The Effect of Body Mass Index on Blood Pressure Varies by Race among Children

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Abstract

The effect of adiposity on blood pressure (BP) intensifies as children become obese, and black children tend to have greater body mass index (BMI) and higher BP than age-matched white children. But few studies have compared the magnitude of the effect of BMI on BP in obese black and white children. We used a novel analytic technique to examine the influence of age and BMI on BP in children seen at a hospital-based obesity clinic. The study sample included 821 overweight and obese children (age and sex adjusted BMI% ranged from 87% to 100%; 306 males, 515 females, 362 blacks, and 459 whites). The mean age of the study subjects was 11.72 ± 3.48 years, the mean BMI was 36.22 ± 8.51 kg/m^2, and the mean systolic and diastolic BP were 109.36 ± 16.10 and 69.99 ± 10.48 mmHg, respectively. In comparison, blacks and whites were similar in age (11.89 vs 11.58; p=0.197); while black patients had higher BMI (37.32 vs 35.34 kg/m^2; p=0.0010), and higher systolic BP% than whites (58.71 vs 50.72 mmHg; p=0.00062). Semiparametric regression models showed that while age and BMI were significantly associated with systolic BP% in both race groups, black children had significantly higher BP% values as compared with white children of the same age and BMI (Fig 1 (a) and (b)). Although BP% values have taken into account the effect of age, there continued to be a significant effect of age on BP% in black children. In conclusion, among children referred for treatment of obesity, black children are at a significantly greater risk for having elevated BP as compared with their white peers of similar age and severity of obesity. Further research is needed to better understand this population-specific intensification of the adiposity effect on BP in obese black children.