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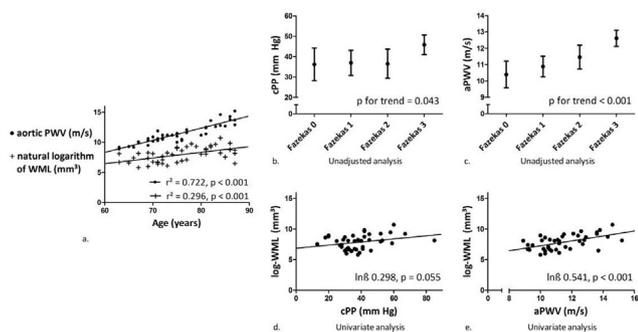
### **P30: THE ROLE OF NOVEL BIOMARKERS IN ARTERIAL STIFFNESS, AND IN PREDICTING FURTHER VASCULAR EVENTS AFTER TIA AND LACUNAR STROKE**

Esme Girdwood, Manuela Mengozzi, Eva Bunting, Jean Timeyin, Pietro Ghezzi, Chakravarthi Rajkumar

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**Conclusion:** Increased pulse pressure and increased aortic stiffness were associated with the severity of WML, assessed with both Fazekas score and a quantitative hyperintensity segmentation method. Age is highly associated with aortic stiffness and cerebral small vessel disease.

## P27

### REPLACED RIGHT HEPATIC ARTERY AND INTERLOBAR BRIDGE OF LIVER WITH UNUSUAL ARTERIAL SUPPLY OF IVTH SEGMENT

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A replaced right hepatic artery (rRHA) arising from the superior mesenteric artery and an interlobar parenchymal bridge over the sagittal fissure of liver have been observed on a 64 year old formalin-fixed male cadaver in the anatomy laboratory.

As we followed a detailed segmental anatomy, encountered an arterial distribution on the segment IV featuring a different pattern from the literature so far. According to our observations, the segment I is supplied by both left (LHA) and middle (MHA) hepatic arteries; the segments II and III are supplied by the LHA while the segment IV is supplied by both the MHA and rRHA. The segments V-VIII are supplied only by the rRHA. Our case emphasizes the importance of arterial variations of liver once again in terms of the surgical procedures during the liver transplantation, hepatic tumors, and etc.

Our discussion particularly focuses to the arterial supply of the segment IV and possible complications it may cause during/after the liver operations.

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## P28

### DETERMINANTS OF ARTERIAL STIFFNESS AS MARKER OF EARLY VASCULAR AGING IN PHYSICIANS POPULATION

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**Objective:** To analyze determinants of arterial stiffness in physician's population.

**Methods:** Observational multicenter study of doctor's vascular health conducted in 12 Russian cities (VICTORIA study). Demographics; smoking status; anamnesis of arterial hypertension (AH) with/without therapy, medications, established CV, renal diseases, diabetes mellitus; cholesterol and glucose level were registered. Arterial stiffness and vascular age was assessed using BPLab® device with Vasotens® technology (Petr Telegin Company, Nizhny Novgorod, Russia). Arterial stiffness was defined as an elevation of pulse pressure (PP) > 60 mmHg, PWV > 10 m/s.

**Results:** 464 individuals were included (247 normotensives (mean age 44 yrs) and 237 with AH (mean age 58 yrs)). Mean PP was  $46.0 \pm 9.8$  mm Hg in normotensive group and  $58.6 \pm 17.4$  mm Hg in group with AH ( $p < 0.001$ ). Mean PWVao was  $10.9 \pm 2.0$  m/s and  $12.5 \pm 2.5$  m/s in groups without and with AH, respectively ( $p < 0.001$ ). PP > 60 mm Hg had 11% subjects without AH and 43% with elevated blood pressure (BP) ( $p < 0.001$ ). PWVao > 10 m/s had 68% of normotensive subjects and 92% of hypertensive patients ( $p < 0.001$ ). PWVao correlated with brachial systolic ( $r = 0,42$ ,  $p < 0.05$ ) and diastolic BP ( $r = 0,38$ ;  $p < 0.05$ ), central systolic ( $r = 0,45$ ,  $p < 0.05$ ) and diastolic BP ( $r = 0,41$ ;  $p < 0.05$ ), age ( $r = 0,37$ ,  $p < 0.05$ ), heart rate ( $r = 0,41$ ,  $p < 0.05$ ). There was association between elevated PWVao and body mass index ( $r = 0,39$ ,  $p < 0.05$ ). In a multiple linear regression model, independent determinants of PWV were systolic BP ( $\beta = 0,29$ ,  $p < 0.001$ ), body mass index ( $\beta = 0,19$ ,  $p < 0.001$ ).

**Conclusions:** High PWVao measured by BPLab® device with Vasotens® technology is characterized physician's population with and without AH. The main determinants of PWVao are systolic BP and body mass index.

## P29

### TOTAL LONGITUDINAL DISPLACEMENT (TLOD) OF THE COMMON CAROTID ARTERY (CCA) DOES NOT DIFFER BETWEEN PATIENTS WITH MODERATE OR HIGH CARDIOVASCULAR RISK (CV) AND PATIENTS AFTER ACUTE MYOCARDIAL INFARCTION (AMI)

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**Background:** Total longitudinal displacement (tLoD) of the common carotid artery (CCA) wall is a novel ultrasound marker of vascular function that can be evaluated using modified speckle tracking techniques. Decreased CCA tLoD has already been shown to be associated with diabetes and was shown to predict one year cardiovascular outcome in patients with suspected coronary artery disease (CAD). The aim of our study was to evaluate if CCA tLoD differ between patients with moderate or high cardiovascular (CV) risk and patients after recent acute myocardial infarction (AMI).

**Methods:** 49 patients ( $54 \pm 6$  years) with moderate or high CV risk and 42 patients ( $58 \pm 7$  years) after recent AMI were included. All patients were non-diabetic. CCA tLoD was evaluated using GE EchoPAC speckle tracking software and expressed as mean of both sides. Data on systolic blood pressure, total and high density lipoprotein (HDL) cholesterol levels, high sensitivity C-reactive protein (hsCRP) level, smoking status and family history of early CV events was evaluated and assessed for association with CCA tLoD.

**Results:** tLoD of CCA did not differ between patients with moderate or high CV risk and patients with very high CV risk after MI ( $0.265 \pm 0.128$  mm vs.  $0.237 \pm 0.103$  mm,  $p > 0.05$ ). Lower tLoD was associated with lower HDL cholesterol levels ( $r = 0.211$ ,  $p = 0.04$ ) and male gender ( $0.228 \pm 0.1$  vs.  $0.297 \pm 0.134$ ,  $p = 0.01$ ).

**Conclusions:** tLoD of CCA did not differ between patients with moderate or high CV risk and patients with very high CV risk after AMI. However, lower CCA tLoD was significantly associated with low HDL cholesterol levels and male gender.

## P30

### THE ROLE OF NOVEL BIOMARKERS IN ARTERIAL STIFFNESS, AND IN PREDICTING FURTHER VASCULAR EVENTS AFTER TIA AND LACUNAR STROKE

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**Objective:** To explore the role of biomarkers (hsCRP, sRANKL, PRDX1 and EPO) in arterial stiffness and in predicting further vascular events.

**Methods:** Patients from the ongoing ASIST study each attended a laboratory visit within fourteen days of their diagnosed TIA or lacunar stroke. Arterial stiffness was calculated using cFPWV (carotid-femoral pulse wave velocity) measured with Complior®Artech, France, and with the CAVI®Fukuda,

Japan (cardio-ankle vascular index) method. Blood samples were taken for ELISA assays. Analysis was completed with SPSS software

**Results:** Forty patients were evaluated in this preliminary project (29 male/11 female, mean age  $70.7 \pm 11.99$ ), with four experiencing a further event during the six month follow up (10%).

All biomarkers and both measurements for arterial stiffness had a higher mean value in patients with a further event (hsCRP 3.89 vs 1.42,  $P = 0.08$ ; EPO 9.06 vs 9.01,  $P = 0.85$ ; sRANKL 0.05 vs 0.03,  $P = 0.31$ ; PRDX1 6.27 vs 6.21,  $P = 0.95$ ; CAVI 11.13 vs 9.69,  $P = 0.15$ ; cfPWV 10.82 vs 10.2,  $P = 0.55$ ), however none were statistically significant.

Levels of PRDX1 were elevated acutely post-event before falling significantly ( $R = -0.475$ ,  $P = 0.002$ ), while hsCRP and EPO continued to be elevated at  $>10$  days post-event.

In addition, CAVI correlated closely with hsCRP ( $R = 0.28$ ,  $P = 0.09$ ) and EPO ( $R = 0.29$ ,  $P = 0.08$ ), but cfPWV was not closely related to any of the biomarkers.

**Conclusions:** This preliminary data suggests that biomarkers, particularly EPO and hsCRP, are more closely related to CAVI than cfPWV. hsCRP was the most relevant as an independent predictive factor for further vascular events.

#### Poster Session II – Obesity and Diabetes

P150

##### ARTERIAL STIFFNESS AND PROGRESSION OF CEREBRAL WHITE MATTER LESIONS IN ASYMPTOMATIC PATIENTS WITH TYPE 2 DIABETES AND MATCHED CONTROLS: A 5-YEAR COHORT STUDY

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**Aim:** Stroke is a frequent and feared complication in patients with type 2 diabetes. Arterial stiffness may improve current suboptimal risk prediction of stroke. However, studies in diabetes populations are lacking. We investigated the association between arterial stiffness progression (carotid-femoral pulse wave velocity [PWV]) and the progression of cerebral white matter lesions (WML), a marker of stroke risk, in patients with type 2 diabetes and matched controls.

**Methods:** In a 5-year follow-up study, data from 49 patients and 58 controls were available for analysis. At baseline, participants had a mean ( $\pm$ SD) age of  $59 \pm 10$  years and patients had a median (range) diabetes duration of 1.8 (1.0–3.2) years. Fifty-two (49%) were males. At both baseline and follow-up, PWV was obtained by tonometry and WML by cerebral T2-FLAIR MRI. WML was assessed by Breteler score, and progression was defined as an upward change in category during follow-up.

**Results:** Patients with type 2 diabetes had a higher PWV than controls at both baseline ( $9.2 \pm 2.2$  vs.  $7.9 \pm 1.4$  m/s,  $p < 0.01$ ) and follow-up ( $9.8 \pm 2.4$  vs.  $8.6 \pm 1.9$  m/s,  $p = 0.01$ ). Breteler scores and WML progression were similar in the two groups ( $p > 0.05$ ). PWV progression was associated with WML progression in the total cohort (adjusted for age, sex, diabetes, baseline PWV and systolic blood pressure progression: OR 1.58 [95%CI: 1.09–2.28],  $p = 0.02$ ). We found no interaction between diabetes and PWV progression on WML progression.

**Conclusions:** PWV progression is associated with WML progression in patients with type 2 diabetes and healthy controls. PWV candidates as a new risk marker for stroke.

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##### CENTRAL PULSE PRESSURE IS ASSOCIATED WITH AORTIC-BRACHIAL STIFFNESS MISMATCH IN PATIENTS WITH ARTERIAL HYPERTENSION AND DIABETES MELLITUS

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**Background:** Central pulse pressure (PP) is a surrogate measure of arterial stiffness (AS) and a predictor of cardiovascular events in type 2 diabetes mellitus (T2DM). AS gradient reflects the vascular ageing.

**The aim of the study:** To evaluate the associations between 24-h central PP and parameters of AS in patients with arterial hypertension (AH) and T2DM. **Materials and methods:** 90 patients with AH and T2DM were included (39% males, mean age  $63.8 \pm 11.6$ ). Mean office BP was  $146 \pm 23/86 \pm 10$  mmHg. Median duration of DM was 8.5 years. 24-h peripheral and central BP monitoring was performed (BPLab Vasotens). AS parameters were assessed by applanation tonometry (Sphygmocor, AtCor). AS gradient was calculated as cfPWV/crPWV and its elevation  $\geq 1$  was considered as AS mismatch.  $p < 0.05$  was considered significant.

**Results:** Mean central BP was  $132 \pm 18/79 \pm 12$  mmHg, cfPWV  $-10.5 \pm 2.4$  m/s, crPWV  $-8.5 \pm 1.4$  m/s, AS gradient  $-1.2 \pm 0.3$ . 24-h central BP levels were as follows:  $132 \pm 18/79 \pm 12$  mmHg for 24hBP,  $132 \pm 18/81 \pm 13$  mmHg for daytime and  $129 \pm 20/75 \pm 11$  mmHg for nighttime. Mean PP levels were  $53 \pm 14$ ,  $52 \pm 14$  and  $56 \pm 15$  mmHg, respectively. 24-h central PP increase  $> 50$  mmHg was observed in 30% patients. These patients were older ( $67.1 \pm 10.5$  vs  $61.8 \pm 11.9$  years), had higher median duration of DM (10; IQR 7–15 vs 5; IQR 0, 9–12 years), cfPWV ( $11.4 \pm 1.9$  vs  $10.0 \pm 2.6$  m/s) and stiffness gradient ( $1.4 \pm 0.3$  vs  $1.2 \pm 0.2$ ),  $p < 0.05$  for trend. There were significant correlations between 24-h central PP and age ( $r = 0.27$ ) and AS gradient ( $r = 0.32$ ),  $p < 0.05$  for trend. No predictors of PP elevation were found.

**Conclusions:** In diabetic patients with AH increase of central PP is associated with aortic-brachial stiffness mismatch. This finding confirms its importance as a marker of vascular ageing in this patient population.

P152

##### MICROALBUMINURIA IN NEWLY DIAGNOSED DIABETES MELLITUS: NOT ONLY ABOUT BLOOD PRESSURE OR ARTERIAL STIFFNESS

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**Background:** Diabetes mellitus (DM) and hypertension (EH) are both associated with micro- and macro-vascular damage. Microalbuminuria is a recognized marker of sub-clinical target organ damage in both DM and EH. However, it's determinants in newly diagnosed DM with or without EH remain unclear.

**Methods:** We enrolled consecutive newly diagnosed DM patients, recording history, demographics, renal, lipid and glycemic profile, office and ambulatory blood pressure, macro-(pulse-wave velocity/PWV) and micro-vascular (microalbuminuria in 24-hour urine) damage and subclinical atherosclerosis (intima-media thickness).

**Results:** We studied 65 DM patients (40 male: 25 female, aged  $57 \pm 11$  years), with a median duration from diagnosis of 2 weeks. Their fasting glucose was 121.5 (IR: 36) mg/dl, HbA1c: 7.47 (IR: 2%). Among them, 26 had already been diagnosed with EH (median duration of 8 (IR: 8) years), while 17 were diagnosed with EH at the time of DM diagnosis. No difference was observed between the two groups, except for significantly higher office and ambulatory BP and PWV in the newly diagnosed EH patients. Microalbuminuria was associated with fasting glucose ( $p = 0.04$ ), HbA1c ( $p = 0.002$ ), serum creatinine ( $p = 0.035$ ), glomerular filtration rate (GFR) ( $p = 0.002$ ), office systolic ( $p = 0.009$ ) and diastolic ( $p = 0.026$ ) BP and PWV ( $p = 0.031$ ). In the multivariate analysis, HbA1c (beta = 0.351,  $p = 0.015$ ) was the only determinant of microalbuminuria.

**Conclusions:** Our study indicates that hyperglycaemia has a significant impact on microalbuminuria even in patients with newly diagnosed DM and