P165: HIGHER BLOOD PRESSURE IN YOUTH IS ATTRIBUTABLE TO A COMBINATION OF HIGHER CARDIAC OUTPUT AND HIGHER TOTAL PERIPHERAL RESISTANCE

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Methods: In 102 patients planned to undertake a cardiac catheterization (65 ± 13 years, 70.6% males) duplicate non-invasive measures of PWV, 15-minutes apart, were obtained with 4 devices measuring two-points carotid-femoral PWV and the related pulse transit time (PTT): Compilor (AlamMedical), PulsePenETT, PulsePenET (DiaTecnica), SphygmoCor (AtCorMedical), and with 2 devices estimating PWV from the oscillometric cuff-derived brachial wave: BPLab (Petr Telegin), Mobil-O-Graph (IEM). PWV and carotid-femoral PTT measurements were compared using coefficients of variation (CVs) and their confidence intervals (CI).

Results: Devices evaluating carotid-femoral PWV showed a good repeatability (CV[CI]: Compilor: 8.8 [7.3–10.1]; PulsePen ETT: 8.0 [6.2–9.5]; PulsePen ET: 5.8 [4.9–6.6]; SphygmoCor: 9.5 [7.7–11.0]), whereas the repeatability of PWV estimated by cuff-based devices was for the BPLab = 5.5 [4.2–6.6] and for the Mobil-O-Graph = 3.4 [2.9–3.8]). A tendency toward a lower repeatability of carotid-femoral PWV was present for greater arterial stiffness, while repeatability of carotid-femoral PTT was not related to its mean values. Differences between repeated PWV measurements were not correlated with blood pressure (R² = 0.005) or heart rate variations (R² = 0.013).

Conclusions: Short-term repeatability of PWV measures was good, with some differences between different devices. A greater repeatability was observed in devices estimating PTT from a cuff-based measurement, compared to devices measuring carotid-femoral PTT, owing to the algorithm of calculation of PWV (Mobil-O-Graph) or to the procedure of correction which eliminates highly variable PWV values (BPLab).

Repeatability of PWV is not influenced by blood pressure or heart rate variations. For carotid-femoral PWV, the repeatability of measures is lower as compared to men and normotensives, respectively (P < 0.001). ICC for PWV was 0.88 (95%CI 0.83, 0.92) and for CAVI 0.57 (95%CI 0.41, 0.69). Bland-Altman plots indicated that measurements taken from both devices were highly reproducible, with most points (85/89 for PWV; 86/89 for CAVI) falling within 2SD of the mean difference. Kappa statistic was 0.76 for PWV and 0.56 for CAVI.

Conclusion: PWV (Arteriograph™) and CAVI (VaSera™) have good test-retest reliability, among Jamaican youth adults; however repeated CAVI values were marginally lower than the first measurement and the ICC and kappa estimates were lower.
Methods: The study was conducted on 2091 participants in the Avon Longitudinal Study of Parents and Children (ALSPAC), a prospective population-based birth cohort study, aged 17. BP measurement and echocardiography was performed and heart rate (HR), stroke volume (SV) and TPR calculated. Data are means (SD).

Results: Table 1 shows selected characteristics of the sample. Higher quintiles of systolic BP were associated with higher SV, higher HR and higher TPR. However, the proportional contribution made by SV, HR and TPR to mean arterial pressure differed little by systolic BP quintile (stroke volume (32–34%) heart rate (25–29%) and TPR (39–41%)).

Conclusions: Higher blood pressure is attributable to a combination of higher cardiac output (i.e. SV+HR) and higher TPR in a population-based sample of adolescents. There is no evidence of a disproportionate contribution from CO at higher BP levels.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Males (n = 939)</th>
<th>Females (n = 1152)</th>
<th>All (n = 2091)</th>
</tr>
</thead>
<tbody>
<tr>
<td>y (mm/m²)</td>
<td>2.7 (0.3)</td>
<td>3.5 (0.3)</td>
<td>3.0 (0.3)</td>
</tr>
<tr>
<td>kg/m²</td>
<td>2.2 (0.3)</td>
<td>3.0 (0.4)</td>
<td>2.8 (0.4)</td>
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<tr>
<td>mmHg</td>
<td>111/65(8)</td>
<td>110/65(7)</td>
<td>110/65(8)</td>
</tr>
<tr>
<td>bpm</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>L/min</td>
<td>1.0 (0.8)</td>
<td>1.0 (0.9)</td>
<td>1.0 (0.9)</td>
</tr>
<tr>
<td>ml</td>
<td>3</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>mmHg/ml/min</td>
<td>7 (5.6)</td>
<td>7 (6.0)</td>
<td>7 (6.0)</td>
</tr>
</tbody>
</table>

P167
HEAD-DOWN TILT BED-REST SIGNIFICANTLY INCREASES CENTRAL ARTERIAL STIFFNESS

Conclusions: Higher blood pressure is attributable to a combination of higher cardiac output (i.e. SV+HR) and higher TPR in a population-based sample of adolescents. There is no evidence of a disproportionate contribution from CO at higher BP levels.

References

P168
ENDOTHELIAL REGULATION OF AWV IS IMPAIRED DURING INCREASE IN BLOOD FLOW IN ESSENTIAL HYPERTENSION

Background: Arterial wall viscosity (AWV) depends on endothelium-derived factors in physiological conditions (1,2). Hypertension is characterized by an altered FMD during sustained flow increase due to endothelial dysfunction (3). Whether NO and EETs regulate change in AWV during increase in flow in hypertensive patients (HT) as compared with normotensive controls (NT) remains to be evaluated.

Methods: Radial artery diameter, wall thickness and arterial pressure were measured in 18 untreated essential HT and 14 frequency matched controls.