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P2.46: RELATION BETWEEN PULSE WAVE VELOCITY AND PREDICTORS OF CLINICAL OUTCOME IN ARTERIAL HYPERTENSION

V. Aursulesei, G. Datcu, M.D. Datcu

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SMOKING HYPERTENSIVE MEN HAVE MORE PRONOUNCED EARLY ARTERIAL DAMAGE AS COMPARED TO NON-SMOKING HYPERTENSIVE MEN WITH HIGHER BODY MASS INDEX

L. Ryliskyte¹, M. Kovaite¹, J. Badariene¹, V. Dzenkeviciute¹, K. Ryliskiene², J. Kuzmickiene², A. Cypiene¹, A. Laucevicius¹.

¹ Vilnius University Hospital Santariskiu Klinikos, Heart Clinic, Center of Angiology and Cardiology, Vilnius, Lithuania

² Vilnius University Hospital Santariskiu Klinikos, Center of neurology, Vilnius, Lithuania

Objective: It is well known that smoking and obesity are cardiovascular risk factors. However, many smokers fear to stop, thinking that following increase in weight will counterbalance the positive effect of smoking cessation. Our aim was to analyze the effect of smoking and obesity on early arterial damage in hypertensive men.

Methods: Hypertensive men without cardiovascular disease were included into the study (n=88, age 48.8±4.1). All patients underwent detailed assessment of cardiovascular risk. Carotid ultrasound (Art Lab System V.2.0), measurements of arterial stiffness and aortic blood pressure by applanation tonometry (Sphygmocor v.7.01) and sphygmomanometry (Vasera VS-1000) were performed in order to evaluate early arterial damage.

Results: Smokers (n=30) were younger as compared to non-smokers (n=58) – 48.5±3.91 vs. 49.28±5.0 years, p<0.05. Non-smokers had higher body mass index (31.5±3.6 vs 29.6±4.0, p<0.05), heart rate (69.1±10.2 vs. 60.7±11.0, p<0.05), and aortic mean blood pressure (101±14.5 vs. 108±12.11), but not aortic pulse pressure (37.9±7.4 vs. 37.3±10.7, ns). However, the aortic augmentation index Alx/HR (22.5±9.7% vs. 15.6±8.9%, p<0.001), heart-ankle stiffness index adjusted for blood pressure (CAVI-right 7.9±0.9 vs. 7.3±1.3, CAVI-left 7.8±0.9 vs. 7.2±1.2, p<0.01) and intima media thickness (0.65±0.17 mm vs. 0.56±0.13 mm, p<0.05) were significantly higher in smokers as compared to non-smokers. Smokers also had higher prevalence of the carotid plaques (p<0.05). Carotid-radial and carotid-femoral pulse wave velocity (Sphygmocor) didn't differ significantly (respectively, 9.2±1.5 vs. 9.25±1.1 m/s; 8.6±1.6 vs. 8.54±1.3 m/s, ns).

Conclusion: Although non-smoking hypertensive patients tend to be older and more obese, the smokers have worse arterial parameters in our study group.

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INCREASED PULSE PRESSURE IS ASSOCIATED WITH LONG LEFT VENTRICULAR EJECTION DURATION IN ISOLATED SYSTOLIC HYPERTENSIVES

K.D. Reesink, E. Hermeling, J. Waltenberger, A.P.G. Hoeks.
Cardiovascular Research Institute Maastricht, Maastricht, Netherlands

Background: Apart from stiff arteries, increased pulse pressure is associated with increased left ventricular (LV) contractility. We investigated whether elevated LV performance can be derived from carotid artery diameter waveforms in hypertensives.

Methods: We obtained common carotid artery (CCA) diameter waveforms by ultrasound in 8 isolated systolic hypertension (ISH) patients (sys/dia: 154±17/77±13 mmHg, age 70±8 yrs). By dedicated signal processing we obtained, with good precision (<10%), left ventricular isovolumic contraction (ICT) and ejection durations (ET) from the diameter curve, as well as diastolic diameter (Dd), distension (ΔD), relative distension (ΔD/Dd), and distensibility (DC) and compliance coefficients (CC).

Results: Dd was 7.9±1.0 mm, ΔD was 0.30±0.12 mm, ΔD/Dd thus 4±2%; pulse pressure was 77±16 mmHg. DC was 10±5 MPa⁻¹ and CC was 0.5±0.2 mm²/kPa, clearly linking the elevated pulse pressure to reduced arterial stiffness. Heart rate was 76±18 min⁻¹ while LV ICT and ET were 40±7 ms and 311±46 ms, respectively. LV dP/dtmax, estimated from the diastolic blood pressure-to-ICT ratio, was 1991±566 mmHg/s, suggesting no conspicuous contribution of LV contractility to increased pulse pressure in ISH. Within the group, however, there was a large spread in LV performance primarily related to ET and heart rate. Interestingly, ET showed a strong correlation with pulse pressure (r²=0.85, p<0.01), suggesting long ejection duration contributes to high pulse pressure in some patients.

Conclusions: Increased left ventricular performance, as reflected by ejection duration, can be observed and discriminated in isolated systolic hypertensives by diameter waveform analysis.

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EVALUATION OF CENTRAL BLOOD PRESSURE AND AUGMENTATION INDEX IN PATIENTS WITH ISOLATED AMBULATORY AND ISOLATED OFFICE HYPERTENSION: THE VOBARNO STUDY

A. Paini, M.L. Muiesan, M. Salvetti, E. Belotti, C. Agabiti Rosei, C. Aggiusti, L. Micheletti, F. Marino, F. Bertacchini, E. Agabiti Rosei.
University of Brescia, Brescia, Italy

Different BP patterns have been identified by the use of office and 24 hours BP measurement: sustained normotension (NT), isolated office hypertension (IOH), isolated ambulatory hypertension (IAH) and hypertension (HT). Pulse-wave analysis has been proposed for evaluation of central BP; "augmentation index" (Alx) is an accepted indirect index of arterial stiffness. Aim of our study was to assess the relationships between PWA and BP patterns in a general population in Northern Italy. **Methods:** In 242 untreated subjects (age 54±9 yrs, BMI 25±4, 47% males) radial artery applanation tonometry and PWA were used to derive central aortic pressures and Alx. All subjects underwent laboratory examinations and clinic and 24 h BP measurement. Subjects were divided into subgroups: NT (office BP<140/90 and 24 h BP<125/80 mmHg), IOH (office BP≥140/90 and 24h BP<125/80 mmHg), IAH (office BP<140/90 and 24h BP≥125/80 mmHg) and HT (office BP≥140/90 and 24h BP≥125/80 mmHg).

Results: Patients with IAH and HT were older than NT (59.5±8.4 and 55.3±9.3 vs 51.1±6.4 yrs p<0.01). BMI was higher in IOH and HT than in NT (25.5±3.9 and 26.8±4.3 vs 23.7±3.3, p<0.01). After adjusting for confounding variables (including also mean BP and HR) Alx was significantly higher in IOH, IAH and HT in comparison to NT (31.1±1.0, 30.8±1.8, 31.3±1.0 vs 26.6±1.0, p<0.01). Central SBP was significantly higher in HT, but also in IOH and IAH, than in NT (HT 120.3±0.7, IOH 120.6±0.7, IAH 121.0±1.2 vs NT 117.8±0.7 mmHg, p<0.01). **Conclusion:** In a general population sample central SBP and Alx are greater in patients with sustained, office or ambulatory hypertension. In IAH, despite normal brachial BP, central BP is significantly increased, possibly contributing to increase cardiovascular risk.

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RELATION BETWEEN PULSE WAVE VELOCITY AND PREDICTORS OF CLINICAL OUTCOME IN ARTERIAL HYPERTENSION

V. Aursulesei¹, G. Datcu¹, M.D. Datcu¹.

¹ University of Medicine and Pharmacy, Iasi, Romania, "Sf. Spiridon" University Hospital, 1st Medical Cardiology Department, Iasi, Romania

Objective: to evaluate the relation between pulse wave velocity (PWV), an independent marker of cardiovascular risk and other parameters with prognostic significance: intima media thickness (IMT), left ventricular hypertrophy (LVH) and flow mediated vasodilatation (FMD) in patients with essential arterial hypertension.

Material and Methods: 142 hypertensive patients (aged 50-75 years, 65% females, without diabetes) were studied before and after 6, 12 months of treatment with ACEI/channel blockers + Indapamide. PWV was assessed using Complior method, IMT and FMD using carotidian/brachial ultrasound respectively. LVH was defined by index of mass (LVMI) and geometric patterns.

Results: 1. PWV is strongly related with LVMI and concentric hypertrophy irrespective the gender, moment of evaluation or regimen of treatment (p<0.05). Correlation with eccentric hypertrophy is evident at baseline only for females (t-test). 2. PWV is related with carotidian IMT (r=0.38, p=0.01) at baseline; after 12 months the relation remains only in ACEI subgroup (r=0.42, p=0.03). 3. Corelation with FMD exists only after adjusting for cardiovascular risk factors (ANCOVA).

Conclusion: our results suggest the complexe interrelation between non-invasive parameters of atherosclerosis, which is influenced by cardiovascular risk profile and antihypertensive regimen. The combination of these measurements is of stronger clinical relevance.

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CAROTID PATHOLOGY AND RISK FACTORS IN HYPERTENSIVE PATIENTS FOR CEREBROVASCULAR DISEASE - CORRELATIVE CLINICAL, NEUROSONOGRAPHIC AND ECHOCARDIOGRAPHIC STUDIES

K. Hristova¹, K. Hristova², E. Titianova³, I. Velcheva², N. Dimitrov³, S. Karakaneva³, P. Damianov², K. Ramshev³.

¹ Katholiekien University, Leuven, Belgium