

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

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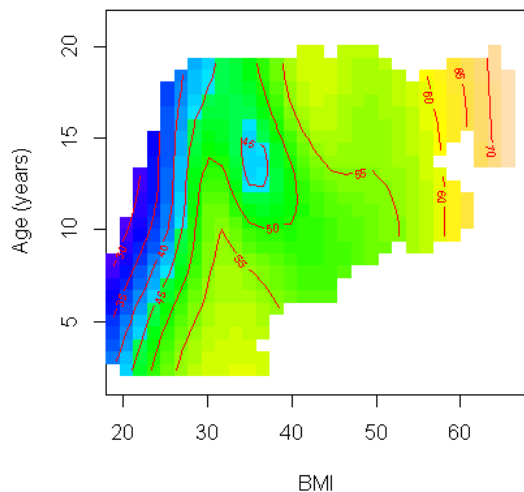
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## Abstract

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  $11.72 \pm 3.48$  years, the mean BMI was  $36.22 \pm 8.51$  kg/m<sup>2</sup>, and the mean systolic and diastolic BP were  $109.36 \pm 16.10$  and  $69.99 \pm 10.48$  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<sup>2</sup>;  $p=0.0010$ ), 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.

(a) White: Systolic BP%



(b) Black: Systolic BP

