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Frequent occurrence of hypogonadotropic hypogonadism in type 2 diabetes.

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**Abstract:** Type 2 diabetes is associated with lower total testosterone (T) levels in cross-sectional studies. However, it is not known whether the defect is primary or secondary. We investigated the prevalence of hypogonadism in type 2 diabetes by measuring serum total T, free T (FT), SHBG, LH, FSH, and prolactin (PRL) in 103 type 2 diabetes patients. FT was measured by equilibrium dialysis. FT was also calculated by using T and SHBG (cFT). Hypogonadism was defined as low FT or cFT. The mean age was 54.7 +/- 1.1 yr, mean body mass index (BMI) was 33.4 +/- 0.8 kg/m<sup>2</sup>, and mean HbA1c was 8.4 +/- 0.2%. The mean T was 12.19 +/- 0.50 nmol/liter (351.7 +/- 14.4 ng/dl), SHBG was 27.89 +/- 1.65 nmol/liter, and FT was 0.250 +/- 0.014 nmol/liter. Thirty-three percent of patients were hypogonadal. LH and FSH levels were significantly lower in the hypogonadal group compared with patients with normal FT levels (3.15 +/- 0.26 vs. 3.91 +/- 0.24 mIU/ml for LH and 4.25 +/- 0.45 vs. 5.53 +/- 0.40 mIU/ml for FSH; P < 0.05). There was a significant inverse correlation of BMI with FT (r = -0.382; P < 0.01) and T (r = -0.327; P < 0.01). SHBG correlated inversely with BMI (r = -0.267; P < 0.05) but positively with age (r = 0.538; P < 0.001) and T (r = 0.574; P < 0.001). FT correlated strongly with cFT (r = 0.919; P < 0.001) but not with SHBG. LH levels correlated positively with FT (r = 0.287; P < 0.05). We conclude that hypogonadotropic hypogonadism occurs commonly in type 2 diabetes