

LETTER TO THE EDITOR

Levels of testosterone and gonadotrophins in men with long-standing tetraplegia

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Dear Editor,

There are several studies investigating the association between spinal cord injury and levels of testosterone and gonadotrophins in men; however, the results are conflicting. With the aim of clarifying this association, a study that was carried out by Kostovski *et al.* was published in the August 2008 issue of *Spinal Cord*, evaluating the pituitary–gonadal axis in six tetraplegic patients in comparison with eight able-bodied controls.¹ I would like to make a few comments on the methods and conclusions of this study.

In this study, the pituitary–gonadal axis has been evaluated very well by measuring the levels of testosterone and gonadotrophins at several time points during the day, and by using the free testosterone index instead of total testosterone measurement. The researchers have also evaluated some other pituitary axes by measuring growth hormone (GH), IGF-1 and 24 h urinary cortisol levels. This is a very good point, because a trauma severe enough to cause tetraplegia is highly possible to include a head trauma, and a gradual hypopituitarism may develop afterwards. However, to evaluate hypopituitarism, certain tests are recommended for each axis, and hormone deficiencies are not diagnosed by making a comparison with normal controls (as it will not be possible to know if normal controls are ‘healthy’) but by internationally defined and accepted basal or stimulated plasma levels. For GH deficiency, an insulin-induced hypoglycemia test is the diagnostic test of choice.² As GH is secreted in a pulsatile manner, basal GH level measurements are not informative.² IGF-1 values are useful only when age-adjusted normal ranges are used, but a normal concentration does not exclude the diagnosis.² For adrenocorticotrophic hormone and for the following cortisol deficiency, again an insulin hypoglycemia test is the gold standard for the assessment of the hypothalamo–pituitary–adrenal axis.² Basal morning serum cortisol levels ≥ 500 nmol l⁻¹ also indicate normality.² Twenty-four-hour urinary cortisol measurements, although valuable for evaluating cortisol excess,

are not recommended for evaluating cortisol deficiency. For the thyroid axis, basal-free T4 (fT4) and thyroid-stimulating hormone level measurements are generally enough for evaluation. Low fT4 levels, with accompanying normal or low thyroid-stimulating hormone levels, are compatible with secondary hypothyroidism. Another pituitary hormone that may give a clue about pituitary insult is prolactin. After a severe trauma, which may well cause both pituitary stalk interruption and spinal cord injury, prolactin levels may be found elevated. Hyperprolactinemia by itself is also a reason for hypogonadism. There are studies reporting high prolactin levels in patients with spinal cord injury, which may support this hypothesis; however, unfortunately, in none of these studies have other pituitary hormones been evaluated.³

To conclude, with the results of the study by Kostovski *et al.*, although it is possible to say that pituitary gonadotrophins, and hence testosterone secretion, are decreased in tetraplegic men, it may not be possible to reach the conclusion that this is an isolated problem secondary to their chronic illness and not a component of hypopituitarism that may have developed in the chronic phase secondary to the trauma that caused tetraplegia itself.

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