

## ANTHROPOMETRIC PREDICTORS OF BLOOD PRESSURE IN CHILDREN 9 & 10 YEARS OF AGE

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**Purpose:** The relationship between excess fat, especially intra-abdominal fat, and risk for diabetes and cardiovascular disease is well established in adults. Those relationships have not been as extensively studied in children, with debate ongoing as to what constitutes an elevated blood pressure. The purpose of this study was to examine (a) distribution of blood pressure in a group of 9 and 10 year olds and (b) relationships among blood pressure and selected anthropometric measures, specifically Waist Circumference (WC), Body Mass Index (BMI), Tricep Skinfold (TSF), and Subscapular Skinfold (SSF).

**Method:** Baseline measures from 166 fourth grade children participating in an NINR-funded school-based anger management study were examined. Subjects were recruited from 4 elementary schools in the South East. Mean systolic (SBP) and diastolic (DBP) blood pressure (BP) was measured by a Dinamap PRO 100, using the method recommended in Update of the Task Force of 1987 on Blood Pressure in Children and Adolescents. Blood pressure percentiles were obtained from tables by the Second Task Force on Blood Pressure Control In Children. Anthropometric measures were obtained using standard protocols. Pearson correlations were used to examine bivariate associations. Multivariate ANOVA and Multiple Regression were used to test for blood pressure differences and associations with WC and BMI. Inferential tests used the 0.05 significance level.

**Findings:** Subjects had a mean age of 9.2 (SD=0.40), were 52% Male, and represented White (64%), African-American (33%), and Other (3%) groups. Five (3%) indicated a history of heart problems. BP distribution tended to be higher than published percentiles (24% of sample were at the 95<sup>th</sup> %ile). Means (SD) observed included: SBP 110.8 (12.8); DBP 61.9 (6.8); WC 28.8 in (5.0); BMI 21.04 (5.64); TSF 19.35 mm (10.57); and SSF 13.27 mm (9.28). No significant differences in mean SBP or DBP, WC, TSF, or SSF were found between age, race, or sex groups. African-Americans had a higher ( $p=.008$ ) mean BMI (22.7) than non-African Americans (20.2). WC, BMI, TSF, and SSF were all significantly associated with SBP and DBP, with WC showing the largest coefficients (.673 with SBP and .436 with DBP). BMI was not a significant predictor of blood pressure after controlling for WC ( $p=.120$ ), while WC was significantly related to blood pressure ( $p<.001$ ) after controlling for BMI.

**Discussion:** With obesity increasing in children, relying on increasing BP percentile cutpoints to define high-risk for cardiovascular disease may be counterproductive. As in adults, WC may be a better predictor of cardiovascular risk in children than BMI, perhaps owing to the metabolic activity of abdominal fat.