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Varicocele Surgery Raises Testosterone Levels

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January 30, 2012 — Surgery increases testosterone production in men with varicocele, the most common cause of male infertility, according to a meta-analysis published in the February issue of the International Journal of Urology. Varicocele, enlargement of the veins in the scrotum, can impair function of the Leydig cells that regulate testosterone production.

Fuping Li, from the Division of Urology at Kobe University School of Medicine, Japan, and colleagues evaluated 125 published studies and narrowed the focus to 9 that described patients who underwent surgery for varicocele, had testosterone serum evaluations before and after surgery by the same methods, and were followed-up for more than a month. The 9 studies involved between 12 and 325 patients each, and a total of 814 men (mean age, 31.4 years) who were followed-up at least 3 months. In all the men, serum testosterone levels "significantly increased" after surgery, the authors write.

According to published research, infertile men with varicocele have reduced serum testosterone concentrations, but it remains to be determined whether that is the cause or the effect of the altered status of Leydig cells, the authors wrote.

Although the effect of surgical repair of varicocele to promote Leydig cell function remains controversial, the authors write, "[t]he result of this meta-analysis showed the benefit of surgical varicocelectomy as a means to improve serum testosterone levels and to partially restore Leydig cell function."

Overall, the researchers found that mean serum testosterone levels increased by 97.48 ng/dL after surgery compared with preoperative levels (95% confidence interval, 43.73 - 151.22). In the study involving 325 men (BJU Int. 2011;108:1480-1484), the mean serum testosterone levels increased by about 150 ng/dL after microsurgery varicocelectomy, the authors note. Mean serum testosterone levels in that study ranged from 200 ng/dL preoperatively to 454 ng/dL postoperatively.

Normal testosterone levels for men can range from 270 ng/dL to 1070 mg/dL. The prevalence of varicocele is about 10% of men per decade of life, and prevalence increases to about 75% of men in their 80s (Andrologia. 2007;393:77-80).

The mechanism by which varicocele affects Leydig cells and testosterone production remains unclear, the authors write, but one possibility is that varicoceles eliminate a heat-exchange mechanism in the veins, causing scrotal temperature to rise.

The authors have disclosed no relevant financial relationships.

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