

## Low Vitamin D Tied to Testosterone Dip in Healthy Men

Pam Harrison | May 27, 2015

Low levels of vitamin D are significantly and independently associated with low levels of testosterone in otherwise healthy middle-aged men, according to a study presented at the American Urological Association 2015 Annual Meeting in New Orleans.

In this new analysis of data from the World Trade Center CHEST program, blood samples from 824 men were analyzed for various parameters, such as 25-hydroxyvitamin D and total testosterone. Hypovitaminosis D was defined as a 25-hydroxyvitamin D level below 30.0 ng/L.

The Framingham 10-year cardiovascular risk score was used as a proxy for general cardiovascular risk.

Level of 25-hydroxyvitamin D were insufficient in 68% of the samples. And only about 11% of participants with insufficient levels took vitamin D supplements, "which is pretty low," said lead investigator Mary Ann McLaughlin, MD, from the Mount Sinai Hospital in New York City.

Total testosterone was higher in men with normal levels of 25-hydroxyvitamin D than in men with lower levels (341.7 vs 319.6 ng/L;  $P = .012$ ).

Even after adjustment for the Framingham 10-year risk score, "subjects with hypovitaminosis D still had significantly lower total testosterone than those with normal total testosterone ( $P = .019$ )," Dr McLaughlin and her colleagues report.

When levels of 25-hydroxyvitamin D were lower, body mass index was higher than when levels were normal (30.8 vs 29.12 kg/m<sup>2</sup>;  $P < .001$ ), waist circumference was greater (41.3 vs 39.8 inches;  $P < .001$ ), and lipid profiles were less favorable.

In previous studies, testosterone levels were shown to be lower in mice who had the vitamin D receptor genetically deleted, said Dr McLaughlin.

"This suggests that there is something about testosterone synthesis that needs vitamin D," she explained.

### Vitamin D Supplementation

In a small German study of healthy overweight men with a low baseline level of 25-hydroxyvitamin D and testosterone levels at the lower end of the reference range, there was a significant increase in total testosterone levels after 12 months of vitamin D 3000 IU daily (*Horm Metab Res.* 2011;43:223-225).

When patients ask if they should take vitamin D, Dr McLaughlin said she assesses their levels first.

"When urologists have patients with low testosterone levels, they should consider looking at the vitamin D levels as well," she advised.

Some researchers have suggested that low vitamin D simply is a reflection of the aging process.

"We see calcification of the arteries with aging," Dr McLaughlin explained. "If we can keep those levels of vitamin D adequate throughout the aging process, maybe we can help prevent vascular calcification."

There has been an association between calcium supplementation alone and increased risk for cardiovascular events in men, "so if you are going to take calcium supplementation, you should take it with vitamin D," she added.

## Pathway Unclear

The association between low vitamin D and low testosterone levels is real, but that the pathway by which supplementation might improve androgen function and increase the biosynthesis of testosterone is simply not clear, said Abdulmageed Traish, PhD, from the Boston University School of Medicine.

Dr Traish pointed out that the German study was primarily a weight-loss study, and weight loss in and of itself causes increases in testosterone.

"We see that in patients who undergo bariatric surgery to remove visceral fat," he explained. "Once the weight loss has taken place, their testosterone levels normalize independent of anything else."

Dr Traish said he has discussed the potential pathway by which the restoration of vitamin D could restore normal androgen physiology with Michael Holick, MD, also from the Boston University School of Medicine, and the author of *The Vitamin D Solution*.

"When we talk about this potential association, we still can't understand how vitamin D restoration might affect testosterone," he told *Medscape Medical News*.

"While I'm sure there are consequences of being vitamin D deficient, we can't quite specify what adverse effects vitamin D deficiency might bring," he said.

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