P154: DOES THE METHOD OF THE MEASUREMENT OF BLOOD PRESSURE CORRELATES DIFFERENTLY WITH PULSE WAVE VELOCITY IN RESISTANT HYPERTENSION?

Jose Mesquita Bastos, Susana Lopes, Catarina Garcia, Verónica Ribau, Susana Bertoquini, Cátia Leitão, P. Ribeiro Ilda, Daniela Figueiredo, L. Viana João, Fernando Ribeiro, Jorge Polónia


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Abstracts

P152
THE EFFECT OF SURGICAL AORTIC VALVE REPLACEMENT ON AORTIC STIFFNESS AND THE PROGNOSTIC ROLE OF AORTIC STIFFNESS ON SURGICAL SUCCESS
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Purpose/Background/Objectives: Aortic stiffness and hemodynamics are established biomarkers for cardiovascular events. Surgical aortic valve replacement (SAVR) remains the first choice for treatment in most patients with aortic stenosis. We investigated the effect of SAVR on aortic stiffness and the role of arterial biomarkers in predicting the echocardiographic response.
Methods: We included thirty-three patients (mean age 71 ± 8 years, 58% males) with moderate to severe aortic stenosis undergoing SAVR. In measurements prior and acutely after the surgery, carotid-femoral pulse wave velocity (cfPWV) and brachial-ankle pulse wave velocity (baPWV) and aortic hemodynamics (aortic augmentation index corrected for heart rate [AIx@75]) were used as indicators of arterial stiffness. Echocardiography, mean and peak pressure gradient of the aortic valve was measured and their differences post and pre-surgery were calculated (i.e. ΔMeanGradient = MeanGradient post-surgery–MeanGradient pre-surgery).
Results: There was a statistically significant increase on measurements of aortic stiffness (7.5 ± 1.4 vs 8.2 ± 1.9 m/s for cfPWV, p = 0.013) and a decrease in wave reflections (28 ± 13% vs 21 ± 11% for AIx@75, p = 0.015). We also observed a negative association of baseline cfPWV with baseline mean and peak gradient of aortic stenosis (r = −0.598 and r = −0.614 with p = 0.002 and p = 0.001, respectively), independently of age, gender and systolic blood pressure. Baseline cfPWV was associated with ΔMeanGradient and ΔPeakGradient (r = 0.609 and r = 0.533 with p = 0.002 and p = 0.009, respectively). (Figure)
Conclusions: Our study shows that post-operative aortic stiffness increases while there is an improvement of wave reflections. Furthermore, increased aortic stiffness prior to surgery predicts smaller benefit in decreasing transvalvular pressure gradient as assessed echocardiographically, implying that low aortic stiffness prior to surgery could lead to better outcome.

P153
PULSE WAVE VELOCITY DISTRIBUTION IN CHILDREN AT A SCHOOL IN THE NORTH OF PORTUGAL
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Background: Pulse Wave Velocity (PWV) is a measure of arterial stiffness and vascular aging and an important parameter for cardiovascular risk stratification. A previous study showed high prevalence rates of early vascular aging in an adult population from the North of Portugal. The aim of this study was to characterize children from the same region regarding PWV and its relationship with central adiposity indices and blood pressure.
Methods: A convenience sample of 285 children aged 10–14 years attending a Northern Portuguese school was used. PWV, height, weight, body mass index (BMI), waist circumference e blood pressure (BP) were measured. Collected data was distributed by gender, age and height specific percentiles.
Results: Mean PWV values were 5.4 ± 1.0 for males and 5.1 ± 0.7 for females. We only found statistically significant differences between males and females PWV in the 13 years old group (p = 0.02). 27.4% of the children (N = 78) had PWV > 90th percentile. 64.1% of which were males (N = 50) and 15.3% (N = 12) were overweight/obese. PWV was significantly higher in children with systolic BP ≥ 90th percentile (p = 0.004). No differences were found in PWV between overweight/obese (BMI ≥ 85th percentile) and healthy weight children.
Conclusion: Our study found a high prevalence rate of elevated PWV in children. This is a concerning aspect, taking into account the highly recognized relationship of PWV and cardiovascular outcomes, indicating that healthy policy measures need to be implemented early in life. Future research is needed to establish PWV reference percentile curves specific for Portuguese children.

P154
DOES THE METHOD OF THE MEASUREMENT OF BLOOD PRESSURE CORRELATES DIFFERENTLY WITH PULSE WAVE VELOCITY IN RESISTANT HYPERTENSION?
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Background: Pulse Wave Velocity (PWV) is a measure of arterial stiffness and vascular aging and an important parameter for cardiovascular risk stratification. A previous study showed high prevalence rates of early vascular aging in an adult population from the North of Portugal. The aim of this study was to characterize children from the same region regarding PWV and its relationship with central adiposity indices and blood pressure.
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Conclusion: Our study found a high prevalence rate of elevated PWV in children. This is a concerning aspect, taking into account the highly recognized relationship of PWV and cardiovascular outcomes, indicating that healthy policy measures need to be implemented early in life. Future research is needed to establish PWV reference percentile curves specific for Portuguese children.
Objective: Carotid-femoral Pulse Wave velocity (cfPWV), the gold standard for measuring stiffness, is a marker of organ damage (OLD). Even though cfPWV correlates with casual (BPc), central (CBP) and ambulatory (ABPM) blood pressure (BP), evidence is limited for resistant hypertension (RH). Method: Thirty-three patients (age, 56.1 ± 8.2 years; weight, 78.0 ± 12.4 kg; height, 1.62 ± 0.08 m) with RH participated in a cross-sectional study. Outcomes included clinical data, BPc, ABPM, and carotid-femoral, cfPWV. Correlation analysis was conducted to assess the association between variables; independent t-tests were conducted to compare variables between those patients with cfPWV < and ≥ 10 m/s.

Results: Patients (20 women and 13 men) presented a peripheral systolic and diastolic Bp of 144.0 ± 3.8 mmHg and 82.0 ± 1.9 mmHg, respectively. The cfPWV correlated with age (r = 0.356, p = 0.045), 24 h systolic BP (24 h SBP) nighttime pulse pressure (night PP), 24 h pulse pressure (24 h PP), casual systolic (SBPc) and diastolic BP (DBPc), central systolic (CSBP), diastolic (CDBP) and central pulse pressure (CPP); controlled for age the correlation remained significant for 24 h SBP (r = 0.446, p = 0.009) 24 hPP (r = 0.464, p = 0.007), nightPP (r = 0.365, p = 0.036), SBPc (r = 0.620, p < 0.001), DBPc (r = 0.488, p < 0.004), PPC (r = 0.592, p < 0.001), central SBP (r = 0.587, p < 0.001), central DBP (r = 0.487, p = 0.001) and central PP (r = 0.506, p = 0.003). Patients with lower values of cfPWV (n = 26) showed lower SBPc (142.8 ± 15.9 vs. 162.6 ± 30.9 mmHg, p = 0.025), central SBP (136.0 ± 15.7 vs. 154.1 ± 31.8 mmHg, p = 0.041) and PP (49.6 ± 9.5 vs. 60.9 ± 20.8 mmHg, p = 0.043) than patients with cfPWV > 10 m/s (n = 7).

Conclusion: Our study found several determinants of PWV in children, some of them modifiable and interfering with cardiovascular outcomes. Future research may provide clarity to the association between PWV in children and cardiovascular events in adulthood.

Abstracts

P156
CARDIO ANKLE VASCULAR INDEX (CAVI) AS ARTERIAL STIFFNESS MARKER IN SUBJECTS WITH ANKYLOSING SPONDYLITIS
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Background: Ankylosing spondylitis (AS) is a chronic, inflammatory disease of the axial spine that can manifest with various clinical signs and symptoms. Cardio-ankle vascular index (CAVI), which is calculated based on the stiffness parameter thus obtained, is theoretically independent of changes in blood pressure. With this distinct advantage, CAVI has been widely applied clinically to assess arterial stiffness in subjects with or without known cardiovascular diseases.

Objectives: The aim of this study was to evaluate the Cardiac Ankle Vascular Index (CAVI) in subjects with ankylosing spondylitis paired with controls free of morbidities.

Methods: We enrolled 41 participants in this study. Eighteen patients with diagnosed AS and 23 controls free of comorbidities. CAVI was measured by VaSera V5-1000 (Fukuda- Denshi Company, Ltd, Tokyo, Japan).

Results: The results are expressed as mean ± standard deviation for continuous variables. The data were analyzed using SPSS v. 24 (SPSS Inc., Chicago, IL). The normality of the data was evaluated with Shapiro-Wilk test. A two-tailed p < 0.05 was considered statistically significant. Individuals with AS exhibited greater pSBP (p < 0.01), DBP (p < 0.05), and MBP (p < 0.01) compared to controls. Moreover, in the AS group we observed a higher CAVI with a mean difference of 1.14 (p < 0.05) compared to controls. Moreover, in the AS group we observed a higher CAVI with a mean difference of 1.14 (p < 0.05), 95% CI of -0.1 to 0.6) (Figure 1).

Conclusion: AS is a chronic inflammatory disease that primarily affects the articular joints of the spine. Individuals with ankylosing spondylitis showed increased CAVI, this contributes to explain the higher risk of cardiovascular disease in this pathological condition.

References