Risk score could lead to better diagnosis of the metabolic syndrome in children

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Researchers have developed a new scoring system that may better identify adolescents with the metabolic syndrome, a group at increased risk of later developing Type 2 diabetes and heart disease. The study, to be presented at The Endocrine Society's 94th Annual Meeting in Houston, describes what the authors call "the first racial/ethnic-specific and sex-specific scoring system for the metabolic syndrome."

"Children with the metabolic syndrome have more than 11 times the odds of developing Type 2 diabetes within 30 years than do those without this cluster of medical abnormalities," said study co-author Mark DeBoer, MD, assistant professor at the University of Virginia, Charlottesville. "A diagnosis of the metabolic syndrome can trigger intervention in adolescents and perhaps lead to starting preventive medical therapy sooner in those at highest risk for future disease."

Current diagnostic criteria for the metabolic syndrome were designed for adults and do not consider race. Even diagnostic criteria modified for use in adolescents tend to miss some children who likely are at increased risk, especially male African Americans, DeBoer said. Black adults have higher rates of Type 2 diabetes and death due to heart disease than do whites, U.S. statistics show, but the metabolic syndrome is less likely to be diagnosed in black male youth. DeBoer and his research partner Matthew Gurka, PhD, of West Virginia University, Morgantown, studied whether the characteristics of the metabolic syndrome might vary for different racial and ethnic groups.

A diagnosis of the metabolic syndrome depends on an individual having abnormal values in at least three of its five components: a large waistline, high blood pressure, high blood sugar levels, high triglycerides (levels of fat in the blood) and low levels of high-density-lipoprotein (HDL), or "good," cholesterol. However, some adolescents may have values that are just shy of the cutoffs for each component. These adolescents do not receive the diagnosis but are still likely at risk for consequences of the metabolic syndrome in adulthood, DeBoer said.

The researchers aimed to address these deficiencies in the definition of the metabolic syndrome by creating a risk score that was "continuous" and could therefore help identify children along a spectrum of worsening findings. This score is a sum of numeric values for all five components.

In addition, the investigators evaluated whether this score differed between races and ethnicities, specifically blacks, whites and Hispanics. To do this, they used factor analysis, a statistical approach that looks for a "behind-the-scenes" factor that helps determine how certain measures group together. The research team used data from 4,174 people ages 12 to 19 years who participated in the National Health and Nutrition Examination Survey from 1999 to 2010.

Results showed that individual components of the metabolic syndrome did group together differently between racial-ethnic groups. Male blacks, for instance, were less likely than other racial groups to have low "good" cholesterol, but when they did, it was a more ominous sign of worsening metabolic syndrome, DeBoer said. The new scoring system diagnosed the metabolic syndrome in nearly 76 percent of male blacks versus only 42 percent using the current system.

DeBoer said the new scoring system did better than the usual system at predicting which adolescents had elevations in cardiovascular risk factors that are related to the metabolic syndrome but not part of its

diagnosis. These included fasting insulin levels, uric acid and C-reactive protein, a marker of inflammation associated with cardiovascular risk.

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