



## Artery Research

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### **P1.36: ARTERIAL STIFFNESS AND MARKERS OF OXIDATIVE STRESS HAPTOGLOBIN AND HOMOCYSTEINE IN NEVER TREATED INCIDENT HYPERTENSIVE PATIENTS**

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the relationship of structural and functional markers of large arteries with blood pressure variability.

**Methods:** Our study sample consisted of 1125 randomly selected participants (mean age: 42.4 years; 49.3% women). One trained researcher conducted vascular measurements, including carotid intima-media thickness (IMT), carotid distensibility and carotid-femoral pulse wave velocity (PWV). Systolic blood pressure (SBP) was measured 5 times consecutively. We assessed within-subject variability independent of the mean (VIM).

**Results:** SBP and VIM averaged 127.9 mm Hg and 3.86 units, while the vascular measurements averaged 0.70 mm, 6.62 m/s and  $24.7 \cdot 10^{-3}$ /kPa for IMT, PWV and carotid distensibility, respectively.

In single regression, IMT correlated with SBP ( $r=0.27$ ,  $p<0.0001$ ) and VIM ( $r=0.22$ ;  $p<0.0001$ ). Similarly, PWV and the carotid distensibility correlated with both SBP (PWV,  $r=0.34$ ;  $p<0.0001$ ; carotid distensibility,  $r=-0.32$ ,  $p<0.0001$ ) and VIM; however, the associations with VIM were weaker (PWV,  $r=0.07$ ;  $p=0.025$ ; carotid distensibility,  $r=-0.09$ ,  $p=0.003$ ). After adjusting for sex and age, and other covariables, the associations of IMT with SBP ( $\beta=0.029$ ,  $p<0.0001$ ) and VIM ( $\beta=0.036$ ,  $p<0.0001$ ) remained. However, those between PWV ( $\beta=0.044$ ,  $p=0.45$ ), carotid distensibility ( $\beta=-0.53$ ,  $p=0.28$ ) and VIM disappeared. PWV ( $\beta=0.353$ ,  $p<0.0001$ ) and carotid distensibility ( $\beta=-2.92$ ,  $p<0.0001$ ) remained associated with SBP.

**Conclusion:** In the FLEMENGHO cohort, blood pressure variability relates to carotid IMT, but not the indexes of arterial stiffness.

### P1.36

#### ARTERIAL STIFFNESS AND MARKERS OF OXIDATIVE STRESS HAPTOGLOBIN AND HOMOCYSTEINE IN NEVER TREATED INCIDENT HYPERTENSIVE PATIENTS

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**Introduction:** Hypertension is a major risk factor for development of cardiovascular disease (CVD). Arterial stiffness is a risk predictor of CVD in this patient group. Oxidative stress has been implicated in the development of arterial stiffness. Haptoglobin (Hp) and homocysteine (Hcy) are well documented markers of oxidative stress. We hypothesized that Hp and Hcy are associated with arterial stiffness in never treated incident hypertensive patients.

**Methods and Material:** We examined 125 patients with newly diagnosed never treated hypertension. Patients had 24h ambulatory blood pressure (BP) measurement (Spacelabs Healthcare®, Hertford, UK) performed and were eligible if daytime BP was  $\geq 135/85$  mmHg. Arterial stiffness expressed as carotid-femoral pulse wave velocity (cfPWV), augmentation index at heart rate 75 (Alx@75), and central systolic blood pressure (cenBP) were measured with the SphygmoCor® device (Atcor Medical®, Sydney, Australia). Hp and Hcy were determined using rate nephelometry (Beckmann IMMAGE™, DK).

**Results:** Patient baseline characteristics are shown in the Table. In a univariate correlation Hp showed a weak association with Alx@75 ( $r=0.16$ ,  $p=0.04$ ) which in an adjusted regression model remained significant ( $r^2=0.45$ ,  $p=0.02$ ). Hp was not associated with cfPWV or cenBP nor was there any association between Hcy and cfPWV, Alx@75, and cenBP.

**Conclusion:** Only Hp was associated with arterial stiffness (Alx@75) whereas no other associations were found. Thus, Hcy appear not to be associated with arterial stiffness in hypertension and further studies are warranted to elucidate the role of Hp as a risk marker in hypertension.

### P1.37

#### RISK FACTORS FOR INTIMAL HYPERPLASIA DEVELOPMENT AFTER CAROTID ENDARTERECTOMY

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**Background:** Intimal hyperplasia is a common complication occurring after carotid endarterectomy (CEA), although pathological mechanisms leading to its progression are not totally clear.

**Methods:** In our study we assessed a role of various factors including age, gender, hypertension, history of smoking, hyperlipidaemia, diabetes mellitus, lesions characteristics, type of arteriotomy closure and regional flow dynamics affecting intima-media thickness (IMT) post CEA. We examined 1003 patients prior to and 1 year after carotid endarterectomy using standardized duplex ultrasound examination. The median age of patients was  $60 \pm 15$  years. Univariate and multivariate regression analysis was used to identify major risk factors and possible correlations between them.

**Results:** Only 2 of systemic factors - elevated level of low-density lipoprotein and platelet aggregation were found to have a minor (although statistically significant) effect on IMT after CEA. Age, gender, hypertension, smoking were not significantly associated with the development of intimal hyperplasia post CEA. Complicated plaques showed a significant correlation with intimal hyperplasia. There were no significant differences in IMT between patients who have had eversion CEA versus CEA with patch. Of local factors, only shear stress demonstrated a negative correlation with IMT.

**Conclusions:** Our results demonstrate that multiple risk factors could be involved in the development of intimal thickening after CEA.

### P1.38

#### RELATIONSHIP BETWEEN ANKLE BRACHIAL INDEX AND OTHER INDICES OF TARGET ORGAN DAMAGE IN HYPERTENSIVE PATIENTS

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**Objective:** Assessment of ankle brachial index (ABI) is a method of peripheral artery disease diagnosis. Its role has been established as a predictor of cardiovascular events. The role of ABI in the hypertensive patients without cardiovascular has not been studied. The aim of study was assessment of the relationship between ABI, target organ damage and ambulatory blood pressure in hypertensives.

**Methods:** 355 hypertensive patients (199 males, 56%) without history of renal or cardiovascular disease were examined. The ambulatory blood pressure (Spacelabs 90207), echocardiography (Vivid 7 Pro™), carotid intima-media thickness (IMT, ArtLab system), carotid-femoral pulse wave velocity (PWV) and central blood pressure (Sphygmocor) were measured. Ankle brachial index (blind Doppler), left ventricular mass index, and estimated glomerular filtration rate (eGFR, MDRD formula) were calculated.

**Results:** In the population ABI (mean  $1.05 \pm 0.11$ ) was weakly related to central pulse pressure ( $r=-0.12$ ;  $p=0.02$ ), but not to central SBP ( $r=0.04$ ;  $p=NS$ ). ABI was not linked to 24-h SBP ( $r=0.03$ ;  $p=NS$ ), 24-h pulse pressure ( $r=0.08$ ,  $p=NS$ ), LVMI ( $r=0.01$ ;  $p=NS$ ), or eGFR ( $r=0.10$ ;  $p=NS$ ). There was no correlation between ABI and other indices of arterial wall properties: IMT ( $r=0.06$ ;  $p=NS$ ) or PWV ( $r=0.03$ ;  $p=NS$ ).

**Conclusion:** ABI is weakly related to central pulse pressure, but not to ambulatory or central blood pressure. ABI is not linked to other markers of cardiac and vascular damage in hypertensives without cardiovascular disease.

### P1.39

#### LOW SHEAR STRESS INDUCES PROGRESSION OF INTIMAL HYPERPLASIA AFTER CAROTID ENDARTERECTOMY

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**Background:** The progression of intimal hyperplasia after carotid endarterectomy (CEA) is influenced by local hemodynamic factors. In our study we investigated associations between flow volume, velocity, shear stress and the intimal hyperplasia (IH) of the common carotid artery after CEA.

**Methods:** 1009 patients ( $60 \pm 15$  years, 86% of which were male) who had had CEA between 2001 and 2011 were included in our study. Blood velocity, internal diameter, flow volume and intima-media thickness were measured using standardized duplex ultrasound examination at 3, 6, 9 and 12 months after operation. Shear stress was calculated as blood viscosity multiplied by blood velocity divided by internal diameter.