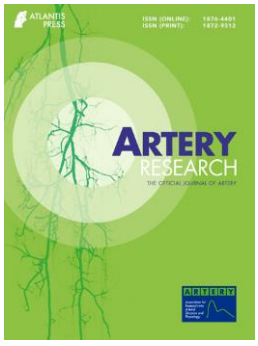

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# P73: AORTIC BUT NOT PERIPHERAL PULSE WAVE VELOCITY IS IMPROVED AFTER HEART RATE TARGETED AEROBIC PHYSICAL TRAINING IN METABOLIC SYNDROME SUBJECTS

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**P73**
**AORTIC BUT NOT PERIPHERAL PULSE WAVE VELOCITY IS IMPROVED AFTER HEART RATE TARGETED AEROBIC PHYSICAL TRAINING IN METABOLIC SYNDROME SUBJECTS**

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**Objective:** To evaluate the response of aortic and peripheral arterial stiffness parameters to heart rate (HR) targeted exercise training in metabolic syndrome (MS) subjects.
**Methods:** This cohort study included 170 individuals with MS (mean age 53.3 ± 6.9 years, 55% women). The subjects were recruited using a 1:1 random sampling method and divided into intervention aerobic physical training (aPT) and control groups. Intervention group subjects participated in a 2-month duration HR targeted aPT programme. Subjects in both groups were investigated at baseline and after 2 months. Arterial stiffness parameters, such as aortic carotid–femoral pulse wave velocity (cfPWV), peripheral carotid-radial pulse wave velocity (crPWV) and aortic augmentation index, mean blood pressure in the aorta (MBP) were evaluated.
**Results:** After 2 months of aPT aortic stiffness decreased indicated by the reduction of cfPWV by 0.54 m/s (6.33 %, p0.05). Using a regression tree method the highest improvement of arterial wall after aPT was achieved when initial cfPWV was >10.1 m/s (-2.31 ± 1.15 m/s) and cut-off value for positive effect was 8.6 m/s.
**Conclusions:** After 2 months of aPT arterial stiffness improved only in reduction of cfPWV and MBP. Therefore, it would be reasonable to measure cfPWV rather than crPWV in order to evaluate the aPT effect on arterial wall function in MS patients.

**P74**
**SLEEP QUALITY IS ASSOCIATED WITH CEREBROVASCULAR FUNCTION IN INDIVIDUALS WITH MULTIPLE SCLEROSIS**

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**Introduction:** Individuals with multiple sclerosis (MS) exhibit impaired cerebrovascular function and have poor sleep quality. In the general population, poor sleep contributes to cerebrovascular dysfunction and is related to cardiovascular disease (CVD). Improving sleep quality may have beneficial effects in preventing CVD; however, the relationship between sleep quality and cerebrovascular function in MS has not been examined.
**Purpose:** To examine the effect of sleep quality on cerebrovascular function in individuals with MS.
**Methods:** Sixteen individuals with MS had sleep quality assessed with the Pittsburgh Sleep Quality Index. Individuals were categorized as having poor sleep quality (n = 6, score >5) or good sleep quality (n = 10, score ≤5). Cerebrovascular function was assessed via transcranial Doppler ultrasound with the following hemodynamic outcomes: mean middle cerebral artery velocity (mMCAv), pulsatility index (PI), and resistance index (RI). An automated blood pressure cuff was used to measure baseline blood pressure (systolic, diastolic, mean (SBP, DBP, MAP)) and heart rate in a seated position. End-tidal $CO_2$ ($EtCO_2$) was measured by gas capnography.
**Results:** Those with poor sleep quality had greater PI and RI, and lower mMCAv compared to those with good sleep quality (p<0.05, table 1). No group differences were seen for weight, height, BMI, $CO_2$, or hemodynamic variables.
**Conclusion:** Our results suggest that individuals with MS with poor sleep quality have worsened indicators of cerebrovascular function. Therefore, sleep quality may be related to the elevated CVD risk in individual with MS, and it should be assessed in future studies evaluating cerebrovascular function in MS, including intervention studies.

**Poster Session I – Pathophysiology**
**P75**
**DIFFERENTIAL ELASTIN DEGRADATION AND MICROMECHANICAL PROPERTIES IN ASCENDING AORTIC ANEURYSM GROUPS: STATISTICAL MODELLING**

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**Background:** Elastin microstructure is an important factor in aortic aneurysms. However, it is unclear whether elastin microstructure varies in different ascending aneurysm aetiologies, and how this relates to micromechanical behaviour. Objective to combine in vitro experimentation and statistical modelling to distinguish between ascending aortic aneurysm groups; bicuspid aortic valve with associated aneurysm (BAV) and idiopathic degenerative aneurysm (DA). The role of micromechanical and biochemical properties as risk factors was explored.
**Methods:** Aortic biopsies were taken from patients undergoing BAV or DA aneurysmal repair (n = 30). Oscillatory nanoindentation was applied to the medial layer [1]. The same tissues were chemically or enzymatically digested and measured for collagen, elastin and glycosaminoglycan (GAG) levels using hydroxyproline, fastin elastin kit and 1-9 dimethylmethylene blue respectively. Elastic fibre numbers and length were measured from Verhoeff-Van Gieson stained images. All measured data and patient clinical characteristics were analysed using least absolute shrinkage and selection operator (LASSO) regression.
**Results:** Micromechanical properties of BAV tissue was found to be significantly higher than DA tissue ($p < 0.001$). Similarly, this significant trend was also noted for GAG ($p = 0.004$) and collagen levels ($p = 0.02$). Although elastin levels were not significant, an increase in the number of long fibres was observed in BAV tissue ($p = 0.02$).
**Conclusions:** LASSO regression showed that micromechanical and elastin properties were unique predictors for BAV, whereas age, gender, collagen and preoperative aortic diameter were unique for DA. Our statistical approach is the first to show that ascending aortic aneurysm groups can be distinguished using novel in vitro measurements.

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**P76**
**CAROTID THERMAL HETEROGENEITY AND DYSLIPIDEMIA: THE HEAT IS ON**

Iosif Koutagiar, Charalambos Vlachopoulos, Dimitrios Terentes-Printzios, Ioannis Skoumas, Evangelia Sigala, Vasiliki Gardikioti, Stavroula Pantou, Angeliki Rigatou, Nikolaos Ioakeimidis, Christos Georgakopoulos, Nikitas-Alexandros Skliros, Georgios Benetos, Spiros Galanakos, Dimitrios Tousoulis
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**Background:** Microwave Radiometry (MWR) is a new validated method, which allows evaluation of thermal heterogeneity of carotid arteries and is associated with inflammation.Purpose: The aim of this pilot study was to determine if thermal heterogeneity in the carotid arteries is associated with aortic elastic properties in patients with dyslipidemia and whether treatment for dyslipidemia affects thermal heterogeneity.
**Method:** Twenty-nine patients with dyslipidemia (mean age 42 ± 13 years, range 22–75, 19 men) without known cardiovascular disease, underwent assessment of carotid thermal heterogeneity (temperature difference-ΔT) using MWR. Mean common carotid intima-media thickness (CIMT) was also assessed. Twenty-one patients were treated for 6 months with statin or/and ezetimibe and thermal heterogeneity was assessed after treatment.
**Results:** There was a positive correlation between ΔT and cIMT ($r = 0.474$, $p = 0.009$). In multivariate regression analysis, after adjustment for potential confounders such as age, sex, mean blood pressure and body-mass index, cIMT showed a positive correlation with ΔT in carotid arteries (Adjusted $R2 = 0.258$, $p = 0.048$). Thermal heterogeneity after 6 months