



P136 Determinants of Arterial Stiffness in Children Using Population-indexed Anthropometric and Hemodynamic Parameters

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ABSTRACT

Background: Arterial stiffness is a significant cardiovascular risk factor. Carotid-femoral pulse wave velocity (cfPWV) is the standard for measuring arterial stiffness, but indices such as central augmentation index (cAIx) and carotid artery elasticity (cE[p]) also correlate to arterial stiffness. Early-life determinants of arterial stiffening are not well understood. We assessed the relationship between population-indexed anthropometric and hemodynamic parameters, and arterial stiffness in healthy children.

Methods: 97 healthy children between 2 to 20 years old were recruited. Z-scores for height, BMI, and brachial systolic (bSBP) and diastolic (bDBP) blood pressure were calculated [1,2]. cfPWV and central arterial waveforms were measured using the Sphygmocor XCEL and CvMS devices (AtCor, Sydney) respectively. Carotid artery maximum and minimum diameters were measured by high-resolution ultrasonography. cfPWV, cE[p], and cAIx were calculated.

Results: In bivariate analysis, cfPWV was associated with age ($b = 0.52, p < 0.01$) and bSBP z-score ($b = 0.24, p = 0.03$). These associations were independent of sex, height z-score, BMI z-score, and bDBP z-score in a multivariable model ($R^2 = 0.23$). cE[p] was significantly associated with age ($b = 0.42, p < 0.01$), bSBP z-score ($b = 0.45, p < 0.01$), and height z-score ($b = -0.33, p = 0.01$), but only bSBP z-score remained statistically significant in the multivariable model ($b = 0.45, p < 0.01; R^2 = 0.20$). cAIx was not associated with anthropometric or hemodynamic z-scores.

Conclusion: cfPWV is associated with age and bSBP z-score, while cE[p] is associated with bSBP z-score only, suggesting a potentially key association between systolic blood pressure and indices of arterial stiffness independent of age and other parameters of growth during healthy early life.

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