



Artery Research

ISSN (Online): 1876-4401

ISSN (Print): 1872-9312

Journal Home Page: <https://www.atlantispress.com/journals/artres>

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

F.A. Kirkham, C. Mills, K. Nambiar, J. Timeyin, K.A. Davies, F. Kern, J.K. Cruickshank, C. Rajkumar

To cite this article: F.A. Kirkham, C. Mills, K. Nambiar, J. Timeyin, K.A. Davies, F. Kern, J.K. Cruickshank, C. Rajkumar (2017) P40: DOES ARTERIAL AGEING DIFFER BETWEEN EUROPEANS AND JAPANESE AND KOREAN PATIENT SAMPLES? RESULTS FROM CURRENT UK STUDIES, Artery Research 20:C, 66–67, DOI: <https://doi.org/10.1016/j.artres.2017.10.070>

To link to this article: <https://doi.org/10.1016/j.artres.2017.10.070>

Published online: 7 December 2019

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.

P38

ASCENDING AORTA DIMENSIONS AND CLINIC AND 24 HOURS BLOOD PRESSURE IN A GENERAL POPULATION IN NORTHERN ITALY: THE VOBARNO STUDY

Anna Painsi, Massimo Salvetti, Fabio Bertacchini, Deborah Stassaldi, Claudia Agabiti Rosei, Carlo Aggiusti, Giulia Rubagotti, Giulia Maruelli, Chiara Arnoldi, Enrico Agabiti Rosei, Maria Lorenza Muesan
University of Brescia, Italy

Background: Epidemiological studies have suggested that even mild enlargement of the ascending aorta may have independent prognostic significance for cardiovascular events.

Therefore, some Authors have proposed that dilatation of the ascending aorta could be considered as a form of preclinical vascular damage in hypertensive patients.

Aim: To assess the correlation between clinic and 24 hours BP values and the dimensions of the aorta, measured at level of the sinuses of Valsalva (Val), at the left ventricular outflow tract (LVOT), and at the level of the proximal ascending aorta (AscAo) in subjects from a general population.

Methods: 250 subjects (43% males, mean age 56 ± 4 years, 42% hypertensives-HT) underwent laboratory examinations, clinic and 24 hours BP measurement, cardiac and carotid ultrasound, carotid-femoral pulse wave velocity measurement (AoPWV).

Results: aortic diameters were greater HT as compared to NT (Val: 3.41 ± 0.54 vs 3.25 ± 0.41 cm, LVOT 2.10 ± 0.28 vs 2.04 ± 0.26 , AscAo 3.39 ± 0.45 vs 3.18 ± 0.38 , all $p < 0.05$). Aortic diameters were all correlated to clinic and 24 hours BP values. The coefficients of correlation were greater for 24 hours BP (Tab). Val, AscAo, LVOT were also significantly correlated with left ventricular mass ($r = 0.61$, $r = 0.48$, and $r = 0.43$, all $p < 0.001$), mean max intima media thickness ($r = 0.13$, $r = 0.24$, and $r = 0.13$, all $p < 0.05$) and with AoPWV ($r = 0.16$, $p < 0.05$, $r = 0.28$ $p < 0.001$, $r = 0.08$ $p = ns$).

	Ao Valsalva		Asc		LVOT	
	r	p	r	p	r	p
SBP	0.148*	0.019	0.161*	0.016	0.135*	0.037
DBP	0.253**	0.0001	0.223**	0.001	0.189**	0.003
MBP	0.220**	0.0001	0.175**	0.006	0.208**	0.002
PP	–0.046	0.470	0.004	0.948	0.003	0.968
HR	–0.005	0.933	–0.028	0.687	–0.004	0.949
SBP 24 hrs	0.231**	0.0001	0.162*	0.017	0.108	0.097
DBP 24 hrs	0.346**	0.0001	0.264**	0.0001	0.234**	0.0001
MBP 24 hrs	0.267**	0.0001	0.214**	0.002	0.164*	0.011
PP 24 hrs	–0.003	0.962	–0.031	0.645	–0.082	0.209
HR 24 hrs	–0.058	0.370	–0.051	0.454	–0.026	0.687

Conclusions: The dimensions of the proximal ascending aorta are significantly related to BP values in normotensive subjects and in hypertensive patients. Aortic dimension are more strictly related to twenty-four hours BP values than to clinic BP values. In this sample of general population, a significant correlation between aortic dimensions and measures of cardiac and vascular organ damage was also observed, confirming the parallelism between different forms of organ damage.

P39

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

Wenyi Yang¹, Ljupcho Efremov¹, Zhen-Yu Zhang¹, Nicholas Cauwenberghs¹, Lutgarde Thijs¹, Fang-Fei Wei¹, Qi-Fang Huang¹, Blerim Mujaj¹, Aernout Lutttun², Peter Verhamme², Tatiana Kuznetsova¹, Jan Staessen¹
¹Studies Coordinating Centre, Research Unit Hypertension and Cardiovascular Epidemiology, KU Leuven Department of Cardiovascular Sciences, Faculty of Medicine, University of Leuven, Leuven, Belgium
²Centre for Molecular and Vascular Biology, KU Leuven Department of Cardiovascular Sciences, Faculty of Medicine, University of Leuven, Leuven, Belgium

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 Vingmed, 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 ($P \leq 0.020$) 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 ($P \leq 0.038$) with central than peripheral diastolic BP for left atrial volume index ($+0.289$ ml/m²), e' (-0.123 cm/s) and E/e' ($+0.094$). Ejection fraction and global longitudinal strain were similarly associated with central and peripheral systolic ($P \geq 0.62$) and diastolic ($P \geq 0.18$) BP.

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.

P40

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

F. A. Kirkham¹, C. Mills², K. Nambiar^{1,3}, J. Timeyin¹, K. A. Davies^{1,3}, F. Kern³, J. K. Cruickshank², C. Rajkumar^{1,3}

¹Brighton and Sussex University Hospital Trust, East Sussex, UK

²Guys and St Thomas' Hospital, King's College and King's Health Partners, UK

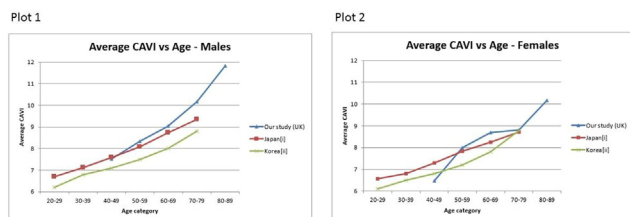
³Brighton and Sussex Medical School, University of Sussex, UK

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 $\pm$ 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 ($r = 0.63$, $p < 0.001$), 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.

Table	
Age category (years)	CAVI mean (SD)
<40	6.83 (0.76)
40–49	7.22 (0.86)
50–59	8.20(1.29)
60–69	8.87 (1.24)
70–79	9.60 (1.36)
80–89	11.11 (1.60)



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

- [1] Namekata et al. Establishing baseline criteria of cardio-ankle vascular index as a new indicator of arteriosclerosis: a cross-sectional study, *BMC Cardiovascular Disorders* 2011, 11:51
- [2] Choi SY et al. Age associated increase in arterial stiffness measured according to the cardio-ankle vascular index without blood pressure changes in healthy adults. *Journal of Atherosclerosis and Thrombosis*. Vol. 20 (2013) No. 12. p. 911–923

P41

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

Fabio Bertacchini, Massimo Salvetti, Anna Paini, Giulia Rubagotti, Deborah Stassaldi, Carlo Aggiusti, Giulia Maruelli, Chiara Arnoldi, Giovanni Saccà, Enrico Agabiti Rosei, Maria Lorenza Muesan
University of Brescia, Italy

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 = MEE/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, 69% 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

(?) analysis MEEI remained independently related to male gender ($\beta = 0.16$, $p < 0.001$), BMI ($\beta = -0.13$, $p < 0.005$), RWT ($\beta = -0.56$, $p < 0.001$) and PWV ($\beta = -0.10$, $p < 0.05$).

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.

P42

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

Stefano Omboni¹, Igor N. Posokhov², Gianfranco Parati^{3,4}, Vitaliy S. Barkan⁵, Ernesto Cardona Muñoz⁶, Elena A. Grigorieva⁷, Irina E. Minyukhina⁸, Maria Lorenza Muesan⁹, Giuseppe Mulè¹⁰, Iana A. Orlova¹¹, Telmo Pereira¹²

¹Clinical Research Unit, Italian Institute of Telemedicine, Varese, Italy

²Hemodynamic Laboratory Ltd, Nizhny Novgorod, Russian Federation

³Department of Cardiology, Istituto Auxologico Italiano, Milan, Italy

⁴Department of Medicine and Surgery, University of Milano-Bicocca, Milan, Italy

⁵Diagnostics Department, The Hospital within the Russian Railroad Network, Chita, Russian Federation

⁶University of Guadalajara, Dept. of Physiology, Guadalajara, Mexico

⁷South Ural State Medical University, Chelyabinsk, Russian Federation

⁸Volga District Medical Center, Nizhny Novgorod, Russian Federation

⁹Dipartimento di Scienze Mediche e Chirurgiche, Università di Brescia, Medicina 2, Spedali Civili, Brescia, Italy

¹⁰Unità Operativa di Nefrologia ed Ipertensione, Centro di Riferimento Regionale per l'Ipertensione Arteriosa, Policlinico Paolo Giaccone, Palermo, Italy

¹¹Lomonosov Moscow State University Clinic, State University, Moscow, Russian Federation

¹²Escola Superior de Tecnologia da Saúde de Coimbra, Instituto Politécnico de Coimbra, Coimbra, Portugal

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 (Alx).

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 Alx 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 SBP variability and arterial stiffness, whereas age, SBP variability and Alx were significantly associated with CC. In the multivariate analysis, including all ●●● variables entered in the bivariate model, adjusted by sex, statistically significant ($p < 0.001$) association was observed for aSBP and age with LVMI (standardized regression coefficient 0.25 and 0.18, respectively), and for age with IMT (0.56) and CC (−0.53).

Correlation coefficients	LVMI (g/m ²)	IMT (mm)	CC (ml/min)
Age (years)	0.25***	0.56**	−0.53**
bSBP (mmHg)	0.23***	0.24**	−0.01
aSBP (mmHg)	0.28***	0.26**	−0.05
SD bSBP (mmHg)	0.01	0.24**	−0.19*
PWV (m/s)	0.09	0.17*	−0.14
Al (%)	0.07	0.22**	−0.18*

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