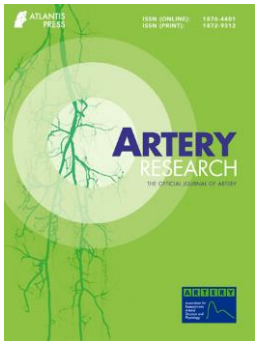

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12.19: ESTIMATION OF CENTRAL SYSTOLIC BLOOD PRESSURE FROM ARM CUFF PRESSURE: COMPARISON WITH THE SPHYGMOCOR SYSTEM

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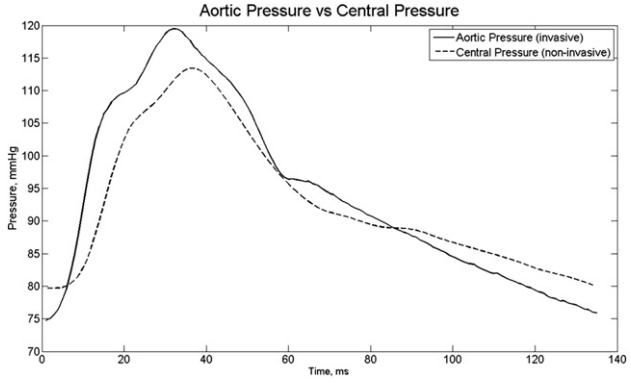
Central aortic pressure is a better predictor for cardiovascular events than brachial pressure[1]. There are a number of devices on the market that find a continuous measurement of pressure in the arm, and from it estimate the central aortic pressure[2]. In this study we focus on one such device, the PulseCor 6.5 Monitor (PulseCor, Auckland, New Zealand) [3]. We compare its output (central aortic pressure waveforms) with an ensemble average of the aortic pressure waveforms measured invasively using a pressure catheter (ComboWire XT GuideWire, Volcano Corporation, Belgium). The results show that the central aortic pressure waveforms have a qualitatively and quantitatively similar shape to the invasively measured waveforms (R=0.9505) (a typical result is shown in figure). The average differences in the systolic and diastolic readings of the device with the invasive measurements are 6.75 mmHg with range [-13.09, 32.0] and 18.15 mmHg with range [-8.45, 86.38], respectively (N=8). We conclude that although the non-invasively measured systolic and diastolic pressures do not match exactly to the invasive measured ones, the waveforms of both measurements are similar.



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P12.19
ESTIMATION OF CENTRAL SYSTOLIC BLOOD PRESSURE FROM ARM CUFF PRESSURE: COMPARISON WITH THE SPHYGMOCOR SYSTEM

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Objective: Central systolic blood pressure (cSBP) is usually estimated by application of a transfer function (TF) to a peripheral arterial waveform. These waveforms are usually calibrated by using either mean (MAP) and diastolic (DBP) blood pressure or systolic blood pressure (SBP) and DBP obtained from an arm cuff. The aim of the present study was to determine whether cSBP derived from upper arm cuff pressure is as accurate as that obtained from radial tonometry.
Methods: We compared estimates of cSBP obtained by application of a TF to arm cuff pressure waveforms with those obtained using a SphygmoCor device (Atcor Medical, Australia) on 42 subjects (20 women, aged 48 $\pm$ 17 years). Waveforms were calibrated using oscillometric values of MAP and DBP and SBP and DBP.
Results: Irrespective of the calibration, there was a close agreement between estimated values from the arm cuff waveforms and radial tonometry: mean difference (SD) -0.46 (4.15) mmHg for MAP and DBP calibration and 2.16 (4.38) mmHg for SBP and DBP calibration.
Conclusion: These results suggest that cSBP can potentially be determined directly from an upper arm blood pressure cuff with similar accuracy to that obtained using the current methods.

P12.20
ANKLE-BRACHIAL INDEX AND INFLAMMATION IN RELATION TO BLOOD PRESSURE CLASSIFICATION: UPS AND DOWNS

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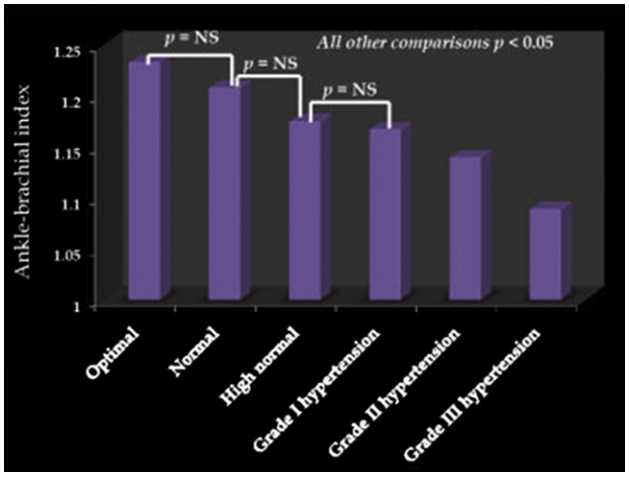
Background: Hypertension is associated with ankle-brachial index (ABI) and C-reactive protein (CRP), which are both predictors of cardiovascular risk. We investigated the differences in ABI and inflammation between the subgroups of the blood pressure (BP) classification (optimal to grade III hypertension), which was proposed by the European 2007 guidelines for the management of hypertension.
Method: 1225 never treated consecutive subjects (53$\pm$12 years, 728 males), with no known cardiovascular disease were divided into six subgroups according to the classification of the 2007 European guidelines: optimal (n=29), normal (n=71), high normal (n=162), grade I hypertension (n=552), grade II hypertension (n=308), grade III hypertension (n=103). ABI was calculated for each leg with the higher of the 2 ankle pressures in relation to the higher of the left or right brachial systolic BP.
Results: ABI decreased from the subgroup with optimal BP to that with the higher brachial BP level ($p<0.001$), and this result remained significant even after adjustment for age, gender, BMI, blood glucose, mean BP, smoking status and heart rate ($p<0.001$, Figure). CRP increased from the subgroup with optimal control to that with the higher BP level ($p<0.001$), however, this result did not remain significant after adjustment for the abovementioned confounders ($p=0.175$, Figure). The between groups comparisons adjusted for the abovementioned confounders are presented in the Figure.
Conclusions: This study shows the gradual decrease of ABI and increase of CRP, according to the European BP classification, even in patients with normal BP. These findings provide further insights into the role of ABI and inflammation in assessment of cardiovascular risk in hypertension.



P12.21
MEASUREMENT OF PULSE WAVE VELOCITY IN HEALTHY YOUNGSTERS — REFERENCE VALUES AND COMPARISON OF THREE DEVICES

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Carotid-femoral pulse wave velocity (cfPWV) is an established method for characterizing aortic stiffness. Normal PWV values for the paediatric population derived from large data collection have yet to be available.
Our aim was to create a database and to assess the factors determining PWV (a) and to evaluate the comparability of cfPWV measured by oscillometry (Vicorder) with applanation tonometry (PulsePen, Sphygmocor) (b)
Patients and methods: Reference tables from cfPWV obtained in 1008 healthy subjects were generated by LMS method. Effect of anthropometric data on PWV was established. cfPWV of 98 youngsters (17.2 (5.3) years) with the three devices.
Results: Reference tables for gender, age and height were generated. By multiple regression, age, height and blood pressure remained major predictors of PWV. (a) PWV by Vicorder was significantly lower than by