

New Guides Expected to Boost Vitamin D Target

The IOM is not likely to recommend that people spend more time in the sun to increase vitamin D.

BY ERIK L. GOLDMAN

SAN DIEGO — The Institute of Medicine is reviewing its 1997 guidelines for vitamin D intake, and will likely recommend increased supplementation when new guidelines are published in 2010.

There is a growing consensus that currently recommended intakes—200 IU per day for individuals under age 50 and 400 IU for those aged 50-70—are too low, said Connie Weaver, Ph.D., director of the department of food and nutrition, at Purdue University, West Lafayette, Ind.

In addition to vitamin D's well known effects on bone metabolism, levels in the range of 1,000 IU per day have been associated with good outcomes in recent controlled and epidemiologic trials that examined risks for falls in the elderly and people with type 2 diabetes.

Also, 1,000 IU is well below the 2,000-IU upper limit of vitamin D mentioned in the existing guidelines, Dr. Weaver said Scripps Health: Natural Supplements: An Evidence-Based Update.

The IOM is not likely to recommend that people spend a lot more time in the sun as a way of increasing vitamin D, advice which would run counter to skin cancer prevention efforts.

Further, "you cannot eat enough vitamin D-containing foods to get anywhere near 1,000 IU of vitamin D per day," said Dr. Weaver, who served on the IOM committee for the current guidelines.

Any substantive increase in recommended daily vitamin D intake will probably mean a call for supplementation. However, the IOM has been reluctant to make nutrient recommendations that exceed what an individual can reasonably obtain from ordinary food consumption.

"Subsequent research has shown that levels much higher than 2,000 per day showed no evidence of harm. So the upper limits will likely change along with the new intake recommendations," Dr. Weaver said. "Until the upper limits go up, the ability to fortify foods is hindered.

Higher upper limits will engender bolder efforts and greater fortification." Osteoporosis prevention is the strongest rationale for increasing vitamin D intake, she added, given the epidemiologic correlations between low vitamin D status and increased risk of fractures in the elderly. Research showed that daily supplementation with 700 IU vitamin D and 500 mg calcium reduced the 3-year rate of first nonvertebral fractures by 5.5%, com-



Both the intake recommendations and upper limits will likely go up in the new vitamin D guidelines, said Connie Weaver, Ph.D.

pared with placebo, in a cohort of 176 men and 213 women aged over 65 (N. Engl. J. Med. 1997; 337:670-6).

Dr. Weaver cited a National Health and Nutrition Examination Survey III data analysis showing significant and positive improvements in bone mineral density in a cohort of adults aged 50 years and older as serum vitamin D increased from 20 nmol/L to 40 nmol/L. The improvements continued to be noted at values over 80 nmol/L. Similar patterns were observed for various ethnicities (Am. J. Med. 2004;116: 634-9).

The same researchers published a meta-analysis of six large population studies showing that the relative risk of all bone fractures starts to decline when daily vitamin D intake increases to roughly

450 IU per day (J. Steroid Biochem. Mol. Biol. 2007;103:614). "You really need to get up around 700 IU per day to achieve the lowest relative risk of hip fractures in this meta-analysis," said Dr. Weaver.

Although vitamin D plays a role in bone metabolism, its fracture-reducing impact may also have something to do with its effects on neuromuscular function and overall health status. Observational data from the NHANES III database showed that those with the highest vitamin D serum levels had the shortest times on the sit-to-stand test in a large cohort of people aged 60-90 years (Bischoff-Ferrari, et al. Am. J. Clin. Nutr. 2004;80:752-8).

But bone health is only one aspect of the vitamin D story, said Dr. Weaver. Low vitamin D level is associated with increased risk of cardiovascular disease and, possibly, type 2 diabetes.

A Framingham Offspring study found a hazard ratio of 1.6 for incident cardiovascular events during a 7-year period for subjects with serum vitamin D levels less than 15 nmol/L. The observed effect was largely attributable to the 40% of the total cohort who were hypertensive at baseline. In this subgroup, the hazard ratio was 2.1 for those deficient in vitamin D versus those who were not. The authors noted that vitamin D receptors are plentiful in vascular smooth muscle, endothelium, and cardiomyocytes (Circulation 2008;117:503-11).

According to Dr. Weaver, the emerging story is vitamin D's role in glucose metabolism and its potential for slowing insulin resistance and lowering the risk for type 2 diabetes.

A new Framingham Offspring study involving 808 nondiabetic individuals

showed a strong inverse correlation between serum vitamin D levels and fasting plasma glucose and fasting insulin, as well as homeostatic model assessment (HOMA) for insulin resistance, after researchers controlled for age, gender, body mass index, waist circumference, and smoking. Compared with those in the lowest vitamin D tertile, those in the highest tertile had a 1.6% lower concentration of fasting glucose and a 9.8% lower concentration of fasting insulin, translating into a 12.7% lower HOMA-IR score.

Vitamin D showed a positive correlation with insulin sensitivity, plasma adiponectin, and HDL cholesterol (J. Nutr. 2009;139:329-34).

This work builds on prior studies at the division of endocrinology, diabetes, and metabolism at Tufts University, Boston.

In an analysis of data on nearly 84,000 women in the Nurses Health Study, the Tufts researchers found a 13% reduced relative risk of type 2 diabetes in the women taking the highest versus lowest amounts of supplemental vitamin D. Supplementation with 1,200 mg calcium or more and 800 IU vitamin D or more was associated with a 33% lower risk of type 2 diabetes, compared with an intake of less than 600 mg calcium and 400 IU vitamin D (Diabetes Care 2006;29:650-6).

The Tufts researchers published an intervention study involving 314 white, nondiabetic people randomized to supplementation with 500 mg calcium citrate plus 700 IU vitamin D, or placebos, for 3 years. Among those with impaired fasting glucose at baseline (n = 92), the active supplements attenuated the rise in fasting glucose at the 3-year point, compared with placebo. Those on the actual supplements had a smaller increase in HOMA-IR scores as well. Among those with normal fasting glucose at baseline, there was no apparent effect associated with vitamin D (Diabetes Care 2007;30:980-6).

Overall, the findings suggest that vitamin D and calcium supplementation at moderate doses can slow the progression of hyperglycemia and insulin resistance. "This is a very interesting story, to be watched closely," Dr. Weaver concluded. ■

Systemic Sclerosis Patients May Need Higher Doses of Vit. D

BY SHERRY BOSCHERT

SAN FRANCISCO — A study of 156 patients with systemic sclerosis in two European cities found that vitamin D deficiency was common, present in 28%.

Deficient levels of serum 25-hydroxyvitamin D (25[OH]D)—less than 10 ng/mL—were seen in 29 (32%) of 90 patients in Paris and 15 (23%) of 66 in southern Italy, Dr. Alessandra Vacca and her associates reported in a poster presentation at the annual meeting of the American College of Rheuma-

tology. In addition, 84% of all patients had insufficient vitamin D levels (less than 30 ng/mL), seen in 75 (82%) of the Parisians and 57 (86%) of the Italians.

Overall, patients had a mean age of 57 years, and 97% were female. The mean vitamin D value in the two cohorts was 19 ng/mL, said Dr. Vacca of the University of Cagliari.

The rates of vitamin D deficiency did not differ significantly between cities and so were independent of the different UV radiation levels in the northern and southern cities. Rates of vi-

tamin D deficiency also were independent of usual levels of vitamin D supplementation (800 IU/day), taken by 30% of Parisian patients and 45% of Italian patients.

Because conventional doses of vitamin D supplementation did not prevent vitamin D deficiency, higher-dose supplementation may be needed in patients with systemic sclerosis, especially those with inflammatory activity, she said.

Low vitamin D levels were associated with pulmonary fibrosis (P = .04), systolic pulmonary

arterial hypertension (P = .004), and inflammatory activity indicated by acute phase reactants—erythrocyte sedimentation rate (P = .004) and C-reactive protein values (P = .01). There was a significant negative correlation between low vitamin D levels and European disease activity scores (P = -.04). A mild negative association was seen between vitamin D deficiency and anti-centromere antibodies.

Low vitamin D levels may be linked to multiple risk factors, Dr. Vacca suggested, including scarce sun exposure due to dis-

ability, insufficient intake and malabsorption of vitamin D due to gastroenteric involvement, or use of drugs that can alter metabolism of vitamin D. There was no association between vitamin D deficiency and other markers of impaired malabsorption such as hemoglobin, ferritin, or albuminemia. No associations were found between vitamin D deficiency and acroosteolysis, calcinosis, or Medsger's disease severity score.

The investigators reported no conflicts of interest related to this study. ■