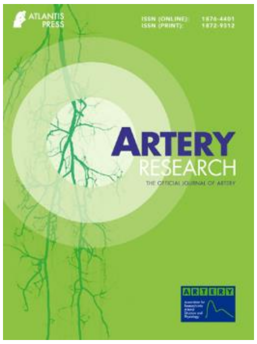

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P2.11

THE IMPACT OF ATRIAL FIBRILLATION AND PACEMAKERS ON ACCURACY OF CENTRAL BLOOD PRESSURE MEASURED BY A NOVEL CUFF-BASED TECHNIQUE

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Background: Non-invasive measurement of Central Blood Pressure (CBP) in the clinic setting is the advantage of the validated, tonometer-based SphygmoCor device. Recently, a novel brachial cuff-based SphygmoCor device (XCEL) has been tested and validated against the tonometer-based method of CBP measurement. We investigated the accuracy of the XCEL measurements in patients with Atrial Fibrillation (AF) and pacemakers.
Methods: Group demographics are listed in the Table. Tonometric and cuff-based assessment of CBP was made in triplicate in a randomized fashion after a period of seated acclimatization. The difference in central systolic (cSBP), diastolic (cDBP), pulse pressure (cPP) and augmentation index normalised to a heart rate of 75 beats/min (AIx75) were analysed. The agreement between parameters for each of these two non-invasive devices was evaluated using Student's paired t-tests and the Bland-Altman method.
Results: The difference between cSBP, cDBP, PP and AIx75 measured on the two devices in all groups is summarized in the Table. The mean and standard deviation of the difference of blood pressure values for each group were within the limits of international guidelines for blood pressure measurement (Table).
Conclusion: The cuff-based, SphygmoCor XCEL technique for non-invasive measurement of central blood pressure parameters has good agreement with the tonometer-based SphygmoCor device in patients with AF or pacemakers and could be used in routine evaluation of such patients in cardiac clinics.

	AF group	Pacemaker group	Without AF/ pacemaker
n	14	23	146
Men	8	13	123
Age (years)	76±11	79±10	65±16
Brachial SBP (mmHg)	121±15	129±17	129±16
Brachial DBP (mmHg)	68±11	69±7	71±10
Heart rate (bpm)	68±12	65±10	67±11
Mean difference between devices of:			
cSBP (mmHg)	-4.2±7.1*	-0.5±6.6	-0.6±6.3
cDBP (mmHg)	-3.8±5.9*	-2.3±3.1**	-1.5±3.8***
cPP (mmHg)	-0.7±8.9	1.5±5.6	1.0±5.7*
Aix75 (%)	-5.6±9.7	-3.1±7.6	-3.5±9.1***

* p<0.05, ** p<0.01, *** p<0.001

P2.12

NON-INVASIVE ESTIMATES OF CARDIAC OUTPUT: COMPARISON OF A NOVEL PULSE WAVEFORM ANALYSIS METHOD WITH INERT GAS RE-BREATHING

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Objectives Non-invasive, cuff-based systems are currently available for the assessment of central haemodynamic parameters. The aim of the current study was to compare measurements of cardiac output (CO) derived from pulse waveform analysis (Vicorder) with an inert gas re-breathing method (Innocor) in response to postural change, (study 1) and mild exercise. (study 2).
Methods Study 1 included 27 subjects, mean age 35±9 years. Haemodynamic indices were measured after 10 minutes each of supine rest, standing and further supine rest. Study 2 included 30 subjects, mean age 35±8 years. Haemodynamic indices were measured after resting on an upright cycle ergometer, and during the final minute of 5 minutes of steady-state cycling at 20rpm and 35rpm, corresponding to 12 and 20 watts respectively.
Results Overall, values of CO and SV were significantly correlated between devices (r=0.42, p=0.001, CO) and (r=0.27, p=0.001, SV). There was reasonable agreement between devices with a mean difference (±SD) in CO of 0.8±2.7 L/minute (supine) 0.7±2.5 L/minute (standing) and 0.7±1.3 (final supine). Similarly, in study 2, the mean differences were 0.4±3.6 L/minute (resting), 0.2±4.3 L/minute and 0.8±3.5 L/minute cycling at 20rpm and 35rpm respectively. The direction and magnitude of the changes in CO detected with each device were similar (Figures 1&2).
Conclusions: The Vicorder and Innocor devices produce similar estimates of CO at rest and detect similar changes in CO in response to physiological challenges. Moreover, the Vicorder is a simple-to-use, cost-effective device that may be considered for comprehensive haemodynamic monitoring.

Figure 1

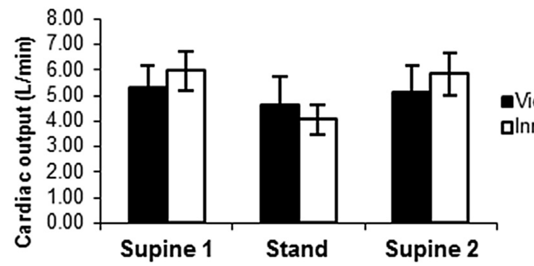
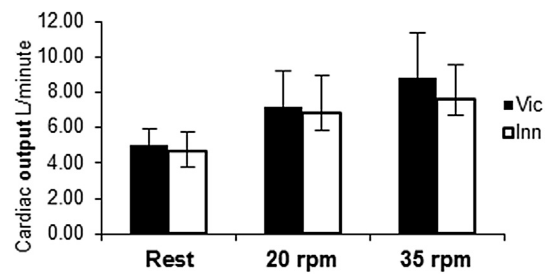


Figure 2



P2.13

INVESTIGATION OF REGIONAL CAROTID MECHANICS USING ULTRASOUND SPECKLE TRACKING IMAGING (STI) AND THE INFLUENCE OF CAROTID AND AORTIC STIFFNESS, CARDIAC PARAMETERS ON CAROTID STRAIN

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Objective: To investigate carotid strain and displacement and to assess their relations with arterial stiffness and cardiac systolic and diastolic parameters.
Methods: Study population consisted of 40 healthy subjects (aged 17-38, median-22). All subjects underwent comprehensive transthoracic echocardiography and ultrasound carotid exams. Peak carotid longitudinal, circumferential strains and longitudinal and radial displacement were measured using two-dimensional Speckle Tracking Imaging. Aortic (at the level of aortic root) and carotid stiffness was calculated using wall-tracking software.
Results: Values for carotid strains and displacements are shown in table 1. Test-retest reliability was higher for longitudinal strain and displacement as compared to radial displacement. Univariant analysis revealed direct associations between longitudinal carotid displacement and carotid (r=0.78) and aortic (r=0.66) distensibility coefficient (p<0.01). Direct correlations were also observed between carotid longitudinal strain and left ventricular (LV) fractional shortening (r=0.33), E/A (r=0.30), relative LV posterior wall thickness (r=0.28), ventricular septum thickness (r=-0.25) (p<0.05). These relations were tested by multivariate linear regression after adjusting for potential confounders (age, blood pressure, male gender, weight). The model demonstrated that both systolic and diastolic heart parameters are independent determinants of longitudinal carotid strain (Table 2).
Conclusions: Carotid strain and displacement are important reproducible parameters of regional carotid mechanics. They are directly related with both aortic and carotid stiffness. Both systolic and diastolic parameters of