Reviewer's report

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

Version: 2 Date: 03 Oct 2018

Reviewer: Martin Hewison

Reviewer's report:

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The authors have improved the manuscript. However, I think they may have misunderstood some comments:

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.

Answer: Thanks for your careful review. In the current study, as the raw data of 25(OH)D were skewed, serum 25(OH)D levels in HT patients were divided into four quartiles, the method being widely applied by numerous researchers (Bin Han et al., European Journal of Neurology 2015; A Nanri et al., European Journal of Clinical Nutrition 2009). Furthermore, up to now, no study has shown an association of rachitic bone disease with depression in HT patients. Hence, we see no need to extend to a quintile.

I wasn't suggesting that the authors link rickets with HT. I was simply asking if any patients had very low serum 25D - i.e. less than 25 nmol/L. At the moment most patients seem to have relatively reasonable levels of 25D.
3. The median 25-hydroxyvitamin D values should be given for each quartile/quintile.

Answer: Thanks for your careful review and insightful comment. The median 25-hydroxyvitamin D values for all quartiles were 30.8, 36.6, 43.7 and 53.1 nmol/L, respectively.

These data have been added to the revised manuscript (Methods section, line 116-117, page 6). This is fine but I think it would help to actually have these data in Table 2.

**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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