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P13.09: REGIONAL AORTIC PULSE WAVE VELOCITY VERSUS LEFT VENTRICULAR MASS IN CLASSIFYING CARDIOVASCULAR RISK DIFFERENCES; A MAGNETIC RESONANCE STUDY

M. Rezai, B. Cowan, A. Young, N. Sherratt, J.D. Finn, F.C. Wu, J.K. Cruickshank

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age is less than vascular age and delta "+" (n=40), when chronological age is higher than vascular age.

We used ultrasound images of carotid arteries for assessing IMT and carotid plaques; computer sphygmography for assessing PWV. "Vascular age" was calculated by using multivariable sex-specific risk factor algorithm, formulated by D'Agostino et al in 2008, which incorporates age, total and HDL cholesterol, systolic BP, use of antihypertensive medication, smoking and diabetes status.

Results: Results showed that vascular age was higher than chronological age in all groups, especially in group "with AG" (p=0,00001)(figure1). The statistical data of "delta" - median" 7,0; low quartile (-13); upper (-2), which means that the largest difference of vascular age from chronological age was 13 year. The PWV, IMT, common plaque levels were not significantly different in two groups. The correlations between both ages (chronological and vascular) and PWV(p=0,001), IMT (p=0,0003), common plaque level (p=0,0001) were almost the same (table 1).

Conclusions: Vascular age is associated with markers of subclinical atherosclerosis at the same weak level as chronological age.

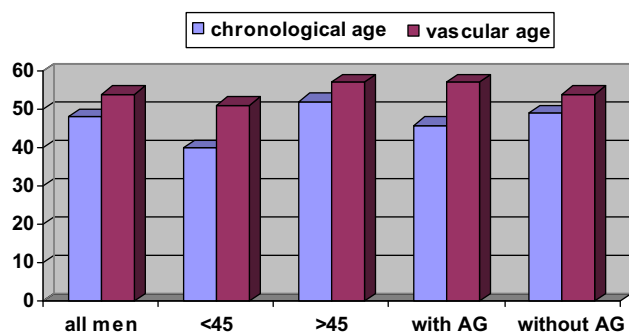


Figure 1 Comparison between chronological and vascular ages in different groups.

Table 1 Spearman Correlations Coefficient between measured study variables and vascular, chronological ages.

№	Parameters	Chronological age (y)		Vascular age (y)	
		R	p	R	p
1	PWV(sm/c)	0,29	0,001	0,25	0,006
2	IMT(mm)	0,34	0,00004	0,30	0,0003
3	Total plaque (%)	0,53	0,0001	0,56	0,0001

p<0,05- significant correlation; R- level of rank correlation.

P13.07

SEVERITY OF VASCULAR DISEASE IN UNCONTROLLED HYPERTENSIVES: ARE TWO SIDES OF A COIN?

P. Forcada¹, D. Olano², S. Gpnzalez¹, S. Obregon¹, J. Chiabaut Svane¹, E. Cavanagh², F. Inserra², C. Kotliar¹

¹Hospital Universitario Austral, Pilar, Argentina

²Universidad Austral, Pilar, Argentina

Introduction: Uncontrolled blood pressure (UBP) is associated with higher risk of target organ damage and CV events. A severe subclinical impairment of vascular function and structure should be expected in this situation but, currently this has not been analyzed.

Objective: To determine the pattern of vascular damage in UBP p.

Methods: We screened 3277 p. derived for non-invasive vascular evaluation (NIVE) (Dec 2006/Dec 2009). After applying exclusion criteria (age >65; diabetes mellitus, secondary HTN, previous CV events/secondary prevention) 1503 hypertensives were included and classified according BP values as UB (≥140/90 mm Hg) or controlled (CBP)(<140/90 mm Hg). (ESH 2007) NIVE comprised: IMT; PWV and FMD; atherosclerotic plaque (AP) characterization; Aortic and Peripheral pulse pressure(CPP and PPP) and Augmentation indexes (CAix and PAix).

Results: UB were 729 p. (47 y.o.; 63% males; 153/96 ± 14/8mm Hg, 69 ± 11 bpm) and CBP 774p. (48.9 years old; 70% males; 124/78 ± 8/6 mm Hg, 66 ± 10 bpm).

UBP patients showed: >IMT (LCC 0,71 ± 0,2 vs 0,68 ± 0,2mm), >PPP (57 ± 12 vs 46 ± 7 mmHg), >CPP (58 ± 16 vs 43 ± 12 mmHg), >PAix (0.9 ± 32 vs -11 ± 32 %) and PWV (11 ± 3 vs 10 ± 2 m/s)(p< 0.5 for all). CPP/ PPP relation was inverted in UB group.

Conclusions: UB was associated with moderate to severe subclinical vascular disease in this large population but it is not clear if UB is rather a consequence than a cause of subclinical vascular disease.

P13.08

CAROTID INTIMA-MEDIA THICKNESS CORRELATION WITH THE NEW ARTERIAL WALL PARAMETERS IN HIGH CARDIOVASCULAR RISK PATIENTS

J. Badariene, D. Jatuzis, K. Ryliskiene, L. Ryliskyte, V. Dzenkeviciute, J. Kuzmickiene, A. Cypiene, Z. Petrulioniene, A. Laucevicius
Vilnius University Hospital Santariskiu Klinikos, Vilnius, Lithuania

Introduction: Increased carotid intima-media thickness (IMT), as early sign of atherosclerosis, closely correlates with traditional risk factors: increased cholesterol level, high blood pressure (BP), age, metabolic syndrome. The aim of our study was to evaluate the relationship between IMT and other arterial wall parameters.

Methods: Consecutive high cardiovascular risk patients aged from 50 to 55 were investigated at the Vilnius University Hospital, including detailed assessment of cardiovascular risk factors, serum lipid profile, C-reactive protein (CRP). Carotid IMT and carotid stiffness were measured by echo-tracking with ART.LAB system. Aortic and brachial pulse wave velocity (aPWV and bPWV), heart rate adjusted aortic augmentation index (AIx/HR) were evaluated by applanation tonometry with SphygmoCor. Endothelial function in brachial artery was assessed by calculating the flow mediated dilatation (FMD). Correlations between IMT and other arterial wall parameters were estimated.

Results: 860 patients (mean age±SD 52.63±1.58; 536 (62.3%) females) were analyzed. There was only a very weak correlation between IMT and femoral PWV (r=0.094; p=0.049) in the whole group. IMT did not correlate with arterial wall parameters in female group, however, IMT correlated with AIx/HR in male group (r=0.190; p=0.004). Significant but relatively weak IMT correlations with age (r=0.079; p=0.024), BMI (r=0.134 ; p<0.001), systolic BP (r=0.122; p=0.001), diastolic BP (r=0,106; p=0,003), HDL-Ch (r=-0.143 ; p<0.001), CRP (r=0.089 ; p=0.013) were observed without impact of gender. Regression models showed that IMT may not be predicted by PWV, AIx/HR, FMD.

Conclusions: Carotid IMT has a weak correlation with the new arterial measures in high cardiovascular risk patients.

P13.09

REGIONAL AORTIC PULSE WAVE VELOCITY VERSUS LEFT VENTRICULAR MASS IN CLASSIFYING CARDIOVASCULAR RISK DIFFERENCES; A MAGNETIC RESONANCE STUDY

M. Rezaei¹, B. Cowan³, A. Young³, N. Sherratt⁴, J. D. Finn², F. C. Wu², J. K. Cruickshank¹

¹Cardiovascular Research Group, University of Manchester, Manchester, United Kingdom

²Department of Medicine, Manchester Royal Infirmary, Manchester, United Kingdom

³Auckland MRI Research Group, University of Auckland, Auckland, New Zealand

⁴Wellcome Trust Clinical Research Facility, Manchester, United Kingdom

Background: Compared with Europeans, South Asians (SA) suffer from excess coronary disease (CHD) while African-Caribbeans (AfC) have less CHD despite greater hypertension/stroke. Underlying arterial function differences are unclear.

Aim: To compare aortic pulse wave velocity (aPWV), and left ventricular mass index (LVMI), both strong, independent predictors of outcomes, in describing cross-ethnic CHD risk difference.

Methods: Magnetic resonance (MR) imaging was used to measure LVMI, and aPWV in the arch (aPWVarch) and descending aorta to bifurcation (aPWVdes) in 50 asymptomatic medication-free community-sampled AfC (n=17, age: 52.2±6yr), SA (15, 52.1±6) and European (18, 53.5±6) men recruited to the European Male Ageing Study. Central systolic blood pressure (BP) was measured using the Arteriograph device on the left arm, supine.

Results: Mean±SE of LVMI (g/m²) was lower in SA (65±2) than in AfC (74±2, p=0.005) and European (71±2, p=0.047) group adjusted for age, systolic blood pressure (SBP) and heart rate (HR); R²=0.45.

aPWVdes (m/s) was higher in SA (7.2 ± 0.3) than AfC (6.2 ± 0.3) or Europeans (6.1 ± 0.3) after adjusting for age and SBP ($R^2=0.42$). aPWVarch (m/s) did not differ significantly; AfC: 8.3 ± 0.5 , SA 7.8 ± 0.5 and Europeans: 7.3 ± 0.5 , in a similar regression model. Substituting central BPs did not alter these results. Central systolic and pulse pressures (mmHg) were not significantly different in AfC (127 ± 4 , 45 ± 2), SA (128 ± 5 , 47 ± 3) and Europeans (125 ± 4 , 45 ± 2), respectively adjusting for age and HR.

Conclusions: aPWVdes described cross-ethnic CHD risk differences better than LVMI and central pressures. aPWVarch, although not significantly different here, may predict stroke risk best in larger samples.

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P14.01

ARTERIAL STIFFNESS IN HEALTHY YOUNG PEOPLE: INFLUENCE OF AGE, GENDER, BLOOD PRESSURE AND ANTHROPOMETRIC PARAMETERS

A. Yagensky¹, V. Yagensky², S. Indyka¹, I. Savchuk¹, H. Yagenska²

¹Lutsk City Hospital, Lutsk, Ukraine

²Lutsk Gymnasium 21, Lutsk, Ukraine

Increased arterial stiffness assessed using pulse wave velocity (PWV) measurements is a predictor of cardiovascular risk in adults. There are limited data on PWV and its determinants in young people.

Objective: To compare PWV and its association with gender, blood pressure (BP) and anthropometric parameters in healthy high school and university students.

Methods: First group - 42 high school students (22 males) 14-15 years (14.8 ± 0.3 years), the second group - 38 university students (18 males) aged 17-21 years (18.8 ± 1.1 years). To study velocities in elastic (Ve) and muscular (Vm) arteries sphygmomanometry was performed on carotid, femoral and radial arteries.

Results: Older students had higher BMI 22.2 ± 2.8 vs 20.06 ± 2.05 kg/m²; $p=0.002$ and trend to higher systolic BP (126.2 ± 16.6 vs 119.6 ± 10.2 mm Hg; $p=0.07$) No difference between groups in Vm was found (7.28 ± 1.18 m/s in 1st group; 7.09 ± 1.14 m/s in 2nd). Ve was higher in older group (6.24 ± 1.06 vs 5.57 ± 0.67 m/s in younger group; $p=0.001$). No gender difference was found in Ve or Vm in either group. Correlation analysis performed jointly in both groups revealed that Ve significantly correlated with age ($r=0.26$), body mass index (BMI) ($r=0.34$), systolic ($r=0.29$), diastolic ($r=0.30$) and mean BP ($r=0.33$). Vm correlated only with height ($r=0.28$). Pulse BP did not correlated with Ve no Vm. Multiple regression found only BMI as independent factor associated with Ve ($\beta=0.27$; $p=0.04$).

Conclusions: Elastic type arteries stiffness is increased with age in young people with no gender difference. It depends on BP levels and BMI. The main determinant of Ve is BMI.

P14.02

SLOW BREATHING AND FINGER ARTERY COMPLIANCE

N. Potocnik, K. Cankar, Z. Melik, V. Starc

Institute of Physiology, Medical faculty, University of Ljubljana, Ljubljana, Slovenia

It is known that 0,1Hz paced breathing reduces blood pressure, but the mechanisms involved in this phenomenon are not completely clear. The aim of our study was to evaluate the changes of finger artery compliance associated with this breathing pattern.

We measured ECG, arterial pressure and finger artery compliance in 21 young adults at rest and during slow breathing. Values obtained were compared by paired t-test. The finger artery compliance measurements based on the comparison of two oscilometric signals, one from Finapres and another from the cuff attached to the middle finger of the same hand, measuring the finger volume changes. A spectral analysis of R-R intervals was done by autoregression method to determine the changes of autonomic tone during slow breathing. We determined the area under the power spectrum curves over high frequency (HF) band (0.15-0.4 Hz), low frequency (LF) band (0.04-0.15 Hz) and very low frequency (VLF) band (<0.04 Hz).

Our results show that finger artery compliance decreased (from 1.04 ± 0.12 to 0.50 ± 0.06), HF component of HRV decreased (from 58.62 ± 5.31 to 26.59 ± 3.81) and percent of LF component increased (from 38.15 ± 4.23 to 69.58 ± 3.43) during slow breathing. All differences were statistically significant ($p<0.001$). Our results unexpectedly showed that sympathetic tone increased during slow breathing. This could be the reason for diminished finger artery compliance in our experimental settings. We suspect that paced breathing acted as stressor agent on persons not familiar with such breathing. Further investigation should be done to clarify this question.

P14.03

IS THERE A SHIFT OF THE REFLECTION POINT FROM PERIPHERAL TO CENTRAL ARTERIES WITH AGE IN HYPERTENSIVE PATIENTS?

P. Forcada¹, D. Olano², S. Gonzalez¹, S. Obregon¹, J. Chiavaut Svane¹, C. Castelaró¹, E. Cavanagh², F. Inserra², C. Kotliar¹

¹Hospital Universitario Austral, Pilar, Argentina

²Universidad Austral, Pilar, Argentina

Introduction: Stiffening of arteries with age has been extensively described but this process has not been fully characterized at different levels of the arterial tree.

Aim: To evaluate the behavior of arterial function parameters according to age.

Methods: We screened 3277 p. derived for non-invasive vascular evaluation (NIVE) (Dec 2006/Dec 2009). NIVE comprised: IMT; PWV and FMD; atherosclerotic plaque (AP) characterization; Aortic and Peripheral pulse pressure (CPP and PPP) and Augmentation indexes (CAix and PAix). After applying exclusion criteria (age >65 ; diabetes mellitus, secondary HTN, previous CV events/secondary prevention) and the availability of data of PWV, CAix and PAix 1503 p. were included and analyzed according age (from 20 to 80 years old in deciles).

Results: We observed a progressive increase of all the arterial parameters with age (from 20 to 80 y.o.): PWV (8.8 ± 2 to 14 ± 4 m/sec), CPP (from 43 ± 15 to 59 ± 17 mmHg), PPP (from 49 ± 12 to 58 ± 13 mmHg), CAix (from 12 to 36%) and PAix (from -40% to 13%).

In the 50th decade a cross of values of PP (Central $>$ Peripheral) and increase of PAix was observed suggesting a shift of the reflection point from peripheral to central arteries.

Conclusions: The stiffening of central arteries with age is associated with a progressive shift of the reflection point from peripheral to the central arteries and the loss of the pulse amplification in peripheral arteries.

P14.04

THE ENDOTHELIAL FUNCTION AND THE INTIMAL-MEDIAL THICKNESS IN PATIENTS WITH CORONARY ARTERY DISEASE WITH THE METABOLIC SYNDROME

K. Yanovska

Institute of Cardiology, Kyiv, Ukraine

Aims: To learn endothelial function and intimal-medial thickness in patients with coronary artery disease and metabolic syndrome depending on the presence of the diabetes. 100 patients with CAD, MS, which made two clinical groups: 1-st group (n=47) from CAD, MS and DT II; 2-nd group (n=53) from CAD, MS without type II diabetes were examined. All patients were determined: anthropometric data, levels of glucose, lipids profile, measuring of IMT carotid artery, endothelial function of brachial artery. As a result complex intimal-medial and endothelial function in patients with CAD, MS and diabetes the IMT were higher than in the groups of patients with CAD, MS without diabetes. The positive correlation between descriptions of IMT and levels of cholesterol ($r=0.68$, $p<0.001$), LDL-cholesterol ($r=0.69$, $p<0.001$) in patients at the 1-st group was found, in this group there was negative correlation between the lipid profile and endothelial function (cholesterol $r=-0.53$, $p<0.001$, LDL-cholesterol $r=-0.55$, $p<0.001$). In patients with CAD, MS without diabetes the faint direct correlation between the levels of cholesterol ($r=-0.14$, $p<0.001$), LDL-cholesterol ($r=0.17$, $p<0.001$) and IMT. In this group found the negative correlation between the endothelial function and levels of cholesterol ($r=-0.77$, $p<0.001$), LDL-cholesterol ($r=-0.74$, $p<0.001$). The diabetes in patients with CAD and MS associate with the increase IMT, which have close positive connection with the level of cholesterol and LDL-cholesterol. Functional changes of endothelial function have negative correlation with the lipid profile.

P14.05

VASCULAR AGING INDICES IN THE DISCRIMINATION OF PREMATURE CORONARY ARTERY DISEASE IN SOUTH ASIANS

J. V. Patel^{1,2}, P. Nikomanis¹, G. Dwivedi^{1,2}, E. A. Hughes^{1,2},

G. Y. H. Lip^{1,2}, S. Dwivedi³, P. S. Gill¹

¹University of Birmingham, Birmingham, United Kingdom

²Sandwell and West Birmingham Hospitals NHS Trust, Sandwell, United Kingdom

³University of Delhi, Delhi, India

South Asian populations have a greater prevalence and earlier presentation of coronary artery disease (CAD) than populations from most other countries. The CAD risk profile common to South Asians (particularly those with early CAD) is devoid of many factors common to White populations of