P40: DOES ARTERIAL AGEING DIFFER BETWEEN EUROPEANS AND JAPANESE AND KOREAN PATIENT SAMPLES? RESULTS FROM CURRENT UK STUDIES


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Results: At each blood pressure (BP) level, there was a quadratic association between CAVI and age, except for a linear association in the optimal BP group. While there was no association between BP and CAVI in younger subjects, there was a linear association between CAVI and BP after 40 years of age. Reference values by age and gender were established. In each age group, except for the male 60–65 group, reference values in our population were lower than in the Japanese one with the difference ranging from −0.29 to 0.21 for males, and from −0.38 to −0.03 for females.

Conclusion: This is the first study providing CAVI reference values in a random sample of the Caucasian population. Our results suggest that the currently used values slightly overestimate CAVI in younger Caucasian, possibly underestimating cardiovascular risk.

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LEFT VENTRICULAR STRUCTURE AND FUNCTION IN RELATION TO PERIPHERAL AND CENTRAL BLOOD PRESSURE IN A GENERAL POPULATION

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Background: Central blood pressure (BP) is a predictor of target organ damage. No previous study addressed the question to what extent central compared with peripheral is related to left ventricular (LV) structure and function in a general population.

Methods: In 577 Flemish recruited from the general population (47.8% women; mean age 50.5 years), we assessed the multivariable-adjusted associations of echocardiographic LV structure and systolic and diastolic LV function (Vivid7 Pro device; Echopac software, version 4.0.4; GE Virgmed, Horten, Norway) with peripheral and central pressure, as recorded by radial applanation tonometry (Sphygmocor software, version 9.0). Association sizes were expressed per 15/10 mmHg increment in peripheral or central systolic/diastolic BP.

Results: Peripheral compared with central systolic BP was 10.2 mm Hg higher (P < 0.0001), whereas diastolic BP was similar peripherally and centrally (P = 0.50). Associations were closer (P < 0.020) with central than peripheral systolic BP for LV mass (+0.59 g/m²) and left atrial volume (+0.29 ml/m²) indexed to body surface area, peak A transmitral flow (+0.12 cm/s), peak e′ mitral annular movement (−0.18 cm/s) and the E/A ratio (−0.017). Associations were closer (P < 0.038) with central than peripheral diastolic BP for left atrial volume index (+0.289 ml/m²), e′ (−0.123 cm/s) and E/e′ (−0.094).

Conclusions: In asymptomatic people recruited from the general population, LV mass and atrial volume indexes and selected haemodynamic measurements reflecting diastolic LV function are slightly but significantly closer associated with central than peripheral BP.

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DOES ARTERIAL AGEING DIFFER BETWEEN EUROPEAN AND JAPANESE AND KOREAN PATIENT SAMPLES? RESULTS FROM CURRENT UK STUDIES

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Objective: Vascular stiffness has long been linked with the ageing process. However, it is only since the development of accurate methods for measuring arterial compliance that unravelling this relationship has become possible. Arterial stiffening over time appears to differ between ethnic groups and/or geographic areas. We investigated how the cardio-ankle vascular index (CAVI) varied with chronological age to make initial comparisons of its change with age between this European study and published data from Japanese and Korean patient populations.

Method: 312 participants (180 men, 132 women), age 63.7 ± 12.9 (mean ± SD), range 25–92 years. The following were measured: CAVI using VaSera VS-1500N® (Fukuda Denshi, Japan); brachial BP using OMRON705-IT; baseline characteristics and physical examination of cardiovascular health. These data are from current UK studies of healthy volunteers with approximately 20% having two or more cardiovascular risk factors.

Results: CAVI was significantly correlated with age (r = 0.63, P < 0.0001), more closely in men (r = 0.71, P < 0.001) than women (r = 0.54, P < 0.001). These data were used to create a preliminary set of ‘usual’ average CAVI values for each age category (Table) and compared against data from Japan [1] and Korea [2] (plot 1 & 2). Korean men had lower CAVI values at each age.
Conclusions: This suggests CAVI is closely related to ageing and may be a useful indicator of vascular age. In initial comparisons, the slope of arterial ageing may be steeper for Europeans, especially men over 60 years, than for Japanese and particularly Koreans, but detailed analysis has not yet been done due to lack of raw data.

References

Table

<table>
<thead>
<tr>
<th>Age category (years)</th>
<th>CAVI mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;40</td>
<td>6.83 (0.76)</td>
</tr>
<tr>
<td>40–49</td>
<td>7.22 (0.86)</td>
</tr>
<tr>
<td>50–59</td>
<td>8.20 (1.29)</td>
</tr>
<tr>
<td>60–69</td>
<td>8.87 (1.24)</td>
</tr>
<tr>
<td>70–79</td>
<td>9.60 (1.36)</td>
</tr>
<tr>
<td>80–89</td>
<td>11.11 (1.60)</td>
</tr>
</tbody>
</table>

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MYOCARDIAL MECHANOENERGETIC EFFICIENCY INDEX (MEEI) AND ARTERIAL STIFFNESS: ASSOCIATION IN A GENERAL POPULATION IN NORTHERN ITALY

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A non-invasive approach for the estimation of mechanical efficiency through the calculation of the ratio between stroke work and HR-pressure product has been recently proposed by de Simone et al. This index, which expresses the amount of blood pumped in a single beat in 1 second by the heart, may be easily obtained by echocardiography. The aim of our study was to evaluate the determinants of myocardial mechanoenergetic efficiency index (MEEI), calculated as stroke volume/heart rate and indexed to LV mass (MEEI = MEEI/LVM) in a large general population sample in Northern Italy.

Design and methods: We evaluated 478 subjects participating in a general population study in Northern Italy (Studio Vobarno). All subjects underwent a physical examination with measurement of clinic blood pressure (BP). In all subjects laboratory examinations, 24 hours blood pressure measurement, echocardiography, and assessment of carotid-femoral pulse wave velocity (PWV) were performed.

Results: Subjects had a mean age of 58 ± 10 years, a BMI of 26 ± 4, 44% were males, 65% had arterial hypertension (55% treated), MEEI was lower in males and in patients with increased PWV. MEEI was inversely correlated with age, BMI, waist circumference, clinic and 24 hours BP, glucose, uric acid, triglycerides and directly correlated with HDL. MEEI was also inversely correlated with relative wall thickness (RWT) and PWV. At linear regression multivariate (I) analysis MEEI remained independently related to male gender (β = 0.16, p < 0.001), BMI (β = −0.13, p < 0.005), RWT (β = −0.56, p < 0.001) and PWV (β = −0.10, p < 0.05).

Conclusions: In a large sample of general population in Northern Italy myocardial mechanoenergetic efficiency was inversely correlated with arterial stiffness, independently of multiple possible confounders.

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24-HOUR CENTRAL BLOOD PRESSURE IS MORE STRONGLY ASSOCIATED TO TARGET ORGAN DAMAGE THAN BRACHIAL BLOOD PRESSURE: FIRST RESULTS OF THE VASOTENS REGISTRY

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Objective: In the present analysis of the VASOTENS study [1] baseline data, we checked whether organ damage of hypertension (TOD) i) is better associated with 24-hour central than peripheral BP and ii) is related to ambulatory arterial stiffness, estimated by pulse wave velocity (PWV) and augmentation index (AIx).

Methods: TOD in 334 hypertensive patients (mean age 53 ± 15, 52% males, 45% treated) was estimated by calculation of left ventricular mass index (LVMI), intima-media thickness (IMT) and creatinine clearance (CC). 24-hour indices were estimated through the Vasotens technology [2]. 24-hour brachial (bSBP) and aortic systolic BP (aSBP), standard deviation of bSBP, PWV and AIx were obtained. Bivariate and multivariate analysis (stepwise linear regression) was used.

Results: A significant relation was found for age, bSBP and aSBP vs. LVMI and IMT (see table). IMT was also significantly related to arterial stiffness, independently of multiple possible confounders.

Conclusions: In a large sample of general population in Northern Italy myocardial mechanoenergetic efficiency was inversely correlated with arterial stiffness, independently of multiple possible confounders.

<table>
<thead>
<tr>
<th>Correlation coefficients</th>
<th>LVMI (g/m²)</th>
<th>IMT (mm)</th>
<th>CC (ml/min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>0.25**</td>
<td>0.56**</td>
<td>−0.53**</td>
</tr>
<tr>
<td>bSBP (mmHg)</td>
<td>0.23**</td>
<td>0.24**</td>
<td>−0.01</td>
</tr>
<tr>
<td>aSBP (mmHg)</td>
<td>0.28***</td>
<td>0.26**</td>
<td>−0.05</td>
</tr>
<tr>
<td>SD bSBP (mmHg)</td>
<td>0.01</td>
<td>0.24**</td>
<td>−0.19*</td>
</tr>
<tr>
<td>PWV (m/s)</td>
<td>0.09</td>
<td>0.17*</td>
<td>−0.14</td>
</tr>
<tr>
<td>AI (li)</td>
<td>0.07</td>
<td>0.22**</td>
<td>−0.18*</td>
</tr>
</tbody>
</table>

*** p < 0.001 ; ** p < 0.01; * p < 0.05.

Abstracts