

Endothelial function in children with white coat hypertension

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Introduction: White coat hypertension (WCH) is defined as the observation of high blood pressure (BP) levels in the doctor's office and normal BP during ambulatory monitoring. Endothelial dysfunction is considered to be an early indicator of atherosclerotic changes preceding the morphological alterations, commonly associated with elevated blood pressure. Several studies have demonstrated endothelial dysfunction in patients with essential hypertension. However, the presence of endothelial dysfunction in children with WCH has not been studied. Therefore, we aimed to study the endothelial function in children with WCH and essential hypertension using a novel method based on assessment of flow mediated dilation (FMD).

Methods: One hundred thirty eight children – 46 (23 boys) children suffering from WCH, 46 (23 boys) patients with essential hypertension and 46 age/gender matched healthy controls - were examined under standard conditions. The age-period of all children ranged from 14 to 18 years. Vascular ultrasound scans were performed with a Prosound F75 Aloka ultrasound machine. Flow increase was induced by inflation of a pneumatic tourniquet to 200 mm Hg for 5 minutes. Diameter of right brachial artery was measured basally and 60 seconds after cuff deflation. Diameter changes were expressed as the percentage change relative to the average baseline scan. Diameter changes < 5% at 60 seconds were considered as a deficient FMD.

Results: Statistical analysis revealed significant differences in the FMD between the both hypertensive groups (WCH, EH) and control group (9 % vs 13%; $p < 0.01$). Despite the fact that deficient FMD was found in both hypertensive groups (WCH, EH), no significant differences were found between both WCH and essential hypertensive groups. None of the patients in the control group had deficient FMD.

Conclusions: The presence of endothelial dysfunction in children suffering from white coat and essential hypertension suggests that hypertensive children have early atherosclerosis associated with increased cardiovascular risk. Importantly, WCH should not be considered a harmless trait and has common features with essential hypertension.