

Sex hormone-binding globulin has no effect on salivary testosterone

Brian G Keevil¹, Tom Fiers², Jean-Marc Kaufman², Wendy Macdowall³, Soazig Clifton⁴, David Lee⁵ and Frederick Wu⁶

We would like to follow up our 2014 publication in this journal (1) by submitting further validation data to support the measurement of salivary testosterone (T), highlighting its independence from variations in circulating sex hormone-binding globulin (SHBG), unlike serum total T which is positively correlated with SHBG. All analyses were performed as previously described (1). In addition, further samples were collected from, 48 males and 38 females, healthy volunteers (mean age 32 y, range 18–66). Ethical committee approval was granted from Ghent University Hospital. These samples were analysed for salivary T, total T and equilibrium dialysis using liquid chromatography-tandem mass spectrometry (2).

Figure 1 shows that: (i) serum total T is significantly and positively correlated with SHBG in both men (n=93) and women (n=86); (ii) serum calculated free T is not correlated with SHBG in men but negatively correlated with SHBG in women; (iii) salivary T is not correlated with SHBG in either men or women; (iv) serum-free T measured using equilibrium dialysis is not correlated with SHBG in men (n=48) but, like calculated free T, is inversely correlated with SHBG in women (n=38). These results demonstrate that salivary T is not influenced by variations in serum SHBG, unlike the analogue serum free T direct assay (3). The sexually dimorphic relationship between free T, whether calculated or measured by equilibrium dialysis, and SHBG, is an interesting observation which, to the best of our knowledge, has not been previously reported.

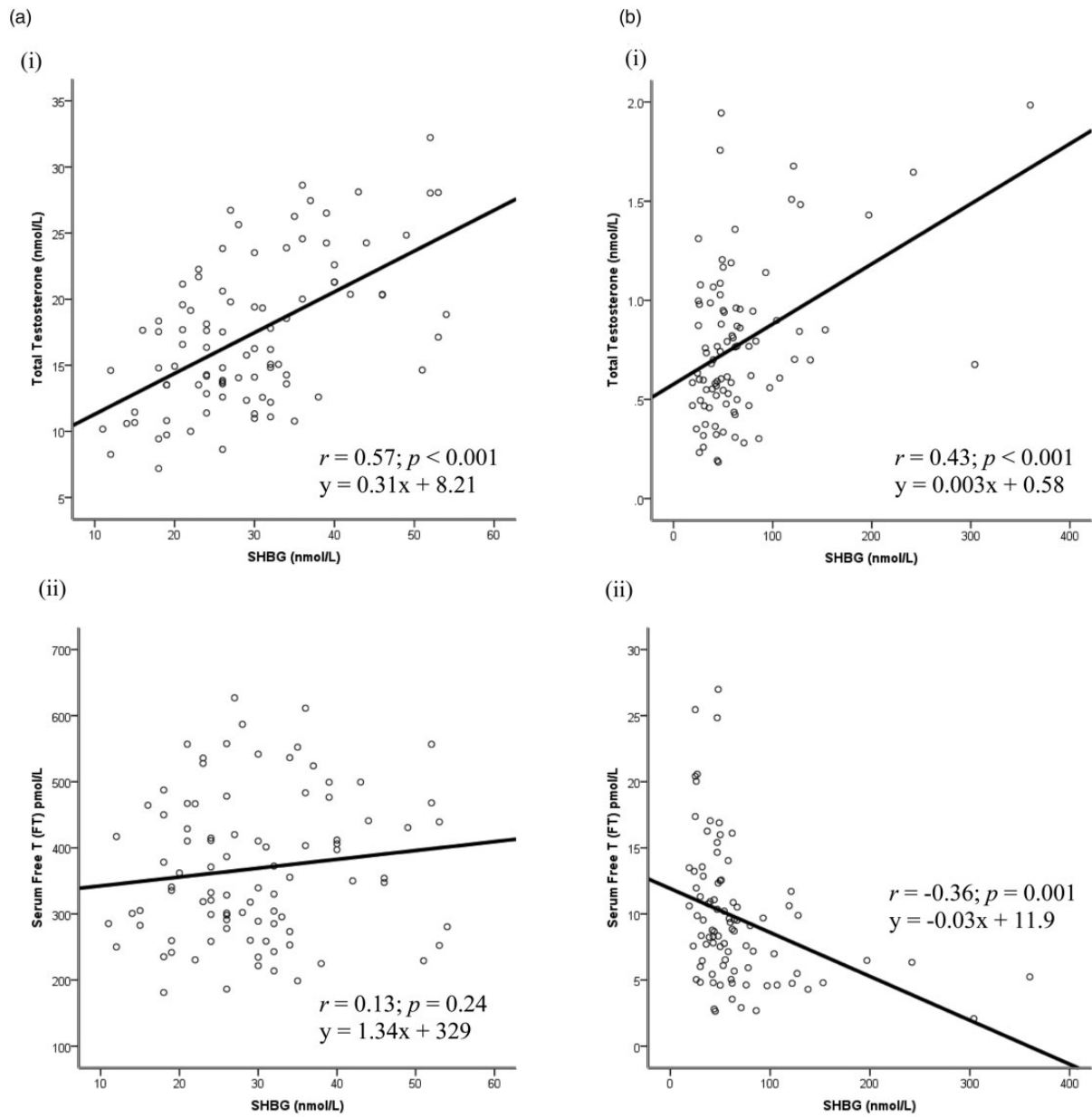


Figure 1. Correlation of SHBG in men (a) and women (b) with (i) serum total T, (ii) serum calculated free T, (iii) salivary T, (iv) serum free T (Eq. dialysis)

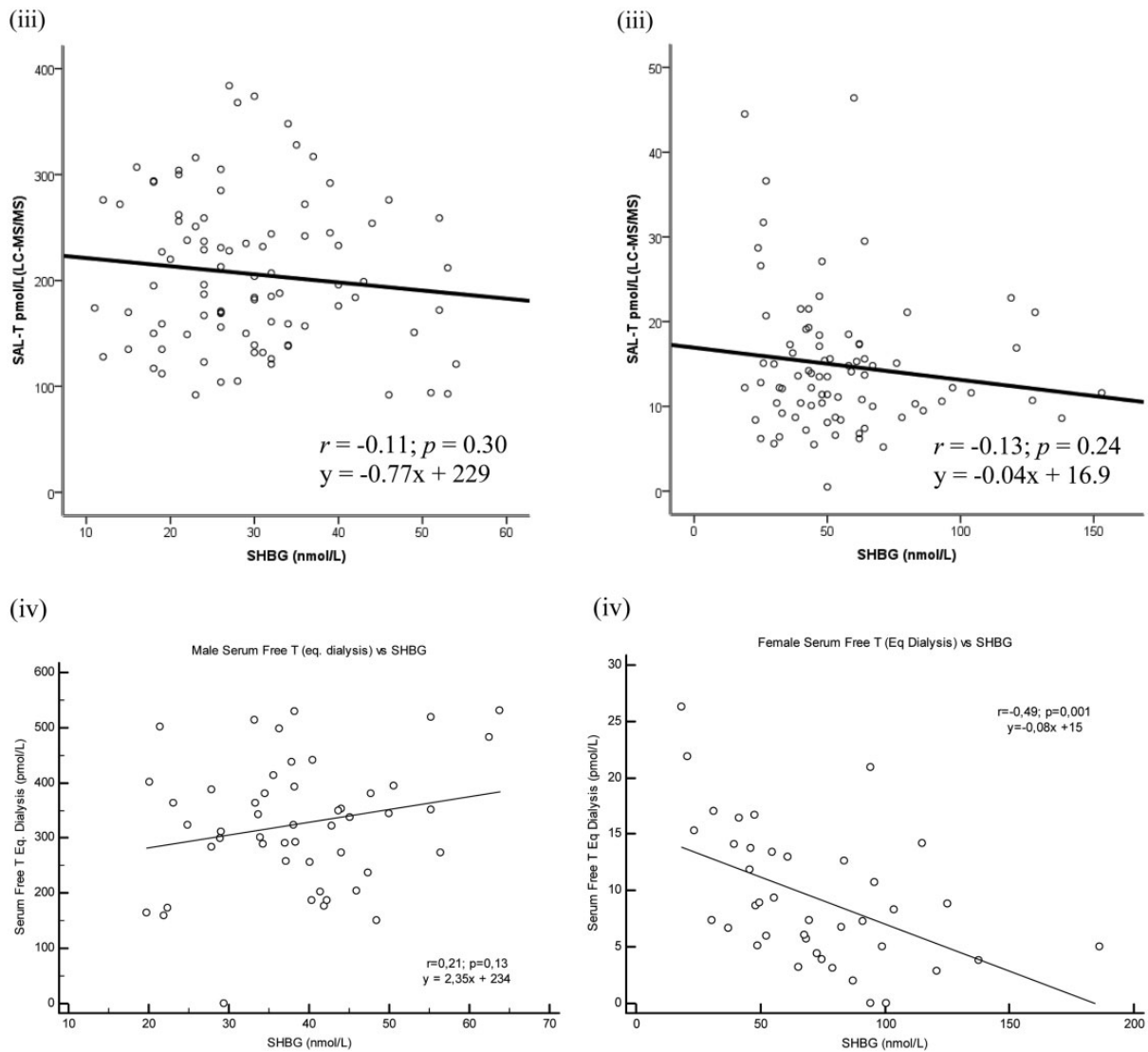


Figure 1. Continued.

Declaration of conflicting interests

FCWW has acted as a consultant for Bayer-Schering, Eli Lilly and Besins Healthcare and also participated in advisory board meetings and lectured on their behalf. FCWW has received lecture fees from Bayer-Schering and Besins Healthcare.

Funding

The study was supported by grants from the Medical Research Council [G0701757]; and the Wellcome Trust [084840]. FCWW has received grant support (2010–2014) from Bayer Schering AG and Besins Healthcare.

Ethical approval

This study was granted ethical approval from Oldham Research Ethics Committee (09/H1011/18).

Guarantor

BK.

Contributorship

All authors contributed to the preparation of the letter.

References

1. Keevil BG, MacDonald P, Macdowall W, et al. Salivary testosterone measurement by liquid chromatography tandem mass spectrometry in adult males and females. *Ann Clin Biochem* 2014; 51: 368–378.
2. Fiers T, Delanghe J, T'Sjoen G, et al. A critical evaluation of salivary testosterone as a method for the assessment of serum testosterone. *Steroids* 2014; 86: 5–9.
3. Winters SJ, Kelley DE and Goodpaster B. The analog free testosterone assay: are the results in men clinically useful? *Clin Chem* 1998; 44: 2178–2182.

¹Department of Clinical Biochemistry, University Hospital South Manchester, Manchester Academic Health Science Centre, The University of Manchester, Manchester, UK

²Departments of Clinical Chemistry and Endocrinology, Ghent University Hospital, Ghent, Belgium

³Department of Social and Environmental Health Research, London School of Hygiene and Tropical Medicine, London, UK

⁴Research Department of Infection and Population Health, University College London, London, UK

⁵Cathie Marsh Institute for Social Research, School of Social Sciences, The University of Manchester, Manchester, UK

⁶Andrology Research Unit, Manchester Centre of Endocrinology and Diabetes, Manchester Academic Health Science Centre, The University of Manchester, Manchester, UK

Corresponding author:

Brian G Keevil, Department of Clinical Biochemistry,
University Hospital of South Manchester, Southmoor
Road, Manchester M23 9LT, UK.
Email: brian.keevil@uhsm.nhs.uk