Dynamic Chiropractic

VITAMINS / SUPPLEMENTS

Vitamin D Absorption, Part 1

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Vitamin D research has exploded in the past few years. The number of conditions that low or deficient levels of vitamin D can cause and/or exacerbate continues to expand. (See table below.) In the course of this research, focus has included the different types of vitamin D. Vitamin D comes in five forms - D_1 , D_2 , D_3 , D_4 and D_5 . Of these, vitamin D_2 (ergocalciferol) and vitamin D_3 (cholecalciferol) are bioactive and used in supplements. A simplified summary of the difference is as follows:

- Vitamin D_2 is synthesized by UV irradiation of chemical derivatives from yeast.
- Vitamin D_3 is synthesized by UV irradiation of chemical derivatives from lanolin.



Both vitamin D_2 and vitamin D_3 are used in over-the-counter supplements, but only vitamin D_2 is available in pharmacologic preparations. This is because vitamin D_2 was developed in the early 1930s and was grandfathered in as a controlled substance when the FDA (as we know it) was formed in 1938. Vitamin D_3 was developed in the 1950s. Historically, they were considered equal

based on the responses of patients with rickets.⁴ This opinion has changed after a number of studies have shown vitamin D3 to be superior to vitamin D_2 . This is based on measuring serum 25-hydroxyvitamin D [25(OH)D], which is the gold standard for determining vitamin D status in humans. Researchers believe vitamin D-binding proteins in the plasma prefer vitamin D_3 over D_2 .

Among the most commonly cited studies is a two-week study in which 17 subjects were given 4,000 IU vitamin D_2 daily and 55 subjects were given 4,000 IU of vitamin D_3 daily. Serum levels of

25(OH)D were 1.7 times higher with D_3 supplementation.⁵ Another commonly cited study, this one a single-dose study, divided 30 people into three groups: 10 individuals took placebo, 10 were given 50,000 IU of vitamin D2 and 10 took 50,000 IU of vitamin D3. Serum 25(OH)D measurements were performed over 28 days. Both forms of vitamin D showed equal elevations four days after the megadose.

By day seven, 25(OH)D levels in the D_2 subjects began to drop, reaching baseline on day 16 and ending with lower levels than the placebo group and less than they had before the study. 25(OH)D levels in the vitamin D_3 group continued to rise and peaked on day 14. On day 28, 25(OH)D

remained elevated above baseline in the D_3 group.⁶ The results of these studies and others were summarized in a paper that concluded vitamin D_3 was clearly superior to vitamin D_2 based on its absorption.⁷

In part 2 of this article (Jan. 15, 2010 issue), I will review a study that showed vitamin D_2 may be better than we think.

References

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