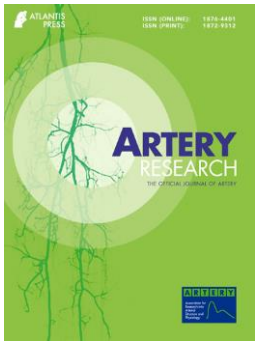

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P11.08: EVALUATION OF ARTERIAL STIFFNESS IN CHRONIC KIDNEY DISEASE (CKD) STAGE 2-5 BY PULSE WAVE MEASUREMENTS AND AMBULATORY ARTERIAL STIFFNESS INDEX (AASI)

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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±0.40, $P<0.05$). 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 (3.7±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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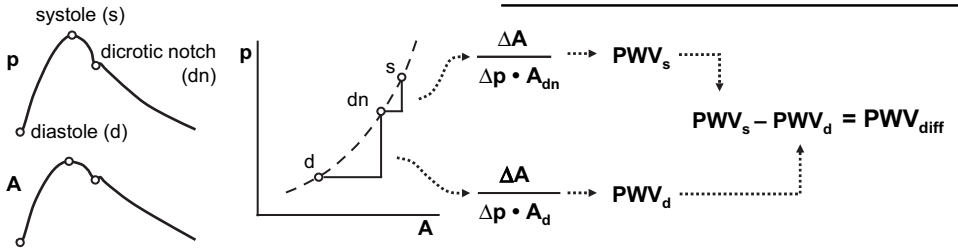
Background: Arterial stiffening potentially plays a role in cardiac hypertrophy. We recently demonstrated in patients that arterial stiffness can be substantially pressure dependent and, here, introduce a non-invasive measure to quantify the pressure dependence in the carotid artery, defined as the difference between systolic and diastolic pulse wave velocity (PWV_{diff}). Both PWV_{diff} and peripheral wave reflections (quantified by augmentation index, AIx) are biomechanically related to (late) systolic pressure increase. Therefore, we investigated the associations of PWV_{diff} and AIx with left ventricular mass index (LVMI).
Methods and Results: In 1522 subjects of the Asklepios cohort (age 35-55 yrs, healthy) PWV_{diff} was calculated from segmental distensibility coefficients, as obtained by carotid artery ultrasound and tonometry (Figure). PWV_{diff} ranged from 0.7 to 4.4 m/s. Linear regression analysis showed a significant association of PWV_{diff} with LVMI (β of 1.26 g/m$^{2.7}$ per m/s, 95% CI: 0.91-1.62), which remained significant after adjusting for covariates ($p=0.03$). AIx showed no consistent association with LVMI.
Conclusions: Carotid PWV_{diff} 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 (AIx) 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 AIx was 28.2%±10.4% and mean aPWV was 9.4m/s±1.0m/s with no significant differences among the stages. The SCC between AASI and AIx 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 ($P=0.006$). ICC_{AASI} 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 pathohysiological 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±1 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 Z_0 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.

	PPEP	PNP	P
Mean arterial pressure (mmHg)	102±17	86±8	<0.001
Systolic pressure (mmHg)	129±21	110±9	0.002
Heart rate (min^{-1})	70±7	66±7	0.011
Cardiac output (l min^{-1})	5.5±1.2	4.9±0.9	0.020
R (mmHg ml^{-1} s^{-1})	1.16± 0.31	1.10±0.29	0.295
Z_0 (10^3–mmHg ml^{-1} s^{-1})	72±30	55±22	0.004