P5.14: IMPACT OF KIDNEY DONATION ON AORTIC STIFFNESS: A FEASIBILITY STUDY

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To link to this article: https://doi.org/10.1016/j.artres.2014.09.151

Published online: 7 December 2019
P5.10 INFLUENCE OF OBESITY IN THE RELATIONSHIP BETWEEN CAROTID ARTERY FUNCTION AND CENTRAL BLOOD PRESSURE
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Background: Obesity blunts the association of cPwV with BP, at least in youth. We assessed the impact of BMI in the relationship between carotid artery function (CAF) and central BP.

Methods: Stiffness index (β), Elastic modulus (Ep), Arterial Compliance (AC) and local PWV (PWVj) were measured at the common carotid arteries by echo-tracking (Aloka prosound alpha 10), and central BP was assessed with the SphygmoCor device. Patients were classified into 3 groups according to BMI (~<25 normal weight; 25~30 overweight; ~>30 obesity). Linear regression models, Pearson’s correlation coefficient and ANCOVA models (age, gender, heart rate and central PP as covariates) were performed.

Results: 222 patients (mean age 42.8 ± 14.2 years; 93 (42%) women; mean BMI 26.4 ± 4.4; 139 (62.6%) hypertensives, 104 (74.8%) under treatment). BMI categories: 85 (36.3%) normal weight, 88 (39.6) overweight, 49 (22.1%) obesity. Age, HR ,central PP showed significant positive association with CAF parameters. BMI categories and gender were not significantly associated with CAF parameters, except for overweight with PWVj (p-value 0.02).

There was no significant difference in β, Ep, AC and PWVj between BMI groups after adjusting by covariates. Pearson’s correlation coefficient between central SBP and CAF parameters was significantly lower if BMI:~25 (β: 0.46, 0.19, 0.13; Ep: 0.69, 0.43, 0.3; AC: 0.46, -0.37, -0.31; PWVj: 0.66, 0.48, 0.36 for normal weight, overweight and obesity, respectively; p-value for overweight:~0.001, p-value for obesity:~0.05).

Conclusions: BMI categories are not closely related to CAF. BMI might blunt the increment of CAF parameters with rising central BP.

P5.11 PROXIMAL AORTIC REMODELING IS ASSOCIATED WITH LEFT VENTRICULAR MASS AND PULSE WAVE VELOCITY IN ESSENTIAL HYPERTENSION
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Background: Hypertension accelerates vascular ageing, leading to aortic stiffening and dilatation. We have few data about ascending aorta diameter (AoAsc) remodeling in hypertension. Recently published reference values for AoAsc enable us to evaluate the remodeling process.

Aim of our study was to evaluate in a cohort of essential hypertensives the association between the AoAsc remodeling and markers of hypertension related organ damage as left ventricular mass (LVM) and aortic stiffening (cfPWV).

Methods: 629 essential hypertensives were included (age 53.2 ± 16.9 years; 93 (42%) women; mean BMI 26.4 ± 4.4; 139 (62.6%) hypertensives, 104 (74.8%) under treatment). BMI categories: 85 (36.3%) normal weight, 88 (39.6) overweight, 49 (22.1%) obesity. Age, HR ,central PP showed significant positive association with CAF parameters. BMI categories and gender were not significantly associated with CAF parameters, except for overweight with PWVj (p-value 0.02).

Results: In this cohort mean AoAsc diameter was 35.6 ± 4.28 mm. AoAsc remodeling was related to systolic, diastolic and mean blood pressure (MBP) (for MBP r =0.11, p =0.024). LVM (r =0.26; p<0.001) and cfPWV (r =0.14; p<0.001) were related to aortic remodeling.

Conclusions: Essential hypertension leads to AoAsc remodeling (3 mm), related to both cardiac and vascular (cfPWV) damage: AoAsc remodeling could be a marker of early vascular ageing, carrying a potential prognostic value.

P5.12 CAROTID-FEMORAL AND BRACHIAL PULSE WAVE VELOCITY IN PERIPHERAL ARTERIAL DISEASE
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Introduction: Peripheral arterial disease (PAD) is associated through its extensive atherosclerotic burden with both increased arterial stiffness and cardiovascular events. Recently, different non-invasive assessment devices that measure carotid-femoral or brachial pulse wave velocity (PWV) have become commercially available.

Aim: To compare PWV derived from carotid-femoral (cfPWV) or brachial (bPWV) assessments in patients with PAD.

Material and methods: Measurements of PWV with the two different non-invasive methods were performed as part of standard-of-care assessment in outpatients with PAD. Pulse wave velocities were assessed as bPWV by Mobil-O-Graph (ABPM by IEM; Stolberg, Germany), which is a brachial cuff-based method and as cfPWV by Vicorder (ST Medical, Wurzburg, Germany) an oscillometric technique for carotid and femoral pulse wave assessment. Differences between the two methods were compared by Mann Whitney U test and Bland Altman plot. Spearman rank correlation was performed to test for age dependency.

Results: In 67 Patients (35.8% female, mean age 69, range 39-91 years) bPWV (mean 10.5 ± 2.4 m/s) was significantly higher than cfPWV (mean 9.2 ± 2.1 m/s; p = 0.0013). Brachial PWV was related to age (r =0.935, p =<0.0001) whereas cfPWV did not (r =0.311, p =0.116). Bland Altman plot for bPWV and cfPWV resulted in a mean difference of -10.4 (+2 SD (4.31), -2 SD (-6.38)).

Conclusion: In patients with peripheral arterial disease, the gold standard assessment (cfPWV) differs from brachial PWV and lacks correlation with age. Aortic-femoral atherosclerotic burden may in part explain this finding since these arterial segments impact the difference in transit time in the femoral segment.
P6.2 EVALUATION OF ARTERIAL STIFFNESS INDICES AND CENTRAL HEMODYNAMICS IN HEALTHY NORMOTENSIVE VOLUNTEERS AND IN TREATED OR UNTREATED HYPERTENSIVE PATIENTS IN AMBULATORY CONDITIONS
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Central blood pressure (BP) and various vascular indices estimated non-invasively over a 24-hour period were compared between normotensive volunteers and hypertensive patients by an innovative technology of pulse wave analysis, integrated in a BPLab ambulatory blood pressure monitoring (ABPM) system. Digitalized waveforms obtained during each brachial oscillometric BP measurement were stored in the device memory and then post-processed using software with Vasotens technology running on a personal computer. Averages for the whole 24-hour period and for the awake and asleep subperiods were computed. A total of 142 normotensive healthy subjects and 661 hypertensive patients were analyzed. 24-hour central BP, aortic pulse wave velocity (PWV) and augmentation indices (AI) were significantly higher in the hypertensive than in the healthy subject group (119.3 vs. 105.6 mmHg for systolic BP, 75.6 vs. 72.3 mmHg for diastolic BP, 9.7 vs. 9.2 m/sec for PWV, -40.7 vs. 11.0 for aortic AI), whereas reflected wave transit time (RWTT) was significantly higher in patients with high BP (126.6 vs. 139.0 ms). After adjusting for age, gender, body mass index and 24-hour BP levels, a statistically significant between-group difference was still observed for 24-hour RWTT (127.5 ms hypertensives vs. 134.5 ms normotensives, p = 0.0001) and 24-hour peripheral AI (-14.1 vs. -20.0, p = 0.005). All estimates of vascular health displayed a typical circadian rhythm. Thus the estimation of arterial stiffness and central hemodynamics by the BPLab device represents an effective tool for evaluation of vascular damage in hypertensive patients in dynamic condition.

P6.3 MODERATE INTENSITY EXERCISE AORTIC RESERVOIR PRESSURE INDEPENDENTLY PREDICTS LEFT-VENTRICULAR MASS INDEX: ONE-YEAR PROSPECTIVE STUDY IN PATIENTS WITH TREATED HYPERTENSION
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Background. Moderate intensity exercise blood pressure (BP) is associated with adverse cardiovascular outcomes. The mechanisms of this association are unknown but may be due to central hemodynamic factors. This study sought to determine the relationship between moderate-exercise central haemodynamics (including aortic reservoir characteristics) and end organ disease assessed by left ventricular mass index (LVMi).

Methods. Resting and moderate cycle exercise (60-70% heart rate maximum) haemodynamics were recorded in 119 participants with treated hypertension (mean age 65±7 years, 47% male) at baseline and one-year. Brachial BP was recorded by auscultation and central haemodynamics (aortic reservoir pressure, augmentation index, systolic BP, pulse pressure) via radial tonometry. LVMi was recorded using real-time 3-dimensional echocardiography.

Results. Baseline to one-year change in LWMi was not related to change in any resting brachial or central haemodynamic variable, or exercise brachial BP (P > 0.05 all). However, change in exercise aortic reservoir pressure (integral) was significantly associated with change in LVMi (r = 0.24, p = 0.006). This relationship was maintained on multiple regression analysis adjusting for age, sex, body mass index, aortic stiffness and 24-hour ambulatory systolic BP (β = -0.001, 95% CI = -0.001-0.001, p = 0.035).

Conclusions. Moderate exercise aortic reservoir pressure independently predicts changes in LVM mass over time. Technology to measure 24-hour ambulatory central haemodynamics (including aortic reservoir characteristics) is now available and should provide additional prognostic information beyond peripheral BP measures.

P6.4 THE DIFFERENTIAL EFFECTS OF RESISTANCE TRAINING AND ENDURANCE TRAINING ON AUGMENTATION INDEX: A PILOT STUDY
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Background: Current literature suggests that increased exercise is associated with decreased cardiovascular risk and improvements in vascular health. However, there is some conflict as to which modality of exercise has the most beneficial effect on vascular health and cardiovascular risk [1-3]. Therefore, the aim of our study was to investigate the influence of two different training modalities on augmentation index (AIx). This was carried out in a group of tightly matched, young, healthy male athletes who were either resistance (RT) or endurance trained (ET). Methods: 17 male athletes (9 RT vs. 8 ET) aged 18-25 years were assessed for height, weight, BMI, mean arterial pressure (MAP) and AIx. AIx, which has been shown to be the most sensitive marker of systemic vascular stiffness in young individuals, was determined using the Mobil-o-Graph device (IEM). Results: No significant differences in height, weight or MAP (p > 0.05) were observed between the RT and ET groups. However, both BMI and HR were found to be significantly higher in the RT compared to the ET group (P < 0.05). Interestingly, the RT group also had significantly higher AIx at heart rate 75 compared to the ET group (14.4 ± 6.5% vs 3.3 ± 12.3 %, P < 0.05).

Conclusion: These results demonstrate that AIx was significantly higher in the RT compared to the ET group. Therefore, different modalities of exercise may elicit differential effects on vascular health. However, as this is a pilot study, larger and longitudinal studies are needed to support these findings.

P6.5 ANTI-INFECTIVE PERIODONTAL THERAPY IS ASSOCIATED WITH IMPROVEMENT OF ARTERIAL STIFFNESS AND PULSE WAVE REFLECTION
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Aim: This parallel-group double blind prospective placebo-controlled clinical trial evaluated the impact of anti-inflammatory periodontal therapy on the expression of surrogate parameters of cardiovascular health including arterial stiffness, pulse wave reflection, and blood pressure.