

PP.6.248 EVALUATION OF ENDOTHELIAL PROGENITOR CELLS IN PATIENTS WITH HYPERTENSION

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Objective: To investigate endothelial progenitor cells (EPC) number in patients with hypertension and its relationship with blood pressure parameters.

Design and Method: Twenty-seven patients with hypertension (aged 46.5 ± 13.7) and 13 normotensives (aged 48.2 ± 12.9) were included into the study. Mean systolic and diastolic blood pressure (SBP and DBP) were determined through ambulatory monitoring. Peripheral blood (PB) mononuclear cells were separated by ficoll gradient centrifugation and cultured in five-day colony forming unit-endothelial cells (CFU-EC) assay to develop EPC. Lipids parameters were assessed.

Results: EPC number in healthy control significantly exceeded those observed in hypertensives (p = 0.001). Strong inverse correlation between SBP and EPC (p < 0.0001) was noticed. Additionally, significant correlations between triglyceride concentration, high density lipoproteins concentration and EPC number in hypertensives were established. In multivariate regression analysis, in both studied groups together, SBP was an independent predictor of EPC. **Conclusions:** Hypertension is associated with decreased number of EPC. Systolic blood pressure has a independent significant impact on the EPC.

PP.6.249 PULSE-WAVE ANALYSIS AND ENDOTHELIAL FUNCTION IN HIGH RISK PATIENTS WITH ARTERIAL HYPERTENSION: RESPONSE ON DIFFERENT TREATMENT REGIMENS

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The Aim: was to evaluate changes in pulse-wave shape and endothelial function (EF) in patients with essential arterial hypertension (AH) treated with calcium-channel blockers- (CCB) or ACEi-based regimens.

Methods: Sixty one patients with high risk (SCORE > 5 %, mean age 59 ± 10 years) AH and preserved left ventricular ejection fraction were consequently enrolled in the study and than randomized to CCB-based regimen (primary, felodipine, 10 mg o.d.) or ACEi-based therapy (ramipril 10 mg, o.d. or enalapril 20 – 40 mg o.d.). Also, in most of patients, indapamide or hydrochlorothiazide was added to achieve blood pressure (BP) goals. Using novel finger photoplethysmographic device AngioScan-01 and traditional ultrasonographic method, EF (in reactive hyperemia test) and pulse-wave characteristics were measured both before and after 5 weeks of treatment. Stiffness index (SI), reflection index (RI), augmentation index (AIx), systolic BP in aorta (SPa), digital pulse amplitude augmentation (by photoplethysmography), and flow-mediated dilation (FMD, by ultrasound) were accessed.

Results: In most of patients before the treatment normal SI, and elevated RI, AIx, SPa (Table 1), and significantly impaired EF (Table 2) were shown. BP goals (< 130 and 90 mmHg) were achieved in all patients validating further analysis. Decrease in SI (p < .05), RI and SPa were revealed in both treatment arms, whereas trends towards AIx decrease (Table 1) and EF improvement (Table 2) were demonstrated only in ACEi-treated patients.

Table 1. Pulse-wave analysis before therapy and after 5 weeks of treatment.

Pulse-wave parameters	Mean, before treatment	Mean changes on therapy		p
		ACEi group	CCB group	
SI, m/s	5.63±1.99	-0.98	-0.97	0.002
RI, %	36.59±15.43	-8.11	-7.39	0.350
AIx, %	40.73±14.85	-2.06	-0.09	0.086
SPa, mmHg	146.13±21.57	-20.68	-26.94	0.469

Table 2. Endothelial function evaluation in ACEi and CCB-treated groups using ultrasound and photoplethysmographic methods.

	ACEi group			CCB group		
	before	after	p	before	after	p
Flow-mediated dilation (ultrasound), %	5.53±2.45	6.68±2.88	0.104	6.13±2.21	6.15±2.26	0.487
Digital pulse amplitude augmentation (photoplethysmography), folds	1.56±0.49	1.75±0.69	0.159	1.69±0.21	1.77±0.89	0.348

Also, substantial correlation (r = 0.4, p < 0.05) between finger photoplethysmographic and traditional ultrasonographic EF assessment was found.

Conclusions: Pulse-wave analysis in patients with high risk AH demonstrated pattern of increased vascular stiffness and peripheral vasoconstriction, accompanying by impaired EF. Both ACEi and CCB treatment resulted in central BP and SI decrease, whereas only ACEi use was associated with trends in EF and AIx improvement in short-term follow-up. Fair accuracy of photoplethysmographically assessed digital pulse amplitude augmentation (compared with ultrasonographically measured FMD) allow to use this more simple and convenient method in clinical practice.

PP.6.250 CAN WE USE THE RATIO BETWEEN CIRCULATING MICROPARTICLES AND ENDOTHELIAL PROGENITOR CELLS LIKE A MARKER OF THE ENDOTHELIAL DYSFUNCTION IN HYPERTENSIVE-HYPERCHOLESTEROLEMIC PATIENTS?

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Objective: The aim of our study is a) to test whether a correlation exist between circulating microparticles (CM), endothelial progenitor cells (EPC), pro BNP like a markers of endothelial dysfunction in hypertensive-hypercholesterolemic (HH) patients and b) to test if irbesartan, an angiotensin AT1 receptors blocker is able to correct it.

Method: We enrolled in a group 1) a number of 22 HH non-diabetic patients without initial treatment not for hypertension or for dyslipidemia and, in a group 2) a number of 22 aged and sex matched health controls. None of the patients presented target organ damage at the enrolment time. Diagnosis of arterial hypertension and hypercholesterolemia was made in accordance with ESC recommendations for ambulatory blood pressure measurement (ABPM) and with NCEP 7. For each patient and control we tested: lipid profile, glycaemia, urea, creatinine, proBNP, homocysteinemia, MP, EPC and perform echocardiography ABPM and intima-media index measurement. A reassessment was done after 2 month of treatment with irbesartan in a dose targeted to control blood pressure (150 mg or 300 mg). We didn't use statine in our patients.

Results: The results showed that, compared to control group, the HH patients present a significantly higher ratio MP/EPC (p < 0,001) and a higher plasmatic proBNP level (p < 0,001) without difference in homocysteinemia level. After 2 month of irbesartan treatment the ratio MP/EPC and pro BNP level decrease reaching a minor statistical significant difference (p < 0,5).

Conclusion: We appreciate that ratio between MP and EPC represents a marker of endothelial dysfunction in hypertensive-hypercholesterolemic patients and treatment with irbesartan could restore homeostasis of the arterial wall. Our study is still in progress in order to raise its significance by increasing the number of patients and the period of treatment with irbesartan.

PP.6.251 GENETIC VARIATION IN THE DDAH-1 GENE IN RELATION TO ADMA LEVELS AND ENDOTHELIAL FUNCTION

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Background: Asymmetric dimethylarginine (ADMA), an endogenous methylated amino acid, has been identified as a competitive inhibitor of nitric oxide synthase (NOS). Elevated ADMA levels have been demonstrated in cardiovascular disorders and many studies have reported an inverse correlation between ADMA and endothelial function. The majority of ADMA is metabolized by dimethylarginine dimethylaminohydrolases (DDAH-1 and DDAH-2). Our aim was to study the genetic variation in the DDAH-1 gene in relation to ADMA levels and endothelial function.

Methods: A total of 959 individuals, aged 70, from the community based Prospective Study of the Vasculature in Uppsala Seniors (PIVUS) study were included. Plasma concentrations of ADMA were measured by high performance liquid chromatography. Endothelial function was evaluated with both the invasive forearm technique (measuring endothelial dependent vasodilation in resistance arteries) and with brachial artery ultrasound (measuring flow mediated dilation in a conduit artery). Forty common single nucleotide polymorphisms (SNPs) in the DDAH-1 gene were analyzed.