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P4.13: HERITABILITY AND OTHER DETERMINANTS OF LEFT VENTRICULAR DIASTOLIC FUNCTION IN THE FAMILY-BASED POPULATION STUDY

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Conclusions: Short-term variability of systolic blood pressure shows an independent relation to aortic stiffness in general population. Our study confirms that those parameters are closely related.

P4.11

ENDOTHELIAL DYSFUNCTION IN URBANIZED AFRICANS WITH LOW PLASMA RENIN LEVELS: THE SABPA STUDY

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Background and objectives: It is known that high renin levels could damage the vasculature and may cause retinal detachment, stroke, heart failure and kidney failure. The objective of this part of the SABPA study was to determine if renin levels in low and high renin participants could contribute to endothelial dysfunction.

Methods: This part of the SABPA study consisted of 113 black urbanized Africans (men and women) from the same socio-economic status (school teachers) from South Africa. The participants were stratified into low (<6.18 pg/ml) and high (≥6.18 pg/ml) renin levels. Blood pressure and other variables were determined with known methods. Active renin levels were determined with a radio-immunometric assay (Renin III Generation, CIS bio-international, Cedex, France). The Von Willebrand Factor (vWF) was analysed with ELISA assay. (DAKO, SA). A calorimetric method were used for urine creatinine and a turbidimetric method for albumin measurement.

Results: In single regression analysis, renin levels associated negatively with the Von Willebrand Factor ($r = -0.3756$; $p = 0.016$) only in the low renin African men. With partial regression analysis after adjustment for age and BMI, the association remained. Renin levels also associated negatively ($r = -0.4846$; $p = 0.002$) with systolic blood pressure only in low renin men. No associations could be encountered with markers of inflammation (IL-6; CRP and TNF- α) as well as stiffness.

Conclusion: The results revealed that renin causing endothelial dysfunction in low renin African men and may lead to high blood pressure in later life.

P4.12

REFERENCE VALUES OF CENTRAL BLOOD PRESSURE IN ADULTS USING A VALIDATED NON-INVASIVE OSCILLOMETRIC METHOD

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Central systolic pressure (csBP) is strongly correlated with cardiovascular outcomes than brachial pressure. However, until recently there weren't widely accepted reference values of csBP established yet. The aim of this work was to determine this missing values of csBP assessed by oscillometric method. Patients and methods: csBP was assessed in apparently healthy, asymptomatic patient population using an invasively validated oscillometric device (TensioMed Arteriograph). The collected database was divided into age decades in order to determine the age-specific reference values. Statistical analysis was carried out with IBM SPSS 20 statistical software. Results: 9076 normotensive subject aged 18-90 years (3749 male and 5327 female) without any medication were included into the analysis. Mean csBP values were determined (109.26 ± 7.92 mmHg, 109.45 ± 9.09 mmHg, 112.01 ± 9.69 mmHg, 115.88 ± 10.47 mmHg, 119.23 ± 10.56 mmHg, 121.04 ± 10.9 mmHg, 122.65 ± 11.27 mmHg and 122.65 ± 11.96 mmHg from the age of 18 to 90, respectively). Conclusions: This is the first study providing large number of csBP values measured with arteriograph derived from a healthy general population including wide range of age. Our results suggest that csBP values are highly dependent on age, therefore these results might serve as age-specific reference values for oscillometrically measured csBP.

P4.13

HERITABILITY AND OTHER DETERMINANTS OF LEFT VENTRICULAR DIASTOLIC FUNCTION IN THE FAMILY-BASED POPULATION STUDY

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Background: Understanding to what extent genetic factors influence diastolic Doppler indexes is an important issue in view of the relation of left ventricular (LV) diastolic dysfunction with outcome. We, therefore, investigated in nuclear families recruited from the general population the heritability of LV diastolic traits and the composite diastolic score.

Methods and results: A random sample of 316 nuclear families (452 parents and 600 offspring, mean age, 58.5 and 33.3 years) was recruited in Belgium, Poland, Italy and Russia. We measured transmitral early and late diastolic velocities (E and A) by pulsed wave Doppler, and mitral annular velocities (E' and A') by tissue Doppler. Using principle component analysis, we summarized 5 Doppler indexes – namely, E, A, E' and A' velocities, and E/E' – into a single diastolic score. To calculate the heritability of diastolic indexes, we used (1) the regression slope of offspring on mid-parent residual values, (2) variance decomposition in siblings. The parent-offspring concordances of all diastolic indexes were significant and ranged from 0.17 for A ($P = 0.009$) to 0.42 for E' ($P < 0.0001$). In variance decomposition analyses in sibships, the abovementioned traits with adjustment for covariables had moderate heritability in a range of 0.12–0.31 ($P \leq 0.01$). Among the parent-offspring pairs and sibships, the heritability estimates of the composite diastolic score were 0.39 and 0.27, respectively ($P < 0.0001$).

Conclusions: Our study demonstrated moderate heritability of various indexes reflecting LV diastolic function in nuclear families. The observation highlights the necessity of further research into the genes that affect LV diastolic function.

P4.14

PREVALENCE OF DIASTOLIC LEFT VENTRICULAR DYSFUNCTION IN EUROPEAN POPULATIONS BASED ON CROSS-VALIDATED DIAGNOSTIC THRESHOLDS

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Objective: Different diagnostic criteria limit comparisons between populations in the prevalence of diastolic left ventricular (LV) dysfunction. We aimed to compare across populations age-specific echocardiographic criteria for diastolic LV dysfunction as well as their correlates and prevalence.

Methods: We measured the E and A peaks of transmitral blood flow by pulsed wave Doppler and the e' and a' peaks of mitral annular velocities by tissue Doppler imaging (TDI) in 2 cohorts randomly recruited in Belgium ($n = 782$; 51.4% women; mean age, 51.1 years) and in Italy, Poland and Russia ($n = 476$; 55.7%; 44.5 years).

Results: In stepwise regression, the multivariable-adjusted correlates of the transmitral and TDI diastolic indexes were similar in the 2 cohorts and included sex, age, body mass index, blood pressure and heart rate. Similarly, cutoff limits for the E/A ratio (2.5th percentile) and E/e' ratio (97.5th percentile) in 338 and 185 reference subjects free from cardiovascular risk factors respectively selected from both cohorts were consistent within 0.02 and 0.26 units (median across 5 age groups). The rounded 2.5th percentile of the E/A ratio decreased by ~0.10 per age decade in these apparently healthy subjects. The reference subsample provided age-specific cut-off limits for normal E/A and E/e' ratios. In the 2 cohorts combined, diastolic dysfunction groups 1 (impaired relaxation), 2 (possible elevated LV filling pressure) and 3.

Conclusion: The age-specific criteria for diastolic LV dysfunction were highly consistent across populations with an age-standardized prevalence of 22.4% vs. 25.1% ($P = 0.09$).