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P1.11: CAROTID STIFFNESS AND BAROREFLEX SENSITIVITY: THE EPP3 STUDY

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P1.09

RESULTS OF THE TWO METHODS OF AORTIC STIFFNESS ESTIMATION IN YOUNG AND MIDDLE AGED PATIENTS WITH CORONARY ARTERY DISEASE

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Aim: The assessment of aortic stiffness in young and middle aged men with coronary artery disease (CAD).

Materials and methods: This study was carried out in 49 CAD patients aged 43.5 ± 4.8 years with coronary artery stenosis diagnosed by angiography and 29 healthy volunteers (the control group) aged 43.1 ± 5.9 years. The patients with arterial hypertension, diabetes mellitus, and hypercholesterolemia were not included in this study. The determination of aortic pulse wave velocity (PWV) was carried out by aorta ultrasound duplex scanning and by "Arteriograph" (TensioMed, Hungary).

Results: Aortic PWV in the control group was $4.4-7.8$ (average 5.8 ± 0.9 m/s), median 5.6 m/s, the upper quartile 6.5 m/s, which was used as the upper normal level. Aortic PWV in CAD patients was $4.6-10$ (average 6.8 ± 1.3 m/s, $p < 0.001$), median - 6.9 m/s. Aortic PWV was higher than 6.5 m/s in 53% CAD patients and in 24% from control group ($p = 0.02$). PWV in CAD patients with 1,2 and 3 coronary artery damage was respectively 6.0 ± 1.1 , 6.7 ± 1.1 и 7.7 ± 1.2 m/s. According to the measurement by "Arteriograph" PWV in CAD patients was on average 8.8 ± 2.4 m/s, and 8.1 ± 2.2 m/s ($p = 2.21$) in control group. Increased PWV was detected in 33% CAD patients and in 21% in the control group ($p = 0.43$). The significant PWV differences in CAD patients with the 1,2 and 3 coronary artery damage were not exposed.

Conclusion: aortic PWV assessment by ultrasound duplex scanning but not by "Arteriograph" indicated the relation of arterial stiffness with the existence and severity of CAD in young and middle aged men.

P1.10

COMPARATIVE STUDY OF PULSE WAVE VELOCITY BY TWO DIFFERENT DEVICES

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Background: According to the 2007 European Society of Hypertension guidelines, measurement of arterial stiffness (AS) is recommended in patients with arterial hypertension (HT). The carotid-femoral pulse wave velocity (PWV) appears to be the "gold standard" for evaluation on vascular changes in these patients. Pulse wave velocity (PWV) has been incorporated to other devices used for assessment of Augmentation index (AI). The aim of this study was to assess the concordance of PWV measured using Complior and Sphygmocor devices.

Material and methods: PWV was measured on a single visit, using both devices in a group of 67 patients, 38 females (57%), 54 (80%) were hypertensives under treatment; mean age 59.9 ± 10.48 , BMI 28.7 ± 4.2 Kg/m²; SBP 134 ± 16.6 mmHg.; DBP 79 ± 12 mmHg.; SBPa 124.3 ± 16.6 mmHg.; DBPa 81.2 ± 11.7 mmHg.

Results: PWV measured using Complior (11.2 ± 2.2 m/s) was significantly higher than that obtained using Sphygmocor (9.5 ± 2.4 m/s). The correlations of the PWV assessed with the Complior with the values obtained using Sphygmocor was $r = 0.73$. The correlation coefficient was higher for women ($r = 0.80$) as compared to men ($r = 0.59$). The Bland-Altman plot indicated that the discrepancies between the two methods depend on the VOP values. The higher the value, the higher the discrepancies.

Conclusions: If the gold standard to measure the PWV is the Complior device, assessment of PWV using other devices needs to be carefully evaluated.

P1.11

CAROTID STIFFNESS AND BAROREFLEX SENSITIVITY: THE EPP3 STUDY

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Arterial baroreflex sensitivity (BS) is dependent on distension rate of baroreceptors, itself dependent on arterial stiffness. Differences in BS between younger and older subjects, and normotensive and hypertensive

patients may be explained by differences in arterial stiffness. The objective was to demonstrate that increased carotid stiffness is a determinant of reduced baroreflex sensitivity.

Methods: 312 subjects were randomly selected from the EPP3 study (10000), a general population based cohort. We obtained intima-media thickness, internal-diameter and distensibility of the common carotid artery thanks to the Artlab[®] echotracking device. Cross spectral analysis between distension rate and RR interval on 5 min recordings was used for BS, estimated through the gain in the low frequency range (LF).

	Sympathetic activation (LF distension rate)	Baroreflex sensitivity (LF gain)
IMT	$R^2 = 0.01$, $p < 0.05$	$R^2 = 0.02$, $p < 0.05$
Dint	$R^2 = 0.01$, $p = 0.06$	$R^2 = 0.04$, $p < 0.001$
Distensibility	$R^2 = 0.08$, $p < 0.001$	$R^2 = 0.04$, $p < 0.05$
ACEi / ARB	$R^2 = 0.04$, $p < 0.001$	$R^2 = 0.02$, $p < 0.05$

Thicker, stiffer and larger carotid, an internal diameter were associated with older age, hypertensive status and increased markers of sympathetic tone and decrease BS, independently of age and blood pressure. Utilization of converting enzyme inhibitors (ACEi) or angiotensin receptor blockers (ARB) decreased sympathetic activation and increased baroreflex sensitivity. All these associations persist in multivariate analysis, independent of age and blood pressure.

Conclusion: baroreflex sensitivity estimated by the cross spectral analysis between the distension rate and the RR interval is correlated with carotid stiffness, thickening and dilatation of the common carotid artery. Antihypertensive drugs have differential effects on BS, ACEi or ARB sensitizing it.

P1.12

PROGNOSTIC ROLE OF REVERSIBLE ARTERIAL STIFFNESS IN MEN WITH CORONARY ARTERY DISEASE

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Background: Men with CAD have been shown to have abnormal arterial stiffness. Arterial function may change over time, according to treatment; the prognostic value of these changes has not been investigated.

Objectives: The aim of the present study was to assess whether an improvement of larger artery rigidity in response to treatment, could predict a more favorable prognosis in a population of men with CAD.

Methods: A total of 157 consecutive men with CAD (mean age 56.9 ± 10.8), using conventional therapy (IACE-63%, β -blocker-88%, statins-96%, calcium channel blockers-25%, nitrates -21%) underwent brachial-ankle pulse wave velocity (baPWV) measurement at baseline and after six months. During the 3.5-year follow-up period 38 patients experienced MACE (acute myocardial infarction, coronary intervention, or cardiac death).

Results: After six months follow-up, baPWV had not improved (Δ baPWV $\geq 0\%$ relative to baseline) in 85 (54.1%) of 157 men (group 1), whereas it had significantly improved (Δ baPWV $< 0\%$) in the remaining 76 men (45.9%) (group 2). During follow-up, we noticed 24 events (8.08 per 100 person-years) in group 1 and 6 events (2.25 per 100 person-years) in group 2 ($p < 0.001$). Cox analyses demonstrated that independent of age at base line and BP changes, absence of baPWV decrease was predictor of MACE. The negative predictive value of Δ baPWV was 28.2% and the positive predictive value was 92.1%. The sensitivity of Δ baPWV was 80%, and its specificity was 54%.

Conclusions: This study demonstrates that an improvement in arterial stiffness may be obtained after six months of ordinary therapy and clearly identifies patients who have a more favorable prognosis.