

News Summary

OR42-2: Testosterone decreases after ingestion of sugar (glucose)

Men with low testosterone should have their hormone levels retested after they fast overnight because eating may transiently lower testosterone levels, a new study concludes. The results will be presented Saturday at The Endocrine Society's 91st Annual Meeting in Washington, D.C.

"Both the incidence of low testosterone, or hypogonadism, in men and the annual number of testosterone prescriptions are increasing, likely as a result of the obesity epidemic and our aging population," said study co-author Frances Hayes, MD, an endocrinologist at St. Vincent's University Hospital in Dublin, Ireland, who did the research at Massachusetts General Hospital, Boston. "The decision to prescribe testosterone therapy is based on the result of a blood sample, so obtaining an accurate measurement of testosterone is key to making a correct diagnosis of hypogonadism."

In current guidelines for evaluating men with hypogonadism, The Endocrine Society recommends measuring blood levels of testosterone—the major male sex hormone—on two or more occasions in the morning, when testosterone is highest. However, no guidelines exist on when to draw a testosterone sample in relation to food intake, Hayes said.

Past research shows that a high level of insulin, the hormone primarily secreted after eating, is related to low testosterone levels. Like eating, glucose intake causes blood glucose (sugar) levels to rise, which stimulates secretion of insulin. Hayes and her colleagues examined the impact of a standard dose of glucose on testosterone levels in 74 men. The researchers administered the oral glucose tolerance test, a screening test for diabetes that involves drinking a sugary solution (75 grams of pure glucose) and then measuring blood sugar levels.

Of the 74 men, 42 had normal glucose tolerance on the test, 23 had impaired glucose tolerance (also called prediabetes) and 9 had newly diagnosed type 2 diabetes.

The authors found that the glucose solution decreased blood levels of testosterone by as much as 25 percent, regardless of whether the men had diabetes, prediabetes or normal glucose tolerance.

Two hours after glucose administration, the testosterone level remained much lower than before the test in 73 of the 74 men, a statistically significant difference, the authors reported. Of the 66 men who had normal testosterone levels before the test, 10 (15 percent) became hypogonadal at one or more time points during the test.

The results did not differ by changes in insulin levels, according to the abstract. Other hormones that could change testosterone measurements also did not appear to affect results. Hayes said more research is needed to find the factor or factors responsible for this drop in testosterone.

Because glucose intake, and likely food, decreases testosterone, she said, "This research supports the notion that men found to have low testosterone levels should be reevaluated in the fasting state."

Lisa Caronia, a researcher at Mass General, will present the results of the study, which was funded by the National Institutes of Health and the American Diabetes Association.