Embry et al

Vitamin D and Seasonal Fluctuations of Gadolinium-Enhancing Magnetic Resonance Imaging Lesions in Multiple Sclerosis

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Auer et al[1] recently showed a striking, near sinusoidal annual variation in the number of active magnetic resonance imaging lesions in 53 multiple sclerosis (MS) patients. Their results provide solid support for past, less-well documented claims of seasonal fluctuation in MS disease activity. Furthermore, the seasonal fluctuation in lesion activity may provide an important clue for identifying environmental factors which are part of MS etiology.

Auer et al proposed that seasonal changes in the rate of common infections might partially explain the seasonal fluctuation in lesion activity. They noted that climatic factors such as temperature, amount of sunlight and UV light exposure might also be involved[1]. We suggest that vitamin D supply, which fluctuates with seasonal UV light exposure, is the main environmental factor involved. Vitamin D and its metabolites have been implicated in MS etiology by epidemiological, experimental and immunological data[2]. Moreover, circulating 25-hydroxyvitamin D [25(OH)D] also shows a near sinusoidal annual fluctuation at higher latitudes[3,4].

To investigate a possible correspondence between the fluctuations in vitamin D intake and lesion activity, we compared published monthly 25(OH)D levels in 415 people, aged 50-80, from southern Germany[4] with the data of Auer et al[1] which were also collected in southern Germany (Figure). Third order polynomial curves fit both the 25(OH)D and lesion data significantly. When the 25(OH)D data are lagged by two months, there is a close correspondence between the two curves with high levels of 25(OH)D correlating with low levels of lesion activity and vice versa. A two-month lag is within reason and is taken to reflect the time for a given 25(OH)D level to affect detectable lesion occurrence.

The inverse correlation between lesion activity and 25(OH)D level suggests that vitamin D nutrition may have a notable immuno-modulating effect on CNS

inflammation, a conclusion also reached through experimental and immunological studies[2]. The impressive correlation also supports the need for proper clinical trials to test whether improved vitamin D nutrition (not the vitamin D hormone, $1,25(OH)_2D$) can reduce formation of CNS lesions and slow the progression of MS. Until definitive results are available, clinicians may want to ensure their MS patients are receiving a meaningful vitamin D intake (3000-4000 IU/day) throughout the year. Although well above current nutritional guidelines (200-400 IU), such an intake is physiological and safe and most importantly, provides a desirable target amount of circulating 25(OH)D[5].

References

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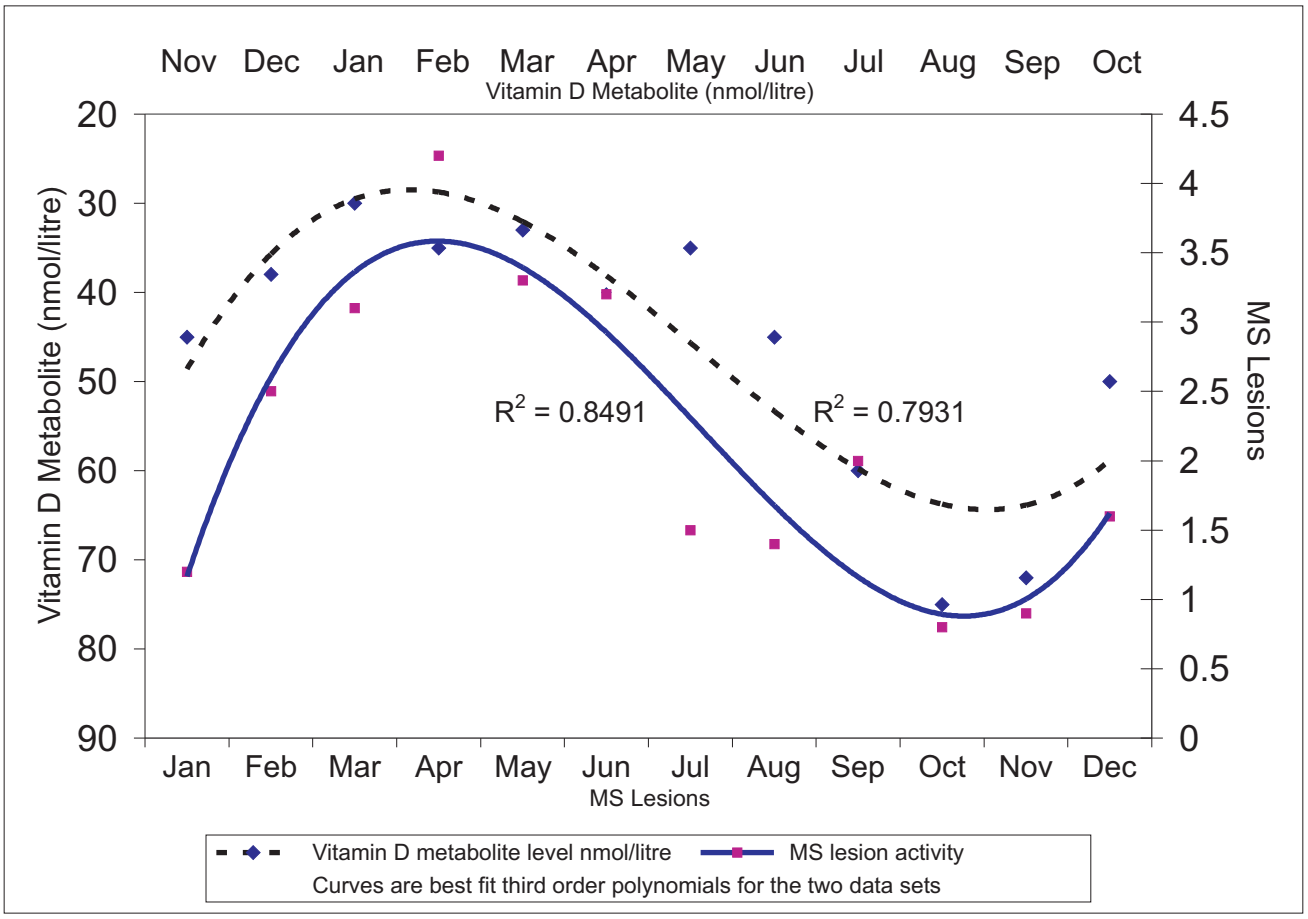

Figure 1. Embry et al.

Figure Caption

Month-to-month variation of average number of active lesions in multiple sclerosis patients from southern Germany as reported by Auer et al[1] and month-to-month variation in the median levels of the vitamin D metabolite, 25(OH)D, in 50-80 year olds from southern Germany as reported in Scharla[4]. The two, fitted, third order polynomial curves show a close correspondence when the 25(OH)D data are lagged two months as illustrated. Note that the 25(OH)D concentration decreases upward on the Y axis to allow a better comparison of the curves which correlate inversely.