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P155: DETERMINANTS OF PULSE WAVE VELOCITY IN CHILDREN

Cristina Silva, Mariana Formigo, Nuno Formigo, Sara Freitas, Cristina Cunha, Margarida Rocha, Clarisse Neves, Laura Castro, Filipe Gonçalves, Maria J. Cotter, Pedro G. Cunha, Jorge Cotter

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¹⁰Research Center in Sports Sciences, Health and Human Development, CIDESD, University Institute of Maia, Maia, Portugal

¹¹School of Health Sciences and Institute of Biomedicine – iBiMED, University of Aveiro, Aveiro, Portugal

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 participants with cfPWV < and ≥ 10 m/s.

Results: Patients (20 women and 13 men) presented a peripheral systolic and diastolic BpC 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 (24hPP), 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 24h SBP ($r=0.446$, $p=0.009$) 24hPP ($r=0.464$, $p=0.007$), 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 data shows that cfPWV correlates with SBpC, 24hSBP, 24hPP and CSBP, after controlled for age, in patients with RH.

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DETERMINANTS OF PULSE WAVE VELOCITY IN CHILDREN

Cristina Silva ¹, Mariana Formigo ¹, Nuno Formigo ^{2,3}, Sara Freitas ¹, Cristina Cunha ¹, Margarida Rocha ¹, Clarisse Neves ¹, Laura Castro ¹, Filipe Gonçalves ¹, Maria J. Cotter ⁴, Pedro G. Cunha ^{1,5,6}, Jorge Cotter ^{1,5,6}

¹Center for the Research and Treatment of Arterial Hypertension and Cardiovascular Risk, Hospital Senhora da Oliveira, Guimarães, Portugal

²Department of Biology, Faculty of Sciences of University of Porto, Portugal

³CIIMAR - Interdisciplinary Centre of Marine and Environmental Research, University of Porto, Portugal

⁴Department of Natural Sciences, Escola E.B. 2,3 João de Meira, Guimarães, Portugal

⁵Life and Health Sciences Research Institute, School of Medicine, University of Minho, Braga, Portugal

⁶ICVS/3B's - PT Government Associate Laboratory, Braga/Guimarães, Portugal

Background: Arterial stiffening measured by Pulse Wave Velocity (PWV) predicts cardiovascular events and mortality in adults. It advances with age and seems accelerated in children with certain disease conditions such as chronic kidney disease or diabetes. The aim of this study was to determine factors that influence PWV in children.

Methods: PWV was captured in 285 children aged 10-14 years attending a Portuguese school. The effects of sex, age, height, weight, body mass index, waist circumference, blood pressure, heart rate and sodium excretion in 24-h urinary samples in PWV were tested.

Results: PWV correlated positively with age, height, systolic blood pressure, diastolic blood pressure and heart rate in males and females ($p < 0.05$) and with weight in males ($p < 0.05$). Major predictors for PWV in a multivariate regression analysis were gender, height, weight, diastolic blood pressure, heart rate and body mass index.

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.

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CARDIO ANKLE VASCULAR INDEX (CAVI) AS ARTERIAL STIFFNESS MARKER IN SUBJECTS WITH ANKYLOSING SPONDYLITIS

Guillermo Alanis-Sánchez ¹, Ernesto Cardona-Muñoz ², David Cardona-Müller ³, Sylvia Totsuka-Sutto ³, Oscar Mares-Flores ², César Murguía-Soto ², Diego Castañeda-Zaragoza ⁴, David Montes-Martínez ⁵, Carlos Ramos-Becerra ⁶

¹MSc Student, West Lab ICORD, University of British Columbia, USA

²Arterial Stiffness Laboratory, Department of Physiology, University of Guadalajara, USA

³Arterial Stiffness Laboratory, Department of Physiology, University of Guadalajara, Mexico, USA

⁴Arterial Stiffness Laboratory, University of Guadalajara, Mexico, USA

⁵Arterial Stiffness Laboratory, Department of Physiology, University of Guadalajara, Mexico, USA

⁶University of Guadalajara, Department of Physiology, Arterial Stiffness, USA

Background: Ankylosing spondylitis (AS) is a chronic, inflammatory disease of the axial spine that can manifest with various clinical signs and symptoms¹. 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 diseases².

Objectives: The aim of this study was to evaluate the Cardio 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 VS-1000 (Fukuda - Denshi Company, Ltd, Tokyo, Japan).

Results: The results are expressed as mean \pm 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 ($p < 0.01$, 95% CI of .41 to 1.8) (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.

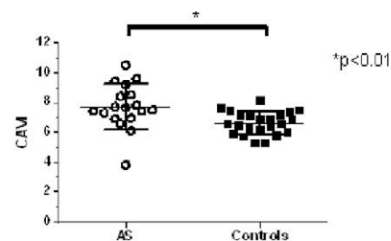


Figure 1. Cardio-ankle vascular index (CAVI) in patients with ankylosing spondylitis (AS) compared to controls

References

1. Van der Heijde D, Ramiro S, Landewé R et al.: 2016 update of the ASAS-EULAR management recommendations for axial spondyloarthritis. *Ann Rheum Dis* 2017; 76: 978-91.
2. Shirai K, Utino J, Otsuka K, Takata M. A novel blood pressure-independent arterial wall stiffness parameter; cardio-ankle vascular index (CAVI). *J Atheroscler Thromb*. 2006;13(2):101–107

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AORTIC CALCIFICATIONS AND INFLAMMATION ARE ASSOCIATED WITH IN-HOSPITAL COMPLICATIONS IN ACUTE CORONARY SYNDROME

Konstantia-Paraskevi Gkini, Dimitrios Terentes-Printzios, Charalambos Vlachopoulos, Iosif Koutagiar, Angeliki Rigatou,