

Vitamin D status is negatively correlated with retinal nerve fiber layer thickness in relapsing-remitting MS patients without acute optic neuritis

Citation for published version (APA):

Knippenberg, S., Smolders, J., van den Maegdenbergh, M., Porro, G., Damoiseaux, J., & Hupperts, R. (2017). Vitamin D status is negatively correlated with retinal nerve fiber layer thickness in relapsing-remitting MS patients without acute optic neuritis. *Multiple Sclerosis Journal*, 23(1), 128-129. <https://doi.org/10.1177/1352458516652950>

Document status and date:

Published: 01/01/2017

DOI:

[10.1177/1352458516652950](https://doi.org/10.1177/1352458516652950)

Document Version:

Publisher's PDF, also known as Version of record

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Letters

Vitamin D status is negatively correlated with retinal nerve fiber layer thickness in relapsing-remitting MS patients without acute optic neuritis

Date received: 26 April 2016; accepted: 8 May 2016

In this journal, Burton et al. demonstrated a correlation of vitamin D insufficiency with greater thickness of the retinal nerve fiber layer (RNFL) as measured with optical coherence tomography (OCT) in patients with acute optic neuritis (ON). The authors conclude that an elevated RNFL thickness in acute ON may reflect a greater propensity for inflammation in the setting of vitamin D insufficiency.¹ We would like to further elaborate on this interpretation.

We collected a cohort of 27 relapsing-remitting multiple sclerosis (RRMS) patients without clinically active disease activity, in which OCT recordings (Stratus 3 OCT; Carl Zeiss B.V, Sliedrecht, the Netherlands), pattern visual evoked potential (VEP) recordings, visual acuity measurements (Snellen chart), and 25-hydroxyvitamin D measurements (Chemiluminescence assay; Immunodiagnostic Systems, Liège, Belgium) were performed during 12-month follow-up. This cohort consisted of 3 men and 24 women, mean age was 38.6 years (standard deviation (SD)=11.4 years), median disease duration since diagnosis was 1.0 year (interquartile range (IQR)=0.17–2.13 years), and median baseline Expanded Disability Status Scale (EDSS) score was 1.0 (IQR=1.0–1.5). A total of 11 subjects were treated with glatiramer acetate, the remainder was untreated.

Multiple Sclerosis Journal
 2017, Vol. 23(1) 128–129
 DOI: 10.1177/
 1352458516652950
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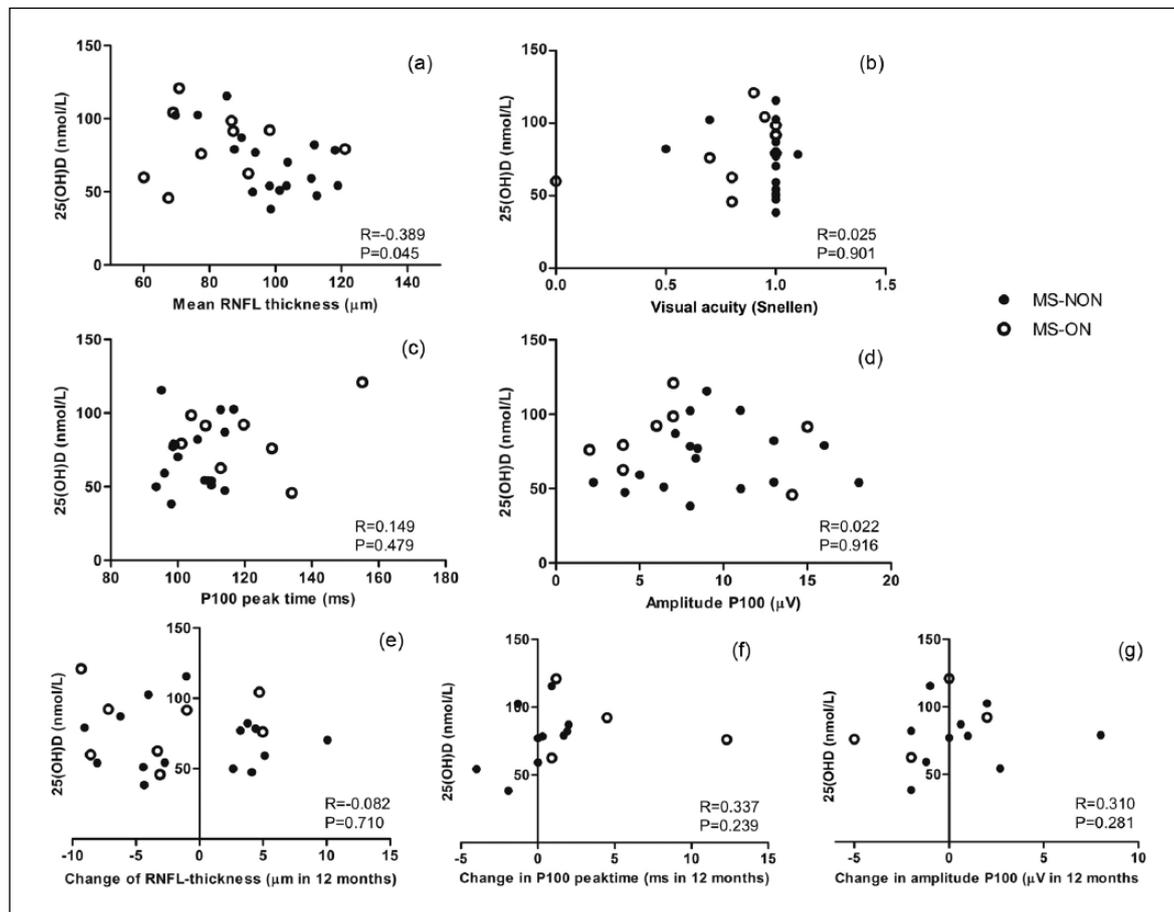


Figure 1. Correlation between vitamin D status and OCT, visual acuity, and VEP outcomes. Correlation of vitamin D status with (a) RNFL thickness, (b) visual acuity, (c) VEP P100 latency, (d) VEP amplitude, (e) change of RNFL thickness, (f) change in VEP P100 latency, (g) change in VEP amplitude. Open dots represent patients with prior ON, and closed dots represent patients without prior ON.

A total of 10 subjects had a history of ON. Patient characteristics were not significantly different between MS subjects with ON or without ON. The worst performing eye was included in the analysis.

Like Burton et al., we observed a negative correlation between vitamin D status and RNFL thickness at baseline (Figure 1(a)). This correlation was stronger when only subjects without previous ON were analyzed ($r=-0.601$, $p=0.011$). We investigated other outcomes of optic nerve function. Vitamin D status did not correlate with visual acuity, VEP P100 latency, or VEP amplitude (Figure 1(b)–(d), respectively). Stratification for a history of ON did not affect the results (data not shown). Finally, we assessed the correlation between vitamin D status at baseline and the 12-month change of RNFL thickness, VEP P100 latency, and VEP amplitude. We found no correlation between vitamin D status and change of RNFL thickness, change of VEP P100 latency, and change of VEP amplitude (Figure 1(e)–(g), respectively).

Although the negative correlation between 25(OH)D levels and RNFL thickness reported by Burton et al. was hypothesized to be due to inflammation of the optic nerve, we replicated this finding in a cohort without active ON. Therefore, an effect of inflammation is unlikely. Alternatively, a detrimental effect of 25(OH)D on RNFL thickness could be hypothesized but is not supported by the longitudinal data of Burton et al., and by the longitudinal OCT and VEP data in this letter. Providing alternative explanations is challenging. A higher ultraviolet (UV) exposure has been associated with a higher risk of macular degeneration.² Therefore, the lower vitamin D status in patients with a reduced RNFL thickness could be a biomarker for detrimental effects of UV-light exposure on the retina. Nevertheless, although the interpretation of the correlation between vitamin D status and RNFL thickness is uncertain, the beneficial effect of vitamin D status on ON recovery demonstrated by Burton et al. is exciting and warrants further investigation.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Response to “Vitamin D status is negatively correlated with retinal nerve fiber layer thickness in relapsing-remitting MS patients without acute optic neuritis” by Knippenberg et al.

Date received: 7 May 2016; accepted: 9 May 2016

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This project was sponsored by an unrestricted grant by TEVA.

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Dear *Multiple Sclerosis Journal* Editors and Dr Knippenberg and colleagues,

Thank you to Dr Knippenberg and colleagues for your letter.¹ Dr Knippenberg et al. report that in their study of 27 patients with relapsing-remitting multiple

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Multiple Sclerosis Journal
2017, Vol. 23(1) 129–130

DOI: 10.1177/
1352458516652951

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