Reviewer’s report

Title: Low vitamin D levels are associated with cognitive impairment in patients with hashimoto thyroiditis

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Reviewer: Martin Hewison

Reviewer's report:

The study by Xu et al describes a simple but interesting study in which the authors have highlighted a link between mild cognitive impairment (MCI) and serum 25-hydroxyvitamin D levels in patients with Hashimoto's disease. As with most studies of this nature, the impact of the investigation is somewhat limited by the fact that the patients, and presumably controls, were analysed for vitamin D at a single time point that may have no relevance to the MCI. Nevertheless, the data are compelling and could provide a fresh perspective on the existing proposed links between vitamin D-deficiency and autoimmune disease.

Specific comments

1. The differences in 25-hydroxyvitamin D levels between Hashimoto’s patients and healthy controls is quite striking. Rather than giving mean ± SD levels the authors should provide median and inter-quartile ranges. In other words, exactly how low is the 25-hydroxyvitamin D in the Hashimoto's patients? What are the lowest values for these patients

2. The quartile data presented by the authors is very interesting, but should either be extended to a quintile to include patients with serum 25-hydroxyvitamin D less than 25 nmol/L - presumably most of these will have MCI? Or expand the quartiles. Basically it is important to know the levels of MCI in patients who are severely vitamin D-deficient (i.e. less than 25 nmol/L). This is the level that has been proposed as predisposing to rachitic bone disease and thus it would be interesting to know if this level also predisposed to MCI.

3. The median 25-hydroxyvitamin D values should be given for each quartile/quintile.
Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.

Yes

Does the work include the necessary controls?
If not, please specify which controls are required in your comments to the authors.

Yes

Are the conclusions drawn adequately supported by the data shown?
If not, please explain in your comments to the authors.

Yes

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I am able to assess the statistics

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