UTILITY OF WAIST-TO-HEIGHT RATIO IN ASSESSING CARDIOMETABOLIC RISK PROFILE AMONG NORMAL WEIGHT AND OVERWEIGHT / OBESE BLACK AND WHITE CHILDREN: THE BOGALUSA HEART STUDY.


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Background: Body Mass Index (BMI) has been extensively used to assess the impact of obesity on cardiometabolic risk in children. However, BMI does not always relate to central obesity and progressively increases with growth and maturation in childhood. Waist-to-Height Ratio (WHtR) is a convenient and a relatively constant anthropometric index of abdominal obesity, regardless of age race and sex. The current study examines the utility of WHtR in children divided according to the accepted cut-offs for BMI used to define normal weight and overweight /obese children.

Methods: A cross-sectional cardiometabolic risk factor variables data on 3238 children (56% white, 50% male), 4-18 years of age was used. The subjects were divided into normal weight (age-, race- and sex-specific 5th - 85th BMI percentiles) and overweight /obese (≥ 85th percentile) groups, and the risk profiles of each group based on the WHtR (<0.5, no central obesity or ≥ 0.5, central obesity) were compared.

Results: 9.22% of the children in the normal weight group were centrally obese (WHtR ≥0.5); 19.8% among the overweight/obese had a WHtR<0.5. On multivariate analysis, the normal weight centrally obese children were 1.74 and 1.43 times more likely to have significant adverse levels (top tertile vs. the rest) for systolic and diastolic blood pressures, 1.82, 2.58 and 2.58, times more likely to have adverse LDL and HDL cholesterol and triglyceride levels and 1.36, 3.91 and 3.60 times more likely to have adverse levels for glucose, insulin and homeostasis model assessment of insulin resistance (HOMA-IR) (p<0.05), respectively. In addition to having a higher prevalence of pre-hypertension, dyslipidemia, hyperinsulinemia, insulin resistance and metabolic syndrome (p<0.01), the normal weight central obesity group had a significantly higher prevalence of parenteral history of type 2 diabetes (p<0.05), signifying an increased lifetime risk of developing type 2 diabetes. In the overweight/obese group, those without central obesity were 0.56, 0.39 and 0.46 times less likely to have significant adverse levels (top tertile vs. the rest) of HDL cholesterol, insulin and HOMA-IR respectively (p<0.05) as compared to those with central obesity. These overweight/obese children without central obesity also showed significantly lower prevalence of low HDL levels, hypertriglyceridemia, hyperinsulinemia, insulin resistance and parenteral history of type 2 diabetes (p<0.05).

Conclusion: These findings emphasize the utility of the waist-to-height ratio not only in detecting central obesity and related adverse cardiometabolic risk among normal weight children, but also in identifying those with healthy risk factor profiles in those without central obesity among the overweight /obese children.