

Biswas M, Hampton D, Newcombe RG, Rees DA. **Total and free testosterone concentrations are strongly influenced by age and central obesity in men with type 1 and type 2 diabetes but correlate weakly with symptoms of androgen deficiency and diabetes-related quality of life.** CLIN ENDOCRINOL 2012; 76(5):665-673.

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Abstract: Objective: Testosterone levels are commonly lowered in men with diabetes, but it is unclear how these relate to symptoms of hypogonadism and quality of life. We sought to investigate the relationship between testosterone levels, symptoms of androgen deficiency, erectile function and quality of life in men with type 1 and type 2 diabetes. Design and subjects: Cross-sectional study of 115 men with type 2 diabetes, 93 men with type 1 diabetes and 121 healthy controls. Measurements: Total, bioavailable and free testosterone levels were measured or calculated by Vermuelen's formula. Quality of life and symptom scores were assessed by the Audit of Diabetes Dependent Quality of Life (ADDQoL), androgen deficiency in the aging male (ADAM) and International Index of Erectile Function (IIEF) questionnaires. Results: Forty-five and sixty-one per cent of men with type 2 diabetes had low total and calculated free testosterone (CFT) levels, respectively. Total testosterone (TT) levels were not lowered in men with type 1 diabetes, but 32% had low CFT. After adjustment for age and waist circumference, only CFT in men with type 2 diabetes (0.037 nm, 95% CI 0.075 to 0.0003 , $P = 0.048$) remained lowered compared with controls. CFT correlated weakly with ADAM ($r = 0.26$, 95% CI 0.42 to 0.08 , $P = 0.006$), IIEF ($r = 0.19$, 95% CI 0.01 - 0.37 , $P = 0.042$) and ADDQoL ($r = 0.21$, 95% CI 0.03 to 0.38 , $P = 0.022$) scores in men with type 2, but not type 1 diabetes. Age exerted the predominant effect on erectile function in both groups, in a model incorporating age, testosterone level and complications. Conclusions: Testosterone levels are strongly affected by age and central obesity in men with type 1 and type 2 diabetes but correlate weakly with symptoms of androgen deficiency and erectile function. Testosterone levels do not appear to be a major determinant of quality of life in patients with diabetes. © 2012 Blackwell Publishing Ltd