Vitamin D status predicts new brain magnetic resonance imaging activity in multiple sclerosis.


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OBJECTIVE: We sought to determine whether vitamin D status is associated with developing new T2 lesions or contrast-enhancing lesions on brain magnetic resonance imaging (MRI) in relapsing multiple sclerosis (MS).

METHODS: EPIC is a 5-year longitudinal MS cohort study at the University of California at San Francisco. Participants had clinical evaluations, brain MRI, and blood draws annually. From the overall cohort, we evaluated patients with clinically isolated syndrome or relapsing-remitting MS at baseline. In univariate and multivariate (adjusted for age, sex, ethnicity, smoking, and MS treatments) repeated measures analyses, annual 25-hydroxyvitamin D levels were evaluated for their association with subsequent new T2-weighted and gadolinium-enhancing T1-weighted lesions on brain MRI, clinical relapses, and disability (Expanded Disability Status Scale [EDSS]).

RESULTS: A total of 2,362 3T brain MRI scans were acquired from 469 subjects. In multivariate analyses, each 10ng/ml higher 25-hydroxyvitamin D level was associated with a 15% lower risk of a new T2 lesion (incidence rate ratio [IRR], 0.85; 95% confidence interval [CI], 0.76-0.95; p = 0.004) and a 32% lower risk of a gadolinium-enhancing lesion (IRR, 0.68; 95% CI, 0.53-0.87; p = 0.002). Each 10ng/ml higher vitamin D level was associated with lower subsequent disability (-0.047; 95% CI, -0.091 to -0.003; p = 0.037). Higher vitamin D levels were associated with lower, but not statistically significant, relapse risk. Except for the EDSS model, all associations were stronger when the within-person change in vitamin D level was the predictor.

INTERPRETATION: Vitamin D levels are inversely associated with MS activity on brain MRI. These results provide further support for a randomized trial of vitamin D supplementation.

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