**Objective:** Visceral artery fibromuscular dysplasia (VA FMD) is being rarely reported, with clinical picture ranging from asymptomatic to life-threatening. The aim of the study is to evaluate the prevalence and clinical characteristics of VA FMD.

**Design and method:** Out of 330 patients enrolled into ongoing ARCADIA-POL study since January 2015 (instituted as Polish-French collaboration) we present 225 patients (185 females, mean age: 46.1 ± 14.7 yrs) with confirmed FMD in at least one vascular bed. All patients underwent detailed clinical evaluation including ABPM, biochemical evaluation, bio-banking, duplex Doppler of carotid and abdominal arteries and whole body angio-CT. In the current analysis, we focused on the prevalence and clinical characteristics of VA FMD (defined as the presence of typical FMD lesions in superior or inferior mesenteric arteries, as well as celiac trunk, splenic and hepatic arteries).

**Results:** Visceral FMD was present in 32 patients (19.1%). Among them, 75% (n = 24) were females, the mean age was 48.6 ± 17.2 years and 96.9% of patients had multivessel FMD. 28 patients reported FMD lesions in mesenteric arteries or celiac trunk, 6 patients in splenic and 8 patients in other visceral arteries. In 28 (12.4%) patients, aneurysms were found in visceral arteries, most commonly in splenic arteries (23 pts [10.2%]). In 2 patients, aneurysms were present in more than one visceral artery. In one patient, a dissection of the celiac trunk was identified. Patients with VA FMD most commonly reported abdominal pain (10 patients, 31.2%). A5 (15.6%) patients suffered from weight loss and 6 (18.6%) from postprandial abdominal pain. 3 patients with VA FMD experienced emergencies. Two patients underwent intestine resection due to acute mesenteric ischemia caused by occlusion of the upper mesenteric artery and of the celiac trunk respectively. In a third patient, the primary manifestation of VA FMD was rupture of hepatic aneurysm complicated by hypovolemic shock. The aneurysm was eventually embolized, with favorable clinical outcome.

**Conclusions:** In ARCADIA-POL study, VAFMD was present in every fifth patient. The clinical presentations of VA FMD varied from asymptomatic lesions to emergencies, including critical ischemia and life-threatening aneurysm bleeding. Our results support screening for VA FMD in patients with FMD in other vascular beds.

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**IN-VITRO CHARACTERIZATION OF MOUSE CAROTID ARTERY MECHANICS BY DYNAMIC BAXIAL PRESSURE-MYOGRAPHY**

M. vanderBruggen1, K. Reesink1, P. Sprochnik1, N. Bitsch1, J. Hameleers1, R. Megens2, C. Schallwijk1, T. Delhaas1, B. Sprochnik1, CARIM/MUMC+, Maastricht, The Netherlands, Ludwig-Maximilians-Universität, Munich, Germany, Yale University, New Haven, CT, USA

**Objective:** Although in-vitro biomechanical behaviour of arteries is commonly studied under quasi-static conditions, dynamic (pulsatile, in-vivo) behaviour may differ substantially. We developed a set-up to characterize mouse carotid artery biaxial mechanics under quasi-static and dynamic conditions, using high-frequency ultrasound to track diameter and two-photon laser scanning microscopy (TPLSM) to capture the microstructure. We aimed to (1) quantify reproducibility and (2) compare quasi-static and dynamic elastic behaviour.

**Results:** Carotid arteries were stretched to in-vivo length and exposed to quasi-static pressure inflations from 0–200 mmHg. Second, axial stretch (lz) was varied for constant pressures of 60/100/140 mmHg to determine an axial stiffness coefficient. Third, vessels were exposed to pulsatile pressures (systolic pressures of 80/120/160 mmHg, at 5 Hz) and at frequencies (f) of 2.5/5/10 Hz at 120 mmHg. Single-point pulse wave velocity (PWV; Bramwell-Hill) was determined and compared with corresponding PWVs calculated from the quasi-static pressure-diameter curve. The axial stiffness coefficient was obtained as the local slope of the F-lz curve. Fourth, information on adventitial collagen-structure deformation was obtained using second-harmonic generation TPLSM. The first three protocol steps were performed in duplicate to determine coefficients of variation (CVs).

**Conclusions:** Our innovative set-up shows well-acceptable reproducibility and demonstrates the importance of quasi-static and dynamic conditions when studying arterial mechanics.

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**THE RELATIONSHIP BETWEEN DIASTOLIC MODALITY, ARTERIOVENOUS FISTULA AND HEMODYNAMIC PARAMETERS OF ARTIFICIAL RESERVOIR-WAVE ANALYSIS**

M. Pae1, C. Fortier1, F. Mac-Way1, M. Allard1, K. Marquis1, M. Schultz2, D. Sharman1, M. Agharazii1, CHU de Québec Research Center, L’Hôpital-Dieu de Québec, Dept of Medicine, Laval University, Quebec, Canada, 2Menzies Institute for Medical Research, Hobart, AUSTRALIA

**Objective:** Arterial reservoir-wave analysis (RAWA) is a new model of arterial hemodynamics that separates the arterial wave into reservoir pressure (RP) and excess pressure (XSP). Whether RAWA parameters are different in hemodialysis (HD), as compared to peritoneal dialysis (PD), and whether any differences are due to the presence of an arteriovenous fistula (AVF) remains unknown. The aims of the present study were to examine the differences in RAWA 1) in HD versus PD patients and 2) in all dialysis patients (HD+PD) without AVF versus HD patients with AVF.

**Design and method:** In a cross-sectional analysis of prevalent PD (n = 53) and HD (n = 208) patients, RAWA was performed using pressure approach applied to the carotid pressure, which was calibrated with mean arterial pressure and used as a surrogate for central pressure. Among HD patients, 115 patients used AVF as vascular access.

**Results:** In HD patients, diastolic blood pressure (BP) was lower (69 ± 14 vs 77 ± 10, mmHg, p < 0.001), while systolic BP was identical, resulting in increased carotid pulse pressure (PP) (58 ± 22 vs 50 ± 22 mmHg, p = 0.036). Carotid RP and XSP integral were higher in HD patients (2.11 ± 0.91 vs 1.89 ± 0.94, p = 0.027, 0.48 ± 0.30 vs 0.39 ± 0.27, p = 0.009). While there were no significant differences in BP medication between groups, HD patients were older and had a higher prevalence of clinical comorbidities such as diabetes and established cardiovascular disease. However, analysis of data according to AVF status resulted in homogeneous groups in terms of age and comorbidities. In AVF group, dialysis vintage was higher (median 2.3 vs 1.1 years, p < 0.001), diastolic BP lower (68 ± 13 vs 72 ± 13 mmHg, p = 0.003), PP higher (59 ± 22 vs 54 ± 22, p = 0.061), and RP and XSP integrals were higher (2.2 ± 0.9 vs 2.0 ± 0.9, p = 0.048; 0.5 ± 0.3 vs 0.4 ± 0.3, p = 0.078). After adjustment for dialysis vintage, XSP was significantly higher in AVF group (p = 0.034).

**Conclusions:** In HD patients, RP and XSP integral were higher as compared to PD patients, but these differences were mainly due to the presence of AVF.

**DISSOCIATION OF PULSE WAVE VOLUME WITH BLOOD PRESSURE DURING DEVICE GUIDED BREATHING**

L. Facconti, B. Furukh, R. McNally, P. Chowiencycz. King’s College London Brit- ish Heart Foundation, Department of Clinical Pharmacology, St Thomas Hospita- l, London, UNITED KINGDOM

**Objective:** Arterial stiffness (AS) measured as carotid-femoral pulse wave velocity (cPWV) is an important determinant of cardiovascular risk closely related to
brachial blood pressure (BP). Whether it can be changed independently of BP in the short term is uncertain but recent observations suggest that AS may be specifically modulated by the autonomic nervous system (ANS). Here we compared effects of device guided breathing (DGB, known to reduce sympathetic activity) with nifedipine on cfPWV.

**Design and method:** Patients with essential HT on pharmacological treatment (mean ± SD age 48 ± 14 years, n = 19) had cfPWV (SphygmoCor) and brachial BP (Omron) measurements performed before and after DGB and oral administration of nifedipine 10 mg. The two interventions were performed consecutively in single visit with the patient lying in supine position. DGB is a biofeedback technique which slows the breathing rate to <10 breaths/minute and decreases BP via its action on the ANS. Nifedipine is a short acting peripheral arterial vasodilator that tends to increase sympathetic activity.

**Results:** Baseline systolic BP (SBP) 150.4 ± 12.6 and diastolic BP (DBP) 89.8 ± 8.7 mmHg, heart rate (HR) 65.9 ± 11.2 bpm; cfPWV 10.3 ± 2.4 m/s. Compared to nifedipine, DGB caused less reduction of both brachial SBP and DBP: decrease of 12.3 (95%CI 8.4, 16.1) vs. 16.1 (12.7, 19.5) mmHg in SBP for DGB and nifedipine and 5.9 (3.1, 8.7) vs. 10.4 (7.1, 13.5) mmHg in DBP (P < 0.05 for difference between DGB and nifedipine). DGB caused a greater reduction in cfPWV: decrease of 1.2 (0.8, 1.8) and 0.7 (0.1, 1.3) m/s for DGB and nifedipine respectively (P = 0.02 for difference between DGB and nifedipine). HR decreased during DGB by 3.6(1.2, 5.9) bpm and increased after administration of nifedipine: 7.6(3.9, 11.3) bpm.

**Conclusions:** DGB had a greater impact on AS despite a smaller effect on BP. These results demonstrate that cfPWV can be changed independently from BP in the short-term and support a specific role of the ANS in regulating cfPWV.

**References:**

1. Baseline systolic BP (SBP) 150.4 ± 12.6 and diastolic BP (DBP) 89.8 ± 8.7 mmHg, heart rate (HR) 65.9 ± 11.2 bpm; cfPWV 10.3 ± 2.4 m/s. Compared to nifedipine, DGB caused less reduction of both brachial SBP and DBP: decrease of 12.3 (95%CI 8.4, 16.1) vs. 16.1 (12.7, 19.5) mmHg in SBP for DGB and nifedipine and 5.9 (3.1, 8.7) vs. 10.4 (7.1, 13.5) mmHg in DBP (P < 0.05 for difference between DGB and nifedipine). DGB caused a greater reduction in cfPWV: decrease of 1.2 (0.8, 1.8) and 0.7 (0.1, 1.3) m/s for DGB and nifedipine respectively (P = 0.02 for difference between DGB and nifedipine). HR decreased during DGB by 3.6(1.2, 5.9) bpm and increased after administration of nifedipine: 7.6(3.9, 11.3) bpm.

**Conclusions:** DGB had a greater impact on AS despite a smaller effect on BP. These results demonstrate that cfPWV can be changed independently from BP in the short-term and support a specific role of the ANS in regulating cfPWV.