Reviewer’s report

Title: Vitamin D, parathyroid hormone and metabolic syndrome - the PORMETS study

Version: 0 Date: 12 Jul 2017

Reviewer: Rachel Crowley

Reviewer's report:

The authors describe a statistical exploration of the relationship between 25OHD and PTH with elements of the metabolic syndrome in a subgroup of a Portuguese study cohort.

Methods:

1) Definition of vitamin D status using Endocrine Society guidelines has defined more than 99% of the study participants as being in a disease state, therefore the conclusions regarding the metabolic syndrome may be difficult to interpret

2) The authors should discuss why they used Endocrine Society rather than IOM guidelines

3) Use of the Endocrine Society guidelines may explain why PTH was 'blunted' - some of these patients had adequate vitamin D to meet their requirements

4) The authors should comment on the health of the subgroup - were they attending the health centres while unwell or were they attending routine study appointments? Were they taking supplementation with calcium / vitamin D, on any antiresorptives / HRT, taking proton pump inhibitors or diuretics?

Results:

1) Table 4 - are the associations point-biserial here?

2) Table 5 please explain the use of odds ratio for this table. Do the authors mean odds of outcome meeting component of MetS? eg trigs >150mg/dl yes/no?

Discussion

As a general comment much of the discussion is repetition of the results, followed by a list of potential explanations for findings that could either represent significant associations or limitations of the study. More explanation of the most likely explanation would be more useful
for the reader. Because of the dissociation of Vit D and PTH levels, their associations are considered separately - this is confusing and suggests to me that the associations are less likely to be clinically meaningful. Line 383-4 does not contribute to the conclusion.

The authors should re-formulate the final sentence - a finding of some associations within a cohort all of whom have low 25OHD by Endocrine Society guidelines is not evidence that supplementation of vitamin D will reverse the findings / associations.

**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.

No

**Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?**
If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

I am able to assess the statistics

**Quality of written English**
Please indicate the quality of language in the manuscript:

Acceptable

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