LEFT VENTRICULAR PERFORMANCE IN PATIENTS WITH AORTIC STENOSIS AND LOW LEFT VENTRICULAR MASS

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Introduction: Left ventricular hypertrophy (LVH), absent in 10 – 35% of patients with aortic stenosis (AS), is traditionally considered a compensatory mechanism in response to chronic LV pressure overload. However, contrary to this classical paradigm, cardiovascular (CV) outcome appears better, not worse, in AS patients without LVH.

Aim: Our aim was to estimate LV performance in patients with AS and low LV mass (LVM) determined either by traditional mass criteria or in relation to LV afterload.

Methods: We retrospectively analyzed medical records of 123 hospitalized clinically stable subjects with moderate (n = 58) or severe (n = 65) isolated degenerative AS in sinus rhythm with EF>40%, free of relevant non-cardiac coexistent diseases. LVH was identified by means of the recognized cut-off criteria, i.e. LVM > 115 g/m2 in men and LVM>95 g/m2 in women. Inadequately low LVM (i-lowLVM) was defined as the lowest quintile of the ratio of a measured LVM to the LVM predicted from height, gender and LV stroke work by a previously validated formula. Addition, we computed circumferential end-systolic LV wall stress (cESS), an estimate of afterload, and LV fractional shortening at the midwall level (mwFS), considered a better index of LV function than EF in concentric LV geometry.

Results: Clinical characteristics, AS severity and LV diastolic diameter, a raw measure of preload, were similar in patients with (n = 83) and without LVH (n = 40), as well as those with (n = 25) and without i-lowLVM (n = 98). By multiple regression, independently of an inverse association between mwFS and cESS ($\beta = -0.43 \pm 0.08$, $p < 0.001$), AS patients without LVH had higher mwFS in comparison to subjects with LVH ($\beta = 0.21 \pm 0.08$, $p = 0.01$). This effect was even more pronounced in patients with i-lowLVM compared to their counterparts with adequate or excessive LVM ($\beta = 0.39 \pm 0.08$, $p < 0.001$).

Conclusion: Low LVM in AS is associated with enhanced load-independent LV systolic function, especially when LVM is disproportionately low to LV afterload. Thus, enhanced myocardial contractility might offset potential detrimental effects of afterload excess in patients with low LVM, thereby contributing to better CV outcome in AS patients without LVH.

EVALUATION OF INFECTOLOGICAL COMPLICATION OF PATIENTS USING CLEAN INTERMITTENT CATHETERISATION

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Introduction: Clean intermittent catheterization (CIC), where patients are emptying the bladder with single use hydrophilic surface catheters, has been the basis treatment of functional urinary retention for the last decades. Despite long experience with CIC technique there is still no agreement on the use of prophylaxis to prevent lower urinary tract infections.

Aim: The aim of the research is to map the bacteriological burden and hospitalization needs of CIC patients and to evaluate the effectiveness of prophylaxis.

Methods: A two arms study was performed in the CIC patient cohort of the Urological Department of Medical School Pécs with a total number of 28 patients. Antibiotic prophylaxis group was compared with the group without using prophylaxis. Patients in the prophylaxis group received in 6 weekly intervals a 5 days antibiotic therapy with either sulfamethoxazole-trimethoprim or cefuroxime, and diluted povidone iodine solution irrigation on weekly basis. As primary end points asymptomatic and symptomatic bacteriuria and urinary tract infection related hospitalisation were recorded.

Results: Of the 98 positive bacteriological findings, 64 asymptomatic bacteriuria and 34 symptomatic bacteriuria were reported. Both asymptomatic and symptomatic bacteriuria in a one-year interval were lower in the group with prophylaxis (0.347/year vs. 0.656/year and 0.293/year vs. 0.456/year respectively).

Conclusion: Regarding logistic regression analysis, the prophylaxis reduced the likelihood of both asymptomatic and symptomatic bacteriuria. The duration of CIC proved to be a significant protective factor against urinary tract infections, by longer duration lower yearly bacteriuria episodes were observed. The major criticism of our study are the small number of the patients and the non-randomised design. Further prospective, randomised studies are needed the validate our preliminary results.

ASSESSMENT OF HSP70 AND HSP90α EXPRESSION IN NASAL EPITHELIAL CELLS OF PATIENTS WITH CHRONIC RHINOSINUSITIS WITH NASAL POLYPS

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Introduction: Converging lines of evidence indicate that nasal epithelial cells (NECs) are of huge importance for maintenance of homeostasis in upper airways. They act as a barrier and release cytokines such as thymic stromal lymphopoietin (TSLP), IL-25, and IL-33. The epithelium-derived cytokines mentioned above are involved in differentiation of immune cells. Furthermore, it has been reported that NECs undergo epithelial-mesenchymal transition (EMT). EMT occurs when the cells lose their epithelial markers and acquire the mesenchymal ones in response to hypoxia and some pro-inflammatory cytokines. EMT cells gain the ability to migrate to the lamina propria and produce components of the extracellular matrix, contributing to wound healing and fibrosis development. NECs are damaged in chronic sinonasal inflammation called chronic rhinosinusitis, which can be classified into chronic rhinosinusitis with (CRSwNP) and without nasal polyps (CRSsNP). Heat shock proteins (HSPs) are known to promote cell survival under stress conditions. Little is known of their expression in NECs in CRSsNP.

Aim: The purpose of our study was to investigate HSP70 and HSP90α expression in NECs of patients with CRSsNP.

Methods: Samples of nasal mucosa were collected from 7 patients with CRSsNP and 7 control subjects with deviated nasal septum. They were stained immunohistochemically with antibodies to HSP70 and HSP90α (Thermo Fischer Scientific, UK) using 3,3'- diaminobenzidine staining for visualization.

Results: HSP70 and HSP90α expression was found to be weak or absent in some NECs in the control group. In patients with CRSsNP, qualitative evaluation of their expression showed a higher number of both HSP70- and HSP90α-positive NECs compared with controls. Moreover, the expression of both HSPs was stronger. We believe that HSP70 and HSP90α overexpression is an adaptation aimed at re-folding of oxidatively modified proteins accumulated due to oxidative stress.

Conclusion: Our findings suggest that CRSsNP is associated with HSP70 and HSP90α overexpression in NECs.

ARTERIAL STIFFENING AND PRIMARY MYOCARDIAL DYSFUNCTION INDEPENDENTLY CONTRIBUTE TO IMPAIRED LEFT VENTRICULAR MIDWALL PERFORMANCE IN DEGENERATIVE AORTIC STENOSIS WITH CONCOMITANT TYPE 2 DIABETES

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Introduction: Degenerative aortic stenosis (AS), a disease of the elderly, frequently coexists with concomitant diseases, including type 2 diabetes (DM), an adverse cardiovascular (CV) outcome predictor. DM affects LV structure and function via both hemodynamic and metabolic factors.

Aim: To compare clinical and hemodynamic characteristics of patients with AS according to DM status.

Methods: Medical records of patients with moderate or severe AS were retrospectively analyzed. We calculated left ventricular (LV) midwall fractional shortening (mwFS), an index of LV myocardial function, and circumferential end-systolic LV wall stress (cESS) and valvulo-arterial impedance (Zva), estimates of LV afterload. Additionally, systemic arterial compliance (SAC) was derived from stroke volume index and pulse pressure.

Results: Patients with DM (n = 42) and without DM (n = 80) did not differ in age, aortic valve area index, aortic pressure gradients, LV mass, LV diameter and ejection fraction. In comparison to non-diabetic subjects, DM patients had significantly higher body-mass index (p = 0.001), cESS (255 ± 119 vs. 208 ± 86 hPa, p = 0.01) and Zva (5.8 ± 2.2 vs. 5.1 ± 1.8 mmHg per mL/m2, p < 0.04), while SAC (0.5 ± 0.2 vs. 0.6 ± 0.2 mL/m2 per mmHg, p = 0.02) and mwFS (11.7 ± 4.0 vs. 14.1 ± 3.7 %, p = 0.001) were decreased. By multiple regression, higher cESS (p < 0.001) and DM (p = 0.03) were independent predictors of depressed mwFS.

Conclusion: DM can contribute to LV dysfunction by arterial stiffening that increases LV afterload in AS. Additionally, DM appears associated with a load-independent impairment of LV function at the midwall level, corresponding to slightly depressed myocardial contractility.

THE INSULIN PUMP THERAPY IN TYPE 1 DIABETES: THE IMPORTANCE OF GLUCOSE VARIABILITY

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Introduction: Continuous subcutaneous insulin infusion regimen (CSII) has proved the effectiveness over multiple daily insulin injections (MDII). Although HbA1c was brought to an optimal range by CSII, one of the main challenges of this method remains glucose variability.

Aim: The aim of this study was to investigate glucose control and glucose variability in patients switched from MDII to the CSII method.

Methods: We analyzed data from the existent electronic and file database of 65 patients treated at the Clinic for Endocrinology, Diabetes and Metabolic Diseases, the Clinical Center of Serbia. HbA1c levels, frequency of hypoglycemia on a weekly basis and daily glycemic profile - which determined the parameters of glucose variability (mean, standard deviation (SD) - the coefficient of variation (CV) and Mean Amplitude Glucose Excursion (MAGE) were analyzed. All results are expressed as the mean ± standard error. The significance of the difference of HbA1c, weekly hypoglycemia, mean, SD and CV was tested by Student's t-test for repeated samples. The significance of difference of MAGE was tested in a specific software made for this study. The correlation between variables was tested by Spirman's bivariate correlation test.

Results: HbA1c value was lower after insulin pump therapy than before one (p < 0,01). Glycemic values from daily profiles, mean, SD, CV and MAGE of all glycemic profiles were lower after insulin pump therapy than before it (p < 0,05). The correlation between HbA1c was observed six months after the insulin pump therapy and SD and CV three months after insulin pump regimen (p < 0,01). There was no significant correlation between HbA1c and MAGE values, neither after three, nor after six months of the insulin pump regimen (p > 0,05).

Conclusion: Therapeutic regimen employing CSII regulates the level of HbA1, reduces the values of all glucose variability parameters and reduces frequency of hypoglycemia compared to MDII, thus indirectly improving life quality.

LDL APHERESIS IN TREATMENT OF FAMILIAL HYPERCHOLESTEROLEMIA (FH): EFFECT ON CRP, FIBRINOGEN AND LP(A)

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Introduction: Familial hypercholesterolemia (FH) is an inherited disease characterized by significantly increased levels of low density lipoprotein (LDL) cholesterol (Ch) and premature occurrence and progression of atherosclerosis. In FH patients, when target LDL-Ch level cannot be achieved by maximally tolerated statin dose, the use of LDL apheresis (LA), an extracorporeal method which selectively binds and eliminates LDL-Ch, is indicated.

Aim: The aim of this research is to examine the effects of LA on inflammatory markers (CRP, fibrinogen, Lp(a)), as other important risk factors in the progression of atherosclerosis.

Methods: 10 FH patients (mean age of 47.2 ± 5.3 years) with established cardiovascular disease, treated with LA (DALI method) twice per month, were included in this research. In each