Trending Topic

CAN VITAMIN D SUPPLEMENTS PREVENT OR IMPROVE THE COURSE OF COVID-19?

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There is currently not enough evidence to indicate that vitamin D supplements can prevent or improve the course of COVID-19. Recent narrative reviews have recommended vitamin D supplementation as a means of reducing the risk of catching or becoming ill from SARS-CoV-2 (i.e. the virus that causes COVID-19). Two reviews of note include one whose authors recommended that adults in Ireland take 20-50 micrograms of vitamin D per day to improve resistance to respiratory infections, such as COVID-19, or to improve the course of the disease (1). The second review suggests "people at risk of influenza and/or COVID-19 take 10,000 IU/d of vitamin D3 for a few weeks to rapidly raise 25-hydroxy-vitamin D (25(OH)D) concentrations, followed by 5000 IU/d" to reduce the risk of infection (2). Some of the authors of this review declared conflicts of interest due to an involvement with or funding by companies that promote and/or sell vitamin D supplements.

The preceding vitamin D supplementation recommendations are based on narrative reviews. The evidence cited in both of these narrative reviews (1,2) is mostly other narrative reviews, not primary research studies or systematic reviews. Narrative reviews themselves are considered low quality due to the possibility of bias in selecting and interpreting research studies or reviews by the narrative review authors (3). The few cited randomized trials mostly used indirect surrogate biochemical outcome measures, which may not be outcomes that are important to people (4).

The SARS-CoV-2 is a new virus. There has not been time for the completion of randomized trials (5) that can inform whether vitamin D assists in the prevention or treatment of COVID-19.

In order to provide evidence-informed dietetic practice advice for vitamin D and COVID-19, systematic reviews that investigate the association of vitamin D supplementation on other acute respiratory tract infections can be examined. (For further information on assessing systematic reviews, see PEN® eNews: Taking a Balanced Look at Systematic Reviews. Part 1: Diamonds in the Forest). Systematic reviews of randomized trials that examined vitamin D and the prevention of respiratory tract infections include a Cochrane review of vitamin D supplementation for the prevention of infection in children (6), a systematic review that compared the results of observational studies and randomized controlled trials on non-skeletal outcomes (7) and a systematic review on the prevention of acute respiratory tract infections (8).

Two of three of these systematic reviews of randomized trials found no beneficial effects for prevention of respiratory tract infections from vitamin D supplementation (6,7). A systematic review of systematic reviews found mixed results (9). The Cochrane review found no difference in radiologically confirmed pneumonia after vitamin D supplementation "(Rate Ratio: 1.06, 95% confidence interval (CI) 0.89 to 1.26; two trials, 3134 participants, moderate quality evidence), and similarly for children with confirmed or unconfirmed pneumonia (RR 0.95, 95% CI 0.87 to 1.04; one trial, 3046 participants)" (6). Worthy of note, the Cochrane

review found a possibility of harm from vitamin D supplementation, which was a higher rate of repeat episodes of pneumonia (RR 1.69, 95%CI 1.28 to 2.21; 3046 participants) among children.

The third systematic review found that among the seven meta-analyses of randomized trials of vitamin D supplementation for the prevention of respiratory tract infections, only a minority (three of the seven) concluded that vitamin D supplementation may lower the risk of infections (8). The review authors found that vitamin D supplement positive effects are most pronounced in those with a high risk of vitamin D deficiency with serum 25(OH)D <25 nmol/L.

Thus, the results from the rigorously conducted systematic reviews differ from the recommendations of the two narrative reviews that recommended broad supplementation.

Some Confusing Data about Vitamin D

People with higher vitamin D levels also tend to be healthier in general. This fact demonstrated in observational studies has led to the idea that poor vitamin D status might be a cause of several diseases, when lower 25(OH)D may actually be a consequence of several diseases (9). Of concern, randomized trials of vitamin D have not demonstrated the beneficial effects expected from the observational studies.

Adding to the confusion is the increasing evidence that serum 25(OH)D, the vitamin D status marker, is a negative acute phase reactant, meaning it decreases in response to additional factors in addition to vitamin D status. Researchers have observed that 25(OH)D decreases when C-reactive protein increases, in response to inflammation, acute illness, ill health, critical illness, surgery and some pharmaceutical drugs (10-19). When a marker changes in response to other variables, it needs to be interpreted with caution. Because 25(OH)D responds to several factors, some people with levels below the level of sufficiency 37.5 nmol/L) (20) are likely to have satisfactory vitamin D status.

Guidance for Dietetic Practice

There is a variance in country-specific recommendations for vitamin D for general health for different ages as well as emerging recommendations related to COVID-19. As an example, The Irish Society for Clinical Nutrition and Metabolism has recently recommended widespread vitamin D supplementation (20-50 micrograms (800-2000 IU) of vitamin D per day) for adults living in Ireland to lower the chances of getting sick from the SARS-CoV-2 (21) based on the recently published narrative review previously noted (1). This recommendation is based on factors specific to Ireland and its population. Vitamin D status is impacted by numerous factors, including geography and whether foods are fortified with vitamin D. Vitamin D status varies from country to country. For example, surveillance data demonstrates that most Canadians have healthy vitamin D status of 40 nmol/L of 25(OH)D and over (22). Thus, country-specific recommendations are not necessarily generalizable to other countries.

Despite the lack of strong evidence from trials on vitamin D supplementation and the beneficial effects on respiratory infections, and that data regarding the prevention and treatment of COVID-19 with vitamin D supplementation is not available yet, health care professionals can still give sound advice to their clients and patients. Vitamin D is an essential nutrient and vitamin D supplementation is recommended in a number of countries for various ages during the life cycle. Country-specific recommendations

can be used as a foundation for advice. See the International Dietary Reference Values Collection.

The Bottom Line

- No studies have examined the effect of vitamin D to prevent or treat COVID-19 infections.
- Information extrapolated from randomized trials that examined respiratory tract infections prevention have not reported consistent beneficial effects of vitamin D compared to placebo in adults or children.
- Potential risks that have been identified include a higher rate of repeat episodes of pneumonia.
- While observational studies suggest that lower serum vitamin D levels are associated with inflammatory response, lower serum vitamin D levels are associated with other factors and not only with inadequate vitamin D intake.
- Vitamin D is an essential nutrient and vitamin D supplementation is recommended in a number of countries for various ages during the life cycle for general health.
- Evidence is lacking to support that additional high dose supplementation with vitamin D is likely to prevent COVID-19 or improve the course of this illness.

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