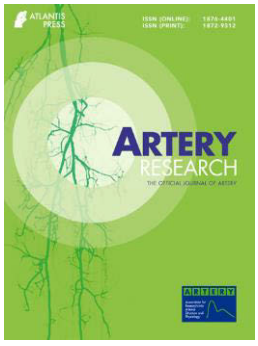

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P84: RELATIONSHIP OF ARTERIAL STIFFNESS AND ANKLE-BRACHIAL INDEX

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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 ($r = 0.35 p < 0.05$).
Conclusions: In view of the preliminary findings, these adolescents are classified as sedentary, presenting hemodynamic and endothelial damage.

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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

(Aix) with ABI in individuals with and without peripheral arterial disease (PAD). The study group included 670 subjects mean age 57 ± 16 years (248 PAD (ABI ≤ 0.9) and 422 No-PAD (ABI ≥ 0,91 −1.3). The aPWV, and Aix was estimated using applanation tonometry. 2. The ankle systolic pressure measurements for the calculation of the ABI was obtained using an 8-mHz Doppler probe. After stepwise selection process, in PAD patients aPWV and Aix were not related to ABI.

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Poster Session II — Brain

P85
CEREBRAL SMALL VESSEL DISEASE AND RISK OF INCIDENT STROKE, DEMENTIA AND DEPRESSION, AND ALL-CAUSE MORTALITY: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Background: MRI features of cerebral small vessel disease, i.e. white matter hyperintensities, lacunes, microbleeds, perivascular spaces, and cerebral atrophy, may be associated with clinical events, but the strength of these associations remains unclear.
Methods: We conducted a systematic review and meta-analysis on the association between these features and incident ischaemic and haemorrhagic stroke, all-cause dementia and depression, and all-cause mortality.
Results: For the association with stroke, 36 studies were identified (number of individuals/events [n] = 38,432/4,136), for dementia 28 (n = 16,458/1,709), for depression nine (n = 9,538/1,746), and for mortality 28 (n = 23,031/2,558). Only two studies evaluated perivascular spaces; these results were not pooled. Pooled analyses showed that all other features were associated with all outcomes (hazard ratios ranged 1.22—2.72). Combinations of two features were more strongly associated with stroke than any individual feature.
Conclusions: Individual features and combinations of CSVD features are strongly associated with incident ischaemic and haemorrhagic stroke, all-cause dementia and depression, and all-cause mortality. If these associations are causal, the strength of these associations suggests that a substantial burden of disease is attributable to CSVD.

P86
BLUNTED CEREBRAL MICROCIRCULATION OXYGENATION DURING EXERCISE IN NEWLY DIAGNOSED HYPERTENSIVE PATIENTS: LINKS WITH INDICES OF MACROCIRCULATION AND ARTERIAL STIFFNESS

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Purpose/Background/Objective: Hypertension has been considered as one of the most common modifiable risk factors for stroke and cognitive impairment. Decreased cerebral perfusion and oxygenation, as a result of capillary rarefaction and microvascular impairment of brain vessels, have been suggested as potentials underlying mechanisms. However, there is no study investigating whether these parameters are present in newly-diagnosed hypertensive patients (HP), without any co-morbidities. Thus, we examined (i) whether functional activation of the human cerebral cortex during handgrip exercise is altered in newly diagnosed HP and (ii) whether cerebral oxygenation correlates with different markers of arterial stiffness.
Methods: Forty-five newly diagnosed HP and 36 normotensives underwent an exercise protocol, consisting of a 3-min-rest, a 3-min-handgrip exercise (30% MVC), and a 3-min-recovery. Continuous-near-infrared-spectroscopy (NIRS) was used to monitor changes in cerebral-[O2Hb]. IMT, Augmentation Index, Central-BP and PWV (Sphygmocor) were assessed.
Results: No significant differences were detected between groups in age, BMI, sex, MVC and force maintained during handgrip. During handgrip, cerebral[O2Hb] increased in both groups; however, hypertensive patientsexhibited a significantly lower average response than normotensives [1.6(1.1—2.7) vs. 2.4(1.4—3.2)μM], respectively, $p < 0.05$ and a lower peak [O2Hb] [4.2(3.3—6.2) vs. 5.9(4.3—9.2), $p < 0.01$]. Significant negative correlations were found between cerebral-[O2Hb] and aortic BP, AI, and PWV.
Conclusions: Hypertensive patients exhibited a blunted cerebral [O2Hb] response during handgrip exercise compared to their normotensive counterparts. This blunted increase in cerebral oxygenation during exercise was present in patients with recent diagnosis of hypertension and without evident TOD and correlated with macrovascular stiffening, indicating a cross-talk between micro- and microcirculation.

P87
CEREBROVASCULAR REACTIVITY DURING COGNITIVE ACTIVATION IN ADULTS WITH CONTROLLED HYPERTENSION

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Hypertension, even when pharmaceutically controlled, may accelerate arterial stiffening and impair changes in blood flow necessary to support neural activity (neurovascular coupling [NVC]). Optimal NVC requires continuous, non-pulsatile flow, which is partially determined by extra- and intra-cranial vessel function.
Purpose: Examine extra- and intra-cranial hemodynamics during cognitive activity in adults with well-controlled hypertension and without hypertension.
Methods: 30 middle-aged, medicated hypertensive and 30 age-, sex-, and Body Mass Index (BMI)-matched non-hypertensive adults (56 ± 6 yrs, BMI 28.2 ± 2.9 kg/m^2; 32 men) underwent cerebrovascular measures at rest and during a Stroop task. Applanation tonometry and ultrasound were used to assess aortic and carotid (single-point) Pulse Wave Velocity (PWV), respectively. Ultrasound and Doppler were used to measure carotid and Middle Cerebral Artery (MCA) blood velocity pulsatility. Near-infrared spectroscopy was used to measure prefrontal oxygenation (tissue saturation index; TSI). Accuracy and reaction times were computed to assess cognitive performance.
Results: Stroop performance was similar between groups ($p > 0.01$). Aortic and carotid PWV increased, carotid pulsatility decreased (p0.01; Table 1). Reductions in CCA pulsatility during the Stroop were associated with increases in cortical TSI in the combined sample ($r = 0.27$), suggesting extracranial hemodynamics may play a role in optimizing intracranial NVC.
Conclusions: Our findings indicate that middle-age adults with medically-controlled hypertension display similar intra- and extra-cranial cerebrovascular reactivity to adults without hypertension. Additionally, adults with and without hypertension may utilize reductions in extracranial pulsatility during NVC to minimize intracranial pulsatility and improve downstream cerebral oxygenation.