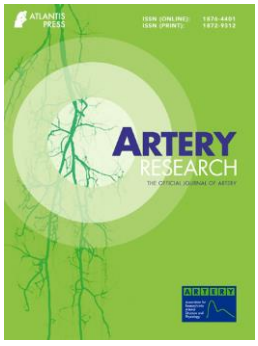

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P80: ANALYSIS OF ENDOTHELIAL FUNCTION IN MALE STUDENTS IN SOUTHERN BRAZIL: THE ROLE OF PHYSICAL ACTIVITY

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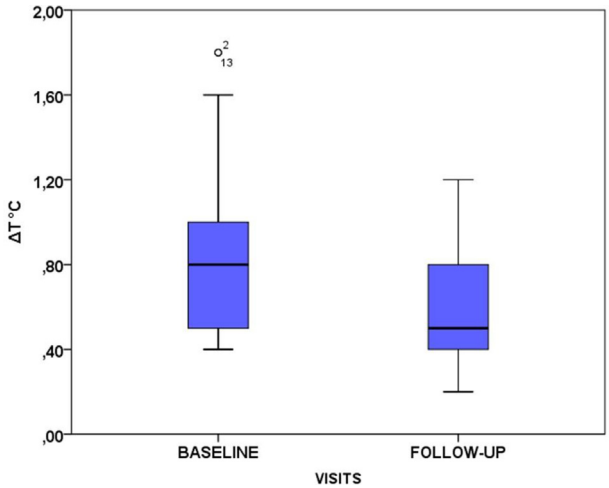
of treatment was reduced statistically significant (0.88 ± 0.42 to 0.58 ± 0.29 °C, p = 0.021) (Image).
Conclusion: In a group of patients with dyslipidemia thermal heterogeneity in the carotid arteries was positively associated with carotid subclinical atherosclerosis. Moreover, dyslipidemia treatment reduced thermal heterogeneity after a short-term period, implying a beneficial effect of treatment on thermal heterogeneity.



P77
TARGETED LIPIDOMICS OF ARTERIAL STIFFNESS AND HEMODYNAMICS IN ATHEROSCLEROSIS

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Objectives: This study examined relationships between lipidomic profile, arterial function and hemodynamics in coronary artery disease (CAD) patients, peripheral arterial disease (PAD) patients and healthy controls.
Methods: We studied 52 patients with CAD, 32 patients with PAD, and 40 apparently healthy controls. Serum levels of 40 acylcarnitines, 76 phosphatidylcholines (PC) and 14 lysophosphatidylcholines (lysoPC) were determined with the AbsoluteIDQ™ p180 kit (BIOCRATES). Arterial applanation tonometry (Sphygmocor, Atcor Medical) was used for pulse wave analysis and carotid-femoral pulse wave velocity (cf-PWV) assessments.
Results: 1) Acylcarnitine profile (CAD patients vs healthy subjects): elevated levels of C16:1, C18:1, C3-DC(C4-OH), PC aa C40:6, Met-SO/Met were observed in the CAD group compared to the healthy controls. Cf-PWV showed positive correlations with C14, C16:1, (C2 + C3)/C0, C2/C0 and the CPT-1 ratio for the CAD group. Moreover, PCA-derived factor 3 (acylcarnitines) proved to be an independent determinant of cf-PWV for these patients. 2) PC and lysoPC profiles (CAD patients vs PAD patients vs healthy subjects): decreased serum levels of several PC and lysoPC species (PC aa C28:1, PC aa C30:0, PC aa C32:2, PC ae C30:0, PC ae C34:2, lysoPC a C18:2) were observed for both patient groups in comparison to the healthy controls. Further, a considerable number of PCs and lysoPCs were inversely related to either cf-PWV, heart rate, asymmetric dimethylarginine (ADMA) or ADMA/arginine only for patients.
Conclusions: In addition to classical lipid-related cardiovascular risk markers, intermediates of lipid metabolism may serve as novel indicators for altered vascular function and hemodynamics.

P78
PRESSURE-INDEPENDENT ROLE OF THE AUTONOMIC NERVOUS SYSTEM IN THE REGULATION OF ARTERIAL STIFFNESS IN SUBJECTS WITH ESSENTIAL HYPERTENSION

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Objective: To test if arterial stiffness (AS) can be modulated by the autonomic nervous system (ANS) independently of blood pressure (BP) in hypertensive patients.
Material and methods: AS was measured by carotid-femoral pulse wave velocity (cfPWV) using the SphygmoCor device (AtCor Medical, Australia). Mean arterial pressure (MAP) was obtained by pulse-wave analysis of the radial artery and ANS activity was estimated by heart rate variability (HRV) as log-ratio of low-frequency/high-frequency heart rate components (Schiller Medilog AR12plus, United States) in hypertensive subjects (n = 43, 17 female, mean ± SD age 45 ± 13 years, brachial BP 145 ± 17/87 ± 10 mmHg) at rest. All measurements were subsequently repeated during supervised device-guided paced breathing (DGB) and reduction of cardiac pre-load by lower limb venous occlusion (LVO). These interventions, which are known to decrease and increase sympathetic activity, were performed in random order.
Results: DGB reduced HRV by 0.14 [0.07, 0.20] (Mean [95% confidence intervals]) and LVO increased HRV by 0.13 [0.08, 0.18] (both P<0.05). DGB reduced cfPWV by 1.3 [0.9, 1.6] m/s alongside with a reduction in MAP of 6.6 [5.1, 8.1] mmHg (both P < 0.01). By contrast, LVO increased cfPWV by 1.0 [0.6,1.4] m/s (P < 0.01), despite a fall in MAP of 1.5 [0.2,2.7] mmHg (P < 0.05). The difference between effects of DGB and LVO on cfPWV was significant whether adjusted or unadjusted for change in MAP (P < 0.05).
Conclusion: Despite BP-lowering effects, DGB and LVO had opposite effects on HRV and cfPWV. This suggest that the autonomic nervous system has a pressure-independent role in the regulation of AS in hypertension.

P79
AORTIC VISCOELASTIC PROPERTIES AND ALTERED ELECTROMECHANICAL CARDIO-AORTIC CONNECTION IN PATIENTS WITH CARDIAC AMYLOIDOSIS

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Background: Cardiac amyloidosis (CA) is an infiltrative disorder caused by deposition of amyloid fibrils in the myocardial extracellular matrix. A wide scientific literature regarding amyloid heart disease is available, but no data about aortic viscoelastic properties. This studio has the aims to start filling this gap.
Methods: 129 outpatients attending the Pavia Amyloid Center were enrolled, 66 of them affected by cardiac amyloidosis. Arterial applanation tonometry (PulsePen, DiaTecne, Milan, Italy) was performed to calculate carotid-to-femoral pulse wave velocity (PWV) as index of aortic stiffness. Carotid pressure wave was calibrated with oscillometric brachial blood pressure (BP) to obtain central BP, pulse pressure amplification (PPA) and augmentation index (Aix). Tonometric data were related to biochemical parameters, clinical data and treatment. Populations with and without cardiac involvement (NCA) were compared.
Results: There is no difference in Carotid-femoral PWV in the two groups (p = 0,749), PPA was significantly reduced in CA subjects (p = 0,0010). CA subjects had lower both peripheral pressure values and central ones. No significant differences in central pulse pressure (p = 0,684), and Aix (p = 0,1518) were found Heart rate is significantly higher in CA (p = 0,0010). In these patients, isovolumic contraction time is prolonged (p = 0.0120), and the ejective period is reduced (p < 0.0001).
Conclusions: Amyloid cardiopathy strongly impairs cardiac function without significantly alteration in aortic function. In other words, in CA there is an altered electromechanical cardio-aortic connection, with preserved aortic properties. Significantly reduced central and peripheral pressure values could be caused by the inability of the heart to develop a proper post load.

P80
ANALYSIS OF ENDOTHELIAL FUNCTION IN MALE STUDENTS IN SOUTHERN BRAZIL: THE ROLE OF PHYSICAL ACTIVITY

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Context: School adolescents in Porto Alegre have a mean physical inactivity (PI) <300 min/week of 43%, and another 13% do not perform physical activities. In this scenario, endothelial cells that regulate vascular homeostasis by the expression of bioactive mediators may be influenced by inflammatory responses and dysfunction. To date, there is no evidence that the level of PI can influence the preservation of endothelial function in this population.
Objectives: To describe the characterization of the hemodynamic and vascular profile of adolescents and to correlate the level of PI with endothelial function.
Methods: This cross-sectional study evaluated 39 volunteer men between 12 and 18 years of age, allocated to different percentiles of body mass index, recruited from the school network. The variables collected were: anthropometry, questionnaire on the behavior of adolescents and dilation mediated by the flow of the brachial artery (FMD). Parametric data are presented as mean and standard deviation and the level of correlation between the level of PI and endothelial function was assessed by the Pearson test.
Results: Age mean was 14.5 ± 4 years, BMI percentile mean was 78.2 ± 38, PI level mean was 210.8 ± 154.7 minutes/week, and FMD mean was 9.7 ± 2.9%. At this moment, with 46% of the sample collected, we found a probability of correlation between the PI and mean arterial diameter until the peak of dilation ($r = 0.41$, $p < 0.01$) and between the PI level and time to peak ($r = 0.35p < 0.05$).
Conclusions: In view of the preliminary findings, these adolescents are classified as sedentary, presenting hemodynamic and endothelial damage.

References

1. Katia Vergetti Bloch. The study of cardiovascular risk in adolescents — ERICA: rationale, design and sample characteristics of a national survey examining cardiovascular risk factor profile in Brazilian adolescentes. Bloch et al. BMC Public Health (2015) 15:94
2. Felipe Vogt Cureaul. ERICA: Physical inactivity in leisure in Brazilian adolescents. Rev Saúde Pública 2016;50(supl 1):4s
3. Anna Kontos. Flow-mediated dilatation, using time course data, shows maturation of the brachial artery from young children to mid-adolescents. Clinical and Experimental Pharmacology and Physiology (2015) 42, 240—245
4. Silva JVP. Physical (In) activity in adolescence: a systematic review. R. bras. Cie Mov 2013; 21(3): 166-179
5. Renato Xavier Coutinho. Risk behaviors prevalence in adolescents. Cad. Saúde Colet., 2013, Rio de Janeiro, 21 (4): 441-9 441
6. Andreas J. Flammer. The Assessment of Endothelial Function from Research into Clinical Practice. Circulation. 2012;126:753-767.
7. Dick H. J. Thijssen. Assessment of flow-mediated dilation in humans: a methodological and physiological guideline. Am J Physiol Heart Circ Physiol, 2011.
8.Katja Pahkala. Vascular Endothelial Function and Leisure-Time Physical Activity in Adolescents. Circulation. 2008;118:2353-2359

P82
REDUCTION IN ENDOTHELIAL, BUT NOT MICROVASCULAR, FUNCTION DURING ACUTE INFLAMMATION: PRELIMINARY RESULTS

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Acute inflammation is associated with increased risk for cardiovascular events and leads to reductions in conduit artery (flow-mediated dilation, FMD) and resistance vessel endothelial function. Whether this dysfunction during acute inflammation is further transmitted down the arterial tree to the microvasculature, inhibiting its ability to dilate or be recruited in response to a hypoxic stimulus, has yet to be investigated. Microvascular function and reactivity can be non-invasively measured using near-infrared spectroscopy (NIRS) during and following an occlusive stimulus.
Purpose: To investigate whether acute inflammation impairs microvascular function.
Methods: The typhoid vaccine was used to induce acute systemic inflammation in 16 young, healthy adults (8 male, 26.3 ± 3.0 years; 21.7 ± 2.4 kg/m^2). Blood pressure, FMD of the brachial artery, and NIRS of the forearm flexor muscles were measured at baseline and 24-h following the vaccination. NIRS was analyzed during a 5-min arterial occlusion to obtain markers of microvascular function and reactivity from the tissue saturation index (TSI): occlusion slope (muscle oxidative capacity); and reperfusion slope, reperfusion magnitude, and peak hyperemic response (microvascular reactivity).
Results: Mean arterial pressure did not change during the inflammatory episode (90 ± 9 mmHg to 90 ± 7 mmHg, $p = 0.83$) and FMD was significantly reduced at 24 h (5.6 ± 2.6% to 4.1 ± 1.7%, $p = 0.03$). No change was noted in the TSI occlusion slope, reperfusion slope, reperfusion magnitude, or peak hyperemic response ($p > 0.05$).
Conclusion: Vaccination-induced acute inflammation reduced endothelial function. However, no differences were noted in microvascular reactivity or oxidative capacity. Further investigation with a larger sample size is necessary to confirm these results.

P83
DIFFERENT PROTOCOLS FOR EARLY CARDIAC REHABILITATION MODULATE THE VASCULAR FUNCTION OF INDIVIDUALS UNDERGOING CORONARY ARTERY BYPASS GRAFTING: RANDOMIZED CLINICAL TRIAL

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Background: Cardiac rehabilitation with aerobic exercises is the first strategy as a non-pharmacological treatment in the postoperative period of individuals undergoing coronary artery bypass grafting (CABG) to improve functional capacity and vascular health. However, other exercise modalities remain uncertain as to the same benefits. Purpose: To evaluate the effect of different modalities of exercise, such as early cardiac rehabilitation, on subjects submitted to CABG on the percentage of flow-mediated dilatation (FMD) of the brachial artery and vascular resistance.
Methods: A randomized clinical trial in which 15 patients (62.7±6.5 years) underwent CABG were randomly assigned to the following groups: isometric (IG, Handgrip Jamar Ò), ventilatory muscle training (VG, PowerBreathe Ò) and control (CG, conventional respiratory and motor physiotherapy). All patients received physical attendance twice a day (20 minutes/session) for a consecutive week after the CABG (hospital admission). Endothelial function was assessed through the technique FMD before and after (~7 days) admission to CABG. The doppler ultrasound videos were analyzed by CardiovascularSuite Ò software to measure %FMD. Statistics: Generalized estimation equation, followed by Bonferroni post-hoc ($p < 0.05$).
Results: Systolic, diastolic and mean arterial pressure (SBP/DBP/MAP, respectively) was of 133, 76, 95 mmHg. The groups presented %FMD before and after intervention of: IG 9,2 - 2,7% p = 0,71; VG 9,7 - 10,9% p = 0,82; CG 10,4 - 2,9% p = 0,15 and medium flow of: IG 245,5 - 207,6 mL/min p = 0,84; VG 83,7 - 58,7 mL/min p = 0,04; CG 94,6 - 101,2 mL/min p = 0,89.
Conclusions: Different protocols for early cardiac rehabilitation modulate the vascular function of individuals undergoing CABG.

P84
RELATIONSHIP OF ARTERIAL STIFFNESS AND ANKLE-BRACHIAL INDEX

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The ankle-brachial index (ABI) is widely accepted as a diagnostic test used to evaluate the presence of peripheral arterial disease (PAD). 1. We investigated the associations between central arterial stiffness evaluated by measurement of aortic pulse wave velocity (aPWV), augmentation index