ORIGINAL STUDIES

Determinants of arterial stiffness in physically active middle aged adults

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Abstract

Background. Increased arterial stiffness is considered an important predictor of cardiovascular events. It correlates with different classical cardiovascular risk factors and it may represent a cumulative measure of the impact of cardiovascular risk factors on the arterial wall. The influence of cardiovascular risk factors on arterial stiffness is not clearly established.

Aims. The aim was to evaluate the association of aortic pulse wave velocity (aPWV) and augmentation index (AIx) as parameters of arterial stiffness and cardiovascular risk factors in a group of physically active middle aged subjects.

Methods. This cross-sectional study included 59 subjects (25 males and 34 females) with normal arterial pressure and without manifest cardiovascular disease, aged 44.55 (±11.64) years. Parameters of arterial stiffness aPWV and AIx were measured using an oscillometric device.

Results. Aortic PWV positively correlated with age ($r=0.65$, $p<0.001$), fasting plasma glucose ($r=0.31$, $p=0.02$), systolic blood pressure ($r=0.05$, $p=0.02$), diastolic blood pressure ($r=0.34$, $p=0.002$), mean blood pressure ($r=0.39$, $p=0.002$) and heart rate ($r=0.32$, $p=0.01$). Brachial AIx directly correlated with age ($r=0.42$, $p=0.01$). After adjusting for age, in multiple regression analysis, the independent predictors for aPWV were fasting plasma glucose ($r^2=0.32$, $p=0.03$) and heart rate ($r^2=0.33$, $p=0.04$) and for AIx, abdominal circumference ($r^2=0.22$, $p=0.03$) and heart rate ($r^2=0.22$, $p=0.02$).

Conclusion. This study showed that fasting plasma glucose, abdominal circumference and heart rate are independent predictors of arterial stiffness. An early therapeutic intervention to optimize these parameters may reduce arterial stiffness and cardiovascular risk.

Keywords: cardiovascular risk factors, aortic pulse wave velocity, brachial augmentation index.