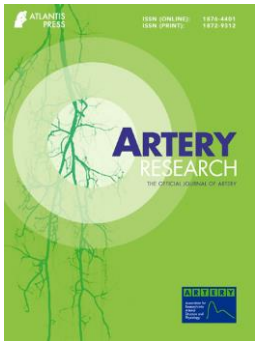

Artery Research

ISSN (Online): 1876-4401 ISSN (Print): 1872-9312
Journal Home Page: https://www.atlantis-press.com/journals/artres

P3.11: ETHNIC DIFFERENCES IN ARTERIAL WAVEFORM MEASURES IN A LARGE SAMPLE OF ADULTS ENROLLED IN THE VITAMIN D ASSESSMENT (VIDA) STUDY

J. Sluyter, A. Hughes, S. Thom, K. Parker, A. Lowe, R. Scragg

To cite this article: J. Sluyter, A. Hughes, S. Thom, K. Parker, A. Lowe, R. Scragg (2013) P3.11: ETHNIC DIFFERENCES IN ARTERIAL WAVEFORM MEASURES IN A LARGE SAMPLE OF ADULTS ENROLLED IN THE VITAMIN D ASSESSMENT (VIDA) STUDY, Artery Research 7:3_4, 129–130, DOI: https://doi.org/10.1016/j.artres.2013.10.099

To link to this article: https://doi.org/10.1016/j.artres.2013.10.099

Published online: 14 December 2019

indices, smoking and MetS components ($p<0.01$). In contrast, AGEs measured by skin autofluorescence were not associated neither with indices of insulin resistance ($r_{HOMA-IR}$ =-0.04, r_{QUICKI} =0.03) nor PWV (r=0.02). Subjects with impaired vs. normal glucose tolerance had higher PWV (9.33±1.54 vs. 8.67±1.54 m/s) and hsCRP (3.54±3.3 vs. 2.53±2.55 mg/L), but not AGEs (2.11±0.41 vs. 2.17±0.44).
Conclusions: In the middle-aged MetS subjects without diabetes hsCRP but not AGEs measured by skin autofluorescence are related to both altered glucose metabolism and arterial stiffening. Our finding suggests that in early stages of the cardiometabolic disorder prevailing determinant of arterial damage is inflammation, but not tissue glycation.

P3.09
STIFFER ARTERIES IN "HEALTHY" SUBJECTS WITH COMPONENTS OF THE METABOLIC SYNDROME

O. Mac Ananey, B. Mc Loughlin, I. Abuzaid, A. Leonard, P. Gaffney, G. Boran, V. Maher
Tallaght Hospital, Dublin, Ireland

Objectives: To compare indices of vascular stiffness and markers of adiposity and inflammation in "healthy" subjects with/without components of the metabolic syndrome (met-x).
Methods: Subjects satisfying ≥1 (≥1 Met-X;) and no criteria (0 Met-X) were recruited (IDF 2006). All were lifelong non-smokers, normotensive, normolipidaemic and normoglycaemic. Augmentation index (AIx) and pulse wave velocity (PWV) were measured using applanation tonometry (Sphygmacor & Vicorder). Fasting leptin, adiponectin, IL-6, TNFα & MCP-1 were measured. Unpaired students t-test and Fischer's exact test was used to detect differences.
Results: Anthropometric, metabolic and haemodynamic indices of the met-x syndrome were significantly higher in the ≥1 Met-X group ($p<0.0001$). AIx and PWV were higher in the ≥1 Met-X group. The adipose related hormones, leptin and adiponectin were higher and lower, respectively, in the ≥1 Met-X group but the pro-inflammatory markers, IL-6, TNFα & MCP-1 were not different (Table 1).

Table 1 Body fat composition, arterial stiffness and humoral adipose/pro-inflammatory markers in subjects with/without early signs of met-x. Results are mean±SD.

	0 Met-X criteria	≥1 Met-X criteria	*P*
n	91	106	
Age (years)	37±10	40±8 years	0.06
Body fat (%)	22.64±6.74	30.44±7.71	<0.0001
AIx (%)	12.83±13.60	19.28±13.34	<0.001
PWV ($m.s^{-1}$)	6.82±0.85	7.14±1.20	<0.05
Leptin ($pg.mL^{-1}.10^{-2}$)	100.39±73.44	168.93±123.94	<0.001
Adiponectin ($pg.mL^{-1}.10^{-2}$)	77.54±41.10	53.91±31.98	<0.001
IL-6 ($pg.ml^{-1}$)	1.59±0.96	2.08±3.01	0.27
TNFα ($pg.ml^{-1}$)	2.98±1.10	3.29±1.50	0.21
MCP-1 ($pg.ml^{-1}$)	214.26±96.85	204.51±80.15	0.55

Conclusion: Subjects with early met-x have stiffer arteries than those with normal metabolic function. These results suggest that premature arterial stiffening may be mediated via hormonal rather than inflammatory mechanisms.

P3.10
GENETIC FACTORS VS CARDIOVASCULAR RISK FACTORS. WHAT IS MORE SIGNIFICANT IN VASCULAR AGING?

A. S. Kruglikova, I. D. Strazhesko, E. V. Plokhova, V. S. Pyhtina, D. U. Akasheva, O. U. Isaykina, O. N. Tkacheva, S. A. Boytsov
National Research Center for Preventive Medicine, Moscow, Russian Federation

Objective: Telomere length (TL) has been identified as a marker for biological, cardiovascular aging and cardiovascular events risk. Increased arterial stiffness and intima-media thickness (IMT) are the main signs of arterial aging and strong predictors for the development of cardiovascular disease. But the origin of the association between cardiovascular events risk and telomere biology is still unknown. The aim of this study was to determine the role of telomere lenght (a largely inherited component) and conventional cardiovascular risk factors (CVRF) (a largely acquired component) in vascular aging process.
Design: The study group included 146 patients free from established cardiovascular diseases, mean age 51,34 ± 19,02 years. Smoking, arterial hypertension, obesity, dyslipidemia, high fasting glucose level were considered as CVRF.
Methods: TL was assessed by quantitative polymerase chain reaction. IMT was determined by ultrasonography in both left and right carotid arteries. Arterial stiffness was appreciated by aortic pulse wave velocity (PWV) measuring with the help of SphygmoCor (AtCor Medical).
Results are summarized in the table.

	PWV	IMT
TL	r = -0,2657	r = -0,1861
	p = 0,0096	p = 0,0618
CVFR	r = -0,0983	r = 0,2997
	p = 0,264	p = 0,0005

Conclusions: TL has strong correlation with PWV, but not IMT. Opposite, the presence of conventional CVRF are contribute to subclinical atherosclerosis, not arterial stiffness. Thus, age-related changes in the vascular wall has different causes and requires an individual approach to the prevention and treatment.

P3.11
ETHNIC DIFFERENCES IN ARTERIAL WAVEFORM MEASURES IN A LARGE SAMPLE OF ADULTS ENROLLED IN THE VITAMIN D ASSESSMENT (VIDA) STUDY

J. Sluyter [1], A. Hughes [2], S. Thom [2], K. Parker [2], A. Lowe [3], R. Scragg [1]
[1]*The University of Auckland, Auckland, New Zealand*
[2]*Imperial College London, London, United Kingdom*
[3]*Auckland University of Technology, Auckland, New Zealand*

Few studies have examined whether central arterial waveform measures vary with ethnicity. We aimed to provide a more comprehensive examination of ethnic differences in several cardiovascular risk factors, which may reveal new ethnic variations. A cross-sectional (baseline) analysis of 5110 adults (2971 M, 2139 F; age range, 50-84 years) from multiple ethnic groups (European/Other, Maori, Pacific, South Asian) participating in a New Zealand clinical trial of the effect of vitamin D supplementation (the ViDA study) on cardiovascular disease events was carried out. Peripheral blood pressure was measured with an Omron T9P oscillometric device. Arterial pressure waveforms were derived from suprasystolic brachial measurement using a Pulsecor R6.5 device, which previously has been shown to yield central pressure measurements highly correlated with those from aortic catheterisation. These were decomposed into forward- and backward-travelling waves and reservoir wave analysis was applied to derive reservoir and excess pressures. Compared to European/Other participants, those in the other three ethnic groups had significantly higher peripheral augmentation index

Table: Preliminary data from the ViDA study.

Measure	Mean (SE)* European/Other (n=2959)	Mean difference (SE)* from European/Other			P-value#
		Maori (n=194)	Pacific (n=254)	South Asian (n=139)	
Brachial BP (mmHg)					
Systolic	139.5 (0.4)	2.9 (1.4)	2.4 (1.2)	-2.1 (1.6)	0.019
Diastolic	76.9 (0.2)	2.0 (0.7)	0.7 (0.7)	-1.5 (0.9)	0.009
Peripheral augmentation Index %	100.6 (0.9)	8.8 (2.9)	3.2 (2.7)	5.8 (3.4)	0.009

*Adjusted for age, sex and BMI; # P-value for variation across all 4 ethnic groups.

after adjustment for age, sex and BMI (Table). Other ethnic differences in arterial waveform parameters and morphologies will be reported, including those derived from reservoir wave analysis. In conclusion, arterial function varies across ethnic groups. Longitudinal analyses will be carried out after 4 years follow-up to determine if arterial waveform measures predict cardiovascular disease incidence.
Funding: Health Research Council of New Zealand

P3.12
PULSE WAVE VELOCITY AND DIABETES DURATION IN TYPE 2 DIABETES MELLITUS

D. Agnoletti [1,2], S. Millasseau [3], A. Salah-Mansour [4], A. D. Protogerou [5], Y. Zhang [6], C. Borghi [2], J. Blacher [1], M. Safar [1]
[1]*Paris Descartes University, APHP Hotel Dieu, Diagnosis and therapeutic center, Paris, France*
[2]*dpt of internal Medicine, University of Bologna, Bologna, Italy*
[3]*Pulse Wave Consulting, Saint Leu la Foret, France*
[4]*Dpt of Internal Medicine or Tizi Ouzou Hospital, Tizi Ouzou, Algeria*
[5]*Dpt of Internal Medicine, Medical School, University of Maastricht, Maastricht, Netherlands*
[6]*Dpt of Cardiology, Shanghai Tenth People's Hospital, Tongji University School of Medicine, Shanghai, China*

Type 2 diabetes mellitus (T2DM) duration is related to early vascular aging and diabetic complications. Aortic stiffness is considered an integrated marker of the combined effect of cardiovascular risk factors, and could represent one of the links between diabetes and cardiovascular disease. To our knowledge, no study has been carried out to specially look at the relationship between aortic stiffness and T2DM duration. 618 patients (259 men) attending the Department of Internal Medicine of Tizi Ouzou Hospital (Algeria) underwent medical examination. Anthropometric, clinical and biological data were sampled; brachial blood pressure was measured, and aortic stiffness assessed from pulse wave velocity (PWV) was obtained. Diabetes duration collected from date of 1st diagnostic and analyzed by tertiles ($<$2 years; 2-9 years; $>$9 years). From lower to higher tertile of diabetes duration, age, brachial blood pressure and PWV increased, while diabetes control and renal function worsened (all $p<0.01$). After adjustment for age and blood pressure, microalbuminuria or insulin therapy, PWV was still higher in the higher duration tertile compare to the other 2. However the difference in PWV was negligeable after adjustment between the 2 lowest duration tertile. Diabetes duration is an important and independent determinant of PWV in type 2 diabetics. This is mainly true for higher durations, reflecting diabetes specific contributions to accelerated vascular stiffening. Furthermore, with aging, physiopathology of arterial stiffness involves other mechanisms that overwhelm diabetes duration.

P3.13
ASSOCIATIONS OF CENTRAL AND PERIPHERAL PULSE PRESSURE WITH HEART STRUCTURE, SYSTOLIC AND DIASTOLIC FUNCTION IN ADOLESCENCE: FINDINGS FROM A GENERAL POPULATION COHORT

D. L. Santos Ferreira [1], A. Fraser [1], L. D. Howe [1], S. Jones [2], R. Tapp [2], D. A. Lawlor [1], A. Ness [1], G. D. Smith [1], N. Chaturvedi [2], A. D. Hughes [2]
[1]*University of Bristol, Bristol, United Kingdom*
[2]*Imperial College London, London, United Kingdom*

Background: In adults central blood pressure has stronger associations with cardiovascular outcomes than peripheral blood pressure, with some evidence that this difference is greater in mid- than older-aged adults. The relationship of central blood pressure to cardiovascular structure and function in adolescence is unclear.
Aim: To compare associations of central and peripheral pulse pressure (PP) with cardiac structure and left ventricular function in a general population of adolescents.
Methods: 1,421 (17y; 45% males) participants in the Avon Longitudinal Study of Parents and Children had measurements of peripheral and central blood pressure using Omron705 IT and Sphygmocor devices and echocardiography using a HDI 5000 ultrasound system.
Results: Central to peripheral amplification was 21 mmHg (95% CI: 20, 21). Central and peripheral PP were positively associated with left ventricular mass index (LVMI), mitral E/A ratio, left atrial size and inversely associated with s′ even when adjusting for age, sex, DEXA determined fat mass and physical activity (Table 1); with consistently greater associations noted for cPP. Neither central nor peripheral PP were associated with relative wall thickness, midwall fractional shortening, ejection fraction e' or E/e′.
Conclusions: Central PP is more strongly associated with measures of cardiac structure and function than peripheral PP in adolescence. Previous studies are likely to have underestimated the effect of PP on cardiac structure and function in children and adolescents based on peripheral measurements.

P3.14 Withdrawn by author

P3.15
ARTERIAL STIFFNESS IN NON-HYPERTENSIVE GHANAIAN SUBJECTS WITH TYPE 2 DIABETES

K. Yeboah [1], A. G.B Amoah [2,3], D.A Antwi [1], B. Gyan [4], V. Govoni [5], J. K. Cruickshank [5]
[1]*Department of Physiology, University of Ghana Medical School, Accra, Ghana*
[2]*Department of Medicine and Therapeutics, University of Ghana Medical School, Accra, Ghana*
[3]*National Diabetes Management and Research Centre, Korle Bu Teaching Hospital, Korle Bu, Ghana*
[4]*Noguchi Memorial Institute for Medical Research, University of Ghana, Legon, Ghana*
[5]*King's College London, London, United Kingdom*

Background: Limited data exists on arterial stiffness in sub-Sahara Africa where diabetes and cardiovascular diseases are increasing rapidly. We aimed to compare the indices of arterial stiffness among type 2 diabetes (T2DM) and non-diabetes subjects (NDM), *without hypertension*, in Ghana.
Method: Thirty eight T2DM patients and 34 NDM volunteers (as screened by OGTT), between the ages of 40-70 years, were randomly recruited, with no history of antihypertensive medication and supine blood pressure (BP) $<$ 140/90 mmHg. Weight, height and waist circumference (WC) were measured. Indices of arterial stiffness, pulse wave velocity (PWV), aortic systolic blood pressure (ASBP), and aortic augmentation index (AAIx) were measured with Arteriograph (Tensiomed, Hungary) . The Cardio-Ankle Vascular Index (CAVI) & derived PWV were measured with the 4-cuff Vasera 1500 (Fukuda-Denshi, Tokyo, Japan) supine after 10 minutes rest in a temperature-controlled room.
Results: There was no difference in the gender distribution ($p=0.6$), mean age ($p=0.2$), BMI ($p=0.07$) and WC ($p=0.4$) between T2DM and NDM subjects. Also, mean ($\pm$SD) brachial systolic (124.9$\pm$9.6 vs. 121.9$\pm$10.0, $p=0.3$) and diastolic (74.3$\pm$7.6 vs. 71.22$\pm$9.7, $p=0.6$) BP did not differ between T2DM and NDM, respectively. However, T2DM subjects had slightly higher PWV (8.2$\pm$1.1 vs 7.1$\pm$0.98, $p=0.048$), CAVI (7.76$\pm$1.12 vs. 6.73$\pm$0.66, $p=0.042$, but lower AAIx (19.3$\pm$10.4 vs. 27.7$\pm$15.1, $p=0.02$), respectively. There was no difference in ASBP between T2DM and NDM subjects (116.7$\pm$11.7 vs. 117.5$\pm$12, $p=0.8$).
Conclusion: In the Ghanaian setting, T2DM may have a greater impact on indices of arterial stiffness in the absence of overt arterial hypertension.

P3.16
CARDIO ANKLE VASCULAR INDEX (CAVI) IS AN INDEPENDENT PREDICTOR OF CARDIOVASCULAR EVENTS IN 1000 PATIENTS

Satoh Yuta, Nagayama Daiji, Imamura Haruki, Ban Noriko, Kawana Hidetoshi, Nagumo Ayako, Yamaguchi Takashi, Ohira Masahiro, Saiki Atsuto, Shirai Kohji, Tatsuno Ichiro
Center of Diabetes, Endocrine, Metabolism, Sakura Hospital, Chiba, Japan

Objects: Recently, a novel arterial stiffness parameter called cardio-ankle vascular index (CAVI) has been developed. This study was conducted in order to elucidate the predictive value of CAVI for future cardiovascular events in 1000 persons.
Subjects and methods: A total of 1,000 outpatients (513 males and 487 females, mean age 63$\pm$11 years), who had the examination of CAVI between 2004 and 2006 at the center of diabetes, endocrinology and metabolism, Sakura hospital were included and followed up for 6.7$\pm$1.6 years. Those had diabetes mellitus (51.0%), hypertension (52.4%) or/and dyslipidemia (62.5%). CAVI was measured using Vasela1500 (Fukuda Denshi. Co.LTD).
Results: New-onset cardiovascular events were observed in 9.0%. In subjects with cardiovascular events, lower HDL-C and higher CAVI (9.9$\pm$2.0 vs. 9.2$\pm$1.6), mean age, prevalence of hypertension, diabetes and smoking were observed. COX regression model revealed that CAVI independently increased the risk of cardio vascular events with OR of 1.13 (95% CI 1.007-