

# Clarifying the Role of Vitamin D in Multiple Sclerosis Risk and Prevention

Recent findings reinforce the link between vitamin D levels and risk of multiple sclerosis.

With **Kassandra Munger, ScD**

Although neurodegenerative diseases such as multiple sclerosis (MS) defy easy categorization, various lines of inquiry have identified possible risk factors. One of the most notable research trends in recent years is assessing the hypothesis that vitamin D levels may influence the risk for development of MS. However, many studies examining the relationship of vitamin D to MS have been too small to verify a pattern. That is why the recent publication of a study tying vitamin D levels to MS risk in more than 1,000 women with MS could perhaps be a significant addition to the literature.<sup>1</sup> Ahead, study co-author Kassandra Munger, ScD, reflects on the significance of the findings and discusses next steps for further elucidating the potential function of vitamin D as a preventive measure.

**Vitamin D has been tied to the prevention of various diseases for many years. Could you provide a brief review of the trajectory of research specifically pertaining to vitamin D and MS?**

**Dr. Munger:** Vitamin D was first suggested as possibly having an etiologic role in MS in the mid-1970s based on the observations of a latitude gradient (lower frequency of MS in more tropical areas where vitamin D levels from sunlight exposure are higher year-round) and areas with diets high in fatty fish (e.g., salmon)—a good source of vitamin D—having lower incidence of MS. Over the next 25 years or so, some work in the animal model of MS suggested that vitamin D decreased the incidence, delayed the onset, and slowed disease progression. The first prospective epidemiological study showing that dietary vitamin D intake may be associated with a reduced risk of MS was published in 2004 and was followed by additional prospective studies measuring blood levels of 25-hydroxyvitamin D, supporting

this association. Studies showing that vitamin D is associated with reduced relapse rates and fewer new CNS lesions in persons with MS, adding to the evidence that vitamin D may have an important role in MS.

**Can you talk about how your study came about, what you hoped to find, and how it builds on the body of research on this topic?**

**Dr. Munger:** The strongest epidemiological evidence supporting a role for vitamin D affecting MS risk has come from prospective studies in which blood samples were collected and were available prior to the onset of MS. Before our recent study, there were only two studies of this kind and both had fewer than 200 MS cases, although both found evidence that higher 25(OH)D levels were associated with a lower risk of MS. However, neither study was able to really evaluate whether vitamin D deficiency specifically was associated with an increased risk of MS (too few subjects in the deficient range). In the Finnish Maternity Cohort—in which we had more than 1,000 cases of MS—over half of the women in our study were deficient in vitamin D. Therefore, we were able to examine whether insufficient or deficient levels of 25(OH)D were associated with an increased risk of MS, which would further strengthen the evidence for a role of vitamin D in MS.

**How do the results compare to previous findings and your expectations. Do they suggest any directions for future inquiries?**

**Dr. Munger:** Based on previous work suggesting a dose-response association between 25(OH)D and MS risk, we did

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expect to see that vitamin D insufficiency and deficiency were associated with an increased MS risk, and that is what we found. Women with 25(OH)D in the deficient range had a nearly twofold increased risk of MS as compared with women in the sufficient range.

Ideally, the findings of our study will be confirmed in other populations. The studies to date have been in mainly non-Hispanic white populations and determining whether this association between vitamin D and MS exists in other populations, especially minority populations, is an important next step in this research.

### **To what extent do these and other findings suggest the potential of vitamin D as a therapeutic intervention for MS?**

**Dr. Munger:** Our findings in the current study can only speak to the risk of developing MS associated with vitamin D levels. However, there is a growing body of research suggesting that adequate vitamin D levels among persons with MS may have beneficial effects on disease activity and progression. There are currently several clinical trials underway to more closely examine this connection.

### **What do you hope clinicians take from this study when it comes to the role of vitamin D in MS prevention?**

**Dr. Munger:** Collectively, the body of evidence from epidemiological and Mendelian randomization studies strongly suggests that there is a causal role of vitamin D in MS. Unfortunately, there are many insurmountable challenges in conducting a primary prevention trial of vitamin D and MS to examine this in an experimental way.

Clinicians should strongly consider advising their patients that first-degree relatives should ensure they have adequate vitamin D levels. For most people, vitamin D supplementation is a safe and easy way to ensure sufficient levels. ■

*For more insight on the role of vitamin D in multiple sclerosis treatment and prevention, see the April 2017 edition of Practical Neurology® (PracticalNeurology.com/2017/04).*

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1. Munger KL, Hongell K, Aivo J, et al. 25-Hydroxyvitamin D deficiency and risk of MS among women in the Finnish Maternity Cohort. [published online September 13, 2017]. *Neurology*