

Vitamin D status in young women – correlated with weight, adiposity and height, but not with bone mineral density

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Vitamin D, a key regulator of bone metabolism, is thought to play an important role in adipogenesis and the prevention of a variety of diseases, including osteoporosis, cancer, diabetes and immune disorders. It is derived from skin exposure to sunlight (vitamin D3) or from food supplements (vitamin D2 or D3) and undergoes successive hydroxylations in the liver and kidneys to give rise to its active metabolite 1 α ,25 dihydroxyvitamin D (1,25(OH)₂D) (4). The vitamin D receptor (VDR) is located in bone and fat and triggers most of the action of vitamin D. There are significant discrepancies in the results of previous studies assessing the relation between vitamin D, bone health and adiposity.

This study assessed the relation between serum 25(OH)D determined by radioimmunoassay, anthropometric measures (weight, height, BMI), and computed tomography (CT) and dual-energy x-ray absorptiometry (DXA) values of body fat (BF) and bone structure. The population evaluated in the study consisted of 90 post-pubertal females (only sexually and

skeletally mature), ages 16-22, residing in California.

59% of subjects were 25(OH)D insufficient, and 41% were sufficient. Compared with women with insufficient levels of serum 25(OH)D, those with normal serum levels had significantly lower weight, body mass, and imaging measures of adiposity. Also, this relationship is independent of the site of fat accumulation. However, circulating 25(OH)D concentrations were not linked to measures of bone mineral density (regardless of the method – DXA or CT) at any site. There was an unexpected positive correlation between 25(OH)D levels and height ($P=0,014$).

The results supports the hypotheses that either vitamin D insufficiency is a risk factor for increased BF or increased BF is a risk factor for vitamin D insufficiency, and also, it is possible that vitamin D status is an independent predictor of weight gain. The investigators also stated that the findings did not support a role for vitamin D in regulating bone mass acquisition at the approximate time it reaches its peak.

Comment on the paper:

Kremer R, Campbell PP, Reinhardt T, and Gilsanz V – Vitamin D Status and its Relationship to Body Fat, Final Height, and Peak Bone Mass in Young Women, *J Clin Endocrinol Metab*, Rapid Electronic Publication first published on Nov 4, 2008 as doi:doi:10.1210/jc.2008-1575