Commentary on: 'Low 25-hydroxyvitamin D and myofascial pain: Association of cancer, colon polyps and tendon rupture'

Jane M Hightower MD

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In the recent publication by Hightower et al. in the Journal of the American College of Nutrition [1], the exposures of vitamin D and magnesium deficiencies were combined for evaluation in a retrospective clinical study. But, because blood analysis of magnesium does not reflect magnesium stores in the human body, the clinical sign of myofascial pain (tender trigger points) was used as a proxy for magnesium deficiency. The study concluded that having a serum 25-hydroxyvitamin D (25(OH)D) less than 30 ng/mL or myofascial pain, increased the risk for cancer, colon polyps and tendon rupture, and the risk was further increased with having both of these exposures. These 3 conditions were chosen for analysis because they were well documented in the medical record, as well as common in the population.

Vitamin D and magnesium research have continued to parallel through time. Very few scientific papers have combined these two important nutritional building blocks under one study, even though they are intimately associated. The hydroxylase enzymes that are involved in making vitamin D in the human body, as well as the vitamin D carrier protein and receptor, require magnesium as a co-factor. Therefore, magnesium deficiency can adversely affect vitamin D levels, and possibly, its function in the body (2-14).

Myofascial pain has been associated with low vitamin D levels as well as low magnesium. But, it is magnesium supplementation that has efficacy in resolving this type of pain, though it takes months to do so (15-22). Many individuals suffer from either latent or active pain, and often fluctuate between both. This increases the likelihood of using pain medications, to include over-the-counter remedies, opiates, benzodiazepines, and neuroleptics. Myofascial pain has also been correlated with increased risk of cancer, such as breast, colon, prostate and lung. And, the pain often increases during chemotherapy treatment, as chemotherapy depletes magnesium in the body (23-27).

The manuscript further discusses the causes of vitamin D and magnesium deficiencies and brings to the forefront the contribution water gives for obtaining adequate magnesium intake, which in turn could affect vitamin D levels. Magnesium content of water can vary from nearly zero mg/L to over 100 mg/L (28-30). It is now recognized that those who live in a soft water municipal district can have higher cancer rates as well as increased morbidity and mortality from cardiovascular disease (30-36). The public and healthcare communities need to be aware of this phenomenon, so that adequate compensation through food, other water sources, or supplementation can be instituted.

How best to compensate for low magnesium intake is tedious, and depends on many factors, including genetics of the individual, disease processes medications and alcohol consumption. The type of magnesium supplement used is also a dilemma, as there are many supplements on the market, with varying absorption rates and incidence of side effects such as diarrhea.

The laboratory reference range for total serum 25(OH)D is still being debated, as it depends on a variety of clinical outcomes. It has been suggested that the serum 25(OH)D concentration should be greater than 30 ng/mL, but for cancer outcomes, greater than 50 ng/mL has been suggested (2,3,14,37). The recommended daily allowance for vitamin D is also being debated and depending on the agency, falls between 400 and 1000 IU of vitamin D3 per day. In addition, age, gender, skin color, sun exposure, living in latitudes above 37°N and genetic variations in vitamin D production can affect 25(OH)D concentrations in the body (38).

As for the Recommended Daily Allowance (RDA) for vitamin D, magnesium was not taken into consideration. It is the author's clinical observation that the requirement for supplemental vitamin D3 in the San Francisco cohort varied from 400 IU to 10,000 IU/day to achieve a 25(OH)D concentration of greater than 50 ng/mL and adding an absorbable magnesium supplement of 400-600 mg/day to the regimen reduced the vitamin D requirement for most individuals [unpublished data].

This manuscript is unique in several areas. It brings into the discussion that magnesium deficiency can be a cause of vitamin D deficiency and that water is important for magnesium intake. It also identifies myofascial pain as a clinical sign of magnesium deficiency. The finding that myofascial pain and vitamin D deficiency were associated with cancer, colon polyps and tendon rupture may prove important for preventive medicine. Whether optimizing vitamin D to greater than 50 ng/mL and magnesium to the point of no trigger point tenderness will reduce disease needs further investigation.

The manuscript raises many questions and will hopefully inspire more research.

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2100 Webster Street Suite 418 San Francisco, CA, USA

Correspondence: Jane M Hightower, MD, 2100 Webster Street Suite 418San Francisco, CA, USA. Telephone (415) 923-3025, e-mail jhightowermd@aol.com
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