Vitamin D Deficiency, Excessive Daytime Sleepiness: An Epiphenomenon or a “Chicken or an Egg—Which Came First” Issue?

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The new research by McCarty et al.¹ titled “Vitamin D, Race, and Excessive Daytime Sleepiness” was very interesting as well as somewhat confusing. The authors reported that more than half of their patients with somatic pain and sleep disruption had vitamin D deficiency. So in this cohort, the most prevalent sleep disorder was expected to be insomnia secondary to medical condition; however, the majority of patients in the study cohort suffered from obstructive sleep apnea ([OSA] 74%) and restless leg syndrome ([RLS] 30%), whereas insomnia was only 16%.

The authors acknowledge that the study did not consider the severity of OSA or RLS. Could these primary sleep disorders be the cause of the excessive daytime sleepiness (EDS) and vitamin D levels an epiphenomenon to this primary process?

The major source of vitamin D in humans is exposure to UV radiation.² Even the vitamin D level in this cohort of white patients differed according to sunlight exposure between the winter and summer months, but black patients had chronically low vitamin D. Increased frequent nocturnal awakenings from any of the primary sleep disorders can lead to sleep fragmentation, thereby causing EDS and less exposure to sunlight. EDS may be the barrier to vitamin D formation, thereby causing low vitamin D levels in these patients. This results in an inverse relation between vitamin D and EDS as was seen in the vitamin D non-deficient group.

In the vitamin D deficient group, it was surprising not to find any correlation between EDS and vitamin D deficiency except for black patients. This negates the hypothesis that vitamin D deficiency in nonblack patients caused OSA by increasing chronic rhinitis or tonsillar hypertrophy. This also suggests that vitamin D level may not be the determinant factor in this cause of EDS.

The editorial³ to this paper suggested a possible role of melanin and skin pigmentation and sleep pat-

terns. Melanin is a neurotransmitter secreted from the lateral tegmentum that works against orexin and consolidates REM sleep. At this moment, other than mere speculation, more studies are need to help us understand the role of melanin secreted during nocturnal REM sleep and vitamin D absorption during daytime with sunlight exposure.

African American patients are also known to have high prevalence of sleep disordered breathing,⁴ noncompliance to treatments,^{5,6} and high risk for vitamin D deficiency for their increased skin pigmentation. Was this the reason for the findings we see in Figure 2, where major part of the black patients had a vitamin D level < 15 and also had high excessive daytime sleepiness? It may be difficult to extrapolate any inference of any relationship between vitamin D and EDS from this small cohort of black patients with so many variables.

I applaud the authors for their keen observation, but the study was inconclusive about the cause-effect relationship between vitamin D and EDS, partly because of the complexity of the cohort and the multiple unknown variables. However, this study demands a well-designed future study addressing all the variables that will help us understand this matter more.

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