P11.06: FIBRONECTIN, BUT NOT LAMININ CONTENT IS INCREASED IN THE TUNICA MEDIA OF SUBCUTANEOUS SMALL RESISTANCE ARTERIES OF PATIENTS WITH ESSENTIAL HYPERTENSION


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with Scheltens’ visual rating scale. Arterial wall parameters were measured by echo-tracking and applanation tonometry. RLS was assessed by contrast transcranial Doppler sonography with agitated saline. In order to explore the relationship between presence and load of DWMLs and possible risk factors logistic and linear regressions were applied.

**Results:** 29 (25.4%) migraineurs had DWMLs. They were significantly older (p = 0.001), had more cardiovascular risk factors, thicker carotid intima-media (p = 0.006), higher CS (p = 0.004) and AxI (0.001) compared to migraineurs without DWMLs. The prevalence of large RLS was higher in patients with DWMLs, but not significant. The predictors of DWMLs were age (OR 1.11, 95%CI: 1.00-1.21), hypertension (OR 6.57, p = 0.001). Higher DWMLs load was predicted by age, obesity, hypertension, and decreased HDL cholesterol. We established no relationship between presence and load of DWMLs and arterial wall parameters or RLS.

**Conclusions:** Age and traditional cardiovascular risk factors, but not arterial wall parameters, are predictors of DWMLs in patients with migraine.

**P11.04 VASCULAR STIFFNESS IS INCREASED IN ANTIPHOSPHOLIPID SYNDROME: SIGNIFICANCE AND CLINICAL ASSOCIATIONS**

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Vascular stiffness is an independent risk factor of cardiovascular events in the general population. While it is established that vascular stiffness is increased in patients with systemic lupus (SLE), studies investigating vascular stiffness in patients with antiphospholipid antibodies yielded conflicting results. In order to determine whether arterial stiffness was increased in patients with antiphospholipid antibodies we studied 53 patients with antiphospholipid antibodies and 109 controls matched for age and sex.

Patients were 46.0 (IQR: 23.3-60.2). 40 female and 13 male. Twenty-six had primary antiphospholipid syndrome, 16 antiphospholipid syndrome associated with SLE. Clinical manifestations included arterial thromboembolic events (n = 14), venous thromboembolism (n = 28), obstetrical manifestations of APS (n = 9) and 11 patients were asymptomatic. Pulse wave velocity (PWV) was used to investigate arterial stiffness and was determined by applanation tonometry. PWV was increased in patients: 8.14 ± 0.40 m/s and 7.24 ± 0.20 m/s in controls (p = 0.036). PWV was correlated with age (r = 0.75; p = 0.0001) and systolic blood pressure (r = 0.62; p = 0.0001). PWV was significantly increased in patients with arterial thrombosis than in controls (9.54 ± 1.20 m/s and 7.23 ± 0.20 m/s, respectively) or patients without arterial thrombosis (7.63 ± 0.40 m/s; p = 0.0416). PWV was not significantly different among various antiphospholipid profiles. In summary patients with antiphospholipid syndrome have increased arterial stiffness, in particular patients with arterial thrombotic events. Arterial stiffness is significantly correlated with age and blood pressure but does not differ according to different antiphospholipid antibodies profiles.

**Design and Methods:** We have investigated 6 normotensive control subjects and 10 essential hypertensive patients. All subjects were slightly older, but of similar height and BMI to controls. Peripheral and centrally derived SBP and radial augmentation index were lower and CIMT higher in essential hypertensive patients. Arterial stiffness is significantly correlated with age and blood pressure. In essential hypertensive patients, PWV was significantly increased in patients with arterial thrombosis than in controls (9.54 ± 1.20 m/s and 7.23 ± 0.20 m/s, respectively). PWV was not significantly different among various antiphospholipid profiles.
Results: As expected, clinic blood pressure values and media to lumen ratio were higher in essential hypertensive patients than in normotensive controls. Fibronectin media content was significantly greater in essential hypertensive patients (7.41±2.28 %), compared with normotensive controls (5.62±1.040, P<0.05). A significant correlation was observed between fibronectin media content and media to lumen ratio (r=0.49, p<0.05). No significant difference in laminin media content was observed between groups (7.1±1.71 % in essential hypertensive patients, 5.63±1.79 % in normotensive controls).

Conclusions: Our results indicate that, in small resistance arteries of patients with essential hypertension, fibronectin, but not laminin media content is increased. Fibronectin might be therefore involved in the development of small resistance artery remodeling in humans.

P11.07
DIFFERENCE BETWEEN SYSTOLIC AND DIASTOLIC CAROTID ARTERY STIFFNESS IS INDEPENDENTLY ASSOCIATED WITH LEFT VENTRICULAR MASS INDEX IN HEALTHY MIDDLE-AGED SUBJECTS
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Background: Arterial stiffening potentially plays a role in cardiac hypertrophy. We recently demonstrated in patients that arterial stiffness can be substantially pressure dependent and, here, introduce a non-invasive measure to quantify the pressure dependence in the carotid artery, defined as the difference between systolic and diastolic pulse wave velocity (PWVdiff). Both PWVdiff and peripheral wave reflections (quantified by augmentation index, Alx) are biomechanically related to (late) systolic pressure increase. Therefore, we investigated the associations of PWVdiff and Alx with left ventricular mass index (LVMI).

Methods and Results: In 1522 subjects of the Asklepios cohort (age 35-55 yrs, healthy) PWVdiff was calculated from segmental distensibility coefficients, as obtained by carotid artery ultrasound and tonometry (Figure). PWVdiff ranged from 0.7 to 4.4 m/s. Linear regression analysis showed a significant association of PWVdiff and Alx with left ventricular mass index (LVMI).

Conclusions: Carotid PWVdiff is independently associated with left ventricular mass index in presumed healthy middle-aged subjects. Non-invasive carotid artery ultrasound and tonometry enable assessment of the contribution of pressure-dependent stiffness to LV pressure load, independently of wave reflections.

P11.08
EVALUATION OF ARTERIAL STIFFNESS IN CHRONIC KIDNEY DISEASE (CKD) STAGE 2-5 BY PULSE WAVE MEASUREMENTS AND AMBULATORY ARTERIAL STIFFNESS INDEX (AASI)
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Purpose: To study arterial stiffness in CKD by AASI compared to Augmentation Index (Alx) and aortic pulse wave velocity (aPWV). To study the intra-patient reproducibility of AASI in CKD.

Methods: Patients were studied 2 days within 2 weeks. Double applanation tonometry recordings of the radial pressure wave form and aPWV and 24-h ambulatory blood pressure measurements were done. AASI was calculated as 1 minus the regression slope of diastolic over systolic blood pressure. CKD stage was determined by estimated glomerular filtration rate. Spearman’s correlation coefficient (SCC) was used for evaluating correlations. Day-to-day reproducibility was evaluated by the intra-class correlation coefficient (ICC).

Results: 68 patients (M50:F18), median age 63 years (range 30-79), with CKD stage 2 (n=17), stage 3 (n=22), stage 4 (n=20) and stage 5 (n=9) were studied. Mean±SD AASI was 0.44±0.15, mean Alx was 28.2±10.4% and mean aPWV was 9.4±3.1m/s with no significant differences among the stages. The SCC between AASI and Alx was 0.320 (P=0.01), between AASI and aPWV it was 0.643 (P<0.0001) and between AIx and aPWV it was 0.346 (P=0.006). ICCAASI was 0.755 (95% CI: 0.630-0.841) with even greater reproducibility in CKD stages 4-5 (ICC=0.860).

Conclusions: The observed values of AASI in CKD patients were similar to those reported for the background population, while AIx and aPWV were higher. Despite good correlations between these parameters, the normal values of AASI found in the present study preclude its use as an index of vascular stiffness in CKD. Intra-patient reproducibility of AASI in CKD stage 2-5 was high.

P11.09
SYSTEMIC ARTERIAL PROPERTIES IN WOMEN 3 YEARS AFTER A PRE-ECLAMPTIC PREGNANCY
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Purpose: Pre-eclampsia is defined by hypertension and proteinuria, occurs in 3-10% of all pregnancies. The pathophysiological adaptation of systemic arterial properties has not been described. We performed a comprehensive study of systemic arterial properties in women with previous pre-eclamptic pregnancy (PPEP) as compared to women with previous normal pregnancy (PNP).

Methods: 35 women (37±4 years) with PPEP (3.5±1.0 years) and 65 (33±4 years) with PNP (6 months postpartum), were studied. Aortic root pressure and flow were obtained by calibrated right subclavian artery pulse trace, and aortic annular Doppler blood flow recordings. Systemic arterial properties were described by total arterial compliance (C), arterial elastance (Ea), characteristic impedance (Z0), and peripheral arterial resistance (R). Wave reflection was assessed as the ratio of the magnitude of the backward (Pb) to forward (Pf) pressure wave. Parameters were estimated by Fourier analysis of central aortic pressure and flow data and methods based on the 2-element windkessel model.

Results: (Table) Women with PPEP had significantly higher blood pressure than PNP. R was not significantly different between the groups, but Z0 and Ea were significantly higher, and C trended lower in the PPEP group. There was significantly higher amplitude in both forward and backward.

Conclusions: The higher blood pressures in women with PEP is not explained by higher peripheral arterial resistance, but is likely related to a stiffer proximal aorta, and lower arterial compliance. This may relate to the higher risk for later cardiovascular events observed in women with PEP.

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<tr>
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<th>PPEP</th>
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<tbody>
<tr>
<td>Mean arterial pressure (mmHg)</td>
<td>102±17</td>
<td>86±18</td>
<td>&lt;0.001</td>
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<tr>
<td>Systolic pressure (mmHg)</td>
<td>129±21</td>
<td>110±9</td>
<td>0.002</td>
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<td>Heart rate (min⁻¹)</td>
<td>70±7</td>
<td>66±7</td>
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<td>Cardiac output (l/min⁻¹)</td>
<td>5.5±1.2</td>
<td>4.9±0.9</td>
<td>0.020</td>
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<tr>
<td>R (mmHg·ml⁻¹·s⁻¹)</td>
<td>1.16±0.31</td>
<td>1.10±0.29</td>
<td>0.295</td>
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<tr>
<td>Z0 (10⁻³·mmHg·ml⁻¹·s⁻¹)</td>
<td>72±30</td>
<td>55±22</td>
<td>0.004</td>
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