

Vitamin D Deficiency Associated With Diabetic Retinopathy

October 22, 2010 (Chicago, Illinois) — A new study has found that patients with diabetic retinopathy, especially the proliferative type, are more likely to have insufficient serum vitamin D levels than people without diabetes, suggesting a link between vitamin D deficiency and one of the leading causes of blindness in adults. The principal investigator presented the findings in a poster here at the American Academy of Ophthalmology and Middle East Africa Council of Ophthalmology 2010 Joint Meeting.

Mean levels of 25-hydroxyvitamin D in adults with type 2 diabetes were well below 30 ng/mL, the cutoff the researchers used to define vitamin D "insufficiency" (deficiency), according to the lead author, John Payne, MD, a vitreoretinal fellow at Emory Eye Center, Atlanta, Georgia. More than 75% of patients with diabetic retinopathy were deficient in vitamin D, the data show.

"Vitamin D insufficiency was much more rampant than we thought it would be," Dr. Payne told *Medscape Medical News*.

In this cross-sectional study, the researchers stratified 221 subjects into 5 groups: no diabetes or retinopathy, no diabetes but another eye disease, type 2 diabetes but no retinopathy, type 2 diabetes with nonproliferative diabetic retinopathy, and type 2 diabetes with proliferative retinopathy. They excluded patients with type 1 diabetes, vitamin D intake greater than 1000 IU/day, and disorders that change the metabolism of vitamin D. To minimize differences in sun exposure, the investigators performed vitamin D testing for all subjects from December 2009 through March 2010. Testing was done at a single time point.

People with diabetes had significantly lower mean 25-hydroxyvitamin D levels than people without diabetes (22.9 vs 30.3 ng/mL; $P < .001$), according to the poster. People with no eye disease had the highest serum vitamin D levels (mean, 31.9 ng/mL), and those with proliferative retinopathy had the lowest levels (mean, 21.1 ng/mL).

Multivitamin Use Linked to Higher Serum Vitamin D

After performing a linear multivariate analysis to control for potential confounders, the authors found only 1 factor that remained statistically significant: daily multivitamin use. "The use of daily multivitamins was somewhat protective against

the development of vitamin D insufficiency," Dr. Payne said.

People who took a daily multivitamin that included vitamin D (n = 102) had a mean serum vitamin D level of 31.1 ng/mL; those who did not take a multivitamin (n = 119) had vitamin D levels averaging only 22.0 ng/mL ($P < .001$), according to the poster. Dr. Payne noted that even those who took daily multivitamins had a 44% incidence of vitamin D insufficiency. The subjects' mean intake of vitamin D from the multivitamins was less than the recommended daily intake of 400 IU, he said.

However, Dr. Payne cautioned that they did not ask subjects about their dietary intake, other than multivitamins. Another study limitation he mentioned was that the patient population was underpowered to control for multivitamin use.

He suggested several reasons that vitamin D might protect against retinopathy, including its beneficial role in maintaining normal glucose metabolism and lowering the production of inflammatory cytokines that are upregulated in type 2 diabetes.

Does Vitamin D Slow Retinopathy Progression?

An ophthalmologist who did not participate in the study, Zac Ravage, MD, said that "it lends support to the possible role of vitamin D" in diabetic retinopathy. Dr. Ravage, assistant professor of ophthalmology at Rush Medical College, Chicago, Illinois, told *Medscape Medical News* that the study does not attempt to answer whether vitamin D supplementation can prevent the progression of diabetic retinopathy. Such information is necessary before ophthalmologists can prescribe multivitamins to their patients with diabetic retinopathy, he suggested.

"One study isn't going to be a game changer, but it would certainly be grounds for more research on whether supplemental vitamin D can lower the incidence of progression of diabetic retinopathy," Dr. Ravage said.

Dr. Payne said that a national clinical trial is needed to study this issue. "But," he said, "it would be hard to do a placebo control because there's so much evidence on the benefits of vitamin D."

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