



## Artery Research

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### **P.099: PREDICTIVE VALUE OF AORTIC PULSE WAVE VELOCITY IN ASYMPTOMATIC PATIENTS FOR CAROTID ATHEROSCLEROSIS**

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decrease arginase II protein expression as compared to both low and oscillatory flow conditions. Immunohistochemistry analysis confirmed a pronounced expression of arginase II on SMCs and macrophages on the atherosclerotic plaques formed by oscillatory and low shear stress *in vivo*. **Conclusions:** The present study demonstrates that arginase expression is modulated by shear stress patterns in carotid arteries perfused *ex vivo*. Similar findings are also observed in a model of shear stress-induced atherogenesis *in vivo*. Histopathological analysis of carotid lesions in ApoE<sup>-/-</sup> mice exposed to shear stress and chronically treated with arginase inhibitors may further elucidate the role of arginases in modulating both plaque size and vulnerability.

#### P.097

##### ADRENALECTOMY IS MORE EFFECTIVE THAN SPIRONOLACTONE IN REDUCING ARTERIAL STIFFNESS IN PRIMARY ALDOSTERONISM\*

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**Objective:** The study was aimed at assessment of the effects of specific treatment of primary aldosteronism (PA) on the arterial stiffness.

**Design and Methods:** 28 patients with confirmed PA (14 with aldosterone-producing adenoma treated by unilateral laparoscopic adrenalectomy, 14 with idiopathic hyperaldosteronism (treated with spironolactone) were investigated by Sphygmocor applanation tonometer using measurement of pulse wave velocity (PWV) and augmentation index (AI) at the time of the diagnosis and then again 1 year after the specific treatment.

**Results:** The mean 24h-BP levels decreased from 149 ± 18/92 ± 11 mmHg to 128 ± 15/81 ± 10 mmHg (p<0,01) after adrenalectomy (p<0,01), and from 155 ± 16/94 ± 12 to 140 ± 18/88 ± 8 mmHg (p<0,05; n.s.) on spironolactone. The PWV significantly decreased after surgery from 9,3 ± 3 na 7,6 ± 2,1 m/s (p=0,002), also the AI decreased significantly from 25 ± 9 na 17 ± 8% p=0,006. However, no significant improvement of the arterial stiffness indices was found in the patients treated with spironolactone (PWV before 9,3 ± 1,6, after 8,9 ± 1,3 m/s, n.s.; AI 24 ± 9...25 ± 8%, n.s.). After correction for differences in 24-h BP fall stays the AI fall more significant (p<0,01) in the surgically treated than spironolactone treated patients.

**Conclusions:** The causal surgical treatment of PA is significantly more effective in improving arterial stiffness than conservative treatment with spironolactone, also after correction for 24-h BP difference. This could indicate a possibility, that the aldosterone receptor blockade by spironolactone doesn't fully prevent arterial wall damage mediated by aldosterone, and that nongenomic aldosterone effects could possibly play a role in pathophysiology of arterial wall damage.

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#### P.098

##### INCREASED ARTERIAL STIFFNESS AND ARTERIAL WAVE REFLECTIONS ARE ASSOCIATED WITH IMPAIRED FUNCTIONAL STATUS IN PATIENTS WITH NORMAL EJECTION FRACTION

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**Introduction:** In asymptomatic men, arterial stiffness and wave reflections have been linked with cardiorespiratory fitness. We previously reported a relationship between arterial properties and objective measures of systolic and diastolic function in patients with preserved ejection fraction (EF). In this study, we investigated the association between symptomatic status and arterial elastic properties in the same patient group.

**Methods:** In 336 patients undergoing coronary angiography, we assessed pulse wave velocity (PWV) invasively, and arterial wave reflections (Augmentation Index - Aix) non-invasively using radial applanation tonometry and a validated transfer function (SphygmoCor system). Functional status, mainly exertional dyspnea, was judged by one single investigator.

**Results:** Patients suffering from exertional dyspnea more often were women, and they had higher blood levels of brain natriuretic peptides and higher left ventricular enddiastolic pressures, as

compared to asymptomatic controls. Brachial as well as aortic blood pressures did not differ significantly between the groups. In symptomatic patients, we observed increased PWV (9.4 +/- 2.3 m/sec vs 8.7 +/- 2.6 m/sec in asymptomatic patients, p=0.01), and increased Aix (31.1 +/- 9.7 vs 28.0 +/- 10.8 in asymptomatic patients, p=0.008). In a logistic regression model, female gender, use of nitrates, and higher PWV were independently associated with functional impairment, whereas higher Aix and higher body mass index were of borderline significance.

**Conclusion:** Exertional dyspnea is associated with increased arterial stiffness and increased/premature arterial wave reflections in patients with normal EF.

#### P.099

##### PREDICTIVE VALUE OF AORTIC PULSE WAVE VELOCITY IN ASYMPTOMATIC PATIENTS FOR CAROTID ATHEROSCLEROSIS

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**Background:** It's widely accepted that carotid ultrasonography can help to identify asymptomatic patients at risk of heart attack and stroke as it's capable of providing direct evidence for the presence and extent of atherosclerosis. Due to limited accessibility of carotid scan the measurement of arterial stiffness is seemed to be suitable functional screening test to select patients who need morphological imaging of arterial tree (eg. carotid scan, multislice-CT or coronarography). However the predictive value of aortic pulse wave velocity for detecting carotid atherosclerosis has been poorly studied.

**Method and patients:** Authors examined 122 consecutive asymptomatic patients (mean age was 60 ± 9,8 years, 78 female, 44 male) in which arterial stiffness parameters (augmentation index: Aix and aortic pulse wave velocity: PWVao) were measured by an oscillometric device (TensioMed arteriograph). Carotid ultrasonography was performed in all individuals by a blinded investigator (who was unaware of the measured stiffness values). **Results:** Mean blood pressure and heart rate was 137/83 mmHg and 72/min. The average Aix was -2,61% and PWV was 10,43 m/s. Carotid atherosclerosis (presence of local plaque in carotid arteries) was confirmed in 72 patients (C+ group) while the arterial wall was intact in 50 patients (C- group). If the upper limit of normal of PWV was drawn at 9,7 m/s, elevated PWVao was measured in 91 of 122 pts (74,5%). Sensitivity of PWVao was 89% (64 pts had high PWV in C+ group), while specificity was 46% (23 pts had low PWV in C- group). Positive predictive value of PWV was 67% (61 pts of 91 with high PWV value were C+) while negative predictive value was 75% (22 pts of 29 with normal PWV was C-).

**Conclusions:** Elevated aortic pulse wave velocity was strongly associated with the presence of carotid plaques. Measuring arterial stiffness with arteriograph seems to be suitable as a screening method of preclinical atherosclerosis according to its high negative and positive predictive values. Screening of all asymptomatic men over 45 and women over 55 (or at younger age) would be reasonable approach to identify atherosclerosis in early and probably reversible phase if these correlations were confirmed in further large prospective study.

#### P.100

##### INVASIVE VALIDATIONS OF A USER INDEPENDENT OSCILLOMETRIC DEVICE (ARTERIOGRAPH) FOR MEASURING AUGMENTATION INDEX AND AORTIC PULSE WAVE VELOCITY

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**Objective:** To validate invasively a new apparatus (Arteriograph), which can measure augmentation index (Aix) and aortic pulse wave velocity (PWVao) simultaneously, within 2-3 minutes. According to the available literature data not any non-invasive device for measuring PWVao was validated with invasive method.

**Design and Method:** Our comparative study was performed on 36 patients who underwent routine coronarography for diagnostic purposes. In 10 cases we measured the brachial Aix with intrabrachial catheter and with Arteriograph, furthermore in 13 cases the intraaortic Aix was compared with brachial Aix on identical pulses. In 25 cases the invasively and non-invasively measured PWVao was compared. In 11 cases we used 2