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ORIGINAL RESEARCH COMMUNICATION

Relation of body mass index and waist-to-height ratio to cardiovascular disease risk factors in children and adolescents: the Bogalusa Heart Study^{1,2,3}

David S Freedman, Henry S Kahn, Zuguo Mei, Laurence M Grummer-Strawn, William H Dietz, Sathanur R Srinivasan and Gerald S Berenson

¹ From the Divisions of Nutrition and Physical Activity (DSF, ZM, LMG-S, and WHD) and Diabetes Translation (HSK), Centers for Disease Control and Prevention, Atlanta, GA, and the Tulane Center for Cardiovascular Health, Tulane University School of Public Health and Tropical Medicine, New Orleans, LA (SRS and GSB)

Background: Several investigators have concluded that the waist-to-height ratio is more strongly associated with cardiovascular disease risk factors than is the body mass index (BMI; in kq/m^2).

Objectives: We examined the relation of the BMI-for-age z score and waist-to-height ratio to risk factors (lipids, fasting insulin, and blood pressures). We also compared the abilities of these 2 indexes to identify children with adverse risk factors.

Design: Children aged 5-17 y (n = 2498) in the Bogalusa Heart Study were evaluated.

Results: As assessed by the ability of the 2 indexes to 7) account for the variability in each risk factor and 2) correctly identify children with adverse values, the predictive abilities of the BMI-forage z score and waist-to-height ratio were similar. Waist-to-height ratio was slightly better (0.01–0.02 higher R^2 values, P < 0.05) in predicting concentrations of total-to-HDL cholesterol ratio and LDL cholesterol, but BMI was slightly better in identifying children with high systolic blood pressure (0.03 higher R^2 , P < 0.05) in predicting measures of fasting insulin and systolic and diastolic blood pressures. On the basis of an overall index of the 6 risk factors, no difference was observed in the predictive abilities of BMI-for-age and waist-to-height ratio, with areas under the curves of 0.85 and 0.86 (P = 0.30) and multiple R^2 values of 0.320 and 0.318 (P = 0.79). This similarity likely results from the high intercorrelation ($R^2 = 0.78$) between the 2 indexes.

Conclusions: BMI-for-age and waist-to-height ratio do not differ in their abilities to identify children with adverse risk factors. Although waist-to-height ratio may be preferred because of its simplicity, additional longitudinal data are needed to examine its relation to disease.

Key Words: BMI • body mass index • waist • height • waist-to- height ratio • children • lipids • blood pressure • insulin

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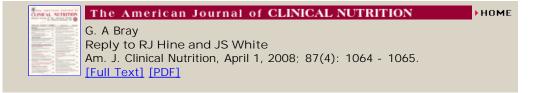
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