Dynamic Chiropractic

VITAMINS / SUPPLEMENTS

How Much Vitamin D? Don't Stop at the RDA

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Vitamin D deficiency officially emerged as an important risk factor for chronic disease in the early 2000s. This finding was a product of scientific research, rather than a consensus statement from a health policy group or government organization. It was not until around 2010 that the Institute of Medicine (IOM) of the National Academies of Sciences, Engineering and Medicine came out with an updated official statement about vitamin D needs.[1] The IOM [now known as the National Academy of Medicine] is actually a private entity that advises the U.S. government. The IOM set the estimated requirement at 400 IU/day for all age groups and set the upper-level intake at 4,000 IU/day for anyone age 9 or older.

What's the Basis for the RDA?

This IOM report was met with harsh criticism from vitamin D researchers, none of whom was invited to participate in process that led to the recommendations. For example, Drs. R.P. Heaney and M.F. Holick stated:[2]

The IOM recommendations for vitamin D fail in a major way on logic, on science, and on effective public guidance. ... We have deliberately avoided a mind-numbing laundry list of the vast number of factual inaccuracies and misinterpretations of the report. ... For now, our recommendation to the American public is that the IOM report should be taken with a grain of salt (another nutrient the IOM finds risky).

In short, by following the IOM guidelines, many people will still not achieve adequate vitamin D levels [measured as 25(OH)D], which most labs set at 30-100 ng/mL. Some vitamin D researchers argue that 40 ng/mL should be considered the low end of normal, likely because many people do not achieve the bone protection effect of vitamin D until this level is achieved.[2] My personal impression is that we should try to maintain a 25(OH)D level of at least 70 ng/mL.[3]

Adequate Levels, Toxicity and Other Considerations

To achieve adequate vitamin D levels, we must either get adequate sun exposure or take a vitamin D_3 supplement. Unnecessary fear often enters a person's mind when they consider how much supplemental vitamin D_3 is safe. Dr. Heaney, whom I mentioned above, has explained that 10,000 IU/day should be the safe upper limit.[4] I realize 10,000 may see like a lot, but that is because we typically think of supplementation in milligram (mg) or gram (g) amounts.

With this in mind, it should be understood that 40,000 IU of vitamin D_3 is just 1 mg. In other words, 10,000 IU is just .25 mg or 250 mcg.

The IOM's report states that "very high levels of vitamin D (above 10,000 IUs per day) are known to cause kidney and tissue damage." In contrast, the DRI [Dietary Reference Intakes] book published by the IOM[5] says 10,000-40,000 IU per day is the threshold for toxicity.

It is important to understand that vitamin D toxicity cannot be determined based on how much vitamin D_3 is taken on a daily basis; it is correlated to serum 25(OH)D levels. The IOM's DRI book for vitamin D and calcium states that vitamin D toxicity is not identified until serum 25(OH)D reaches 200-240 ng/mL or higher. Based on this, you can see why it is foolish to worry about the supplemental dose of vitamin D_3. Even worse, it is especially problematic that the IOM would suggest taking 10,000 IU/day causes kidney and tissue damage.

The, dare I say, sole focus related to vitamin D supplementation should be one's 25(OH)D level. The minimum goal should be to reach at least 40 ng/mL, all the while knowing 100 ng/mL is within the normal range and signs of toxicity will not typically appear until at least 200 ng/mL is exceeded.

This means there should be zero emotion about taking vitamin D_3 supplements. If you have normal serum 25(OH)D because you are in the sun a lot, then there is no need to supplement. Otherwise, your supplemental level should be tailored to keep your 25(OH)D at 40 ng/mL higher. This is why the RDA or RDI fails: for vitamin D, it is not about your intake, it is about achieving a proper 25(OH)D level.

Why Vitamin D Matters: A Profound Micronutrient

Here is why you should care about your 25(OH)D level. Vitamin D is involved in the modulation of more than 1,000 different genes. In particular, vitamin D modulates immune cell expression. A deficiency in vitamin D leads to an overproduction of pro-inflammatory Th1 cells and an underproduction of anti-inflammatory Th2 and T-regulatory cells. The outcome is an overproduction of pro-inflammatory cytokines, such as IL-1, IL-6 and tumor necrosis factor; and an underproduction of IL-10, which is a key anti-inflammatory cytokine.[3]

The same shift to overproduce pro-inflammatory cytokines occurs when one lacks magnesium and omega-3 fatty acids. Obesity also leads to the same state of chronic inflammation. This should alert you to the reason why just supplementing with vitamin D to achieve normal levels may not relieve patients from pain, depression and other pro-inflammatory conditions.[3]

Studies that report about the ineffectiveness of vitamin D do not comment on the other nutritional factors that promote the same state of chronic inflammation as vitamin D deficiency.

My suggestion is to normalize the many pro-inflammatory markers that are easy to measure, of which vitamin D is just one. Lipids, glucose, body mass index and waist:hip ratio are other examples to take into account.[3,6]

References

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