High BMI in Teens Predicts Heart Disease Risk

VITALS

Major Finding: An elevated BMI during adolescence, even within the range currently considered normal, strongly predicted the diagnosis of CHD on angiography by the age of 45 years.

Data Source: A prospective cohort study of 37,674 healthy military men who were followed from approximately age 25 years for a median of 17 years for the development of angiography-proven CHD and type 2 diabetes.

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BY MARY ANN MOON

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Among males, an elevated body mass index during adolescence was a strong predictor of angiography-proven coronary heart disease in young adulthood, according to large, prospective study.

Male adolescents who were in the top 10% of body mass index had a risk for developing coronary heart disease at ages 25-45 years that was nearly seven times higher than the risk in adolescents in the lowest 10% of BMI, according to Dr. Amir Tirosh of the division of endocrinology, diabetes, and hypertension at Brigham and Women's Hospital, Boston, and his associates (N. Engl. J. Med. 2011;364:1315-25).

"Although obesity in adulthood is a

well-documented risk factor for both type 2 diabetes and CHD, it [has been] unclear whether a longer history of relative overweight, starting earlier in life, poses an additional risk," Dr. Tirosh and his associates said.

"Given the current obesity pandemic, it is important to determine whether elevated BMI in childhood [or] adolescence … contributes independently to the risk of disease," they noted.

Dr. Tirosh and his colleagues examined the issue with the use of data from the Israel Defense Forces' ongoing Metabolic, Lifestyle, and Nutrition Assessment in Young Adults study.

All men in the Israeli military are examined every 3-5 years, beginning at about age 25 and continuing throughout their military careers, and the information is recorded in a database.

Also recorded are the weight and height measurements obtained during the men's medical examination at induction into the military, usually at age 17.

The researchers used those data to calculate body mass index in adolescence.

For this study, Dr. Tirosh and his associates analyzed data on 37,674 male military personnel who were followed prospectively for a mean of 17 years, starting at about age 25, and whose body mass index during adolescence was tracked retrospectively. At that time, body mass index ranged from 15 to 36 kg/m^2.

During follow-up, there were 327 incident cases of angiography-proven CHD, which were diagnosed when the subjects were aged 25-45 years. After the data were adjusted to account for potential confounders such as subject age, presence or absence of a family history of CHD, blood pressure, physical activity level, smoking status, and lipid profile, elevated adolescent body mass index was a significant predictor of CHD across the entire BMI range, reported Dr. Tirosh and his colleagues..

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CHD risk was sevenfold higher in young men whose teen BMI had been in the top 10%, vs. the lowest 10%.

The nearly 4,000 subjects whose body mass index was in the 90th percentile and above had a hazard ratio of 6.85 for developing CHD, compared with those subjects who were in the 10th percentile and below.

'Our study may help to redefine what constitutes a "normal" or "healthy" BMI in adolescence and to highlight the role of elevated BMI at different ages in the pathogenesis' of diseases.

The excess CHD risk was present even at BMIs that are "well within the range currently considered to be normal," rising 12% for every 1-unit increment in BMI, Dr. Tirosh and his associates reported.

"Our study may help to redefine what constitutes a 'normal' or 'healthy' BMI in adolescence and to highlight the role of elevated BMI at different ages in the pathogenesis of different diseases," the researchers said.

In contrast to CHD risk, the risk of type 2 diabetes did not correlate with adolescent body mass index once the data were adjusted to account for potential confounders.

Diabetes was more influenced by recent BMI and weight gain, "suggesting that BMI in adolescence has a more reversible or shorter term effect on the risk of diabetes as compared with its effect on the risk of CHD," they reported.

"Our results might be explained by the fact that diabetes represents a more functional pathomechanism than CHD, which relies on anatomical changes (atherosclerosis)," Dr. Tirosh and his colleagues said.

Because the study involved only young Israeli military men, the findings may not be generalizable to other patient populations, they added. ■