Testing vitamin D status

In this review article, the author points out that more than 50 metabolites of vitamin D have been described, but only a few of these have been quantified in blood. The serum half-life of vitamin D is around 24 hours, thus making its concentration in serum dependent on recent vitamin D ingestion and recent sunlight exposure. In contrast, the serum half-life of 25-hydroxyvitamin D is about three weeks, which makes measurement of this metabolite more accurate for assessing long-term vitamin D exposure. In addition, hepatic production of 25-hydroxyvitamin D is not significantly regulated and is primarily dependent on substrate concentration. For these reasons, measurement of serum 25-hydroxyvitamin D provides the best estimate of vitamin D status. However, unacceptable variations have been encountered in 25-hydroxyvitamin D measurements from one laboratory to the next, as well as with the use of different methods of assessment. For example, of 42 specimens sent to a lab that used an in-house radioimmunoassay, 17% were classified as being vitamin D-insufficient (< 80 nmol/L), as compared with 90% of a group of nearly identical specimens sent to another lab that used a commercially available radioimmunoassay.

Comment: The serum concentration of 25-hydroxyvitamin D is the best test available to assess vitamin D status, but it is not perfect. The serum level of 1,25-di hydroxyvitamin D is not a reliable indicator of vitamin D status, even though it is the active form of the vitamin. That is because there may be a compensatory rise in 1,25-dihydroxyvitamin D levels in response to vitamin D deficiency, so the level of this compound may be normal or even elevated in people who are vitamin D-deficient. An elevated serum concentration of parathyroid hormone may also suggest vitamin D deficiency, although hyperparathyroidism may also occur for reasons unrelated to vitamin D status.

Fructose: A common cause of irritable bowel syndrome

Of 80 patients with irritable bowel syndrome, 31 (39%) had a positive breath hydrogen test after ingestion of 25 g of fructose in 250 ml of water, indicating fructose malabsorption. The patients with fructose malabsorption were prescribed a low-fructose diet. Fourteen patients complied with the diet and were available for long-term follow-up (mean, 13 months). Among the compliers, pain, belching, bloating, fullness, indigestion, and diarrhea improved significantly (p < 0.02). Among the patients with fructose malabsorption who did not comply with the diet, the only symptom that improved was belching.

Comment: Unlike glucose, which is completely absorbed in the intestine, the capacity to absorb fructose is limited. When healthy volunteers were challenged with varying doses of a ten-percent fructose solution, absorption capacity ranged from 5 g to more than 50 g of fructose. Unabsorbed fructose may serve as an osmotic load that draws fluid into the intestinal lumen, resulting in symptoms such as diarrhea, abdominal pain, bloating, flatus, belching, and discomfort. Symptoms may also result from the action of colonic bacteria on unabsorbed fructose. Approximately 50% of fructose malabsorbers experience gastrointestinal symptoms after ingesting fructose. The results of the present study indicate that more than one-third of patients diagnosed with irritable bowel syndrome have fructose intolerance and that symptoms improve in these patients on a fructose-restricted diet.

Vitamin D supplementation: Slow and steady

Three hundred thirty-eight nursing home residents (mean age, 84 years; mean serum 25-hydroxyvitamin D concentration, 25.0 nmol/L) were randomly assigned to receive vitamin D3 in doses of 600 IU per day, 4,200 IU once a week, 18,000 IU once a month, or placebo for