

Arterial stiffness – a novel important cardiovascular risk factor in the pediatric essential and white coat hypertension?

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The term „arterial stiffness“ denotes alterations in the mechanical properties of arteries, which may represent higher cardiovascular risk in middle-aged and older adults. Recently, the question regarding the arterial stiffness in patients with risk factors for the early progression of systemic atherosclerosis in vulnerable adolescent age-period are rare. Thus, the aim of this study was to evaluate the arterial stiffness and early atherosclerotic changes in adolescents suffering from essential and white coat hypertension using noninvasive markers.

Methods: Twenty-eight patients (14 boys) with essential hypertension (EH) and white coat hypertension (WCH) without clinical symptoms of other cardiovascular diseases and age/gender-matched controls were examined. The age-period of all subjects ranged from 17 to 18 years. Evaluated parameters - cardio-ankle vascular index (CAVI), brachial-ankle pulse wave velocity (baPWV) and carotid-femoral PWV (cfPWV) - were assessed using the system VaSera 1500 (Japan). In addition, mean heart rate was evaluated.

Results: Mean heart rate and baPWV were significantly higher in adolescents with WCH than healthy subjects ($p < 0.01$). However, CAVI and cfPWV mean values did not differ significantly between EH (5.35 ± 1.06 ; 8.7 ± 3.0 , respectively), WCH (5.58 ± 0.79 ; 7.7 ± 2.5 , respectively) and control groups (5.02 ± 0.71 ; 7.9 ± 2.0 , respectively).

Conclusions: Our results of increased brachial-ankle pulse wave velocity associated with tachycardia indicate a potential sympathetic overactivity as a major pathomechanism leading to the development and stabilisation of hypertension. Furthermore, no significant differences in other parameters between individual diagnoses at this age-period were found. We suggest that further research regarding the potential atherosclerotic changes using the sensitive noninvasive parameters in pediatric hypertension is important. Support: VEGA 1/0087/14.