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### **P3.07: THE INFLUENCE OF ANTIHYPERTENSIVE TREATMENT ON ARTERIAL STIFFNESS AND ARTERIAL WALL SHEAR STRESS**

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## P3.06

## RELATION BETWEEN HAPTOGLOBIN PHENOTYPE AND ARTERIAL STIFFNESS IN NEWLY DIAGNOSED UNTREATED HYPERTENSIVE PATIENTS

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Arterial stiffness is a valuable predictor of cardiovascular risk in essential hypertension. Arterial stiffness is affected by several factors including genetic polymorphisms. Moreover, increased arterial stiffness has been associated with oxidative stress. Haptoglobin (Hp) is an innate antioxidant which due to molecular heterogeneity forms three phenotypes: 1-1, 2-1, and 2-2. The antioxidant ability is phenotype dependent. In diabetes mellitus Hp 2-2 is a predictor of vascular complications but whether Hp 2-2 predicts vascular complications in essential arterial hypertension has not previously been examined.

The aim of the study was to investigate if Hp 2-2 was positively associated with aortic pulse wave velocity (aPWV) and central systolic blood pressure (sysBP).

We examined 94 newly diagnosed untreated hypertensive patients. aPWV and central sysBP were measured using the SphygmoCor device. Hp phenotype was determined using high-performance liquid chromatography. The cohort consisted of 42 men and 52 women with an average age of 48 ± 11 years. The median aPWV was 7.6 (6.0; 9.7) m/s in Hp 1-1, 8.0 (5.3; 11.0) m/s in Hp 2-1, and 8.3 (5.5; 10.6) m/s in Hp 2-2. The difference was non-significant (p=0.5, ANOVA). The median central sysBP was 147 (123; 163) mmHg in Hp 1-1, 151 (123; 187) mmHg in Hp 2-1, and 155 (124; 195) mmHg in Hp 2-2. Also, these differences were non-significant (p=0.4, ANOVA).

This study showed a potential yet non-significant difference in aPWV and in central sysBP between Hp phenotypes with the highest levels in Hp 2-2 hypertensive patients.

## P3.07

## THE INFLUENCE OF ANTIHYPERTENSIVE TREATMENT ON ARTERIAL STIFFNESS AND ARTERIAL WALL SHEAR STRESS

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The aim of the study was to compare the effects of 5 drugs representing different antihypertensive classes on arterial wall shear stress (WSS) and arterial stiffness in patients with essential arterial hypertension (HT).

**Material and methods:** 95 pts. with HT (stage 1 and 2) were divided into 5 groups, (N=19) and treated for 6 months by: quinapril 20-40 mg/d (group-1), amlodipine 5-10mg/d (group-2), hydrochlorothiazide 12,5-25mg/d (group-3), losartan 50-100 mg/d (group 4), bisoprolol 5-10 mg/d (group-5). Before and then after 1,3 and 6 months of treatment WSS in common carotid artery (CCA) was calculated using blood viscosity measured by Brookfield DV-III pro and maximal blood flow velocity measured ultrasonographically. At the same visits carotid femoral pulse wave velocity (PWV) was measured using 3 devices Complior®, Sphygmocor® and Arteriograph™, office BP was measured using Omron M5-I device.

**Results:** At the baseline no differences between groups were observed in BP, PWV, CCA-WSS. ANOVA for repeated measurements revealed for all groups during treatment period significant decrease in SBP (p<0.001), DBP (p<0.001) and PWV measured by three different devices (p<0.001). CCA-WSS increased significantly (p<0.001). No between treatment groups differences were observed in above mentioned effects. In multiple regression analysis decrease of PWV was in significant relation to its baseline value (B= 0.567, p= 0.00032 and increase of CCA-WSS (B=0.232, p= 0.0074).

**Conclusion:** Antihypertensive treatment reduces arterial stiffness proportionally to its baseline value and independently of the used drug. This effect could be partially explained by increase of arterial wall shear stress.

## P3.08

## NITROGLYCERIN EFFECT ON AORTAL AUGMENTATION AND CENTRAL AUGMENTATION INDEX

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**Background:** Nitroglycerin (NG) reduces the systolic blood pressure, pulse pressure and augmentation index. The aim of our study was to evaluate the effect of NG on aortal augmentation (AA) and central augmentation index (CAI) in patients with different significance of the angiographically proved coronary artery disease (CAD).

**Methods:** The group of 66 patients referred for scheduled coronary angiography at Paul Stradins Clinical University Hospital Latvian Centre of Cardiology was analyzed. The mean age of patients was 62.8±11.9 years, 48.5% of them were male. The data about case history, cardiovascular risk factors, previous and concomitant therapy were collected. The applanation tonometry with Sphygmocor device, including radial pulse wave analysis (PWA), carotid PWA, carotid-femoral PWV before and after NG, was done. Coronary angiography was done for determination of presence and degree of coronary artery stenoses (CAS).

**Results.** Aortal augmentation and central augmentation index before and after nitroglycerin are seen in the Table 1.

Table 1 PWA before and after NG test and CAS.

PWA	No CAS	CAS<50%	CAS 50-70%	CAS>70%	p value
AA before NG, mmHg	12.7 ± 10.9	17.4 ± 7.2	15.3 ± 6.4	22.0 ± 9.9	0.012
AA after NG, mmHg	4.3 ± 6.4	2.3 ± 8.1	2.6 ± 4.7	11.5 ± 9.9	0.003
CAI before NG, %	25.2 ± 16.3	36.0 ± 17.9	28.6 ± 6.8	37.0 ± 10.0	0.019
CAI after NG, %	9.8 ± 15.3	6.3 ± 19.9	4.3 ± 9.7	21.0 ± 15.3	0.014
AA decrease after NG, %	86.0 ± 62.9	80.8 ± 39.0	89.1 ± 25.5	48.4 ± 47.8	0.061
CAI decrease after NG, %	89.6 ± 73.9	71.4 ± 45.4	87.7 ± 34.2	46.5 ± 38.6	0.055

**Conclusions.** There is a tendency of less decrease of the aortal augmentation and central augmentation index after the nitroglycerine test in patients with significant CAS. Additive prognostic value of nitroglycerine test should be further explored in future studies.

## P3.09

## TREATMENT WITH TOCILIZUMAB IMPROVES ARTERIAL FUNCTION IN RHEUMATOID ARTHRITIS: A 6-MONTHS PILOT STUDY

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**Background:** Endothelial function and arterial stiffness are significantly worse in rheumatoid arthritis (RA) compared to healthy controls in part due to the high-grade inflammation. In non-RA subjects, elevated serum levels of interleukin (IL)-6 are associated with accelerated atherosclerosis. Objectives: To examine whether therapeutic blockade of IL-6 receptor by tocilizumab in patients with active RA improves endothelial dysfunction and increases arterial elasticity.

**Methods:** In 11 non-diabetic women with RA (aged 44.5±9.9 years, mean±SD) without concomitant cardiovascular disease, who had documented endothelial dysfunction (defined by flow mediated dilatation (FMD) of the brachial artery: <5%), we assessed (i) endothelial function by FMD and (ii) central arterial stiffness (by carotid-femoral pulse wave velocity (PWV)) at baseline after 3 and 6 months of treatment with tocilizumab (8mg/kg IV/28 days).

**Results:** FMD improved significantly after 3 months and this improvement was sustained at 6 months [FMD (%) from 3.3±0.8 to 6.4±1.3 and 5.2±1.9, respectively, p=0.003 for trend by Friedman test]. PWV showed significant progressive amelioration after each trimester of TCZ treatment [PWV (m/sec) from 8.2±1.2 to 7.7±1.3 and 7.0±1.0, respectively: p<0.001 for trend by Friedman test] without alteration of the mean arterial blood pressure. High sensitivity reactive protein (hs-CRP) decreased dramatically from