

# **Effect of vitamin D supplementation on axonal damage in relapsing-remitting multiple sclerosis**

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Short title: Vitamin D and axonal damage in RRMS

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## **Abstract**

### *Background*

The effect of vitamin D supplementation in relapsing-remitting multiple sclerosis (RRMS) is not established.

Neurofilament light chain (NfL) is a sensitive biomarker for axonal damage and an inverse relationship has been found between NfL and 25-hydroxyvitamin D (25(OH)D) levels in RRMS.

### *Material and methods*

To investigate this further, we have analyzed the association between serum levels of NfL and 25(OH)D in a two-year randomized placebo-controlled trial of high-dose oral vitamin D3 supplementation (20.000 IU/week) in 68 RRMS patients (NCT00785473).

### *Results*

In contrast to earlier reports, we found a positive baseline correlation between the serum concentrations of 25(OH)D and NfL ( $r=0.25$ ,  $p=0.04$ ). However, despite the mean 25(OH)D level increased by approximately 70 nmol/L in the vitamin D group, no effect was noted on the change in NfL levels from baseline to week 48 ( $p=0.93$ ) or week 96 ( $p=0.56$ ) when compared to the placebo group. Still, in a subgroup analysis restricted to patients without disease modifying therapy at baseline, a strong trend was detected towards an effect of vitamin D with a decrease of 30.9% from baseline to week 48 and 32.6% to week 96 when alterations in NfL concentrations were compared between the vitamin D and the placebo group ( $p=0.06$  for both times).

### *Conclusion*

We conclude that with a possible exception for patients without disease modifying treatment, weekly oral supplementation with 20.000 IU vitamin D3 seems to have no clear effect on axonal damage in RRMS.