

### Vitamin D supplementation

I was very impressed with Dr Schwalfenberg's article on vitamin D in the May issue of *Canadian Family Physician*.<sup>1</sup> Certainly vitamin D deficiency is common in northern regions, such as Canada, and its association with elevated risk of cancers, multiple sclerosis, osteoporosis, and other conditions is concerning. This is an important health issue about which our colleagues should be well informed, and the review contributes substantially to this end. The only point I'm concerned about is the implication that prescribing vitamin D2 (ergocalciferol) might be unsafe in managing deficiency. The papers referred to regarding vitamin D2 toxicity describe unusual cases of clear overdose, lack of monitoring, and ingestion of unregulated supplements. I have prescribed vitamin D2 dozens of times over the past few years and have found it to be effective in correcting vitamin D deficiency. Appropriately prescribed and monitored, vitamin D2 therapy doesn't, in my experience, result in a follow-up blood level of 25-hydroxyvitamin D (25[OH]D) higher than desired. To correct a deficiency, I prescribe Ostoforte (1 capsule weekly for a few months, depending on the degree of deficiency). I check 25(OH)D levels after treatment (aiming for at least 80 nmol/L, but ideally 100 to 110 nmol/L), and then recommend an over-the-counter vitamin D3 supplement for maintenance and prevention (typically 1000 to 2000 IU per day). Once again, I commend you for an excellent review and for elevating awareness of this topic.

—Bruce Eveleigh MD  
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by e-mail

### Reference

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### Response

I would like to thank Dr Eveleigh for his excellent comments regarding vitamin D toxicity. Indeed there have been cases of toxicity with vitamin D2 (ergocalciferol) resulting in hypercalcemia,<sup>1</sup> deafness,<sup>2</sup> and even death.<sup>3</sup> Vitamin D2 that is not quality controlled (imported and unregulated) might result in toxicity as well.<sup>4</sup> I always recommend that my patients look for a Drug Identification Number (DIN) on the vitamin D bottle.

There are no reported cases of toxicity from vitamin D3 (cholecalciferol) in humans, but vitamin D3 when improperly mixed into animal feed has caused death.<sup>5,6</sup> This lack of reported cases might simply be a reflection of the smaller dose (400 to 1000 IU) tablets of vitamin

D3 and the fact that one is unlikely to ingest 50 or so tablets a day.

Repletion of vitamin D with vitamin D2 is common practice, and vitamin D2 can be used safely when monitored to achieve normal levels of 25(OH)D. This might take 2 to 3 months, as discussed in your letter and in my paper, because the half-life is about 2 weeks. Using vitamin D3 (1000 to 5000 IU) daily, depending on the level of deficiency, will also achieve this goal. I also agree that the goal is to achieve levels of 25(OH)D higher than 100 nmol/L, preferably 100 to 125 nmol/L.

My concern regarding vitamin D2 is that it is a synthetic analogue and might interact with the vitamin D receptor differently in various cell systems. It has been reported that vitamin D3 might improve glycemic control.<sup>7</sup> Vitamin D2 has been reported to cause worsening of glycemic control in people of East Indian descent.<sup>8</sup> Is this because of vitamin D receptor polymorphism, or because of enhanced 24-hydroxylase enzyme activation, or is it due to how vitamin D2 interacts with the receptor? Until this has been sorted out, I feel safest using vitamin D3. There are about 2000 synthetic analogues of vitamin D. The search is on for one that can cross the blood-brain barrier to treat certain types of brain cancers without causing hypercalcemia.<sup>9</sup> But then again, what other effects would this compound have? There are still so many unknowns.

The first step is to recognize that most Canadians do not get enough vitamin D, especially in the winter months, because of where we live. This recognition might reduce the need for expensive drugs to treat various conditions and might improve the well-being of many Canadians.

An ounce of prevention is worth a pound of cure.

—Gerry Schwalfenberg MD CCFP  
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by e-mail

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