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THE EFFECT OF SURGICAL AORTIC VALVE REPLACEMENT ON AORTIC STIFFNESS AND THE PROGNOSTIC ROLE OF AORTIC STIFFNESS ON SURGICAL SUCCESS

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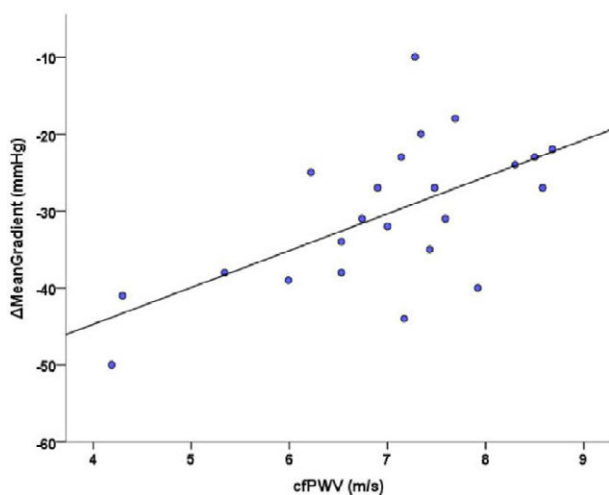
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Purpose/Background/Objectives: Aortic stiffness and hemodynamics are established biomarkers for cardiovascular events. Surgical aortic valve replacement (SAVR) remains the first choice of treatment in most patients with aortic stenosis. We investigated the effect of SAVR on aortic stiffness and the role of arterial biomarkers in predicting the echocardiographic responses.

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. $\Delta\text{MeanGradient} = \text{MeanGradient post-surgery} - \text{MeanGradient pre-surgery}$).

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, $p = 0.033$) and a decrease in wave reflections ($28 \pm 13\%$ vs $21 \pm 11\%$ 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 $\Delta\text{MeanGradient}$ and $\Delta\text{PeakGradient}$ ($r = 0.609$ 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.



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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 and 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 $\text{PWV} \geq 90\text{th}$ 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 $\geq 90\text{th}$ percentile ($p = 0.004$). No differences were found in PWV between overweight/obese ($\text{BMI} \geq 85\text{th}$ 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.

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

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