

Vitamin D2 Is As Effective As Vitamin D3 In Maintaining Concentrations Of 25-Hydroxyvitamin D

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Researchers from Boston University School of Medicine (BUSM) have found that vitamin D2 is equally as effective as vitamin D3 in maintaining 25-hydroxyvitamin D status. The study appears online in the December 2007 issue of the *Journal of Clinical Endocrinology & Metabolism*.

Researchers studied healthy adults aged 18-84 who received either placebo, 1,000 International Units (IU) of vitamin D3, 1,000 IU of vitamin D2, or 500 IU of vitamin D2 plus 500 IU of vitamin D3 daily for three months at the end of winter to establish what effect it had on circulating levels of total 25 (OH)D as well as 25(OH)D2 and 25(OH)D3. Sixty percent of the adults were vitamin D deficient at the start of the study.

Adults who received the placebo capsule daily for three months demonstrated no significant change in their total 25(OH)D levels during the winter and early spring. Adults who ingested 1,000 vitamin D2/d gradually increased their total 25(OH)D levels during the first six weeks. Adults who ingested 1,000 IU of vitamin D3 had a baseline 25(OH)D that was statistically no different from the baselines of either the placebo group or the groups that took 1,000 IU of vitamin D2/d or 500 IU vitamin D2 plus 500 IU vitamin D3/d. The vitamin D3 group increased their serum 25(OH)D levels similar to that of the group that ingested vitamin D2.

The circulating levels of 25-hydroxyvitamin D increased to the same extent in the groups that received 1,000 IU daily as vitamin D2, vitamin D3, or a combination of 500 IU vitamin D2 and 500 IU vitamin D3. The 25-hydroxyvitamin D3 levels did not change in the group that received 1,000 IU vitamin D2 daily. One thousand IU of vitamin D2 or vitamin D3 did not raise 25-hydroxyvitamin D levels in vitamin D deficient subjects above 30 ng/ml.

According to BUSM researchers, vitamin D2 has been the main stay for the prevention and treatment of vitamin D deficiency in children and adults and as little as 100 IU of vitamin D2 was found to be effective in the prevention of rickets. Both vitamin D2 and vitamin D3 form 25-hydroxyvitamin D.

Michael Holick, PhD, MD, director of the General Clinical Research Center and professor of medicine, physiology and biophysics at BUSM and senior author of this study, is an internationally recognized expert in vitamin D

and skin research. Most recently, he gave the keynote address to the Indian Endocrine Society in India.

"The maintenance of the serum 25(OH)D3 levels was most likely due to the release of vitamin D3 stored in the body fat since skin synthesis of vitamin D3 does not occur during the winter in Boston," said Holick, who is also director of the Bone Healthcare Clinic and the vitamin D, Skin and Bone Research Laboratory at Boston University Medical Center.

"One thousand IU of vitamin D2 daily was as effective as 1,000 IU of vitamin D3 in maintaining serum 25-hydroxyvitamin D levels and did not negatively influence serum 25-hydroxyvitamin D levels," said Holick. "Therefore, vitamin D2 is equally as effective as vitamin D3 in maintaining 25-hydroxyvitamin D status."

Article adapted by Medical News Today from original press release.

Quest Diagnostics, the nation's leading provider of diagnostics testing, information and services, analyzed the specimens used in the study.

For more information on Boston University Medical Center, please visit <http://www.bumc.bu.edu/>.

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: [J Clin Endocrinol Metab.](#) **2004 Nov;89(11):5387-91.** [Links](#)

Vitamin D2 is much less effective than vitamin D3 in humans.

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Vitamins D(2) and D(3) are generally considered to be equivalent in humans. Nevertheless, physicians commonly report equivocal responses to seemingly large doses of the only high-dose calciferol (vitamin D(2)) available in the U.S. market. The relative

potencies of vitamins D(2) and D(3) were evaluated by administering single doses of 50,000 IU of the respective calciferols to 20 healthy male volunteers, following the time course of serum vitamin D and 25-hydroxyvitamin D (25OHD) over a period of 28 d and measuring the area under the curve of the rise in 25OHD above baseline. The two calciferols produced similar rises in serum concentration of the administered vitamin, indicating equivalent absorption. Both produced similar initial rises in serum 25OHD over the first 3 d, but 25OHD continued to rise in the D(3)-treated subjects, peaking at 14 d, whereas serum 25OHD fell rapidly in the D(2)-treated subjects and was not different from baseline at 14 d. Area under the curve (AUC) to d 28 was 60.2 ng.d/ml (150.5 nmol.d/liter) for vitamin D(2) and 204.7 (511.8) for vitamin D(3) ($P < 0.002$). Calculated AUC(infinity) indicated an even greater differential, with the relative potencies for D(3):D(2) being 9.5:1. Vitamin D(2) potency is less than one third that of vitamin D(3). Physicians resorting to use of vitamin D(2) should be aware of its markedly lower potency and shorter duration of action relative to vitamin D(3).

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