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Diagnostic and therapeutic implications of using calculated free testosterone in men with low-normal total testosterone levels

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Introduction: Making the diagnosis of biochemical hypogonadism is critical in the appropriate management of men presenting with clinical hypogonadism. There is a wide laboratory range for normal levels of total testosterone (TT), which may lead to under-diagnosis of hypogonadism in men with low-normal TT. We examined the role of calculated free testosterone (cFT) in this group of men presenting with suspected hypogonadism.

Materials and methods

Twenty-eight men with erectile dysfunction (ED) were investigated with TT, SHBG, albumin, fasting blood glucose, hormonal profile and a lipid profile. Free testosterone and bio-available testosterone (BAT) were calculated in all men using the calculator on the *ISSAM* website (http://www.issam.ch/freetesto.htm).

Results: The mean age was 55.57 years (range: 27–6 years±11.48), with a mean body mass index of 29.69 kg/m^2 (range: 19.02–39.19±4.33). 28.5% had type 2 diabetes. Only 5/28 (17.8%) men had their TT assessed by their primary care physicians prior to referral to the secondary care service. 7/28 (25%) men were clearly hypogonadal based on TT. Of the remaining 21 men with TT in the normal range (9–27 nmol/l), 13 (61.9%) had TT <14 nmol/l (borderline TT) and 8 (38.1%) had more than 14 nmol/l. 10/13 (76.9%) men with borderline TT had low levels of cFT, and 3/13 had normal levels of cFT. All those with TT>14 nmol/l had normal cFT values. BAT was also lower than normal in 5/10 but within the reference range in 5/10 with low cFT. This is likely to be due to the normal levels of albumin and relatively low levels of SHBG.

Conclusion

Our study highlights the importance of calculating cFT in order to accurately diagnose biochemical hypogonadism in men presenting with clinical hypogonadism but low-normal levels of TT.
