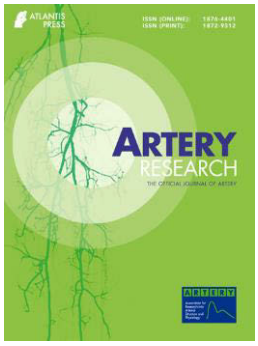

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P1.29: ONE CLINIC MEASURE OF LIGHT EXERCISE CENTRAL BLOOD PRESSURE IS A STRONGER CORRELATE OF LEFT VENTRICULAR MASS THAN 24 HOUR AMBULATORY BLOOD PRESSURE MONITORING

J.E. Sharman, S. Thomas, J.L. Hare, R. Leano, C. Jenkins, T.H. Marwick

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(24±6y) and 11 old (60±12y) subjects. Continuous beat-to-beat changes in CCA diameter were used to determine FMD magnitude in percentage change in end diastolic diameter (ΔD/D) and mean centre stream blood velocity (ΔV/V). Endothelial function (EF) is estimated by the relative response of ΔD/D to ΔV/V.
Results: Heart rate increases significantly during and post hypercapnia. No significant changes are seen in peripheral blood pressure. Hypercapnia stimulus induces significant increases in flow velocity and diameter in both populations, reaching a steady state after 3 minutes. EF=0.6±0.03 (young), and EF=0.4±0.08 (old).
Conclusions: CO2 stimulated FMD response at the CCA exposes the dynamic interrelationship between blood velocity and diameter. It provides a direct and well-tolerated tool to quantify endothelial function in atherosclerotic prone arteries.

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P1.29
ONE CLINIC MEASURE OF LIGHT EXERCISE CENTRAL BLOOD PRESSURE IS A STRONGER CORRELATE OF LEFT VENTRICULAR MASS THAN 24 HOUR AMBULATORY BLOOD PRESSURE MONITORING

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Background: Twenty four hour ambulatory blood pressure (24ABPM) is the gold standard for assessing blood pressure (BP) control. However, central BP during daily activity may be a stronger determinant of cardiovascular risk. This study aimed to compare 24ABPM with light exercise central BP (mimicking daily activity) for predicting left ventricular (LV) mass.
Methods: Study population comprised 54 patients (aged 58±7 years; 20 men) including those with treated hypertension (n=16), untreated masked hypertension (n=23) and normotensive controls (n=15). Subjects underwent 2D echocardiography for determination of LV mass (indexed; $g/m^{2.7}$), resting brachial BP, 24ABPM and estimated central BP by radial tonometry during graded cycle ergometry. Central systolic BP (SBP) was estimated from the radial second systolic peak (P2) as well as the derived central waveform.
Results: The range of LV mass index and 24ABPM SBP were 17.8-55.1 $g/m^{2.7}$ and 107-153 mmHg respectively. As expected, 24ABPM SBP was significantly associated with LV mass index ($r=0.30$, $p=0.02$), but not with clinic resting brachial ($r=0.21$; $p=0.14$) or central SBP ($r=0.20$; $p=0.14$). However, the strongest correlates of LV mass index were light exercise (50% heart rate reserve) radial P2 ($r=0.54$, $p<0.001$) and central SBP ($r=0.47$; $p<0.001$). On multiple regression analysis, radial P2, but not 24ABPM SBP, was independently associated ($\beta=0.45$; $p<0.01$) with LV mass index after accounting for other confounding variables.
Conclusion: A one-off clinic estimate of light activity central SBP outweighs 24ABPM for predicting LV mass. This rapid, noninvasive technique may provide a superior measure of BP control compared with the current gold standard.

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P1.30
INDICES OF ARTERIAL STIFFNESS AND RAISED BLOOD PRESSURE AMONGST PUBLIC SCHOOL CHILDREN IN GUJARAT, INDIA

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Background: Pediatric hypertension is increasing in prevalence with the global childhood obesity epidemic. The burden of paediatric hypertension and prehypertension are poorly understood in areas of the Indian subcontinent.
Methods: Using standardised methods for anthropometry (International Society for the Advancement of Kinanthropometry), and blood pressure (British Hypertension Society guidelines) - paediatric obesity, blood pressure and a marker of arterial stiffness (stiffness index using digital volume pulse analysis PCA Micromedical) were measured within 303 school children (4-14 years) in rural Gujarat, India.
Results: The prevalence of prehypertension was 13.3% in boys and 13.7% in girls, which were markedly higher those reported for the US (3.4%). Many of the Indian children were deemed not have reached their true growth potential, where 82.5% of children were below the 50th percentiles for height, gender and age as advised by consensus US guidelines. On logistic regression, prehypertension was associated with waist to height ratio ($P<0.001$) and body-mass index ($P<0.001$). Median stiffness index was comparable in boys 6.89 m/s (IQR: 2.95-7.79) and girls - 6.62 m/s (5.58—7.72). Prehypertension was unrelated to indices of arterial stiffness, which were associated with waist to height ratio ($r = -0.34$, $P<0.001$).
Conclusion: Low birth weight and an early manifestation of aberrant endocrine activity are likely to be implicated in higher blood pressure for these children, for which further research is warranted given the impeding threat of over nutrition that looms with the rising epidemic of obesity across the Indian subcontinent. Given the healthcare challenge of cardiovascular morbidity that faces Asia, the assessment of paediatric hypertension and obesity amongst children is an important consideration for prevention strategies.

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P1.31
DETERMINING PULSE WAVE VELOCITY USING MRI: A COMPARISON AND REPEATABILITY OF RESULTS USING SEVEN TRANSIT TIME ALGORITHMS

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Aim: MRI provides a non-invasive method for assessing segmental aortic pulse wave velocity (aPWV). However, the best mathematical algorithm for transit time calculation using MRI flow waves is unclear.
Methods: 7 different algorithms were applied to aortic flow waveforms measured by MRI (10 subjects, 36±7 years, 4 male). Two measurements were recorded in each subject on different days for repeatability analysis. PWV was calculated between 5 sites along the aorta. Outlier PWV results were classed as a ''failed'' measurement and the success rate calculated. Bland-Altman plots were constructed for each algorithm, and repeatability calculated. Agreement between different methods was calculated using repeated measures analysis.
Results: The method of intersecting lines of fit during late diastole and early systole had the highest success rate followed by the Fourier analysis phase-slope method (99%; 98% respectively). Repeatability of measurement was highest using the phase-slope method followed by the method of intersecting lines (standard deviation 1.9; 2.2 m/s respectively). Methods of deviation of a systolic line of fit, maximum of second derivative, intersecting lines of fit, and the corner detection algorithm had the highest agreement, corrected for repeatability (corrected standard deviation range 1.8-1.9 m/s).
Conclusions: Whilst agreement between several PWV algorithms was high, no one algorithm was better in all categories. The intersection of lines of fit method was most robust. The phase-slope method showed the greatest repeatability. These findings are important in aPWV measurement, and for reliable and accurate PWV measurement in general.

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P1.32
BRACHIAL-ANKLE PULSE WAVE VELOCITY: A NEW METHOD FOR CLINICAL EVALUATION OF ARTERIAL STIFFNESS COMPARED WITH CAROTID-FEMORAL PULSE WAVE VELOCITY

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Background: Arterial stiffness (AS) reflects morfo-functional modifications of elastic arteries due to aging and atherosclerosis.
Carotid-femoral pulse wave velocity (PWVcf) represents an estabilished marker of aortic stiffness and predictor of cardiovascular mortality.
Recently, a new method for evaluating arterial stiffness based on brachial-ankle pulse wave velocity (PWVba) and capable to provide a stiffness index, CAVI (cardio-ankle vascular index), has been proposed.
Aim: to compare PWVba with PWVcf and to evaluate the corresponding relationships with age and blood pressure in healthy subjects and patients with major risk factors for atherosclerosis.
Methods: 46 subjects (19 controls; 27 patients with risk factors but without clinical cardiovascular disease; 31 women; age 43±18) were studied. PWVcf