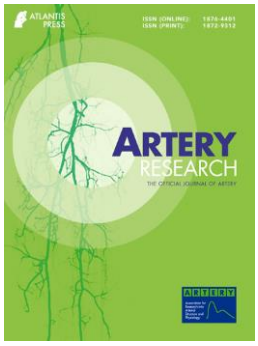

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P1.17: ARTERIAL STIFFNESS IS RELATED TO LEFT VENTRICULAR DIASTOLIC DYSFUNCTION IN DILATED CARDIOMYOPATHY

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generalized arterial disease proposing a score that incorporates intima-media thickness (IMT) from the carotid and femoral arteries.
Methods: 56 consecutive non diabetic patients (mean age: 58±12 yrs) affected by non-psychogenic and non-hormonal ED were evaluated for penile vascular disease severity by penile Doppler ultrasound. The mean systolic velocity (PSV) shows the greatest flow velocity detectable in an artery throughout the systole. Ultrasonographic assessments of IMT, lumen diameter and plaques in the carotid and femoral arteries were evaluated and a score was developed.
Results: Patients with high score (n=26) compared with subjects with low score were older (59 vs 54 yrs, P=0.06), had decreased mean PSV (25.3 vs 33.1 cm/s, figure) and longer duration of ED (3.8 vs 2 yrs, P<0.05), whereas these two groups did not differ regarding systolic pressure, metabolic profile and smoking status. Analysis of covariance revealed that PSV values of penile arteries were significantly different between the two groups after adjustment for confounders (P<0.05). Moreover, in the entire population, mean PSV exhibited a negative correlation with femoral (r=-0.34, P<0.05) and carotid IMT (r=-0.29, P<0.05).
Conclusions: Ultrasound findings of penile vasculature and duration of ED correlate significantly with increasing severity of carotid and femoral artery wall thickness and atherosclerotic lesions. These data suggest a close interrelationship between progression of vasculogenic ED and early atherosclerosis.

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P1.16
HIGHER ORDER NON-LINEARITY IN ARTERIAL WALL DISTENSIBILITY IS PRESENT IN ONE-THIRD OF PATIENTS WITH CARDIOVASCULAR DISEASE

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Background: It is generally accepted that arterial cross-section is an exponential function of pressure. We hypothesized that the order of non-linearity varies substantially between individuals.
Methods: We obtained simultaneously intra-arterial pressure waveforms and common carotid artery (CCA) diameter waveforms by ultrasound in 10 patients (age 70±8 yrs) undergoing coronary catheterisation. We extracted beat-to-beat diastolic (D), systolic (S), and dicrotic notch (N) values from both pressure and diameter waveforms by an automated algorithm. We reconstructed pressure-cross-section curves of each patient by fitting the $p=p_d\cdot\exp(a(A-A_d)/A_d))$ model to D, S, and N; with: pressure (p), diastolic pressure (p_d), artery cross-section (A), and diastolic cross-section (A_d). Based on a we recalculated systolic blood pressure (p_s).
Results: Eight patients had systolic hypertension and two were normotensive. P_s was 144±25 (mean±SD), p_d was 75±12, and pulse pressure was 69±25 mmHg. In 7/10 the exponential model (a=9.4±3.9) fitted the three point data well ($r^2>0.99$, difference in $p_s=0\pm1$ mmHg), but in 3/10 (one normotensive) the fit was less good because the non-linearity was of a higher order than contained in the model. In those particular patients, the model underestimated real p_s by 4 to 10 mmHg.
Conclusions: Non-invasive methods to estimate local pulse pressure or characterize arterial stiffness based on the above exponential model are less suitable in 30% of patients with cardiovascular disease due to the presence of a higher order non-linearity in arterial wall distensibility.

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P1.17
ARTERIAL STIFFNESS IS RELATED TO LEFT VENTRICULAR DIASTOLIC DYSFUNCTION IN DILATED CARDIOMYOPATHY

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Aim: . To evaluate the relationship between left ventricular (LV) diastolic and systolic function, arterial stiffness and endothelial function in patients with dilated cardiomyopathy (DCM)
Methods: In 54 patients with DCM (age 63±13 years, 10 females) and LV ejection fraction (EF)<45%, applanation tonometry (Sphygmocor®) was evaluated for determining augmentation index (AIx) and pulse pressure (PP) amplification (brachial PP / central PP%) by pulse wave analysis and carotid to femoral pulse wave velocity (PWV). Endothelium-dependent (flow-mediated dilation, FMD, after 5-minute of forearm ischemia) and independent (sublingual glycerol trinitrate, GTN, 25 μg) vasodilation were assessed by ultrasounds and computerized analysis of brachial artery diameter changes. A Doppler and echocardiographic study was also performed, for measurements of E/A ratio and E wave deceleration time (ETD).
Results: . Mean LV EF was 32±10%. AIx was related to E/A ratio (r=−0.51; p<0.01) and EDT (r=0.36; p<0.05). PP amplification correlated with E/A ratio (r=0.61; p<0.0001) and EDT (r=−0.36; p<0.05). PWV was associated with EDT (r=0.36; p<0.05). A significant correlation was found between PP amplification and LV EF (r=−0.33; p<0.05). No significant correlations were apparent between FMD, response to GTN and FMD/GTN ratio with respect to indexes of LV systolic and diastolic function.
Conclusions: In DCM patients, arterial stiffness is related to LV diastolic dysfunction, indicating that increased arterial stiffness is associated with either restrictive or pseudo-normal LV filling. Pulse wave amplification is directly related to diastolic parameters and inversely to systolic function, suggesting lesser central pressure augmentation rather than increased peripheral amplification.

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P1.18
AN HEMODYNAMIC STUDY OF THE LOWER LIMB ARTERIAL NETWORK AND ITS APPLICATION IN A MODEL FOR PREDICTIVE BYPASS SURGERY

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Vascular bypass surgery is commonly performed in the lower limb network in symptomatic patients presenting arterial occlusions. These bypasses can be performed with prosthetic material (PTFE/ polyester) of different diameters, or with autologous veins. Venous grafts have shown a better long-term patency (persisting graft function) than prosthetic ones (70% versus 40% at 4 years)(1). One hypothesis is an abnormal hemodynamic into the bypass leading to thrombosis or intimal hyperplasia. Nowadays, no objective tool is available to help the surgeon to predict the patient-specific hemodynamic performance of a bypass and choose its most adequate characteristics (material, diameter).
In order to analyse the hemodynamic parameters of the lower limb pathological arterial network before surgery, non-invasive measurement techniques are used: area, velocity and flow rate are recorded by doppler ultrasound; pressure and pulse wave velocity by SphygmoCorÒ. These measurements allow the evaluation of the outflow conditions of the leg (resistance and compliance) and their physiological behaviour related to the bypass. The hemodynamic modification due to the bypass is measured during surgery by invasive techniques: needle technique and Radi PressureWireÒ for the pressure waves and ultrasound flowprobes for the flow rate curves. These data are included in a numerical model which aim to predict the flow rate expected in the bypass depending on its characteristics of material and diameter. The results are compared to those of published studies describing velocity and flow rate data predictive of early graft failure (1).
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P1.20
ASSOCIATION BETWEEN LOW-GRADE ALBUMINURIA AND ARTERIAL STIFFNESS IN HYPERTENSIVE SUBJECTS

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Background: Microalbuminuria is an established risk factor for cardiovascular morbidity and mortality. Recently, the prognostic value of low-grade albuminuria for cardiovascular disease has been suggested. However, most studies were performed in heterogeneous population.
Methods: The association between urinary albumin excretion and arterial stiffness was evaluated in subjects with never treated hypertension and without diabetes and cardiovascular complications. Urinary albumin creatinine ratio (UACR) was measured with morning spot urine sample after overnight fasting. Arterial stiffness was measured with brachial-ankle pulse wave velocity (baPWV). Definition of low grade albuminuria was UACR <22 for men or <31 mg/g creatinine for women according to 2007 ESH/ESC