ANDROLOGY

Potential for diagnostic errors in men taking statins

Men with type 2 diabetes who are on long-term statin therapy could be wrongly diagnosed with hypogonadism, as these drugs lower total testosterone level. This is the commonly measured parameter that defines the biochemical diagnosis of hypogonadism, but it may not be relevant, according to a new study by Roger Stanworth and co-workers, who are all based at hospitals and universities in Yorkshire, UK. "Assessing androgen status using total testosterone in men with type 2 diabetes treated with statins, particularly atorvastatin, may potentially lead to diagnostic error," says Stanworth (University of Sheffield, UK).

Theoretically, all statins have the potential to lower serum testosterone levels, as cholesterol is the substrate for testosterone biosynthesis. Many men with metabolic syndrome, type 2 diabetes and cardiovascular disease have low levels of circulating testosterone; a significant proportion are diagnosed as hypogonadal on the basis of biochemical evidence of testosterone deficiency. Stanworth and colleagues suggest that this practice needs to be reconsidered.

Subanalysis of results from a cross-sectional epidemiological study of 355 men with type 2 diabetes showed that use of atorvastatin was associated with a significantly lower total testosterone level, as well as with a trend toward a lower concentration of sex-hormone-binding

globulin. Interestingly, simvastatin did not produce these effects. Neither statin had any significant impact on the amount of bioavailable or free testosterone in this group of men.

A key feature of this study is the period during which the clinical data were collected; 2002–2003. "At that time, only approximately half the men in the study were treated with statins; the opportunity to conduct similar studies in men with type 2 diabetes has probably now passed because of the almost ubiquitous use of statin therapy," notes Stanworth. The

findings are, therefore, particularly valuable. The authors advise that, if low testosterone levels are detected in men with type 2 diabetes who are taking any type of statin, concentrations of bioavailable testosterone should be checked to confirm the diagnosis of hypogonadism.

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Original article Stanworth, R. D. *et al.* Statin therapy is associated with lower total but not bioavailable or free testosterone in men with type 2 diabetes. *Diabetes Care* 32, 541–546 (2009).