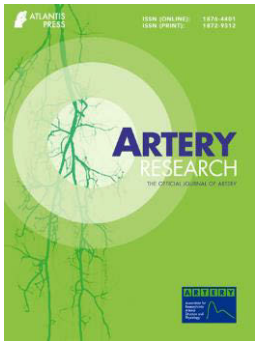

Artery Research

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

P.029: MECHANICAL CHARACTERISTICS OF CAROTID ARTERY WALLS IN RELATION WITH PREVALENT CARDIOVASCULAR DISEASES

I.M. Graf, F. Schreuder, W. Mess, A.P.G. Hoeks

To cite this article: I.M. Graf, F. Schreuder, W. Mess, A.P.G. Hoeks (2007) P.029: MECHANICAL CHARACTERISTICS OF CAROTID ARTERY WALLS IN RELATION WITH PREVALENT CARDIOVASCULAR DISEASES, Artery Research 1:2, 59–59, DOI: https://doi.org/10.1016/j.artres.2007.07.086

To link to this article: https://doi.org/10.1016/j.artres.2007.07.086

Published online: 21 December 2019

Aim: Evaluating efficiency of antianginal therapy with β-adrenoblockers (BAB) in patients with stable angina during the switch to nebivolol; evaluating the dynamics of vasculature functional state and concentration of NO metabolites during the nebivolol treatment.
Materials and Methods: Open-label observational study was conducted on 30 patients with II-III FC angina. Prior to the nebivolol administration and also after 12 weeks of treatment, in addition to the evaluation of clinical state and nebivolol tolerance. The assessment of arterial stiffness was done by way of measuring brachial-ankle pulse wave velocity (baPWV). A new parameter presenting stiffness of the vascular wall independent on the BP dynamics. Endothelial function was calculated based on flow-mediated dilatation (FMD) parameters. Serum nitrate and nitrite as NO metabolic products were measured.
Results: After 12 weeks of the nebivolol therapy, the rate of anginal attacks significantly decreased by 60%, and nitroglycerin (NG) intake reduced by 75% as compared to the previous treatment. Switching the patients to nebivolol was associated with a significant decrease in baPWV by 6.1% while FDV increased by 27%. Serum level of NO metabolites increased by 47%.
Conclusion: The nebivolol treatment was generally well tolerated and lead to significant patient condition improvement. This effect of nebivolol of should be attributed to baPWV lowering and endothelial function bettering.

P.027
ARTERIAL STIFFNESS IN RELATION TO URINARY ALDOSTERONE EXCRETION AND COLLAGEN METABOLISM IN ESSENTIAL HYPERTENSION

K. Stolarz-Skrzypek [1], W. Lubaszewski [1], A. Olszanecka [1], W. Wojciechowska [1], M. Cwynar [2], M. Loster [1], T. Grodzicki [2], K. Kawecka-Jaszcz [1]. *[1]First Department of Cardiology and Hypertension, Jagiellonian University Medical College, Krakow, Poland, [2]Department of Internal Medicine and Gerontology, Jagiellonian University Medical College, Krakow, Poland*

Background: In animal experiments, aldosterone has been shown to substantially contribute to the accumulation of collagen fibres in the arterial wall, which can increase arterial stiffness. The aim of the study was to examine the above relationships in human hypertension.
Methods: The study group included 50 hypertensive patients (mean age = 56.8 years, 16/34 M/F) and 29 normotensive controls (mean age = 54.6 years, 15/14 M/F). A Sphygmocor device was used to measure the carotid, radial and aortic augmentation index (AIx) of systolic blood pressure, as well as the aortic pulse wave velocity (PWV). 24-hour urinary aldosterone excretion was assessed. The plasma levels of collagen synthesis marker - procollagen type III amino-terminal peptide (PIIINP) were evaluated.
Results: Hypertensive patients as compared to normotensive controls had higher carotid AIx (142.8 ± 25.2 vs 124.2 ± 24.7%; p = 0.004), higher aortic AIx (39.4 ± 10.1 vs 30.8 ± 13.5%; p=0.005), and higher PWV (9.57 ± 2.86 vs 8.58 ± 1.51 m/sec; p=0.05). With adjustments applied for age, gender, body height, mean arterial pressure and current smoking, 24-hour urinary aldosterone excretion correlated positively with carotid AIx (r=+0.22; p=0.05) and aortic AIx (r=+0.19; p=0.09). We observed also positive correlations between plasma level of PIIINP and carotid AIx (r=+0.20; p=0.06) and aortic Aix (r=+0.24; p=0.05).
Conclusion: In our study group, aldosterone excretion tended to correlate to carotid and aortic, but not radial, augmentation index. The increased arterial stiffness in hypertensive patients could be caused by the deleterious effects of aldosterone excess on the fibrosis and remodeling of the arterial wall, as assessed by circulating PIIINP.

P.028
EPIGENETIC INTERACTION BETWEEN α-ADDUCIN AND RENIN-ANGIOTENSIN-SYSTEM GENES IN RELATION TO THE ELASTIC PROPERTIES OF THE FEMORAL ARTERY

J.S. Seidlerova [1], J.A.S. Staessen [1], T.N. Nawrot [1], HAS.-B. Struijker-Boudier [2], T.K. Kuznetsova [1], G.B. Bianchi [3], E.B. Brand [4], SMB.-H. Brand-Hermann [5], R.F. Fagard [1], J.F. Filipovsky [6]. *[1]Studies Coordinating Centre, Division of Hypertension and Cardiovascular Rehabilitation, Department of Cardiovascular Diseasese, University of Leuven, Leuven, Belgium, [2]The Department of Pharmacology and Toxicology, Cardiovascular Research Institute, Maastricht, Netherlands, [3]Divisione di Nefrologia Dialisi e Ipertensione, Ospedale San Raffaele, Universitá Vita Salute, Milan, Italy, [4]Department of Internal Medicine D, University Clinic, Münster, Germany, [5]Department of Molecular Genetics of Cardiovascular Disease, Leibniz Institute for Arteriosclerosis Research, Münster, Germany, [6]The Faculty of Medicine in Pilsen, Charles University, Pilsen, Czech Republic*

Background: We previously demonstrated that epigenetic interaction between the α-adducin (ADD1) Gly460Trp and the ACE I/D polymorphism modulates the properties of the femoral artery. Here, we investigated multiple-gene interactions between ADD1, ACE and other genes of the renin-angiotensin system: angiotensinogen (AGT) C-532T, G-6A, and angiotensin II receptor type 1 (AGTR1) A1166C.
Methods and results: We assessed the properties of the femoral artery with a wall-track system in a family-based random sample of 1064 subjects (participation rate 64.3%, mean age 43.6 years, 50.4% women). In population-based analyses, we computed phenotype-genotype associations, while adjusting for confounders, life style, and family clusters. In family-based analyses, we used a multivariate-adjusted quantitative transmission disequilibrium test (QTDT).
Results: In ADD1 Trp allele carriers, but not in ADD1 GlyGly homozygotes, AGTR1 AA subjects had lower femoral cross-sectional compliance (0.649 ± 0.030 vs 0.742 ± 0.029 mm^2/kPa, P=0.027) and a lower distensibility coefficient (10.18 ± 0.43 vs 11.27 ± 0.41 10^{-3}/kPa, P=0.067) than AGTR1 C allele carriers. QTDT confirmed these associations. The between-family component of phenotypic variability was not significant, suggesting that there was not population stratification. None of the gene-gene interactions involving AGT was statistically significant (P≥0.088).
Conclusions: The ADD1 Gly460Trp, AGTR1 A1166C and ACE I/D jointly influence the functional properties of the femoral artery.

P.029
MECHANICAL CHARACTERISTICS OF CAROTID ARTERY WALLS IN RELATION WITH PREVALENT CARDIOVASCULAR DISEASES

I.M. Graf [1], F. Schreuder [2], W. Mess [2], A.P.G. Hoeks [1]. *[1]Biomedical Engineering, Maastricht, Netherlands, [2]AZM, Maastricht, Netherlands*

Background: Cardiovascular diseases (CVD) modify the mechanical characteristics of arteries. A better understanding of the corresponding changes will improve diagnostic possibilities.
Methods: With a 7.5 MHz linear array ultrasound system, the left and right common carotid artery of 97 subjects (54m; age 36-95y, average 65y) were assessed. The displacement of the arterial walls was calculated for half-overlapping windows of 20 ms by 0.3 mm, at maximum wall deformation rate, together with their standard deviations across the echo lines. The ultrasound images were separately processed to measure manually intima media thickness (IMT) and IMT-inhomogeneity.
Results: 82% of the patients were hypertensive, 37% of the patients were diagnosed with CVD, all patients had high cholesterol and LDL with low HDL levels. 64% of the patients presented an inhomogeneous posterior wall structure. The maximum strain rate varied between 0.5%/ms and 4.3%/ms with an average of 2%/ms. Distension at peak acceleration varied between 0.04 and 0.5 mm (average 0.24 mm). Patients with a high standard deviation of strain rate and distension had an increased IMT (560 mm vs 475 ± 10 mm), with an inhomogeneity between 2 and 19%.
Conclusions: The present investigation shows that the standard deviations of distension and strain rate are indicative for an irregular wall-lumen transition. The results underline the necessity of detailed analysis of arterial wall characteristics in patients with increased CVD risk.

P.030
ARTERIAL STIFFNESS IS PREDICTOR CARDIOVASCULAR EVENTS IN MEN WITH CORONARY ARTERY DISEASE

I. Orlova, F. Ageev, E. Nuraliev. *Russian Cardiology Research Center, Moscow, Russian Federation*

Measuring of brachial-ankle pulse wave velocity (baPWV) is a valid and viable method by which to assess arterial stiffness, a potential surrogate marker of atherosclerosis. The AIM of the study was to for the first time ever establish whether baPWV is a predictor of major adverse cardiovascular events (MACE) in patients already diagnosed with Coronary Artery Disease (CAD) while all previous studies dealt solely with those having the risk factors.
Methods and Results: baPWV measurement was performed on 178 men with CAD aged 39-72 years (mean age 54.5 ± 7.7). The examination comprised body mass index, blood pressure, blood glucose, total cholesterol. During