



Artery Research

ISSN (Online): 1876-4401

ISSN (Print): 1872-9312

Journal Home Page: <https://www.atlantis-press.com/journals/artres>

P.039: THE NUMBER OF CD34+ CELLS IN PATIENTS WITH STABLE ANGINA PECTORIS: INFLUENCE OF ABNORMAL GLUCOSE METABOLISM AND CORONARY ANGIOPLASTY

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To cite this article: M. Ruda, O. Vyborov, T. Arefieva, Yu. Karpov, Ye. Parfyonova (2007) P.039: THE NUMBER OF CD34+ CELLS IN PATIENTS WITH STABLE ANGINA PECTORIS: INFLUENCE OF ABNORMAL GLUCOSE METABOLISM AND CORONARY ANGIOPLASTY, Artery Research 1:2, 61–62, DOI: <https://doi.org/10.1016/j.artres.2007.07.096>

To link to this article: <https://doi.org/10.1016/j.artres.2007.07.096>

Published online: 21 December 2019

DM-1 does not appear to be COX2 mediated or acutely affected by hyperglycemia. Endothelial-independent vascular smooth muscle response in women may be sensitive to COX2 inhibition and warrants further investigation.

P.035
BIOLOGICAL VARIABILITY OF THE ULTRASONOGRAPHIC ASSESSMENT OF ENDOTHELIAL DYSFUNCTION IN CHILDREN WITH HIGH RISK OF MANIFESTATION OF ATHEROSCLEROSIS^{☆,☆☆}

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Background: Subclinical atherosclerosis should be detected before clinical symptoms of vascular complications occur. Varying reproducibility of currently used ultrasonographic methods makes diagnosis of endothelial dysfunction (ED) in children difficult.

Aim of the study: To assess flow mediated dilation (FMD) and deceleration index (DI), based on postocclusion changes in arterial bed in children with familiar hypercholesterolemia (FH) and diabetes mellitus of type 1 (DM1). Evaluation of the intraindividual variability of FMD and DI should than validate a predictive importance of these methods.

Methods: FH group, n=32, age 14,7(±2.9) years, DM1 group, n=30, mean age 14.6 (±1.68) and group of healthy children, n=30, mean age 15.1(±1.74) years were enrolled. The measurements were performed twice during the same day period one month apart from each other to assess intraindividual variability of FMD and DI with respect to possible diurnal and ovarian cycles.

Results: No significant differences in FMD and DI were found between the FH, DM 1 and control groups, the corresponding mean FMDs were 7.31, 7.30 and 6.34% respectively, while DIs 19.78, 16.51 and 21.49 %, respectively. Variability coefficients [median (interquartile range)] were in FMD and DI 1.77 (55-179) and 1.02 (0.68-1.53) respectively.

Conclusion: Statistically nonsignificant difference of FMD and DI between study groups could be partly explained by therapeutic interventions and short duration of DM1. Nevertheless, FMD and DI showed very high intraindividual variability, which decrease markedly its reliability to quantify the degree of endothelial dysfunction in children.

☆ Supported by IGA, the Czech Ministry of Health (Nr. 8455-3).

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P.036
ASYMMETRIC DIMETHYLARGININE AND OXIDIZED LDL – SENSITIVE BIOCHEMICAL MARKERS OF ENDOTHELIAL DYSFUNCTION IN CHILDREN WITH FAMILIAR HYPERCHOLESTEROLEMIA^{*}

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Background: Endothelial dysfunction (ED) as a sign of preclinical atherosclerosis should be detected early in children with familiar hypercholesterolemia (FH). Varying sensitivity of many biochemical and ultrasonographic markers makes diagnosis of ED difficult.

Aim of the Study: To assess specific biochemical markers of ED and correlate them with flow mediated dilation (FMD) and deceleration index (DI) in children with FH.

Methods: FH group, n=32, age 14,7 (±2.9) years and group of healthy children, n=30, age 15.1 (±1.7) years were enrolled. The high selective CRP (hsCRP), oxidized LDL (oxLDL), malondialdehyde (MDA), asymmetric dimethylarginine (ADMA), FMD and DI were assessed.

Results: ADMA levels in the FH group was higher than in healthy controls - 0.94 umol/l (±0.18) versus 0.77umol/l (± 0.14), p< 0.001. Levels of oxLDL were significantly higher in the FH group - 73,7 mU/l (±24,9) versus 55,7 mU/l (±30,5), p< 0.01. FMD and DI did not show significant differences between the FH and control groups. No correlations between ADMA, oxLDL, hsCRP and ultrasonographic markers were found.

Conclusion: ADMA and oxLDL appear to be more sensitive markers in detection of ED in children with FH than FMD and DI. The absence of correlation between biochemical and ultrasound markers could be explained by high biological variability of FMD and DI. The combination of ADMA, oxLDL and advanced imaging methods could improve the prediction of cardiovascular risk in children with FH.

☆ Supported by IGA, the Czech Ministry of Health (Nr. 8455-3).

P.037
PRESSURE WAVEFORM ESTIMATION IN THE COMMON CAROTID ARTERY – DIFFERENT METHODS IN COMPARISON

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Non-invasive blood pressure waveform estimation in the common carotid artery (CCA) would yield an indirect estimation of its mechanical properties. Assuming both diastolic (P_d) and mean arterial pressure (MAP) to be constant over the arterial tree and considering arteries as rotationally symmetrical, CCA pressure waveform ($P_{CCA}(t)$) can be estimated by rescaling the diameter waveform in the CCA ($D_{CCA}(t)$) on the radial artery (RaA) blood pressure waveform ($P_{RaA}(t)$), using either a linear or an exponential estimation method.

11 normotensive volunteers were included. For each subject, 3 repeated measurements over three days with a weekly interval were performed in the RaA and the CCA simultaneously. $P_{RaA}(t)$ was measured using applanation tonometry, whereas $D_{CCA}(t)$ was measured with ultrasound.

Linear Estimation: $D_{CCA}(t)$ was linearly rescaled over $P_{RaA}(t)$ by equalizing diastolic and mean values of both waveforms: $P_{CCA}(t) = \delta \cdot D_{CCA}(t) + P_d$. **Exponential Estimation:** the CCA cross sectional area waveform, $A(t)$, was exponentially rescaled over $P_{RaA}(t)$ according to: $P_{CCA}(t) = P_d \cdot \exp(\alpha \cdot (A_{CA(t)/Ad,CCA} - 1))$, iteratively adjusting α (stiffness index) to equalize RaA and CCA mean pressures.

The difference between systolic pressure values estimated by means of the two methods in the CCA is on average 2.6 ± 1.1 mmHg, approximately pressure-independent. The mean difference between the systolic pressure in the RaA and the CCA, using the exponential method, is 17.6 ± 6.3 mmHg. The difference between the radial MAP computed as integral mean and the one estimated with $[1/3 \cdot P_s + 2/3 \cdot P_d]$ is -0.3 ± 3.4 mmHg. Estimation quality is not depending on the MAP value.

P.038
INTERRELATION BETWEEN DYNAMICS OF CHANGES ENDOTHELIUM-DEPENDENT DILATATION AND LOCAL RIGIDITY OF THE BRACHIAL ARTERY IN PATIENTS WITH HYPERLIPIDEMIA ON A BACKGROUND OF RECEPTION STATINS WITHIN 6 MONTHS

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Aim: To estimate and contrast the marks of a flow-mediated dilatation (FMD) and distensibility coefficient (DC) of the brachial artery in patients with primary hyperlipidemia on a background of statins within 6 months.

Materials and Methods: 25 patients, age 58 (51;64) years, with drug-controllable hypertension and not received lipid-lowering therapies at least 4 weeks prior to the beginning of research. Patients accepted the statins (6 months) in doses which were defined by titration before achievement of target levels of low density lipoprotein.

Results: FMD of the right brachial artery has been increased significantly after 3 and 6 months of therapy. DC and Blood pressure level changes were not significant within 6 months. Positive dynamics of FMD has been noted in 16 patients (64%), among them in 8 person (50%) negative dynamics DC is noted. The correlation analysis has revealed statistically significant negative interrelation between dynamics FMD and DC ($r = -0,47$; $p = 0,043$). Significant correlation between marks of FMD and DC it has not been revealed.

Conclusion: Improvement endothelial functions can be accompanied by increase local rigidity the main arteries of muscular type in the early period of therapy of statins in consequence of decrease basal tone and carry of loading on stiffness layers of an arterial wall, which demands the further researches.

P.039
THE NUMBER OF CD34+ CELLS IN PATIENTS WITH STABLE ANGINA PECTORIS: INFLUENCE OF ABNORMAL GLUCOSE METABOLISM AND CORONARY ANGIOPLASTY

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Background: Circulating progenitor cells (CPCs) play an important role in endothelial repair. We evaluated numbers of CD34+ cells in patients with

stable angina pectoris (AP) and influence of abnormal glucose metabolism (AGM) and percutaneous transluminal coronary angioplasty (PTCA) on this parameter.

Methods: Blood samples were taken from 54 persons (mean age 54.3 ± 1.0 years): 36 patients with AP (16 with AGM, 20 without) and 18 controls. CD34+ cells were measured by flow-cytometric analysis. Besides, CPCs numbers were estimated in patients without AGM undergoing coronary angioplasty on the 1st day and the 3rd-5th day after the procedure.

Results: All patients with AP had reduced numbers of CPCs by 29% in comparison to control subjects ($p=0.01$). The group of patients with AGM displayed a tendency to greater decrease in CPCs' count than group without ($p=ns$). On the 1st day after PTCA we observed significant reduction of CPCs number in comparison to this parameter before the procedure ($p=0.03$). On the 3rd-5th day after coronary intervention the number of CPCs increased (insignificantly) as compared to the 1st day after PTCA but did not reach the level observed before the procedure. No significant difference was found between CPCs numbers on the 1st day after PTCA and this parameter in patients with AP and concomitant AGM ($p=ns$).

Conclusions: AP was associated with CPCs reduction, especially in patients with concomitant AGM. Coronary intervention also led to significant decrease in CPCs' count. The influence of AGM and PTCA on CPCs level was similar. These findings suggest a possible use of CPCs as a new diagnostic marker and therapeutic target for AP treatment.

P.040

ASSOCIATION OF ARTERIAL STIFFNESS, CAROTID INTIMA-MEDIA THICKNESS, CAROTID PLAQUES AND FLOW-MEDIATED DILATATION WITH METABOLIC SYNDROME

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Purpose: The purpose was to investigate whether the metabolic syndrome was associated with measures of arterial stiffness, flow mediated dilatation (FMD), carotid intima-media thickness (IMT) and carotid plaques (CP) in middle-aged subjects without and with MetS.

Methods: 186 asymptomatic volunteers (40-65 years old, 86 males) without clinically overt cardiovascular disease were examined. MetS was defined according to the International Diabetes Federation consensus. The prevalence of MetS was 32.8%. Augmentation index (Alx) and carotid-radial pulse wave velocity (PWV) as measures of arterial stiffness were assessed by applanation tonometry. FMD as the measure of endothelial function was determined using high resolution B-mode ultrasonography. IMT and CP were assessed by high resolution B-mode ultrasonography.

Results: PWV was significantly elevated in the MetS group (9.20 ± 1.08 vs. 23.30 ± 1.02 , $P = 0.003$). FMD was significantly lower in the MetS group (5.32 vs. 6.45% , $P = 0.018$). There was no statistically significant difference in Alx between patients with and without MetS (23.97 ± 8.08 vs. 23.30 ± 9.75 , $P = 0.248$). The presence of MetS was significant ($P = 0.005$) when predicting values of PWV but not FMD. IMT was higher in the MetS group (0.08 [$0.07-0.1$] vs 0.07 [$0.06-0.08$] $P < 0.001$). The MetS was a significant predictor of the presence of carotid plaques (OR = 0.341, 95% CI [$0.173-0.673$], $P = 0.002$).

Conclusions: Metabolic syndrome is associated with increased arterial stiffness, decreased flow mediated dilatation, increased carotid intima-media thickening and with the presence of carotid plaques.

P.041

ARTERIAL STIFFNESS MAY BE DETERMINED BY ASYMMETRIC DIMETHYLARGININE (ADMA)

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Background: Arterial stiffness is an independent determinant of cardiovascular outcome. However, the factors regulating arterial stiffness remain unclear. Endothelial nitric oxide may partly regulate arterial stiffness. We hypothesized that asymmetric dimethylarginine (ADMA) an endogenous inhibitor of nitric oxide synthase would correlate with arterial stiffness.

Methods: The Caerphilly Prospective Study (CaPS) is a longitudinal cohort study of a representative sample of 2512 men aged 49 to 59 years in Wales. In a subset of 850 men (mean age 73 years) we assessed arterial stiffness (aortic pulse wave velocity, PWV) and wave reflections (augmentation index, Alx). ADMA measurements were made on a subsample of 250 men from the top and bottom of the age-adjusted PWV distribution by ELISA (DL Diagnostika).

Results: The mean and median PWV was 11.8 and 11.6 m/s (SD 3.8 m/s), mean Alx 30.6% (SD 7.5%) and mean and median ADMA was 1.2 $\mu\text{mol/l}$ and 0.89 $\mu\text{mol/l}$ (IQR 0.69, 1.78 $\mu\text{mol/l}$). There was a positive dose-response association between PWV and ADMA values after adjustment for GFR, heart rate, mean arterial pressure and age. The geometric mean PWV values were 10.9 m/s, 11.4 m/s and 11.8 m/s per tertile of ADMA (p -value for trend = 0.04). There was no association between ADMA and Alx (p -value for trend = 0.91).

Conclusion: This study shows that ADMA levels are greater amongst subjects with an elevated PWV. As this study is cross-sectional, we cannot be sure whether inhibition of nitric oxide synthase leads to arterial stiffening or vice versa. Future prospective studies are required.

P.042

NOT ONLY DIABETES MELLITUS, BUT ALSO IMPAIRED GLUCOSE TOLERANCE IS ASSOCIATED WITH ERECTILE DYSFUNCTION IN HYPERTENSIVE PATIENTS

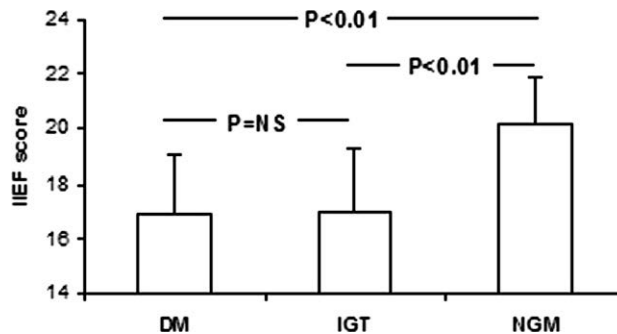
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Introduction: Erectile dysfunction may be an early sign of atherosclerosis. The incidence of erectile dysfunction is increased in patients with cardiovascular risk factors, such as hypertension and diabetes mellitus. However, the effect of glucose metabolism on the incidence of erectile dysfunction in hypertensive subjects has not been defined.

Methods: We studied 255 consecutive male subjects (age 52 ± 11 years) with never-treated uncomplicated hypertension. The study population was divided into three groups according to glucose metabolism: i) type-II diabetes mellitus (DM) 13 patients, age 58 ± 13 years, ii) impaired glucose tolerance (IGT) 51 patients, age 55 ± 10 years, and iii) normal glucose metabolism (NGM) 191 patients, age 50 ± 11 years. Erectile dysfunction diagnosis and score were evaluated according to the International Index of Erectile Function (IIEF) questionnaire.

Results: Patients with DM had decreased IIEF score compared to NGM patients (16.9 ± 6.6 vs. 20.2 ± 5.1 , $p < 0.01$). Patients with IGT had also decreased IIEF score compared to NGM patients (17.0 ± 6.9 vs. 20.2 ± 5.1 , $p < 0.01$). When patients with DM were compared to patients with IGT no difference was observed in IIEF score.

Conclusions: Not only diabetes mellitus, but also impaired glucose tolerance is associated with erectile dysfunction, i.e. an early sign of atherosclerosis, in hypertensives.



P.043

INFLUENCE OF CATECHOLAMINES ON ARTERIAL STIFFNESS IN PHEOCHROMOCYTOMA

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Objective: To evaluate the effect of long-term catecholamine overproduction in subjects with pheochromocytoma on arterial stiffness measured