



Artery Research

ISSN (Online): 1876-4401

ISSN (Print): 1872-9312

Journal Home Page: <https://www.atlantis-press.com/journals/artres>

P.014: AUGMENTATION INDEX IS A MORE PROMINENT PARAMETER AS COMPARED TO FLOW MEDIATED VASODILATATION FOR THE DETECTION OF ARTERIAL WALL DYSFUNCTION IN YOUNG WOMEN WITH SYSTEMIC LUPUS ERYTHEMATOSUS

A. Cypiene, A. Laucevicius, A. Venalis, J. Dadoniene, R. Rugiene, L. Ryliskyte, Z. Petrulioniene, M. Kovaite, V. Skorniakov

To cite this article: A. Cypiene, A. Laucevicius, A. Venalis, J. Dadoniene, R. Rugiene, L. Ryliskyte, Z. Petrulioniene, M. Kovaite, V. Skorniakov (2007) P.014: AUGMENTATION INDEX IS A MORE PROMINENT PARAMETER AS COMPARED TO FLOW MEDIATED VASODILATATION FOR THE DETECTION OF ARTERIAL WALL DYSFUNCTION IN YOUNG WOMEN WITH SYSTEMIC LUPUS ERYTHEMATOSUS, Artery Research 1:2, 56–56, DOI: <https://doi.org/10.1016/j.artres.2007.07.071>

To link to this article: <https://doi.org/10.1016/j.artres.2007.07.071>

Published online: 21 December 2019

including hypertrophy, vascular inflammation, myocyte necrosis and fibrosis. This study set out to evaluate whether spironolactone had a beneficial effect on arterial stiffness (in comparison to bendrofluthiazide) and to what extent this could be predicted by the aldosterone renin ratio (ARR).

Methods: This is a substudy of a double-blind, randomised, crossover, trial in hypertensive subjects with either a high ARR (> 750 and a plasma aldosterone > 250pmol/l), or low ARR (< 300 and a plasma renin activity <10ng/ml/h). Each group underwent 12 weeks treatment with spironolactone 50mg OD and bendrofluthiazide (BFZ) 2.5mg OD in random order, separated by a 2-week washout. Brachial pulse wave velocity (Br-PWV) and pulse wave analysis for central blood pressure, augmentation index (Alx) and time of reflection (Tr) measurements using Sphygmocor technique was conducted at the end of each treatment.

Result: 98 subjects (59 high and 39 low ARR) completed the sub-study. Reduction in central SBP was significantly greater after spironolactone compared with BFZ for both the high and low ARR groups (Delta (Δ) -3.39 mmHg $P < 0.035$) with no difference between the groups in relative response to spironolactone and BFZ. There were no differences in Br-PWV, Alx or Tr between treatments or the ARR groups ($P > 0.05$ for all).

Conclusion: The result of this study suggests that the benefit of spironolactone on blood pressure is not influenced by the prevailing state of activation of the RAAS. There was no convincing evidence that mineralocorticoid antagonism had a beneficial effect on arterial stiffness independent of blood pressure lowering.

P.010

RENAL ARTERY STENOSIS AND ITS DIAGNOSTICS IN TYPE 2 DIABETIC PATIENTS

I. Klefortova¹, M. Shamkhalova¹, A. Bukhman¹, O. Remizov¹, M. Shestakova¹, D. Ustyuzhanin², M. Sharia², E. Tugeeva³, U. Buziashvili³.
¹Endocrinology Research Center, Moscow, Russian Federation, ²Cardiology Research Center, Moscow, Russian Federation, ³Bakoulev Scientific Center of Cardiovascular Surgery, Moscow, Russian Federation

Aims: The purpose of this study was to evaluate sensitivity and safety of several techniques for renal artery stenosis (RAS) detection in subjects with type 2 diabetes and coexistent hypertension.

Materials and methods: We studied 157 patients. All of patients underwent duplex sonography (DS). Patients with RAS detected by DS underwent magnetic resonance angiography (MRA) or multislice computed tomography (MSCT) of the renal arteries. We used 1.5 T MR scanner and 16 slices MSCT. **Results:** We found that DS detected RAS in 58 (36.3%; 28.7% unilateral, 7.6% bilateral) type 2 diabetics (specially in smoking males) with myocardial dysfunction and rheological abnormalities. 10 patients with glomerular filtration rate (GFR) <60 ml/min but >30 ml/min underwent MRA of renal arteries and abdominal aorta with bolus injection of 20 ml gadolinium (Gd) based contrast agent. The diagnosis was confirmed in 8 cases, (6 subjects had unilateral RAS, 2 subjects had bilateral RAS) (sensitivity 80%). 28 patients with GFR >60 ml/min underwent MSCT of renal arteries and abdominal aorta with bolus injection of 50 ml "iso-osmolar" non-ionic contrast agent. The diagnosis was confirmed in 22 cases (16 subjects had unilateral RAS, 6 subjects had bilateral RAS) (sensitivity 78,6%). Serum creatinine, was recorded for three consecutive days after procedures. There was no change from the baseline in both groups.

Conclusions: DS is a valid routine method of investigation of diabetics at risk for RAS. MRA and MSCT are safe methods of RAS verification.

P.012

THE ASSOCIATION BETWEEN FREE THYROXINE, AORTIC RIGIDITY AND GENETIC POLYMORPHISM OF ANGIOTENSIN II TYPE 1 RECEPTOR IN A POPULATION SAMPLE*

O. Mayer, J. Filipovský, M. Pešta, J. Hrbková, M. Dolejšová. *2nd Dept. of Internal Medicine, Charles University, Medical Faculty, Pilsen, Czech Republic*

Background: Thyroid hormones showed direct proliferative properties on cardiovascular system also by modulating the expression of renin-angiotensin axis. The aim of our study was to establish, whether interaction between mutation of angiotensin II, type 1 receptor (AGTR1) and mild changes in free thyroxine (fT4) may influence the aortic rigidity.

Methods: 249 euthyroid subjects (m121, f128, mean age 48.03 \pm 0.70) was selected from population based-study. Aortic pulse wave velocity (PWV) was measured using Sphygmocor, A1166C mutation of AGTR1 by PCR. The

sample was stratified according to fT4 quintiles for optimal (2nd to 4th quintile), low-normal (1st quintile) and high-normal (5th quintile) fT4 strata. **Results:** [mean \pm SEM; optimal vs. low-normal (p_1) or high-normal (p_2), *adjusted for age and gender]

fT4 strata:	optimal	low-normal	p_1	high-normal	p_2
A1166C mutation absent:					
n	72	32		32	
age	47.7 \pm 1.29	49.0 \pm 2.17	0.45	51.34 \pm 1.91	0.10
systolic blood pressure	122.6 \pm 1.72	128.4 \pm 3.40	0.12	130.6 \pm 3.21	0.07*
diastolic blood pressure	79.2 \pm 1.06	81.4 \pm 1.93	0.43*	81.5 \pm 1.57	0.50*
aortic PWV [m/sec]	7.80 \pm 0.24	7.87 \pm 0.41	0.40*	8.06 \pm 0.75	0.57*
A1166C mutat. present:					
n	75	23	0.17	15	0.26
age	46.0 \pm 1.31	49.6 \pm 1.98	0.33*	49.4 \pm 2.68	0.09*
systolic blood pressure	123.5 \pm 1.82	128.7 \pm 3.19	0.34*	133.5 \pm 4.27	0.89*
diastolic blood pressure	79.3 \pm 1.14	82.4 \pm 2.50	0.88*	81.3 \pm 2.85	<0.004
aortic PWV [m/sec]	7.26 \pm 0.20	7.46 \pm 0.42		8.63 \pm 0.72	

Conclusion: In our sample of general population we found, that high-normal fT4 was associated with increased aPWV, however significantly expressed only in patient with A1166C mutation of AGTR1.

* (supported by grant IGA9333-3, Ministry of Health CZ).

P.013

BLOOD PRESSURE, ARTERIAL RIGIDITY AND ALCOHOL INTAKE IN A POPULATION SAMPLE*

O. Mayer Jr., J. Filipovský, M. Dolejšová, L. Handl. *2nd Dept. of Internal Medicine, Charles University, Medical Faculty, Pilsen, Czech Republic*

Objectives: Increased alcohol intake impaires the control of hypertension in treated patients. The aim of this study was to evaluate the relation between weekly alcohol intake, blood pressure and arterial stiffness.

Methods: 257 subjects (m126, f131 mean age 48.04 \pm 0.66) were selected from population- based postMONICA study. Arterial stiffness was measured using Sphygmocor device as aortic pulse wave velocity (APWV) and radial augmentation index (RALx), the one-week alcohol intake was ascertained by diet recall.

Results: The sample was divided according to reported weekly intake of pure alcohol into 3 categories: none or minimal intake (0-42g), mild drinkers (43-154 g) and moderate to heavy drinkers (> 154g). Among these categories, significant increasing trend in blood pressure and aortic rigidity were found (see table). These trends remained significant even after adjustment for age, current smoking, body mass index, antihypertensive treatment, LDL and glyceamia as potentially confounding factors of hypertension and/or increased arterial rigidity.

weekly alcohol intake:	0-42g	43-154 g	> 154 g	p for trend
N	131	72	54	-
age [years]	47.9 \pm 0.99	48.3 \pm 1.30	48.1 \pm 1.45	0.83
gender [% of males]	21.4	65.3	94.4	<0.0001
body mass index [kg/m ²]	26.1 \pm 0.36	26.9 \pm 0.45	27.2 \pm 0.56	0.14
systolic BP [mmHg]	122.8 \pm 1.46	128.0 \pm 2.03	130.3 \pm 1.77	<0.003
diastolic BP [mmHg]	78.2 \pm 0.88	82.0 \pm 1.43	83.1 \pm 1.28	<0.03
antihypertensives [%]	18.3	23.6	13.0	0.31
APWV [m/sec]	7.36 \pm 0.18	7.44 \pm 0.24	8.24 \pm 0.46	<0.02
RALx [%]	73.8 \pm 1.89	71.2 \pm 2.51	66.9 \pm 2.99	0.35

Conclusion: Moderate to heavy drinkers showed in our general population sample gradually higher blood pressure, probably because of increased aortic stiffness.

* (supported by Internal Grant Agency, Ministry of Health CZ, grant No 9333-3).

P.014

AUGMENTATION INDEX IS A MORE PROMINENT PARAMETER AS COMPARED TO FLOW MEDIATED VASODILATATION FOR THE DETECTION OF ARTERIAL WALL DYSFUNCTION IN YOUNG WOMEN WITH SYSTEMIC LUPUS ERYTHEMATOSUS

A. Cypiene¹, A. Laucevicus², A. Venalis¹, J. Dadoniene¹, R. Ruziene¹, L. Ryliskyte², Z. Petruilioniene², M. Kovaite², V. Skorniakov². ¹Institute of Experimental and Clinical Medicine, Vilnius University, Vilnius, Lithuania, ²Clinic of Heart Diseases, Vilnius University; Centre of Cardiology and Angiology, Vilnius, Lithuania

Background: Systemic lupus erythematosus (SLE) is a chronic inflammatory, autoimmune disease, which may lead to arterial dysfunction, and that could be the reason of enhanced development of atherosclerosis and premature aging of the arteries.

Aim of the study: was to assess whether aortic augmentation index (Alx) and endothelium-dependent flow-mediated dilatation (FMD) were modified in young age SLE women and which of parameters is more prominent.

Methods: We examined 30 SLE women (age 37.33 ± 9.22 years) with moderate disease activity (SLEDAI 18.40 ± 8.17) and 66 controls women (age 37.45 ± 8.69 years). Alx was assessed non-invasively by applanation tonometry (Sphygmocor v.7.01, AtCor Medical). The FMD test in a brachial artery was performed by the ultrasound system (Logiq 700, General Electric).

Results: In SLE women Alx (20.53 ± 12.40 vs 13.50 ± 10.14 ; $p=0.004$) was significantly higher as compared to the controls. Linear regression did not indicate direct relationship between arterial wall parameter Alx and presence of SLE. The main explanatory factor for Alx was MBP. FMD was not significant decrease in SLE women compared to the controls (9.25 ± 5.12 vs 9.69 ± 3.29 ; $p=0.670$) and it depends on vessel diameter, disease duration and body mass index.

Conclusions: Alx, not FMD, is a more prominent arterial wall parameter in the group of relatively young SLE women as compared to the controls. Nonetheless, the inclusion of additional factors shows that Alx is better explained by MBP. Relationship between SLE and measures of arterial wall parameters still remains unclear. Although there are evidences at least of indirect impact of SLE on arterial stiffness parameters.

P.015

AUTOMATED RADIO-FREQUENCY VERSUS MANUAL B-MODE ULTRASOUND COMMON CAROTID INTIMA-MEDIA THICKNESS MEASUREMENTS IN ROUTINE CLINICAL PRACTICE: A DIRECT COMPARISON OF RISK FACTOR RELATIONS AND ASSOCIATIONS WITH FUTURE EVENTS

S. Dogan, Y. Plantinga, J.M. Dijk, Y. van der Graaf, D.E. Grobbee, M.L. Bots. *Julius Center for Health Sciences and Primary Care, University Medical Center Utrecht, Utrecht, Netherlands*

Background: Carotid intima-media thickness (CIMT) serves as an indicator of atherosclerosis and cardiovascular risk in observational and intervention studies. Off-line measurements from stored B-mode images using manual tracing or automated-edge-detection programs are the most applied methods. Direct measurements by automated radio-frequency (RF) approach might be an interesting alternative. We compared these methods in terms of risk-factor relations and associations with future events.

Methods: Data from participants of the SMART-study was used. Far wall common CIMT was measured with B-mode and automated RF. Detailed risk factor information was obtained. All participants were followed for occurrence of vascular events (mean follow-up 2.1 years). CIMT was related to risk factors with linear-regression models and to future events with Cox-Proportional-Hazards models.

Results: Data were available for 2146 participants. Intraclass correlation between two methods was modest (0.45). The relation between B-mode CIMT with age and systolic blood pressure was twice as strong as compared to RF CIMT. The relation of B-mode CIMT with events was stronger than for RF CIMT: vascular death (1.27 vs. 1.00) and ischemic stroke (1.45 vs. 1.03). In subjects with B-mode measured CIMT < 1.00 mm, RF CIMT showed stronger relationships with vascular death (1.30 vs. 0.80), although B-mode CIMT was stronger associated with ischemic stroke (3.70 vs. 0.97).

Conclusion: Given our findings, the choice for either B-mode CIMT or RF CIMT measurements in research is partly driven by type of study-population, expected presence of local atherosclerotic abnormalities, and of the main aim of the study (risk-factors or events).

P.016

THE ASSESSMENT OF ENDOTHELIAL FUNCTION IN BRACHIAL ARTERY MAY CONTRIBUTE TO THE DISCRIMINATION OF THE METABOLIC SYNDROME

L. Ryliskyte, M. Kovaite, A. Badariene, V. Dzenkeviciute, A. Cypiene, A. Laucevicus. *Vilnius University Hospital Santariskiu Klinikos, Heart Clinic, Vilnius, Lithuania*

Purpose: We aimed to investigate the relationship between the presence of the metabolic syndrome (MetS) and endothelial dysfunction in middle-aged subjects with signs of central obesity but without overt cardiovascular disease.

Methods: We studied 176 subjects (age 49.1 ± 6.4 , 40% of males) diagnosed with central obesity according to the IDF criteria. Patients underwent the detailed evaluation of cardiovascular risk factors (including blood tests for high sensitivity C-reactive protein, fibrinogen, serum glucose and lipid profile) and the evaluation of endothelial function by ultrasound assessment of flow-mediated dilatation (FMD) in the brachial artery.

Results: Totally 120 subjects (68%) were diagnosed with MetS, 56 (32%) had isolated central obesity or central obesity plus one additional component of MetS. FMD was significantly lower in patients with MetS as compared to the subjects without it ($6.4 \pm 3.9\%$ and $7.8 \pm 3.9\%$, $p=0.029$), although groups did not differ significantly regarding age, gender, diameter of the brachial artery, family history and smoking status. Serum high sensitivity C-reactive protein (hsCRP) but not fibrinogen was higher in patients with MetS ($p=0.013$ and $p=0.47$, respectively). Logistic regression analysis revealed that the presence of MetS is significantly predicted by the decrease of high density lipoproteins and flow-mediated dilatation ($p=0.0053$ and $p=0.0054$).

Conclusion: Association between impaired endothelial function and the presence of metabolic syndrome suggests that the assessment of endothelial function can have an additive value in the discrimination of patients with MetS.

P.017

THE INFLUENCE OF ETHNICITY ON FEMORAL-DORSALIS PEDIS PULSE WAVE VELOCITY: A STUDY COMPARING SOUTH ASIANS AND CAUCASIANS

B. McDonnell¹, C.M. McEnery², I.B. Wilkinson², J.R. Cockcroft¹. ¹Cardiology Department, Wales Heart Research Institute, Cardiff University, Cardiff, United Kingdom, ²Department of Clinical Pharmacology, Vascular Research Unit, University of Cambridge, Cambridge, United Kingdom

Background: South Asians living in the UK have lower rates of peripheral vascular disease (PVD) than Caucasians. The reason for this is unclear. Arterial stiffness is an independent risk factor for CV disease and may precede the development of clinically overt atheroma. Thus a possible explanation for this lower incidence of PVD in South Asians, is that they have increased arterial compliance in the femoral vascular bed compared to Caucasians.

Method: We investigated this hypothesis in measuring F-D PWV in 93 male volunteers, matched for age and mean arterial pressure (MAP). 43 healthy Caucasians (HC) and 50 healthy South Asians (HA), free from cardiovascular medication and known PVD were used in the analysis. F-D PWV was recorded using foot to foot pulse wave velocity (PP-1000 Hanbyul Meditech, Korea).

Results: F-D PWV was significantly higher in the HC group compared to the HA group (10.5 ± 2.4 v 9.4 ± 1.6 m/s, $P=0.019$).

Conclusion: F-D PWV was significantly lower in South Asians living in the UK compared to matched Caucasians. This finding may account for the decreased incidence of PVD seen in this ethnic group. In addition these data support the hypothesis that increased arterial stiffness may predispose to atheromatous disease.

P.018

ABDOMINAL AORTIC ANEURYSMS AND THEIR EFFECT ON ARTERIAL WAVE REFLECTION AND MORPHOLOGY

A. Swillens¹, L. Lanoye¹, J. De Backer², N. Stergiopoulos³, P. Verdonck¹, F. Vermassen⁴, P. Segers¹. ¹Cardiovascular Mechanics and Biofluid Dynamics, Institute of Biomedical Technology, Ghent, Belgium,