

No impact on lipids with vitamin-D supplementation

JUN 22, 2012 [Michael O'Riordan](#)

New York, NY - A large cross-sectional study of laboratory test results confirms previous studies showing an association between serum concentrations of 25-hydroxyvitamin D (25[OH]D) and lipid levels [1]. Patients deficient in vitamin D had significantly higher total and LDL cholesterol levels, higher triglyceride levels, and lower levels of HDL cholesterol when compared with individuals not deficient in vitamin D.

Despite the association, however, a longitudinal analysis of a subset of individuals who replenished their bodies' stores of vitamin D to optimal levels, nearly all with vitamin-D supplements, failed to demonstrate any significant improvements in these lipid parameters. As a result, the researchers suggest that correcting for vitamin-D deficiency with dietary supplements "might not translate into clinically meaningful changes in lipid concentrations.

"In the absence of clinical trials, this novel, inexpensive [analysis] fills a gap for quickly examining the effect of vitamin-D repletion on the lipid panel, a major predictive biomarker for cardiovascular risk," write **Dr Manish Ponda** (Rockefeller University, New York) and colleagues in a report published online June 20, 2012 in *Circulation*. "Moreover, and particularly important for patient-oriented research, the data were obtained from patient encounters in settings reflective of true clinical practice across the United States."

Vitamin D: Causal or a surrogate for health

Epidemiologic evidence has shown there is an inverse relationship between circulating levels of 25(OH)D and cardiovascular-risk biomarkers. Although vitamin D can be supplemented, whether supplementation modifies cardiovascular risk has not yet been established. To date, it is still unknown whether low vitamin-D levels cause cardiovascular disease or whether vitamin-D status is simply a marker of health.

As clinicians, researchers, and patients await randomized, controlled trials testing the vitamin-D hypothesis, Ponda and colleagues, including researchers with Quest Diagnostics, a company that has the largest private database of patient laboratory data, performed a cross-sectional and longitudinal analysis to assess the relationship between 25(OH)D and blood lipids. From 4.06 million patient records that included simultaneous 25(OH)D and lipid panel tests between 2009 and 2011, 107 811 records had two or more simultaneous 25(OH)D, lipid panels and glucose tests within four and 26 weeks apart. Patients with 25(OH)D concentrations <20 ng/mL were considered vitamin-D deficient while those with levels \geq 30 ng/mL were considered to have optimal levels.

Patients with optimal levels of vitamin D had total cholesterol levels 1.9 mg/dL lower than patients who were vitamin-D deficient. In addition, LDL-cholesterol levels and triglyceride levels were 4.5 mg/dL and 7.5 mg/dL lower among patients with optimal vitamin-D levels, while HDL-cholesterol levels were 4.8 mg/dL higher. All differences were statistically significant.

However, in the longitudinal analysis, the researchers examined 6260 patients who increased their vitamin-D levels from deficient at the initial visit to optimal levels at the time of study completion. Compared with 2332 patients whose initial and final vitamin-D concentrations remained deficient, those who raised their vitamin-D levels into the optimal range had a mean 0.77-mg/dL increase in total cholesterol and nonsignificant changes in their LDL-cholesterol and triglyceride levels. HDL cholesterol was increased 0.42 mg/dL in those who replenished their vitamin-D levels.

Clinically minimal effect on total cholesterol

In their paper, Ponda and colleagues suggest these small and clinically minimal effects on total and HDL cholesterol and lack of benefit on LDL cholesterol and triglycerides might mean that vitamin-D status is a surrogate marker of health and that vitamin D might simply have no effect on lipid metabolism. Another explanation for the lack of significant effect in the longitudinal analysis is that dyslipidemia might be responsible for the low vitamin-D levels and not the other way around, say Ponda et al.

"With the benefit of serial testing in clinical practice, we now present evidence of an uncoupling between vitamin D and lipids for association vs intervention," they write. "In contrast to the cross-sectional association between 25(OH)D levels and a healthier lipid profile, raising 25(OH)D levels from 'deficient' to 'optimal' in a cohort neither improved nor worsened the lipid profile. This suggests that a higher level of 25(OH)D may simply be a passive marker of better cardiovascular health."

In an editorial [2], **Drs Rolf Jorde** and **Guri Grimnes** (University Hospital of North Norway, Tromsø) point out that vitamin-D studies have exploded in the past decade, with 50 to 100 new vitamin-D articles registered in PubMed each week. The lay press has picked up on the "vitamin D-lightful" phenomenon, and if read uncritically, the literature would suggest "vitamin D appears to be good for almost any condition thinkable and is today the hottest magic cure."

In their view, the analysis by Ponda et al highlights the difficulties with cross-sectional studies, noting that these results are often not replicated in prospective studies. Numerous studies, including this latest, have shown that high serum concentrations of 25(OH)D are associated with favorable lipid profiles. However, these associations are not proof of causality. "People in good health stay outdoors more and therefore get more sunshine and vitamin-D production in the skin, and [they] may also have healthier food habits," they write. "Their higher serum 25(OH)D levels may therefore be the result and not the cause of good health."

Randomized controlled trials testing vitamin D are under way, and the results are expected in a few years. "Until then, there is no need to rush recommendations on vitamin-D supplementation based on associations and speculations," conclude Jorde and Grimnes.

Sources

1. Ponda MP, Huang XX, Odeh MA, et al. Vitamin D may not improve lipid levels: A serial clinical laboratory data study. *Circulation* 2012; DOI:10.1161/CIRCULATIONAHA.111.077875. Available at: <http://circ.ahajournals.org>.
2. Jorde R, Grimnes G. Vitamin D and lipids: do we really need more studies. *Circulation* 2012; DOI:10.1161/CIRCULATIONAHA.112.119693. Available at: <http://circ.ahajournals.org>.

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