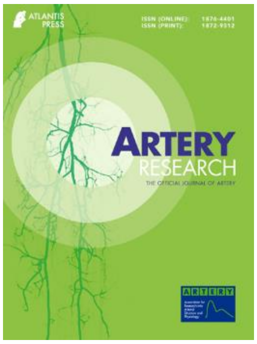

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12.11: THE RETROGRADE FLOW A NOVEL PARAMETER OF AORTIC STIFFNESS

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Background: Obtaining pulse pressure non-invasively from applanation tonometry requires the calibration of pressure waveform with brachial systolic and diastolic blood pressure. In literature, several calibration methodologies are applied and clinical studies do not agree about the predictive value of central hemodynamic parameters.
Objective: To compare 4 calibration methodologies and assess the usefulness of pulse pressure amplification as an index independent of calibration.
Methods: We investigated 108 subjects with tonometry in carotid, femoral, brachial, radial and dorsalis pedis arteries; pulse pressure amplification between arterial waveforms was calculated. Four methods to calibrate the waveforms were compared: the 1/3 rule, the 40% rule, the integral of radial and brachial waveforms. Pulse pressure amplification in 5 arterial territories was studied (carotid-femoral, carotid-brachial, carotid-radial and carotid-pedis amplifications; femoral-pedis amplification).
Results: Pulse pressure can non-invasively be measured in 5 arteries. Pulse pressure strictly depends on calibration, with differences up to 18 mmHg between methodologies. When pulse pressure amplification was calculated, calibration method effect disappeared. Furthermore, pulse pressure amplifications in 5 arterial territories presented a peculiar pattern of clinical/biological determinants: heart rate and body height were common determinants of carotid to brachial, radial and femoral amplifications; diabetes was related to carotid to brachial amplification and pulse wave velocity to femoral to pedis amplification.
Conclusion: The calibration method can influence the results from clinical trials and that pulse pressure amplification can evade this issue. We also suggest that the alteration of amplification in each arterial territory might be considered as a signal for the discovery of clinical/subclinical damage.

P12.10
TWO NEW INDICES FOR A MORE ACCURATE ASSESSMENT OF THE LOCAL AORTIC STIFFNESS

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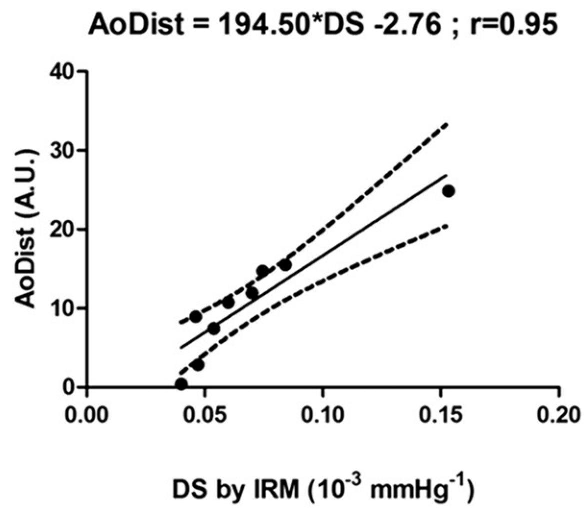
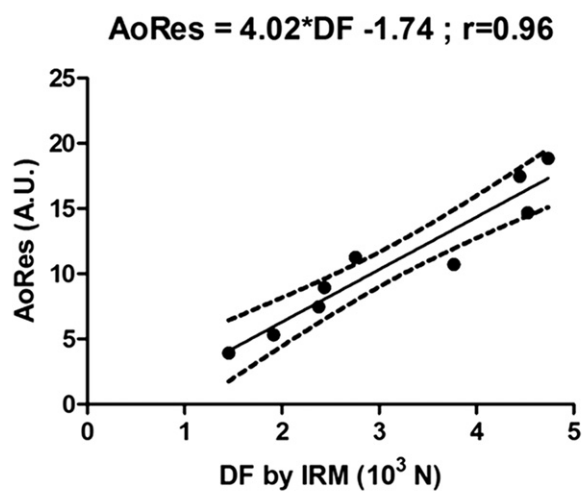
Purpose: Recently, the local aortic stiffness (AoStiff) can be evaluated using a non-invasive bioelectrical impedance (BI) technique. Herein, AoStiff is estimated from the measurement of two new BI variables: 1) The local aortic flow resistance (AoRes) exerted by the drag forces onto the flow 2) The local aortic wall distensibility (AoDist). We propose to compare these two indices with the reference pulse wave velocity (PWV) measurement and the direct assessment of the aortic drag forces (DF) and distensibility (DS) obtained by the magnetic resonance imaging technique (MRI).
Methods: PWV was measured by tonometry (Pulse Pen, Diatecne) on 98 patients (mean age ± years). Local aortic properties (DF and DS indices) were estimated from phase-contrast MRI data on 9 patients (mean age 58 ± 14 years). In both studies, AoRes and AoDist indices were evaluated by BI technique on patients at rest.
Results: A significant correlation was found between PWV and AoRes, AoDist respectively (r= 0.58, p<0.0001, 95% confidence interval: 0.43 to 0.70; r= -0.45, p<0.0001, 95% confidence interval: -0.60 to -0.27) as well as between AoRes and DF (r= 0.96, p=0.0002, spearman coefficient) and between AoDist and DS (r= 0.95, p=0.0004, spearman coefficient).
Conclusion: The local BI method relies on a differential analysis of AoStiff leading to two new indices (AoRes and AoDist) which show a higher and significant correlation with the parameters obtained with MRI technique than PWV method. Furthermore, a larger scale validation should be performed before considering these indices as a suitable alternative to standard methods.





P12.11
THE RETROGRADE FLOW A NOVEL PARAMETER OF AORTIC STIFFNESS

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Aim: The aim of this prospective study was, to quantifies parameters of the retrograde flow (volume, flow rate) using magnetic resonance phase shift velocity and to study there relationships with aortic stiffness parameters calculated using both MRI and tonometry and waves reflections parameters.
Materials: Eighty healthy subjects without history of cardiac disease were studied (50 men and 30 women. The median age of the subjects was 42 years, ranging from 13 to 79
Results: The mean value of the retrograde volume mean was 13.2 ml (range from 2.2 to 46 ml), or expressed as a percentage of antegrade flow, it was 2.1% (range from 0.31% to 9.5%). All parameters of the retrograde flow were correlated significativly with age in univariate analysis.
The rate of the pic of retrograde flow rate to pic of the anterograde flow rate was more closely correlated to age (r=0.753, PS) compared to CF PWV (r=0.8008, PS). All parameters of the retrograde flow correlates closely to the parameters of waves reflectin calculated (Ti and Ai)
Conclusion: The retrograde flow appear to be a novel parameter of aortic stiffness witch correlates significativly with age and parameters of aortic stiffness and waves reflection.