

Male obesity linked to low testosterone levels, study shows

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Obesity, a condition linked to heart disease and diabetes, now appears to be associated with another health problem, but one that affects men only -- low testosterone levels.

Results of a study published online ahead of print in the journal [Diabetes Care](#), conducted by University at Buffalo endocrinologists, showed that 40 percent of obese participants involved in the Hypogonadism in Males (HIM) study had lower-than-normal [testosterone](#) readings.

The percentage rose to 50 percent among obese [men](#) with diabetes. Results also revealed that as [body mass index](#) (BMI) -- a relationship of weight-to-height -- increased, testosterone levels fell.

"The effect of diabetes on lowering testosterone levels was similar to that of a weight gain of approximately 20 pounds," says Sandeep Dhindsa, MD, an endocrinology specialist in the UB Department of Medicine and first author on the study.

"In view of the fact that almost one-third of the U.S. is obese, these observations have profound pathophysiological, clinical, epidemiological and public health implications."

This is the largest analysis of the association between obesity and low testosterone, and the first to compare prevalence of low testosterone with obesity and diabetes separately and together. The study shows that obesity and diabetes may exert independent influences on testosterone

concentrations.

"We published a report in 2004 on the high prevalence of low testosterone levels in men with [type 2 diabetes](#), and multiple studies all over the world have confirmed the association of low testosterone with diabetes," Dhindsa notes.

"The Endocrine Society now recommends that all men with type 2 diabetes should have their testosterone levels measured. Our new study shows that obese men also have a very high prevalence of low testosterone levels, so physicians should consider screening obese non-diabetic men, as well, for low testosterone."

The HIM study was funded by Solvay Pharmaceuticals Inc., and was conducted from November 2003 to February 2004 in 95 primary care practices throughout the U.S. The study involved 2,165 men 45 years or older who provided blood samples for analysis of testosterone concentrations.

UB researchers excluded participants from the full study who had no BMI data or were on certain drugs that can affect testosterone levels, providing a study population of 1,849 men -- 398 with diabetes and 1,451 non-diabetics.

"With the rising prevalence of obesity in the U.S. and the rest of the world," says Paresh Dandona, MD, head of the Division of Endocrinology, Diabetes and Metabolism at UB and Kaleida Health, and senior author of the study, "it is imperative that the prevalence of low testosterone levels in obese men be defined. In addition, the magnitude of the contribution of obesity to subnormal testosterone needs to be quantified.

"We hypothesized that obese men are more likely to have low

testosterone than non-obese men, and that we would find more low testosterone levels in men with diabetes than in men without diabetes, both obese and non-obese."

Results confirmed these hypotheses, showing a 40 percent higher prevalence of low testosterone in obese men compared to the non-obese participants. Men with diabetes, whether obese or not, showed lower levels of testosterone than non-diabetic men across all weight categories. Testosterone levels decreased significantly in both diabetic and non-diabetic men as BMI increased.

"In view of the increasing prevalence of obesity, even in younger populations, it would be important to conduct a similar study in the men at the prime of their reproductive years," he says.

UB endocrinologists published a study in [Diabetes Care](#) in 2008 showing that more than 50 percent of men between 18 and 35 years old with type 2 diabetes had lower than normal testosterone levels.

"In view of the high rates of subnormal testosterone in patients with obesity or diabetes, testosterone concentrations should be measured regularly in these populations, especially when these conditions occur together," says Dandona.

Provided by University at Buffalo

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