# P41: MYOCARDIAL MECHANOENERGETIC EFFICIENCY INDEX (MMEI) AND ARTERIAL STIFFNESS: ASSOCIATION IN A GENERAL POPULATION IN NORTHER ITALY
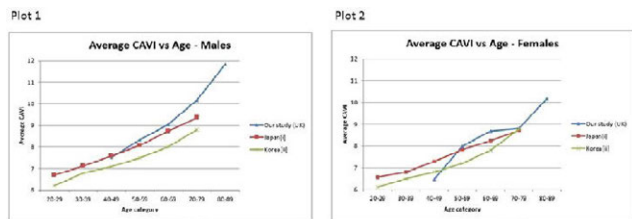
Fabio Bertacchini, Massimo Salvetti, Anna Paini, Giulia Rubagotti, Deborah Stassaldi, Carlo Aggiusti, Giulia Maruelli, Chiara Arnoldi, Giovanni Saccà, Enrico Agabiti Rosei, Maria Lorenza Muiesan

**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) |



Plot 1 — Average CAVI vs Age - Males

Plot 2 — Average CAVI vs Age - Females

**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 (MMEI) AND ARTERIAL STIFFNESS: ASSOCIATION IN A GENERAL POPULATION IN NORTHER 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 = 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 $58 \pm 10$ years, a BMI of $26 \pm 4$, 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**

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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 $53 \pm 15$, 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 SBP variability and arterial stiffness, whereas age, SBP variability and AIx 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 |
| AI (%) | 0.07 | 0.22** | −0.18* |

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