

Adiposity in Children and Adolescents: Correlates and Clinical Consequences of Fat Stored in Specific Body Depots

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Needs Assessment

Forty-three million children under age 5 are overweight throughout the world, joining 500 million obese and 1.5 billion overweight adults.¹ Pediatric obesity has become one of the greatest public health challenges of the 21st century, and the identification of children who are at risk of health problems due to their obesity is a priority for modern health care. A major public health goal in the United States is to achieve health equity, eliminate disparities, and improve the health of all groups by 2020.² A total of 51% and 64% of the racial gap in life expectancy in white and African American men and women, respectively, can be explained by differences in mortality rates from diabetes, cardiovascular disease (CVD), and cancer, all of which are impacted by obesity.³ The degree to which these differences can be explained by sex, race and ethnic differences observed in childhood remain to be determined.

Studies among adults have shown that body fat stored in different depots (hips, abdomen, etc) may confer different health risks.^{4,5} Children also vary greatly in fat distribution, and it is evident that there are sex and race differences in obesity prevalence.⁶ However, the degree to which there are age, sex and ethnic differences in both the storage and health consequences of adipose tissue stored in different locations is not well understood.

Studies are beginning to appear in the literature that rely on advanced imaging techniques such as computed tomography (CT) and magnetic resonance imaging (MRI) to quantify depot-specific body fat in children. Abdominal fat measured by MRI is linked to metabolic and inflammatory complications in both male and female adolescents.⁷ A recent MRI study demonstrated that Hispanic obese youth have more pancreatic fat than African American obese youth, and the pancreatic fat was linked to markers of type 2 diabetes and metabolic disorders.⁸ Imaging technology will greatly enhance our ability to understand the health risks associated with body fat stored in different locations, and any differences there might be related to sex and ethnicity.⁹⁻¹²

The outcome of the symposium will inform the development of clinical guidelines that will aid in the early identification of health risks in children so that corrective action may be taken early, thereby reducing the health burden associated with obesity.

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