Identification of Obesity and Cardiovascular Risk Factors in Childhood and Adolescence

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KEYWORDS

• Obesity • Risk factors • Cardiovascular • Childhood • Adolescence

KEY POINTS

- Overweight and obese youth are at increased risk for premature cardiovascular disease.
- Identification of obesity with the consistent use of body mass index and anthropometric measurements is necessary to identify children and adolescents with cardiovascular risk factors.
- The development of atherosclerosis begins in childhood and is accelerated in the presence of obesity.
- Screening for hyperlipidemia is of particular importance in the overweight and obese child and adolescent in order to implement interventions to prevent early cardiovascular events.

Excessive adiposity is increasing on both the national and international levels. Adults, adolescents, and children are all affected by the epidemic. Obesity in the child and adolescent population is a growing problem. Rates of obesity have risen dramatically in a short period of time. Between 1999 and 2000, the prevalence of US teenagers aged 12 to 19 years who were identified as overweight or obese was 30% ± 1.4%, and in 2003 to 2004 it increased significantly to 34.3% ± 2.6%.[1] Similar increases were seen in children, with the most dramatic increase seen in the 6-year-old to 11-year-old cohort. According to the 2013 Heart Disease and Stroke Statistics Update, 23.9 million (31.8%) children aged 2 to 19 years are overweight or obese and 12.7 million (16.9%) are obese.[2]

The primary goal of labeling adolescents as overweight or obese should be to identify a population that is at an increased risk for current or future disease related to their excess adiposity. Obesity has a strong association with cardiovascular disease and, specifically, accelerated atherosclerosis.[3] As a result, it is of the utmost importance that clinicians identify and risk stratify overweight and obese individuals in order to

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institute primary prevention and/or treatment to reduce future cardiovascular morbidity and mortality in this vulnerable population.

This article (1) discusses the definition of child and adolescent obesity and the need for standardization, (2) discusses anthropometric measurements and the potential pitfalls and benefits of using additional measures when assessing the overweight and/or obese child, (3) reviews data to advocate for ethnic-specific cut-points and further research in minority populations, (4) reviews literature about the metabolic syndrome in children and current recommendations, (5) reviews literature concerning the cardiovascular effects of obesity, and (6) summarizes systematic reviews of obesity prevention studies. In conclusion, this article calls for a standardized definition of obesity and the measures of obesity in the child and adolescent; as well as increased awareness and screening of the cardiovascular complications of the obesity epidemic.

Key message

- Obesity is strongly associated with accelerated atherosclerosis
- Overweight and obese adolescents should be consistently identified
- Primary care providers can be instrumental in reducing future cardiovascular morbidity/mortality by identifying, screening, and instituting primary prevention

DEFINITIONS OF ADOLESCENT OBESITY

One of the first problems to arise when considering obesity in the pediatric population is how to define and identify it. The 2007 obesity guidelines by the American Academy of Pediatrics[4] recommends using body mass index (BMI), a measure of body weight relative to height. Unlike in adults, in whom absolute BMI cutoff points are used to define obesity, this article recommends the use of percentiles specific for age and gender to categorize children as underweight, normal weight, overweight, or obese. The expert panel advocates the use of 2 specific cutoff points to minimize overdiagnosis and prevent underdiagnosis, using the 85th and 95th percentiles for age and gender. If patients are between the 85th and 94th percentiles, they should be categorized as overweight, and if they are greater than or equal to the 95th percentile they are categorized as obese. This approach represents a change in terminology, but not in cutoff points, from the 1998 expert committee recommendations in which the term obese was avoided.[5]

This recommended cutoff point is in agreement with the US Centers for Disease Control and Prevention (CDC) growth standards of 2000.[6,7] However, in addition to this recommendation there are several other organizations with varying cutoff points. The World Health Organization (WHO) developed international standards for children 0 to 5[8] and 5 to 19 years of age,[9] as did the International Obesity Task Force (IOTF).[10] In addition, there are several country-specific references that are used in individual nations.

The lack of agreement about definitions and cutoff points has been attributed to the lack of strong evidence and the absence of a definite correlation between childhood weight and future health outcomes.[11] Although there is clearly no perfect measure or cutoff point, several studies have compared the different growth curves and cutoff points of different organizations.[12–15] The studies showed disagreement between growth curves and showed that usage of the WHO criteria yielded a higher prevalence of overweight/obesity. The most recent study[12] was conducted in Spain and classified participants as obese, overweight, or normal weight based on CDC, WHO, and the Spanish Reference Criteria. Forty-eight percent were categorized as obese by the