Sympathoadrenergic and metabolic factors are involved in ambulatory blood pressure rise in childhood obesity.

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We investigated in a young Italian obese population, the relationship between ambulatory BP (ABP) and several pathophysiological factors linking obesity to hypertension. A total of 89 obese children and adolescents underwent a 24-h ambulatory BP monitoring (ABPM) and an oral glucose tolerance test. The circulating levels of insulin, lipids, uric acid, C-reactive protein, interleukin-6, renin and aldosterone and the 24-h urinary levels of epinephrine, norepinephrine and albumin excretion rate were measured. Nine percent of subjects had daytime sustained hypertension (SH), 26% night-time hypertension and 11% a non-dipping pattern. SH subjects compared to those with sustained normotension (SN) were more obese ($P < 0.05$), with a more frequent family history of hypertension ($P < 0.05$), higher urinary catecholamine ($P < 0.05$) and heart rate values ($P < 0.05$) after adjustment for standard deviation score (SDS) of body mass index (BMI) and sex. Subjects with night-time hypertension compared to those with night-time normotension were more obese ($P < 0.0001$), with a higher prevalence of impaired glucose tolerance ($P < 0.05$) and metabolic syndrome ($P < 0.05$) and higher 2-h glucose ($P < 0.05$), uric acid ($P < 0.05$) and triglycerides ($P < 0.05$). In multivariate regression analysis, daytime systolic BP (SBP) remained independently correlated with urinary norepinephrine and SDS-BMI ($P < 0.05$ for both), daytime diastolic BP (DBP) with waist circumference ($P < 0.05$) and night-time SBP and DBP with SDS-BMI ($P < 0.01$ for both). The risk of having systolic and diastolic hypertension increased with the increase in SDS-BMI and waist circumference, respectively. In conclusion, in our cohort of obese children and adolescents, daytime and night-time hypertension were associated with activation of the sympathoadrenal system and worst metabolic conditions, respectively.