



## Artery Research

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### **P4.05: DERANGED ARTERIAL WALL REMODELLING IN CENTRAL ARTERIES OF PATIENTS WITH ABDOMINAL AORTIC ANEURYSMS – A REASON FOR THE HIGH COMORBIDITY/MORTALITY IN CARDIOVASCULAR DISEASE?**

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**Conclusion:** Higher apolipoprotein B/A-I and total /HDL cholesterol ratios are independent predictors of increased arterial stiffness in never-treated hypertensives and predict increased arterial stiffness better than LDL.

#### P4.03

##### WOMEN WITH SYSTEMIC SCLEROSIS HAVE WORSE ENDOTHELIAL FUNCTION AS COMPARED TO WOMEN WITH RHEUMATOID ARTHRITIS AND SYSTEMIC LUPUS ERYTHEMATOSUS

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**Introduction:** The endothelial function has been repeatedly shown to be damaged in rheumatoid arthritis (RA), systemic lupus erythematosus (SLE) and systemic sclerosis (SSc) patients. However, it is uncertain which of diseases has the greatest influence on endothelial function.

**Methods:** We studied 60 women with RA (aged 40.47 ± 9.93 years) with disease activity (DAS28) 5.47 ± 0.94, 30 women with SLE (aged 37.33 ± 9.22 years), disease activity index (SLEDAI) 18.40 ± 8.17, organ damage index (SLICC) 1.27 ± 1.53 and 16 women with diffuse cutaneous SSc (aged 47.94 ± 10.46 years). Blood tests included serum lipid profile, glucose and high-sensitivity CRP (hsCRP) measurement. The endothelium-dependent flow-mediated dilatation (FMD) test in a brachial artery was performed by the ultrasound system (Logiq 700, General Electric).

**Results:** Direct comparison of FMD in RA, SLE and SSc groups has shown that there was overall difference between groups ( $p = 0.033$ ). This result was confirmed by application of linear models with adjustment for other confounding factors. FMD significantly differed in SSc and RA groups (5.69 ± 5.10 % vs. 8.37 ± 3.84 %;  $p = 0.021$ ;  $\beta = -0.2$ ) as well as in SSc and SLE groups (5.69 ± 5.10 % vs. 9.25 ± 5.15 %;  $p = 0.021$ ;  $\beta = -0.2$ ).

**Conclusion:** Results of our study have shown that FMD is lower in SSc group as compared to RA and SLE groups, thus the SS does greater damage on endothelial function as compared with RA and SLE.

#### P4.04

##### IMPAIRED ABDOMINAL AORTIC WALL INTEGRITY IN ELDERLY MEN CARRYING THE ANGIOTENSIN-CONVERTING ENZYME D-ALLELE

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**Objective:** A genetic polymorphism in the angiotensin-converting enzyme (ACE) gene (ACE I/D polymorphism) has been associated with abdominal aortic aneurysm. A link between aortic aneurysm and aortic stiffness has been suggested. However, no study has previously investigated the relationship between ACE and abdominal aortic wall integrity. The aim of this study was to explore the links between ACE I/D polymorphism, circulating ACE, and abdominal aortic wall integrity determined by abdominal aortic wall stiffness.

**Methods:** The study population consisted of 406 subjects (212 men and 194 women), 70-88 years. Diastolic lumen diameter, pulsatile diameter change and intima-media thickness were measured and used to calculate the cross-sectional compliance (CC), distensibility coefficient (DC), stiffness  $\beta$  and wall stress. ACE genotype was determined by PCR followed by gel electrophoresis, and circulating ACE level was measured using ELISA.

**Results:** Male carriers of the ACE D allele had a lower distensibility coefficient than II carriers (ID/DD 8.09 vs. II 10.38,  $p=0.017$ ). Multiple regression analyses adjusting for confounding factors showed significant associations between the ACE D-allele and increased stiffness  $\beta$  as well as reduced CC. No significant association between abdominal aortic stiffness and the ACE D-allele was found in women.

**Conclusion:** This study showed, for the first time, a gender-specific association between the ACE-D allele and abdominal aortic wall mechanics, with men carrying the ACE D-allele having stiffer abdominal aortas compared to II carriers. Increased abdominal aortic stiffness indicates impaired vessel wall integrity, which along with other local predisposing factors, may increase the risk of aneurysm formation.

#### P4.05

##### DERANGED ARTERIAL WALL REMODELLING IN CENTRAL ARTERIES OF PATIENTS WITH ABDOMINAL AORTIC ANEURYSMS – A REASON FOR THE HIGH COMORBIDITY/MORTALITY IN CARDIOVASCULAR DISEASE?

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**Objectives:** Patients with abdominal aortic aneurysm (AAA) have a high cardiovascular comorbidity besides the risk of aneurysmal rupture, the reasons being largely unknown. The aim of this study was to determine other possible vascular defects in the arterial system besides aneurysmal disease that might be of relevance for the increased comorbidity.

**Methods:** 23 male AAA-patients and 20 age-matched controls (C) were examined with tonometry using the Sphygmocore system, to determine aortic and brachial PWV. The relation between local common carotid artery (CCA) pressure and lumen diameter (LD) as well as IMT determined by ultrasound was studied as a measure of remodelling capacity of the carotid wall.

**Results:** AAA:s had higher aPWV than C (11,2±2 vs 9,9±2 m/s,  $p=0.03$ ). No difference in bPWV was seen. An increased LD in CCA was found in the AAA:s (7,5±1,3 vs 6,5±0,7 mm respectively,  $p<0,001$ ). In C there was a positive correlation between local pulse pressure (LPP) and CCA IMT ( $r=0,49$ ,  $p<0,001$ ), which was not seen in the AAA ( $r=0,03$ , NS). The expected negative correlation between LPP and LD/IMT ( $r=-0,44$ ,  $p=0,004$ ) indicating a remodelling response in the CCA was found in C but not in AAA ( $r=-0,25$ , NS).

**Conclusion:** A changed aortic wall structure in central elastic arteries with high PWV in patients with AAA is seen. Further, the remodelling of the common carotid artery in response to local pulse pressure is defect. This form a background explaining the high cardiovascular comorbidity besides the risk of aneurysmal rupture in these patients.

#### P4.06

##### ENDOTHELIAL VASOMOTOR FUNCTION AND ARTERIAL STIFFNESS IN YOUNG MEN WITH ARTERIAL HYPERTENSION, GRADE I, AND THEIR RELATION WITH RED BLOOD CELL DISTRIBUTION WIDTH

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Endothelial dysfunction and arterial stiffness increasing are negative prognostic markers in arterial hypertension. Red blood cell distribution width (RDW) was shown as a new negative prognostic marker in some cardiovascular diseases.

**Objective:** To study the relation between endothelial function and RDW, arterial stiffness and RDW in young men with arterial hypertension.

**Materials and Methods:** 54 men, 29,9±0,9 y ( $M\pm SE$ ), with arterial hypertension, Grade I were examined. Flow-mediated vasodilatation (FMD) was assessed by Vivid 7 (GE), arterial stiffness by brachial-ankle pulse wave velocity (PWV) (Vasera VS-1000, Fukuda Denshi), RDW by Cell Din 3500 (Abbot).

**Results:** FMD ranged from 18,4% to -1,8% (6,8±0,7%), PWV from 9,7 m/s to 16,3 m/s (12,1 ±0,2 m/s), RDW from 12,3% to 16,2 % (14,2 ±0,1%). Endothelial dysfunction was detected in 46% patients, increasing the arterial stiffness in 61% and elevated RDW in 37%. Patients with elevated RDW had lower FMD (4,6±0,4 % vs 8,0±0,4 %,  $p=0,01$ ), more prevalence of endothelial dysfunction (70% vs 33 %,  $p=0,01$ ) and higher values of PWV (12,6±0,3m/s vs 11,9±0,2 m/s,  $p=0,04$ ) in comparison with patients with normal RDW. RDW correlated with FMD:  $r = -0,4$ ,  $p=0,01$ . Chance of endothelial dysfunction in young men with arterial hypertension and elevated RDW is more in 5 times.

**Conclusion:** Endothelial dysfunction, increased arterial stiffness and elevated RDW have high prevalence in young men with arterial hypertension. Elevated RDW is associated with endothelial dysfunction and increased arterial stiffness and may be considered as a perspective prognostic marker in arterial hypertension.

#### P4.07

##### DIFFERENT IMPACT OF HYPERTENSION AND TYPE 2 DIABETES ON AORTIC, CAROTID AND PERIPHERAL VASCULAR STIFFNESS

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Aim of the study was to evaluate the impact of diabetes, hypertension, and their combination on aortic, carotid and peripheral stiffening.