

**Left ventricular in obese and overweight asymptomatic adolescents may be affected by higher arterial blood pressure, as compared with lean adolescents**

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**Background and Aim.** Structural and functional cardiac changes are known in obese adults but respective disturbances in children and adolescents are still controversial. The aim of this study was to assess the relationship between arterial blood pressure, body mass index (BMI) and echocardiographic measurements in overweight and obese asymptomatic adolescents

**Methods.** This study included 93 healthy subjects aged 10-15 years (mean  $12.6 \pm 1.2$  years). In all, systolic and diastolic blood pressure, weight, height, BMI, waist, hips, waist/hips ratio, hematologic and biochemical blood tests were assessed. Based on BMI, subjects were divided into three groups: lean (L, n=32), overweight (Ov, n=33) and obese (Ob, n=32). In the same day, a complete transthoracic echocardiographic examination was performed.

**Results.** Interventricular septal and LV posterior wall end-diastolic thickness was increased parallel to the BMI (L:  $0.84 \pm 0.09$  cm, Ov:  $0.88 \pm 0.1$  cm, Ob:  $0.96 \pm 0.1$  cm,  $p < 0.001$ , and L:  $0.78 \pm 0.1$  cm, Ov:  $0.80 \pm 0.09$  cm, Ob:  $0.94 \pm 0.08$  cm,  $p < 0.001$ , respectively). Relative wall thickness (RWT) and LV mass index (LVMI) adjusted to body surface area were similarly increased (L:  $0.34 \pm 0.05$ , Ov:  $0.34 \pm 0.05$ , Ob:  $0.40 \pm 0.04$ ,  $p < 0.001$ , and L:  $78 \pm 13$  g/m<sup>2</sup>, Ov:  $77.6 \pm 13$  g/m<sup>2</sup>, Ob:  $86.9 \pm 16.3$  g/m<sup>2</sup>,  $p = 0.022$ , respectively). Systolic blood pressure (SBP) values were significantly different (L:  $107.5 \pm 7.5$  mmHg, Ov:  $115 \pm 11$  mmHg, Ob:  $118 \pm 12$  mmHg,  $p < 0.001$ ), whereas diastolic blood pressure (DBP) values were not significant (L:  $74 \pm 6$  mmHg, Ov:  $76 \pm 7$  mmHg, Ob:  $74 \pm 9$  mmHg,  $p = 0.428$ ) between groups. SBP correlated with BMI ( $r = 0.282$ ,  $p = 0.006$ ) and with LV posterior wall thickness ( $r = 0.243$ ,  $p = 0.019$ ), whereas DBP correlate with LV ejection fraction ( $r = -0.227$ ,  $p = 0.029$ ), with deceleration time of E wave ( $r = -0.223$ ,  $p = 0.032$ ), with LV lateral early diastolic velocity ( $r = 0.215$ ,  $p = 0.039$ ).

**Conclusion.** The systolic blood pressure is higher in obese and overweight adolescent compared with lean adolescents. Both, high blood pressure and obesity, may affect left ventricular systolic and diastolic function in these patients.

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