

Arterial stiffness evaluated by cardio-ankle vascular index (CAVI) is lower in hypertensive children with overweight

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Introduction: Cardio-ankle vascular index (CAVI) represents a novel marker for early diagnosis of increased arterial stiffness associated with atherosclerosis. However, the studies related to interaction between CAVI and hypertension/overweight in children and adolescents are rare. Previous study found increased arterial stiffness indexed by CAVI at the onset of essential hypertension[1], and another study reported lower CAVI in children with overweight compared with control subjects[2]. Based on these studies, we aimed to evaluate the arterial stiffness using CAVI in children with essential hypertension with normal weight and overweight.

Methods: The studied groups consisted of fifteen normal-weight adolescent boys with newly diagnosed essential hypertension (16.9±1.7 years, body mass index (BMI) 22.3±1.3kg/m²), fifteen overweight boys with newly diagnosed essential hypertension (16.9±1.6 years, BMI: 28.0±1.1 kg/m²) and fifteen normal-weight healthy controls (16.9±1.1 years, BMI: 21.5±1.3 kg/m²). Arterial stiffness indexed by CAVI was examined using the system VaSera 1500N (Fukuda Denshi, Japan) between 8.00 and 10.00 a.m. under standard conditions after 15 minutes of rest in supine position.

Results: Statistical analysis revealed significantly increased CAVI in normal-weight hypertensive group compared with overweight hypertensive subjects and control group (p=0.003, p=0.005, respectively). No significant difference was found between overweight hypertensive group and healthy controls.

Conclusion: Our findings revealed higher CAVI in normal-weight children with hypertension compared with controls and overweight hypertensive children. In contrast, no significant difference was found between overweight hypertensive group and control children. We suggest that the effect of essential hypertension on arterial stiffness could be masked by the effect of increased weight in hypertensive children indicating potential impact of higher arterial elasticity associated with body composition. This finding is different to studies in adult obese hypertensive patients characterized by higher arterial stiffness; therefore, it could help to elucidate the pathophysiological mechanisms in essential hypertension in children and adolescents.

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