pacing and shocks emitted. Patients invited to follow--up (FU), AF with rapid ventricular response (RVR) diagnosed. After unsuccessful pharmacology and cardioversion treatment, nonselective ablation of AV node performed.

Case study 2: A 69-year-old man with biv PM Stratos LV-T almost daily sending messages of a high number of ventricular extrasystoles. In Aug 2006, alerts "PM tachycardia detected" and "decrease in % of resynchronization therapy" (% CRT). Newly, a high percentage of intrinsic atrial and ventricular events in "AV conduction histogram" found. Suspected AF confirmed at FU.

Case study 3: A 69-year-old man with biv ICD Lumos VR-T. On Feb 6, 2007 sent repetitive messages about VF detection with therapy withdrawal and several with "30J shock unsuccessful" and VT detection. AF with RVR and non-sustained VTs diagnosed. Amiodarone introduced.

Conclusion: AF diagnostics in HM is dependent on "complications" such as rapid ventricular response leading to VT/VF detection in ICD or decrease in % CRT in biv devices. We detected AF also after false repetitive messaging of PM tachycardia.

IDENTIFICATION A NOVEL MUTATION OF TROPONIN-T GENE CAUSING MALIGNANT FORM OF HYPERTROPHIC CARDIOMYOPATHY

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Objectives: Genetic origin is important in the development of hypertrophic cardiomyopathy (HCM) which is characterized by myocardial hypertrophy and rhythm disorders. The third most common mutated gene leading to HCM is the troponin-T (*TNNT2*) gene with an incidence of 2%. Our aim was to analyze mutations of the *TNNT2* gene in children and young adults.

Patients and methods: DNA was isolated from peripheral blood of 26 patients followed by PCR (*TNNT2* gene, exons 8,11,14,15,16). Mutation analysis was performed using dHPLC and positive chromatograms were sequenced.

Results: One mutation was found in the patient cohort (3.8%). It is a novel mutation, a deletion of a glutamic acid

in exon 11, at one of the amino acid positions between 165 and 168. This mutation has not been published in the literature so far. The patient is a 19-year-old girl, who had endured aborted sudden cardiac death (SCD) twice, so implantation of an implantable cardioverter defibrillator was necessary. Family screening revealed that the patient's mother also had HCM. Her disease was characterised by mild septal hypertrophy, pronounced fibrosis and an uncommon restrictive diastolic dysfunction. She had suffered malignant arrhythmias several times and died of progressive heart failure at the age of 30. In another patient, two polymorphisms were found in intron 14 (base 18497C > G, base 18585C > T).

Conclusion: We have identified a novel *TNNT2* gene mutation which resulted in malignant ventricular arrhythmias and aborted SCD despite a mild myocardial hypertrophy. The phenotype was consistent with the previous data of *TNNT2* gene mutations causing HCM published in the literature earlier.

HYPERURICEMIA IN ACUTE MYOCARDIAL INFARCTION: THE IMPACT ON IN-HOSPITAL MORBIDITY AND MORTALITY

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Aims: To investigate the incidence of elevated values of serum uric acid (UA) concentration in patients with acute myocardial infarction (AMI) and assess its impact on in-hospital morbidity and mortality.

Methods: We analyzed the course of AMI in 289 patients (141 or 68.8% male; mean age 66.2 ± 12.1 years; mean hospital stay 13.3 ± 5.8 days) admitted to the Coronary Care Unit during the year 2003. Clinical and therapeutic variables were analyzed. Patients with raised (> 410 mol/L, n = 84) and normal UA concentration were compared to determine the predictive value of UA on end-point events (death, acute cardiac failure, non-fatal reinfarction, early post-infarction angina). Receiver operating characteristic (ROC) curves were carried out.

Results: Patients with elevated UA (mean value 525 ± 71.1 mol/L) showed more often signs of heart failure – Killip II (31.0% vs. 11.7%; p = 0.0002) and Killip III–IV (22.6% vs. 6.3%; p = 0.0001). They had a higher in-hospital mortality rate (16.7% vs. 7.8%; p = 0.041). ROC analysis demonstrated that increased UA predicted more frequent composite end-point (death, heart failure). Cut off value 407 mol/L; AUC 0.700; SE 0.036 (95% CI = 0.643 to 0.753). Odds ratio 4.85 (95% CI = 2.775–8.462). Sensitivity of a test was 54.3 and specificity 80.8.

Conclusions: One third of patients with acute myocardial infarction had elevated serum uric acid concentration. In that group the course was more often complicated by signs of cardiac failure and death. Our results suggest that serum uric acid concentration in acute myocardial infarction is a suitable predictive marker of a complicating early course of the disease.

PEDOF PROBE MEASUREMENT OF PEAK VELOCITY AVOIDS MISCLASSIFICATION OF AORTIC STENOSIS SEVERITY IN TWENTY-FIVE PERCENT OF PATIENTS WITH AORTIC STENOSIS

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Purpose: The constraint of time allotted to perform echo examinations, and continuous miniaturization and improvement of signal-to-noise ratio of modern combined imaging and Doppler transducers (steerable) have forced some echocardiographers to assess aortic jet velocity signal using only steerable transducers (ST). The accuracy of aortic jet peak velocity measured using modern ST in comparison with Pedof probe (PP) has never been tested.

Methods: We studied 58 consecutive patients (62% M, 62 ± 14 yrs) with moderate-severe AS (Peak gradient = 64 ± 32 mmHg, EOA = 0.92 ± 0.35 cm^2). Each pt was searched for highest possible transaortic velocity using CW modality form apical and right parasternal approach using ST and PP in random order. Feasibility was 100% and 83% using ST and 93% using PP from apical and right parasternal approach, respectively.

Results:

	Steerable	Pedof	PValue
Vmax Apical (m/s)	3.76 ± 0.8	3.66 ± 0.8	0.02
Vmax Right Intercostal (m/s)	3.76 ± 0.97	4.04 ± 0.99	< 0.0001
Pvalue	0.82*	< 0.0001*	< 0.0001^
Peak Gradient Apex (mmHg)	53 ± 24	52 ± 26	0.68
Peak Gradient Right Intercostal (mmHg)	56 ± 30	66 ± 33	< 0.0001
Pvalue	0.23*	< 0.0001*	< 0.0001^
EOA Apex (cm^2)	0.96 ± 0.36	0.99 ± 0.38	0.034
EOA Right Intercostal (cm^2)	0.96 ± 0.41	0.89 ± 0.36	0.001
Pvalue	0.37*	< 0.0001*	< 0.0001^

*Apical vs right intercostal approach; ^ ST from apex vs PP from right intercostal approach

Using ST only, 3 patients out of 5 (60%) would have been misclassified as mild instead of moderate AS, and 10 patients out of 18 (55%) would have been misclassified as moderate instead of severe AS.

Conclusions: PP and ST measure comparable peak flow velocities through the AV from the apical approach however PP allows recording of higher velocities from right parasternal approach. Using the right intercostal approach and PP avoid misclassification of AS severity in 25% of patients with suspected AS.

2-YEAR MORTALITY OF PATIENTS WITH CONGESTIVE HEART FAILURE (CHF)

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Aim: Stratification of risk factors of 2-year mortality of patients with (CHF).

Methods: Retrospective analysis of medical records of patients dismissed from the Internal Cardiology Dpt. in Oct–Dec 2004.

Results: We analysed 839 patients. CHF diagnosis criteria satisfied 144 (17.2%), mean age 68.2 years. 2-year mortality of non-CHF was 8.9%, of CHF patients 27.1% (p < 0.00001), NYHA < III 22.2% and NYHA ≥ III 35.2% (p = 0.09). Comparing comorbidities of surviving and non-surviving patients, there were 74.3% vs 79.5% with IHD, 61.0% vs 59.0% suffered cardiac infarction, 65.7% vs 64.1% with HT, 41.9%

vs 46.2% with atrial fibrillation in anamnesis, 20.0% vs 12.8% with dilated CMP and 33.3% vs 46.2% with DM (all NS). In hemodynamics, systolic BP was 124.8 vs 119.5 mmHg, heart rate 73.0 vs 75.3/min, pulse BP 50.2 vs 51.3 mmHg (all NS), diastolic BP 74.7 vs 68.2 mmHg ($p < 0.01$), mortality was higher in patients with left ventricular (LV) EF < 25% ($p < 0.05$). In lab, mean cholesterol (CH) was 4.85 vs 4.20 mmol/L, LDL-CH 2.93 vs 2.23 mmol/L (both $p < 0.05$), HDL-CH and triglycerides (TG) were decreased in dead (NS), blood urea was 7.7 vs 11.3 mmol/L, creatinine 110.7 vs 141.2 mol/L, uric acid 395.8 vs 488.5 mol/L, hemoglobin 138.7 vs 123.9 g/L (all $p < 0.01$). In medication, beta-blockers (BB) had at dismissal 82% vs 72%, diuretics 84% vs 87%, digitalis 32% vs 36%, spironolacton 54% vs 56%, anticoagulation 18% vs 8% (NS), ACE-I/ARB 90% vs 72% ($p < 0.01$), BB + ACE-i/ARB combination 76% vs 59% ($p < 0.05$).

Conclusion: Two-year mortality of patients with CHF is 3.5 times higher than patients without CHF. Negative impact had elevated nitrogen substances, uric acid, lowered total and LDL-CH, low diastolic BP, severe systolic LV dysfunction, anemia. Monitored comorbidities did not influence mortality separately but by mutual intensification of negative affects. A Positive affect on mortality had ACE-I/ARB, their combination with BB and anticoagulation.

EMBOLISM OF SUPERIOR MESENTERIC ARTERY AS A COMPLICATION OF CORONARY ANGIOPLASTY SOLVED BY LOCAL THROMBOLYSIS. CASE REPORT

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Introduction: Arterial embolism into splanchnic bloodstream may be a potential complication of acute coronary angiography and primary coronary intervention (PCI). Mortality of such an event depends on early diagnosis and treatment – may be low (without infarction of affected tissue) as well as reach 70–90%.

Case report: 59-year-old man with diabetes mellitus, severe hyperlipidaemia and gouty arthritis, was admitted to the coronary unit with acute inferolateral cardiac infarction with ST elevation, delay 10hours, Killip I. A successful PCI with stent implantation in a. coronaria dx. was performed. Minutes after the intervention, the patient complained of severe pain in epi- and right hypogastrium. As the pain was worsening, we thought of arterial embolism as well. On urgent contrast CT examination of stomach we found a mural infrarenal thrombus in aorta and defects of blood flow in superior mesenteric artery (SMA). Having consulted a surgeon and an invasive radiologist, we performed a local thrombolysis of SMA branches using alteplase (Actilyse) 30 mg fractionally injected with an arterial catheter. There was an immediate relief of the patient's pain. Continual infusion with dalteparin (Fragmin) followed. The patient's state was favourable then – rehabilitation, food tolerance, no marks of infarction. Control Duplex examination of SMA detected normal arterial blood flow. Patient was dismissed the 9th day of hospitalisation.

Conclusion: Our case report demonstrates the necessity to consider an extracardiac thromboembolic event when acute stomach pain occurs, especially following arterial catheterisation. It is important to manage extended examination – duplex sonography, contrast CT or CT angiography, eventually direct angiography. Early diagnosed cases may be solved with invasive radiological techniques including selective thrombolysis with good clinical effect.

OUR EXPERIENCE WITH THE USE OF IMPEDANCE CARDIOGRAPHY TO MONITOR HEMODYNAMICS IN PATIENTS WITH ACUTE HEART FAILURE – COMPARISON WITH TERMODILUTION

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Objectives: The method of impedance cardiography (ICG) is based on Ohm's law: the ICG electrodes apply an alternating electrical current to the thorax and measure the corresponding voltage to detect changes in thoracic impedance which is dependant on blood volume in the thorax. Variables such as cardiac output/index (CO, CI), stroke volume/index (SV, SI), systemic vascular resistance/index (SVR, SVRI) etc. can be derived. Several studies have proved its validity, safety and considerable cost and risk when compared to invasive techniques. Correlations of CO and CI calculations to bolus thermodilution (BT) and direct Fick methods vary from 0.73 to 0.93.

Aim: To compare BT and ICG results in patients with acute heart failure on mechanical ventilation and unconscious by whom such data is missing.

Method: We used ICG with beat-to-beat blood pressure monitoring as a part of Task Force Monitor® device to check haemodynamic state in patients admitted to coronary unit with acute heart failure, all mechanically ventilated, unconscious. We recorded 10-minute ICG digital strips right after having measured CO, CI, SV and SVRI using bolus thermodilution. We used average values of ICG and mean values of 5 BT measurements.

Results: We included 8 paired measurements (BT vs ICG) performed on 4 patients in different clinical states. Mean CO was 5.26 vs 4.61L/min, CI 2.51 vs 2.26l/min/m^2, Spearman corr. index 0.90 and 0.97 ($p < 0.01$). Mean SV was 49.6 vs 42.6 mL, SVRI 2244 vs 2920 dynescm5/m^2, Spearman corr. index 0.10 and 0.64 (both NS).

Conclusion: We confirmed that measuring of CO and CI in heart failure patients in critical state using modern ICG monitoring systems is highly comparable to bolus thermodilution method. It is a non-invasive, safe and easy-to-read device providing a beat-to-beat analysis. Other variables like SVRI and SV were useful in monitoring trends rather then providing absolute values.

LATE THROMBOSIS IN DRUG ELUTING STENTS

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Background: Late thrombosis in drug-eluting stints (DES) seems to be a more serious problem than expected. There are a lot of controversies among the experts worldwide and the data published are often incomplete and uncertain.

Methods: We have followed up 146 consecutive patients to whom DES were implanted in our institution since 2002 till 2005. With these patients we have paired 146 patients, who received bare metal stints (BMS) always immediately after the patient with DES implantation. The aim of our retrospective study was to show the mortality rate difference between both groups. We have found out the main cause of death and the section report by contacting the physicians taking care of the patients before they died.

Results: The all cause mortality was 10.3% (n = 15) in DES vs 10.9% (n = 16) in BMS patients (NS). There were

33.3% (5/15) sudden deaths in DES group compared to the 50.0% (8/16) in BMS group. The average follow up was 42 months. The time from the stent implantation to death was 17.25 months in DES group and 10.0 months in BMS.

Conclusion: The all cause mortality and sudden death in patients receiving BMS was nonsignificantly higher than in DES group.

PULMONARY EMBOLISM AND FEVER: WHEN SHOULD I THINK TO RIGHT-SIDED INFECTIVE ENDOCARDITIS?

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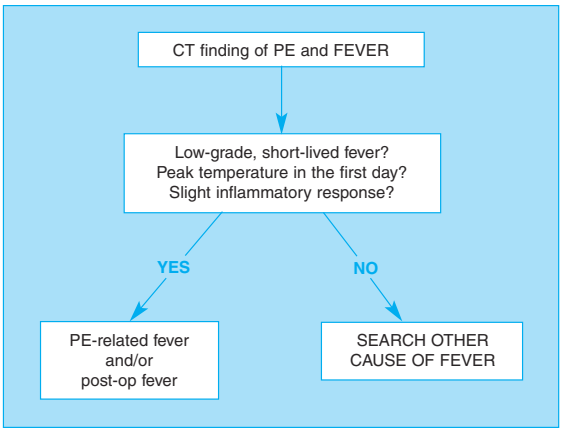
Low-grade short-lived fever in pulmonary embolism is usually a benign sign and does not need further investigation. Contrariwise, high-grade fever is often due to another cause. Among patients with fever not justified by pulmonary embolism alone, and without computed tomography findings potentially explaining fever or septic pulmonary embolic phenomena, it is crucial to have a high clinical suspicion of right-sided infective endocarditis. Right-sided infective endocarditis is indeed a common cause of septic pulmonary embolism, and if not promptly recognized and treated causes significant mortality and morbidity. Right-sided infective endocarditis is difficult to disclose by computed tomography, even if some features could occasionally suggest its presence. In this clinical scenario, echocardiography should be performed without delay, since it correctly diagnoses right-sided infective endocarditis and addresses the physician to proper antimicrobial or surgical therapy *(Figure)*.



IN HOSPITAL COSTS AND LENGTH-OF-STAY IN PATIENTS WITH ACUTE HEART FAILURE

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Heart failure (HF) hospitalization is a significant source of health care expenditures and has become more frequent as the population ages and medical care continues to improve survival. The retrospective cost analysis is undertaken from a health care payer perspective. The inclusion criterion was that the patients were admitted due to acute HF (AHF) to the Faculty Hospital Brno between June and Dec. 2006. In-patient care costs include rate of admission and stay in standard cardiology unit (SCU) and/or intensive care unit (ICU), medication, rates of investigations and interventions. The costs of daily care in ICU are counted according to TISS scores. Results are presented as mean values. The overall direct hospital cost of 282 patients (58% male, median 73.5 years) with AHF was € 883414 within 7 months. The mean hospital stay was 8.7 days, one-day cost was € 360 and total in-patient cost was € 3133. A half of all passed through both SCU and ICU; 30% only SCU and 20% only ICU. The mean length of stay in the SCU was 7.7 days with one-day cost of € 47.5 and total in-patient cost of € 366. The mean length of stay in the ICU was 3.6 days with one-day cost of € 390.4 and total in-patient cost of € 1405. The total cost of cardiac catheterisations and revascularisation procedures by 48.6% patients was € 357087; the cost of antiarrhythmic interventions (in particular the cost of antiarrhythmic devices) which by 6% patients was € 175238. The hospital mortality associated with HF was more than 11%. AHF is associated with high costs during hospital admission; prevail revascularisation procedures (40.5%), stay in ICU (30.5%) and antiarrhythmic interventions (20%). Because of the ever-rising morbidity of patients with HF and increases in hospitalization, mortality and costs there is an obvious need to inform medical specialists about the costs of management of AHF.

MORBIDITY AND MORTALITY DATA OF HYPERTROPHIC CARDIOMYOPATHY IN HUNGARY

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Hypertrophic cardiomyopathy is a primary disorder of the myocardium with reasonable morbidity and mortality. Morbidity and mortality data on the disease are not fully explored in Hungary. One-hundred-and-seventy-four patients with hypertrophic cardiomyopathy (99 males, 75 females, average age: 53 ± 17 years) from the Szeged HCM Registry were evaluated. Maximal left ventricular thickness, determined by transthoracic echocardiography, was 23 ± 6 mm; in 33 patients a left ventricular outflow tract gradient > 30 mmHg was present (average resting peak gradient 55 ± 31 mmHg). Apart of medical treatment, in 10 patients ICD implantation, in 8 patients percutaneous transluminal septal myocardium ablation (PTSMA), in 4 patients percutaneous coronary intervention (PCI), in 4 patients myectomy, in one patient ACBG and mitral valve replacement, and in 3 patients pacemaker implantation was performed. In the whole patient cohort 13 patients developed documented atrial fibrillation (11 males, mean age 55 ± 13 years), 3 patients developed stroke and 4 patients developed systolic heart failure. Follow up data was available on 138 patients (79%). During follow up 12 patients have died (8.7%, 8 males, 4 females, average age: 59 ± 19 years). Survival time from diagnosis to death was 151 ± 104 month (range 37–51 month). The cause of death was sudden cardiac death in 6 patients (50%, 5 males, average age 58 ± 14 years), therapy refractory heart failure in 2 patients (17%, 1 male, average age 40 ± 32 years), stroke in 2 patients (17%, 1 male, average age 56 ± 5 years), and it was not cardiac death in 2 patients (1 gastric cancer, 1 pneumonia). In one more case heart transplantation was performed due to progressive systolic heart failure.

PREDICTIVE FACTORS FOR MACRO – AND MICROANGIOPATHY IN DIABETES MELLITUS TYPE 2*

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Diabetes mellitus type 2 (DM2) presents an extreme risk for macro- and microangiopathy. The aim was to estimate the relationship between macro- and microangiopathy complications of DM2 and the possibility to predict the non--manifest macro- and microangiopathy in these patients. The study group of 415 DM2 followed in our outpatient clinic (218 males, 197 females, *p* NS) was divided in 2 groups – with manifested macroangiopathy (n = 112, MMC+) and without it (n = 303, MMC-). The patients' history, anthropometric and laboratory data were ascertained from the patients' medical records. The MMC+ group was significantly older than the MMC- group (69.6 ± 6.3 vs. 63.9 ± 9.8 y, $p < 0.001$) and the duration of DM2, arterial hypertension and dyslipidemia was significantly ($p < 0,01$) longer. There was no difference in smoking habits, systolic blood pressure, BMI, waist circumference, DM2 compensation, LDL and total cholesterol, triglycerides and proteinuria. Serum creatinine (119.9 ± 11.1 vs 109.5 ± 24.9, $p < 0.001$) and urea (7.3 ± 3.5 vs 6.4 ± 2.3, $p < 0.001$) were higher in the MMC+ group, HDL cholesterol (1.10 ± 0.24 vs 1.16 ± 0.24, $p < 0.05$) and Apo-A (1.20 ± 0.23 vs 1.30 ± 0.28, $p < 0,01$) were lower. In the MMC+ group, more patients suffered from the diabetic foot (11% vs 3%, $p < 0.05$), nephropathy (29% vs 9%, $p < 0.001$) and neuropathy (33% vs 19%, $p < 0.05$). There was no difference in cardiovascular and antidiabetic medication between the groups, except aspirin and betablockers. The results suggest the level of plasma creatinine and urea, apolipoprotein A and HDL cholesterol can be predictive for the presence of macro- and microangiopathy in DM2. Those with macroangiopathy are supposed to have more often microangiopathy than the patients without it. Age and duration of DM2 and hypertension are the major predictive factors for vascular complications.

METABOLIC SYNDROM AND RISK FACTORS OF ATHEROSCLEROSIS IN YOUNG CZECH POPULATION

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Aim: Atherosclerosis is a chronic disease of blood-vessel wall proceeding for long time asymptomatically. There are atherosclerosis lesions type I–II (foam cells and fatty streak) in 60% of adolescents. The aim of this work is to determine incidence of risk factors of atherosclerosis and metabolic syndrome.

Methods: Casual BP, ABPM, anthropometric parameters and laboratory values were determined.

Results: Total 276 participants (51% of women) age 23.8 ± 3.6 years. Hypertension was diagnosed according to casual BP in 25.4% of persons (28.9% of men and 22.7% of women), according to ABPM in 28.3% of persons (37.8% of men and 19.1% of women). Casual hypertension was verified by ABPM in 17.0% of men and in 12.1% of women. There were 5.9% of men and 12.1% of women smoking. Overweight (BMI 27–29.9) had 2.2% of persons, obesity 1st degree (BMI 30–34.9) had 0.7 % of persons. No man had waist-hip ratio above 1.0 and 2 women (1.4%) had WHR above 0.85. Total 2.2 % men had girth above 102 cm and none of the women had girth above 88 cm. Cholesterol > 5 mmol/L had 24.4% of persons, LDL > 3 mmol/L had 16.8% of persons, triglycerides > 2 mmol/L had 4.4% of persons, HDL < 1 mmol/L had 8% of men, HDL < 1.2 mmol/L had 2.3% of women. Young women had significantly higher total cholesterol and HDL. Men with positive family history had significantly higher pulse pressure, women had higher systolic, diastolic and pulse pressure and lower HDL. Men with hypertension had lower HDL. Total 2.7% of participants had glycemia 6.1–7.0 mmol/L.

Conclusion: Metabolic syndrome was diagnosed in 3 men and 2 women. There is high prevalence of hypertension, low prevalence of smoking and obesity. Women in young age had more suitable lipid spectrum. Sportsmen had lower diastolic BP, higher HDL and lower LDL. Positive family history is risk factor for BP and lipid spectrum.

NONOINVASIVE DETECTION OF VESSEL STIFFNESS FROM CONTINUOUS BLOOD PRESSURE RECORDINGS IN HYPERTENSIVE PATIENTS

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Hypertension belongs among the most important risk factors contributing to cardiovascular (CV) morbidity and mortality. This study presents parameters computed from a derivative continuous blood pressure (BP) signal, these parameters reflect dynamic properties of BP changes closely connected with vessel stiffness.

Methods: The protocol includes 5-minute measurement with paced breathing at 0.1 Hz in the supine position. ECG and BP (Finapres – 2300, Ohmeda) were continuously recorded, the signals were digitalized and processed with software ANNAlab ScopeWin ANS.

Study groups: We measured 4 groups of patients: 12 young healthy individuals (YH, age 26 ± 4, 4 female), 10 old healthy individuals (OH, age 54 ± 10, 2 female), 12 patients with non-medicated hypertension (H1, age 31 ± 9, 3 female) and 16 non-medicated hypertensive patients with additional risk factors (obesity, hyperlipidemia, diabetes mellitus).

Parameters: The mean and standard deviation values were computed, the following key parameters were obtained and compared between the groups: RR intervals, SBP, DBP, pulse pressure, RR variability RSTD, SBP and DBP variability STD, maximum and minimum of derivative BP – dBP/dtmax and dBP/dtmin, difference ΔdBP = dBP/dtmax – dBP/dtmin, depression time T2 = dBP/dtmax - dBP/dtmin.

Results: The fundamental parameters are SBP and pulse pressure, which as expected differentiate between normotensive and hypertensive groups. Interval RR was shorter in the hypertension group, but the difference was not significant. Substantial differences were found between groups H1 and H2 in dynamic parameters: dBP/dtmax, dBP/dtmin, ΔdBP, T2. The results showed steeper rise of BP in the group H2. Groups H1 and H2 were equivalent in traditional markers of CV risk such as BP and HR, however the higher stiffness and lower compliance of vessels reflect in dynamic parameters.

PULMONARY EMBOLECTOMY FOR ACUTE MASSIVE PULMONARY EMBOLISM

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Due to the development of systemic thrombolysis the surgical pulmonary embolectomy became a rare procedure reserved for a small group of patients only. Considering hemodynamic instability and obvious critical conditions of the patients, the morbidity and mortality remains very high despite modern peri and postoperative care.

Between November 1998 and September 2006, 8 patients (4 males, 4 females, mean age 52.3) underwent pulmonary embolectomy in our centre. All procedures were performed under cardio-pulmonary bypass. In 3 cases pulmonary thromboembolism was associated with paradoxical embolism. 3 patients died, the mortality was 37.5%.

The indications, optimal timing and post-operative care are discussed.

THE UTILITY OF PULSED-WAVE TISSUE DOPPLER ECHOCARDIOGRAPHY FOR DIAGNOSTICS OF LATE MYOCARDIAL DAMAGE AFTER ONCOLOGICAL TREATMENT IN CHILDHOOD

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Background: Pulsed-wave tissue Doppler echocardiography (PW-TDI) of mitral annular motion has been currently used in the assessment of left ventricular longitudinal function in the variety of myocardial diseases.

Objective: To evaluate the utility of PW-TDI for early detection of late myocardial damage in patients treated for malignancy in childhood.

Patients: 72 patients in long term remission of the malignancy at the average age of 15 ± 3 were examined. The average follow-up period of the patients after the treatment was 11 ± 3 yrs. The control group consisted of 70 healthy volunteers at the average age of 15 ± 2 yrs.

Methods: Left ventricular ejection fraction (LVEF) was assessed by Simpson's rule. Maximal systolic velocity (Smax) of the motion of lateral and medial aspect of mitral annulus (MA) was assessed by means of PW-TDI and the average Smean value was calculated.

Results: No significant difference in LVEF was observed between the groups. Smax of the septal aspect of MA was significantly lower than that of the lateral aspect of MA in both the groups. Both Smax and Smean values were significantly lower in the group of patients as compared with the control group. 50 (69%) patients received anthracyclines as a part of the therapy, while 22 (31%) patients did not. Both of the groups of patients significantly differed neither in LVEF nor Smax and Smean values. No correlation was observed between S values and cumulative dose of anthracyclines or follow-up period in the patients.

Conclusions: The results reported support the utility of left ventricle longitudinal function assessment using PW-TDI in early detection of late myocardial injury. Left ventricular longitudinal function is significantly diminished in the patients despite normal values of LVEF. Surprisingly, the results show that anthracycline therapy is unlikely to determine the late toxicity of chemotherapy.

OUR EXPERIENCES WITH CRT IN CHF PATIENTS (SINUS RHYTHM COMPARED TO ATRIAL FIBRILLATION)

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Aim: The aim of the study was to evaluate the state of the patients (patients.) with congestive heart failure (CHF) one year after receiving cardiac resynchronisation therapy (CRT). We compared patients. with sinus rhythm (SR) and atrial fibrillation (AF).

Study group and methods: We determined the quality of life (QOL), mortality, left ventricular ejection fraction (LVEF), mitral regurgitation (MiReg.), tricuspid regurgitation (TriReg.) in patients. before receiving CRT and in 12th month after receiving CRT at the Cardiology Clinic of The University Hospital Brno within the years 2003–2005. CRT devices received 74 patients. with CHF, the mean age was 67 ± 8 years, male patients 71.6%. The mean follow up of the patients was 23 ± 14 months. 9 patients (12.2%) were in AF, 65 patients were in SR, of whom permanently in SR retained 59 patients (79.7%) and AF developed in 6 patients (8.1%) after receiving CRT.

Results: One-year mortality of SR patients was 11.9% (7 patients), of AF patients was 11.1% (1 pt.) and patients with newly developed AF was 16.67% (1 pt.). The QOL in 12th month was significantly better in SR patients vs. AF patients ($p < 0.001$). There was a significant improvement of LVEF ($p < 0.02$), MiReg. ($p < 0.07$) in 12th month after receiving CRT, no significant differences were found in TriReg. No significant differences were found in both groups of AF patients in any of followed parameters in 12th month compared to the initial state.

Conclusions: The benefit from the CRT in CHF patients was confirmed by one-year follow up. No significant differences were found in one-year mortality between SR patients and permanent AF patients (p = NS) nor between SR patients and patients with newly developed AF (p = NS). We found significantly improved QOL, LVEF, MiReg. in SR patients in 12th month after receiving CRT. No significant differences in QOL nor echoparameters were found in AF patients in 12th month after receiving CRT.

4 YEARS EXPERIENCE WITH TRANSRADIAL CORONARY ANGIOPLASTY IN ST SEGMENT ELEVATION MYOCARDIAL INFARCTION

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Background: This study was performed to compare the outcome and complication rate between transradial (TR) and transfemoral (TF) PCI in STEMI.

Methods: The clinical and angiographic data of patients with STEMI treated by PCI between January 2001 and December 2005 were reviewed and evaluated. Access site cross over, rate of access site complications, major adverse cardiac events (MACE) at 1-month and consumption of angioplasty equipment were evaluated. Patients with rescue PCI and cardiogenic shock were excluded.

Results: From TR group 156 interventions were performed from right radial (93%) and 11 (6.5%) procedures from the left radial artery. The indication of left radial access was small radial artery in 7 patients (63%) and negative Allen test in 4 patients (36%). From the TF group 43 patients (7.3%) were excluded due to cardiogenic shock and rescue PCI. The TF interventions were performed in 357 (96%) patients from right femoral and in 15 (n = 15, 4%) patients from left femoral artery. In the TR group the cross over rate to femoral approach was 8 (n = 8, 5.1%). In TF group the procedure was accomplished via radial artery in 3 patients (n = 3, 0.8%) due to severe iliac artery tortuosity ($p < 0.05$). The procedure was angiographically successful in all patients in TR group (100%) and in 370 (99.4%) patients in TF group (ns.). Major access site complications occurred in 19 patients (5.1%) in the TF group and none in the TR group ($p < 0.05$). Minor entry site complications were detected in 35 patients in TF group (9.4%), and in 6 patients

in TR group (3.5%) ($p < 0.05$). The MACE rate was 7 in TR group (4.4%) and 41 (11%) in TF group ($p < 0.05$).

Conclusions: Our results suggest that TR approach is a safe and effective way for the treatment of STEMI. The lack of site related complication in the TR group is extremely important in the STEMI patient subset with high risk of bleeding risk.

TRANSRADIAL APPROACH FOR CAROTID ARTERY STENTING WITH CEREBRAL PROTECTION. TECHNICAL NOTES AND REPORT AFTER 20 CASES

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Purpose: Carotid artery stenting is emerging as an attractive alternative to surgical endarterectomy for the treatment of carotid artery disease. The purpose of this study is to report our initial experience using the radial artery as access for carotid stenting.

Materials and Methods: A retrospective study was performed in which twenty patients, high risk for carotid endarterectomy, underwent carotid stenting with cerebral protection via either radial artery under local anesthesia. All procedures were performed in the operating room from March 2006–December 2006. Seven lesions were symptomatic with carotid stenosis (> 70%) and 13 lesions were asymptomatic with stenosis (> 80%). Patients were evaluated for access site complications, procedural completion, patient mobilization, need for intravenous analgesia and development of neurologic complications (stroke or transient ischemic attacks /TIAs/).

Results: Procedural success was achieved in 18 patients (90%). The 30-day incidence of stroke and death was 0%. There was one puncture related complication: it was a radial artery occlusion in a patient with vasospasm. One patient had persistent local pain requiring intravenous medication for relief. All patients were mobilized within 2 hours of intervention and were discharged on the first post-operative day.

Conclusions: Carotid artery stenting with cerebral protection devices can be safely and effectively performed using radial access with acceptable morbidity and high technical success. Further study is needed prior to recommending that femoral access be replaced by radial access for carotid artery intervention.

CARDIAC MRI DERIVED LEFT VENTRICULAR MASS INDICES CORRELATE MODERATELY WITH ECG HYPERTROPHY SCORES IN PATIENTS WITH HYPERTROPHIC CARDIOMYOPATHY

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Background: Left ventricular hypertrophy (LVH) is a hallmark of hypertrophic cardiomyopathy (HCM), the magnitude of which has been shown to harbour prognostic significance. Measuring the real degree of LVH has become feasible with the use of cardiac magnetic resonance imaging (CMR).

Aims: We thought to correlate ECG hypertrophy scores and CMR derived LVH indices in patients with HCM.

Materials and methods: Thirty patients with HCM were studied (23 males, age: 43 ± 16 years, maximal left ventricular wall thickness: 28 ± 6 mm). Patients underwent CMR imaging according to standard methods. Left ventricular mass (LVM) was calculated from the images and were indexed to body height (LVMiH), body weight (LVMiW), body surface area (LVMiBSA) and body mass index (LVMiBMI). ECG hypertrophy scores (maximal R or S voltage, total voltage score, Sokolow-Lyon score, Cornell score, Romhilt--Estes score) and score products (score QRS duration) were calculated from quality 12-lead surface ECG recordings.

Results: Maximal R or S voltage scores were significantly related to all LVM indices and the best correlation was found between maximal R or S voltage score and LVMi--BMI ($r = 0.667$, $p < 0.001$). Cornell and Romhilt-Estes scores did not correlate significantly with LVM indices. Apart of LVMiH, the level of correlation increased with indexation and LVMiBMI showed the largest number of significant correlations. ECG score products did not show better correlation values than ECG scores alone.

Conclusion: Among traditionally used ECG scores of hypertrophy the maximal R or S voltage score shows the best, albeit moderate correlation with CMR derived indices of left ventricular hypertrophy in patients with HCM.

SUPINE BICYCLE STRESS ECHOCARDIOGRAPHY IN HYPERTROPHIC CARDIOMYOPATHY

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Hemodynamic changes during exercise may have important clinical and prognostic correlations in patients with hypertrophic cardiomyopathy. Supine exercise stress echocardiography was performed in 34 patients with hypertrophic cardiomyopathy (19 males, average age: 45 ± 12 years). During the test echocardiographic parameters, including left ventricular outflow tract gradient (LVOTG) was measured at three time points: at baseline, at peak exercise and at recovery phase. In twenty patients invasive haemodynamic examination has been also done.

No major complication occurred during the examinations. Exercise capacity of the patients was low (median: 90 W, 95% CI: 75–100 W). Resting LVOTG increased significantly during peak exercise (40 ± 38 vs. 74 ± 62 mmHg, $p < 0.0001$), and increased further during the recovery phase (72 ± 60 vs. 95 ± 73 mmHg, $p = 0.0004$). In patients with resting LVOTG < 30 mmHg only the LVOTG at peak exercise increased significantly (10 ± 9 vs. 29 ± 28 mmHg, $p = 0{,}0035$). In patients with resting LVOTG > 30 mmHg both the LVOTG at peak exercise (71 ± 32 vs. 119 ± 54 mmHg, $p = 0.0009$), and during recovery was increased significantly (111 ± 53 vs. 141 ± 56 mmHg, $p = 0.0014$). At peak exercise both pulmonary systolic peak pressure (35 ± 14 vs. 53 ± 31 mmHg, $p = 0.0420$), mitral insufficiency grade ($p = 0.0001$), and tricuspid insufficiency grade ($p = 0.0002$) was significantly increased. Measurements of the resting LVOTG by echocardiography or by invasive methods correlated well ($r = 0.6614$, $p = 0.0015$), and echocardiographic LVOTG measured during peak exercise or recovery phase correlated also well with post extrasystolic LVOTG measured during hemodynamic examination ($r = 0.6093$, $p = 0.0043$ ill, $r = 0.6631$, $p = 0.0097$). In conclusion, supine exercise stress echocardiography is a safe method and provides important hemodynamic information in patients with hypertrophic cardiomyopathy.

SHORT-TERM CONTROL OF BLOOD PRESSURE: COHERENCE BETWEEN BLOOD PRESSURE AND SYSTEMIC PERIPHERAL RESISTANCE FLUCTUATIONS AROUND 0.1 HZ*

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Background: Task Force Monitor enables the beat-to-beat blood pressure (BP) and total peripheral resistance (TPR) monitoring. Those data can be used for evaluation of the baroreceptors elicited TPR response if the coherence between BP and TPR fluctuations around 0.1 Hz is relatively high (> 0.5).

Aim: The measurement of coherence (COH) between systolic BP and TPR (COH SBP-TPR) fluctuations around 0.1 Hz was the aim of the present study.

Methods: Blood pressure, cardiac impedance and ECG were monitored during 5-minute metronome-controlled breathing (0.33 Hz) in 10 volunteers (age between 30 and 60 years). Spectral analysis was performed and baroreflex heart rate sensitivity (BRS, ms/mmHg) was calculated. In the range of frequencies 0.05–0.15 Hz the maximal COH between SBP and inter-beat interval (COH SBP-IBI), between SBP and cardiac output (COH SBP-CO) and between SBP and TPR (COH SBP-TPR) were determined (mean ± SD).

Results: The following values were obtained: BRS: 9.59 ± 7.14 ms/mmHg, COH SBP-IBI: 0.69 ± 0.18, (COH SBP-CO): 0.68 ± 0.17, COH SBP-SPR: 0.67 ± 0.24.

Conclusion: Results indicate that COH SBP-TPR is similar to COH SBP-IBI and COH SBP-CO and therefore the spectral method of calculation of baroreflex response of TPR can be elaborated. However, because of the difference between stroke volume and volume of blood flow from the aorta during the corresponding cardiac interval, the method will not be as simple as the spectral method for determination of BRS and further development will be necessary.

DOES THE EXTRACORPOREAL CIRCULATION CHANGE PERIPHERAL MICROCIRCULATION? LASER DOPPLER FLUXMETRY USED DURING ECC

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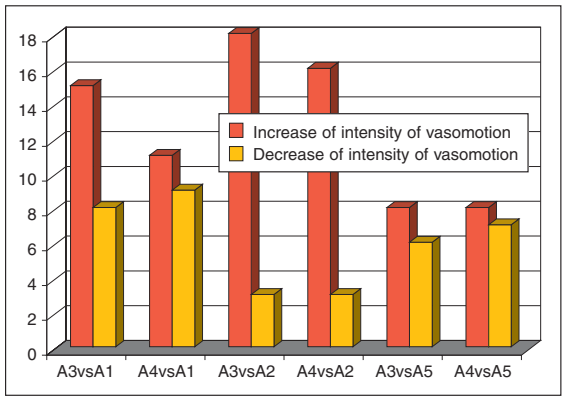
Aim: To assess peripheral microcirculation during the extracorporeal circulation.

Method: we included 10 patients (4 women) of the average age 68 years undergoing extracorporeal circulation during operations for ischemic heart disease (6 patients), aortic valve replacement (3 patients), or combination of both diagnoses (1 patient). We observed peripheral microcirculation on the skin of the right upper extremity (dorsal side of third finger) using frequency analysis of the Laser Doppler Fluxmetry (LDF). LDF records were analysed in 5 fractions: 1. fraction (A1) before anaesthesia (5 min), (A2) after intubation (5 min), (A3) during extracorporeal circulation (clamped aorta) (5 min), (A4) during extracorporeal circulation (declamped aorta) (4 min), (A5) after operation theatre (5 min) in 4 frequency domains 0.01–0.05, 0.06–0.10, 0.11–0.15, 0.16–0.20. We extracted source data directly from LDF records. Using this original procedure we analyzed 70 data instead of 10 data proposed by original software of the producer.

Results: In total of 40 areas (4 observed frequency domains, total 10 patients) significant increase of vasomotion was observed in 20 areas comparing the extracorporeal circulation with declamped aorta and fraction before anaesthesia (20/40). Significant increase of vasomotion was observed in 23 areas (23/40) comparing fraction of the extracorporeal circulation with clamped aorta and fraction before anaesthesia. Significant increase of vasomotion was observed in 20 areas comparing the extracorporeal circulation with clamped (20/40) or declamped (20/40) aorta and fraction after intubation.

Conclusion: During the extracorporeal circulation the intensity of spontaneous vascular movement stays high, even in certain areas increased.

Our special thanks are due to Professor Cerny, Center of Cardiovascular Surgery and Transplantation, Brno, Czech Republic.



N-TERMINAL PRO BRAIN NATRIURETIC PEPTIDE PREDICTS EXERCISE TOLERANCE IN HEART TRANSPLANT RECIPIENTS

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The diagnostic value of N-terminal pro-brain natriuretic peptide (NT-proBNP) after heart transplantation (HTx) is still incompletely understood. As certain graft factors (eg., diastolic dysfunction) may affect both, cardiac synthesis of BNP and functional performance) we hypothesized a relationship between exercise variables and NT-proBNP levels after HTx.

Patients and Methods: 105 asymptomatic HTx recipients (92 m, 13 f; aged 59 ± 10 yrs; donor age 33 ± 11 yrs; 88 ± 52 months after HTx; body mass index 27 ± kg/m^2; cyclosporin/sirolimus/tacrolimus 68/19/13%) were studied. From 2004 April to 2005 June, 120 graded symptom-limited bicycle exercise tests and NT-proBNP assays (by Roche Diagnostics) were performed.

Results: Mean exercise tolerance was 7 417 percent predicted normal (0–49%: n = 10; 50–69%: n = 37; 70–84%: n = 38; 85–115%: n = 35). Peak systolic blood pressure and heart rate were 184 ± 27 mmHg and 140 ± 19 bpm, respectively. Median resting NT-proBNP level was 282 pg/mL (25th–75th percentile 132–584; range 29–4143 pg/mL). Log-transformed NT-proBNP levels correlated inversely with exercise tolerance (r = -0.23; p = 0.011), peak systolic blood pressure (r = -0.38; p = 0.0001) and peak heart rate (r = -0.25; p = 0.004) and directly with time after HTx (r = +0.30; p = 0.001).

Conclusion: Our data – confirming earlier results of a time dependent rise in NT-proBNP levels late after HTx- demon-

strate that increased endocrine activity of the transplanted heart is associated with limited exercise tolerance, and hence, corresponding key exercise variables. By that a role of myocardial versus extracardiac factors in limiting fitness in HTx recipients is suggested.

PNEUMOCOCCAL ENDOCARDITIS-INFREQUENT CAUSE OF BACTERIAL ENDOCARDITIS IN ADULTS. CASE REPORT

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Streptococcus pneumoniae is an infrequent cause of bacterial endocarditis in adults. The classic presentation is Osler's tetrad of pneumonia, meningitis, endocarditis in an alcoholic. The course of pneumococcal endocarditis is typically aggressive and is associated with high morbidity and mortality rates. The mortality is reduced if is it managed with a combined medical-surgical approach as compared with pure medical approach. We present complicated case of pneumococcal endocarditis. We emphasize the very important role of TEE in the management of severe pneumococcal infection.

HOW DOES RENIN-ANGIOTENSIN SYSTEM BLOCKADE INFLUENCE THE PROGNOSIS OF PATIENS WITH ATRIAL FIBRILLATION?

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Backround: Recent observations indicate that ACE inhibitors and ARBs prevent the development of new-onset AF, improve the likelihood of successful DCC, and prevent recurrence of AF after DCC.

Objective: In our study, we tried to find the impact of RAS blockade on patient's mortality.

Method: Retrospective study of medical records of all patients with AF hospitalized at the Department of Internal Cardiology Medicine of Faculty hospital in Brno in 15 month period (10/2004–12/2005), all together 827 patients (451 men, 377 women) with average age of 70 years and any kind of AF. We divided them in two groups, the first one medicating ACEI/ARBs (n = 559), the latter without these drugs, n = 268. We compared the common risk factors and one-year mortality between these groups.

Results: Patients using ACEI/ARBs were older (average age 71.5 compared to 66.5 years, $p < 0.0001$), in higher NYHA class (average 2.0 to 1.6, $p < 0.0001$), more often suffered from chronic heart failure (32.2% vs 12.7%, $p < 0,0001$), coronary artery disease (61.5% vs 35%, $p < 0.0001$), diabetes (29.7% vs 17.5%, $p < 0.0002$), hypertension (83% vs 51%, $p < 0.0001$), more of them having stroke in anamnesis (20.6% vs 13%, $p < 0.01$), their average ejection fraction of left ventricle was lower (49.4 vs 56.2, $p < 0.0001$). We found no statistical difference in prevalence of diastolic dysfunction, in serum levels of creatinine, uric acid, cholesterol, triglycerides and haemoglobin. The one-year mortality of the first group was 10.7% (60 patients of 559), in the second group 16% (43 of 268), $p = 0.0304$.

Conclusion: The mortality of patients treated with ACEI/ARBs was significantly lower despite more risk factors and comorbitities than in the group of patients without RAS blockade.

EZETIMIB MONOTHERAPY IN PATIENTS WITH STATIN INTOLERANCE – FIRST CLINICAL EXPERIENCE

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Introduction: Ezetimib is a new drug used in dyslipidemic patients, mostly used in combination with statins. We observed successful ezetimib monotherapy in patients with side effects during statin treatment.

Patients and methods: In three patients, in which simvastatin or atorvastatin monotherapy was interrupted due to laboratory pathology (elevation of creatinine kinase – CK, ALT and AST) was ezetimib monotherapy started. In all of these patients, control laboratory tests showed lowering of cholesterol and triglyceride levels and also lowering of CK, ALT and AST. No new side effects during ezetimibe treatment occurred. Detailed data will be presented.

Conclusion: Ezetimib monotherapy in patients with statin side effects is well tolerated and regression in pathological laboratory tests was observed. No new side effects occurred.

CORD – COMPARISON OF RECOMMENDED DOSES*

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The CORD study is a multicentric, single blinded study testing the antihypertensive and metabolic efficacy of recommended doses of ramipril and losartan in hypertensive patients.

Patients treated > 3 moths with an ACE-I (treatment stopped 1 day before randomization) and with BP < 160/90 mmHg (group A) are switched to losartan 50 mg. Patients not treated with an ACE-I or AIIA and with BP > 140/90 mmHg (group B) are randomized on treatment with losartan 50 mg or ramipril 5 mg.

If blood pressure within one month does not decrease below 140/90 mmHg titration to100 mg losartan resp. 10 mg ramipril, the next step is adding of hydrochlorothiazide (month 3).

The inclusion of patients is "competitive", till the number of patients treated with losartan reaches 9193 (LIFE population).

BP, heart rate, metabolic parameters (lipids, insulin resistance), renal functions, blood count and left ventricle hypertrophy are measured. The duration of the study is 12 months; SCORE risk is calculated at each visit.

The primary aim (group A) is to confirm the safety of switching from ACE-I to losartan and to confirm that losartan and ramipril in recommended doses (group B) have similar antihypertensive and metabolic effect, but the treatment with losartan is accompanied with less adverse events.

The study was started in June 2006, 11 093 patients were included till the end of the year 2007. Mean age is 61.5 years, 5248 (47.7%) are male, 5739 (52.2%) are female, 16 (0.1%) sex not mentioned. The most frequent accompanying antihypertensive treatment are diuretics 44.6% and beta blockers 43.4%. 40.1% patients are treated with statins, ischemic heart disease is known in 30.9% and diabetes mellitus in 32.1% patients.

The study recruitment should be stopped in February 2007.

AHEAD – ACUTE HEART FAILURE DATABASE

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AHEAD (Acute HEArt Failure Database) is a registry of patients with AHF hospitalized at cardiologic departments with 24 hour cath lab emergency. The Czech Republic is a country which is completely covered by a cath lab emergency for direct angioplasty in acute MI, one cath lab is mostly for a region of 400 000 inhabitants and the transfer time (telephone – door) is usually < 60 minutes.

Four big hospitals (2 Prague, 2 Brno) serving for a region with about 2.000,000 inhabitants collect data of patients hospitalized with AHF. The registry is prospective, available on web site (https://trials.cba.muni.cz) and monitored by an independent institution of Masaryk University, Brno. The registry started in July 2006 and till 31. 12. 2006 data about 382 patients were collected. 59.3% had de novo AHF, 38.9% had acute decompensation of chronic HF (1.8% unknown), 42.1% had ischemic event, 68.1% were male. Female had more frequently de novo HF (72.4%) than male (52.9%). The mean age was 71.1 year, mean BMI was 27.9 kg/m^2. Female were older with higher BMI. History of hypertension was present in 58.5% and diabetes 37.7%. The mean heart rate was 86 beats per minute, mean blood pressure 135/79 mmHg. Female had significantly higher BP. The mean ejection fraction was 36.1%, female had statistically higher EF (42.1% vs 32.4%, $p < 0.001$).

Levosimendan was given 5.7% patients, 63.7% of them had chronic HF decompensation. 71.2% of the patients treated by levosimendan were younger than the mean of all patients and none of them had EF > 40%.

Summary: Patients treated at cardiologic departments for acute HF had more frequently ischemic etiology of de novo HF and higher number of young man is present, than within patients treated in general hospitals. The in hospital mortality will be known during the congress. Six general hospitals will join the registry at the beginning of the year 2007.

CIRCADIAN RHYTM OF HEART RATE TURBULENCE IN HEALTHY SUBJECTS*

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Objective: To detect the parameters of circadian rhythmicity of heart rate turbulence (HRT) in a group of patients without organic heart disease.

Methods: We selected the group healthy patients with 24hour Holter recordings. For each patient were calculated: the total HRT (included the parameters turbulence onset-TO and turbulence slope- TS), the number of VPBs (ventricular premature beats) and HRT after two and four hours.

Results: HRT was determine for 48 patients (23 men, 25 women), the average age was 48.4 years (± 15.3). The results after 2 hours: the quantity of VPBs and TO – with no significant different ($p = 0.917$, $p = 0.253$). There was found significant different in parameter TS ($p < 0.001$). The results after 4 hours: the different of TS ($p = 0.001$), the other parameters no significant (number of VPBs with $p = 0.609$, TO with $p = 0.133$).

Conclusions: The parameter TS shows significant variability during the day. At nighttime hours the values of TS are higher. The parameter TO manifests the certain variability (like the trend of TS), but it is not important variability. The demonstrability of daily variability of HRT is present in the evaluation after 2hours, but this demonstrability after 4 hours disappears and confirms the absence of an evident distinct trend. As optimal time for detection of HRT is the interval between 10 and 12 o'clock AM.

FISH OIL AND ATORVASTATIN DECREASE SUSCEPTIBILITY OF HYPERTRIGLYCEROLEMIC RAT HEARTS TO VENTRICULAR FIBRILLATION

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N-3 polyunsaturated fatty acids (PUFA) and lipid-lowering drugs were shown in human to possess an antiarrhythmic potential, therefore, aim of this work was to examine their effects on VF threshold, cardiomyocyte ultrastructure and expression of gap junction protein C 43 (ensuring electrical impulse propagation) in hypertriglycerolemic rats (HTG). HTG and control Wistar rats were feed with PUFA (40 mg/100 g of body weight) or atorvastatin (0.05 mg/100 g of body weight) for 2 month. Isolated perfused heart model was used to test VF threshold starting with 1sec burst of electrical rectangular pulses at 100 pulses/sec, 1ms in duration at 15 mA. When sustained VF was not induced after repetitive 5 stimuli, the stimulus intensity was increased in 5 mA steps. Ventricular tissues were taken for ultrastructure and C 43 analysis. Results showed that VF threshold of HTG rat hearts was lower than in normal Wistar rats (15 mA vs 25 mA). PUFA and atorvastatin treatment resulted in a significant increase of VF threshold to 40 mA and 45 mA in HTG rat hearts. Moreover, in three of eight PUFA fed HTG rats only transient VF could be induced using repetitive 45 mA test stimulus. Immuno-labelling and electron microscopy of HTG rat heart ventricles revealed changes in distribution of C 43-positive cell-to-cell gap junction, i.e. increased number of lateral gap junctions and internalisation of intercalated disc-related gap junctions. This pattern of distribution, known as highly arrhythmogenic, was not affected either by PUFA or Atorvastatin. However, structural integrity of the cardiomyocytes and gap junctions was better preserved upon treatment. It is concluded that PUFA and Atorvastatin exert significant anti-fibrillating effects in rats suffering of dyslipidemia despite arrhythmogenic gap junction C 43 remodelling was not eliminated.

INITIATION, SUSTAINING AND TERMINATION OF VENTRICULAR FIBRILLATION DEPEND ON INTRACELLULAR CALCIUM CONCENTRATION

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The aim of the study was 1. to monitor myocardial [Ca2+]i levels during the development and persistence of ventricular fibrillation (VF) as well as during its conversion to sinus rhythm. 2. to detect cell-to-cell gap junction coupling alterations prior occurrence and immediately after termination of VF when sinus rhythm appeared. 3. to analyse as whether susceptibility of the heart to VF is associated with the activity of main myocardial Ca2+ cycling system, i.e. SERCA2a. Results showed that elevation of diastolic [Ca2+]i reached 180% of baseline level prior occurrence of acute hypokalemia-induced VF and it was associated with an impairment of gap junction mediated cell-to-cell coupling. VF itself resulted in further [Ca2+]i increase that aggravated cell-to-cell coupling injury and synchronisation. In contrast, VF conversion to sinus rhythm was dependent on the restoration of basal [Ca2+]i levels (facilitated by antiarrhythmic drug stobadine) and it was linked with apparent abolishment of cell-to-cell coupling disorders. SERCA2a activity was significantly decreased in old guinea pig hearts that were susceptible to VF in comparison to young hearts that were rather resistant. The latter developed Ca2+ overload-induced cardiomyocyte injury including marked impairment of cell-to cell coupling only after long-term repetitive electrical stimulations different to old guinea pig hearts that developed these changes after a few electrical stimuli. Collectively these findings indicate that modulation of Ca2+ handling systems may be a critical in development, sustaining and termination of VF. It appears that prevention or abolishment of Ca2+ overload in diseased heart by enhancement of sarcoplasmic reticulum SERCA2a activity can protect against malignant arrhythmias.

ACUTE DISSECTING ANEURYSMA OF THE AORTA – TYPE B, CASE REPORT

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We present a case of a 70-year-old man, up to now without any known cardiovascular disease admitted to the cardiology clinic with anamnesis of sudden arisen chest pain propagated into the neck. Based on the anamnesis, physical examination with repeated normal ECG and negative markers of myocardial necrosis, a suspicion of the spontaneous dissection of the aorta was pronounced. CT angiography examination confirmed a diagnosis – dissecting aneurysm of the aorta – type B Stanford classification. Subsequently, at a cardiac surgery clinic, a chest stentgraft was implanted under total anaesthesia (way of a. femoralis). Nine months after implantation optimal effect of stentgraft persists and the patient is without any limitations in his current life.

Dissecting aneurysm of the aorta poses an urgent, life threatening condition associated with high mortality. A clinical manifestation simulates acute coronary syndrome, it may as well coincide under picture of ischemia of the extremity, or acute aortal regurgitation. In rare cases it may be manifested by hematemesis eventually hemopthysis when perforated the oesophagus, or trachea. Hypotension or shock indicates heart tamponade or bleeding into pleural cavity. Only urgent cardiac surgical intervention leads to decrease of mortality of acute dissection.

Casuistic, as presented by us, introduces an endovas-cular treatment of dissecting aneurysm of the aorta – type B Stanford classification, by vascular replacements – stentgrafts, which is an alternative method of surgical treatment for particular patients an the department of the multidiscipline team of specialists that delivers excellent results.

CONTRIBUTION TO DETERMINATION OF "OPTIMAL" ATRIOVENTRICULAR INTERVAL BY MEANS OF TRANSTHORACIC IMPEDANCE CARDIOGRAPHY IN PATIENTS WITH SICK SINUS SYNDROME TREATED BY DUAL-CHAMBER PACING

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Aim: 1. To determine by means of impedance cardiography (ICG) the "optimal" atrioventricular interval (AVI) in accordance with maximal (max) cardiac output (CO). 2. To review whether A00 pacing yields higher CO than D00 pacing does. 3. To review the influence of controlled breathing (CB) on CO.

Patients and methods: In 34 patients (pts), with sick sinus syndrome – SSS, CO was determined by ICG (Task Force Monitor CNSystems, Austria) in lying position during normal breathing (NB) and with CB of 20 breaths per minute. The PM programmed: DDD, 80 ppm (to achieve stable pacing frequency), AVI 75, 100, 120, 140, 160, 180, 250 and 300 ms (AVI programmed in random order). Equalizing phase 2 min, NB 2 min, CB 4 min. In the case of identical max CO in two adjacent AVIs the longer AVI was applied. Retest of one of AVIs was performed in 10 patients

Results: Max CO in individual AVI (DDD, 80 ppm, n = 34) – see the *Table*. Retests confirmed the reproducibility of measured values with a deviation of ± 0.1 $l.min^{-1}$, during both NB and CB.

Discussion: During experimental extension of the AVI in patients with SSS there is a change in atrial contribution to ventricular filling (increase – decrease) and a change in ventricular activation pattern as presented by the QRS shape. Both factors influence CO. Higher CO with A00 vs D00 pacing was not proved. It could be caused by long atrial stimulus-QRS interval (227 ± 51 ms, 120–300 ms). An unexpected result was the high number of patients with "optimal" short AVI. A proper definition of the "optimal" AVI remains a question.

Conclusion: The values of "optimal" AVI (as that causing max CO) show obvious interindividual variation (in agreement with other methods). Higher CO during A00 pacing in comparison with D00 pacing was not proved. Statistically, CO does not change significantly during CB when compared to NB.

AVI [MS]	75	100	120	140	160	180	250	300
Max CO (NB) in n pts	1	9	4	13	1	7	0	0
Max CO (CB) in n pts	1	10	5	9	3	5	1	1

EFFECT OF ACUTE CELLULAR REJECTION AFTER HEART TRANSPLANTATION

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Purpose: In patients after heart transplantation the role of moderate acute cellular rejection (Banff 2) without clinical and echocardiographic manifestation is not yet clear. We evaluated the course of the first two posttransplantation years in relation to rejection episodes.

Methods: This is a retroprospective study of one hundred thirty-nine heart transplant recipients who were operated between January 2000 and December 2004 and survived first 6 months. We analyzed the presence of acute rejection during first 6 months in relation to the course of the first

two postoperative years. We observed graft dysfunction, incidence of infections, malignancy, immunosuppressive therapy and mortality. According to the degree of cellular rejection, patients were divided into groups: 1 – without the presence of significant cellular rejection (No 67), 2 – with only one episode of acute cellular rejection Banff 2: 2a – who received acute antirejection treatment (No 19), 2b – who didn't receive acute antirejection treatment (No 8), 3 – with repetitive occurrence of rejection Banff ≥ 2 (No 45).

Results: We didn't observe statistically significant differences in monitored parameters among the three groups (see *Tables* 1, 2). The main change in immunosuppressive therapy was conversion from cyclosporin A (CsA) to tacro-limus (Tac) during the follow-up. The significantly higher Tac using was detected at the first and second years after transplantation (gr. 3 – 31.8%, gr. 2 – 16%, gr. 1 – 10.6%, 3 : 1 $p < 0.001$, 2 : 1 $p < 0.031$).

Conclusions: We didn't prove a significant impact of moderate cellular rejection on course of the first two years after heart transplantation. The high incidence of recurrent rejection is an indication for the conversion from CsA to Tac.

Table I
First year

	Group 1	Group 2	Group 3	*p*
Graft dysfunction	7.5%	11.1%	6.7%	NS
CMV infections	20.9%	18.5%	28.9%	NS
Mortality	0	0	2.2%	NS

Table II
Second year

	Group 1	Group 2	Group 3	*p*
Graft dysfunction	1.5%	8%	2.2%	NS
CMV infections	0	0	0	
Mortality	1.5%	4%	2.2%	NS

EVALUATION OF THE RIGHT VENTRICULAR FUNCTION BY STRAIN IN HYPERTROPHIC CARDIOMYOPATHY AFTER SEPTAL ABLATION

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Background: Strain has been proposed as a sensitive tool to detect early systolic function abnormalities in hypertrophic cardiomyopathy (HCM). We investigated the peak shortening strain (PkS) for evaluation of early systolic function abnormalities of the right ventricle (RV) in patients with obstructive HCM after alcohol septal ablation.

Methods: We prospectively enrolled consecutive patients with HCM after alcohol septal ablation with a mild residual outflow tract gradient (< 15 mmHg). PkS was assessed in apical free wall of RV derived from TDI and also in basal segments of lateral, inferior and anterior wall of the left ventricle. TDI of the lateral annulus, tricuspid annular plane systolic excursion and RV dimension were measured.

Results: Fourteen patients with HCM and 16 healthy controls were evaluated. Between both groups, there were no statistically significant differences in PkS from free wall of the RV, the diameter of RV, tricuspid annular plane systolic excursion and acceleration time of the pulmonary flow. In patients with HCM the lateral tricuspid annulus velocity (E' wave) was slower than in controls (10.6 ± 1.67 vs 12.6 ± 2.21; $p < 0.05$). We found statistically significant difference in longitudinal PkS in lateral (-11.62 ± 2.77 vs -16.63 ± 2.76; $p < 0.01$), inferior (-8.96 ± 2.31 vs -12.97 ± 3.21; $p < 0.01$) and anterior wall (-12.58 ± 4.32 vs -17.82 ± 3.86; $p < 0.01$) of the left ventricle.

Conclusion: Systolic function of RV measured by peak shortening strain is not worse in HCM after hemodynamically successful alcohol septal ablation than in healthy subjects compared to diastolic function of RV and systolic function of the left ventricle (measured by strain).

As the authors submitted their abstract after the deadline, it was included additionally at the end.

COMPARATIVE STUDY OF AUGMENTATION INDEX MEASURED BY AUTOMATIC AND SEMI-AUTOMATIC DEVICES

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Background: Recent studies emphasizing the significance of vessel wall estimation properties of large arteries not only for research purposes, but already in clinical practice. Newly launched OMRON device enable to measure the radial augmentation index (AIx) automatically. The aim of this study was to compare intra-individually this new device with long term-established semi-automatic Sphygmocor device in patients with manifest coronary heart disease.

Methods: One-hundred randomly selected patients with manifest coronary heart disease, a random sub-sample of Czech EuroAspire III study series. The measurements of radial augmentation index were done in virtually similar condition twice, using HEM9000AI (OMRON) device and Sphygmocor (ATCor Systems) device.

Results: (see *Table*) The OMRON device measured in average higher AIx, than Sphygmocor and this intra-individual difference is highly statistically significant. The median difference between both devices is 14 units, which corresponds to 17.4% of average intra-individual difference. Both estimates (i.e. AIx from OMRON and from Sphygmocor) significantly correlates, however, the correlation coefficients is for this kind of comparison rather low (about 0.44). Thus, the observed difference between both devices is probably not systematic.

Mean AIx by Sphygmocor (SD)	83.0 (17.3)
Mean AIx by OMRON (SD)	90.7 (13.1)
p for difference by paired *t* test	< 0.0005
Spearman's correlation coeff. (*p* value)	0.436 (< 0.0001)
Mean absolute percentual difference	17.4
Median absolute difference (95% conf. int.)	14.0 (13.6–17.8)
Median variability coeff. (95% conf. int.)	1.13 (1.08–1.18)

Conclusion: The OMRON and Sphygmocor devices estimates were in coronary patients not equivalent and the result from one device seems to be not transferable to the second.