Reviewer's report

Title: Association of back pain with hypovitaminosis D in postmenopausal women

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Reviewer: Bita Shakoory

Reviewer's report:

The study by Silva et al uses a readily available dataset collected for an RCT. This aspect limits the confounders and offers a well-selected study subject. The study is well powered (maybe overpowered?) and adds to the body of knowledge about Vit D. The clinical relevance and significance, however, are uncertain. Even though the manuscript needs major editing before it is ready for submission, it will be worth reconsidering, once the errors are addressed.

Strengths:
1. Well powered study given that it uses readily available large dataset
2. Relevant in establishing additional consequences of hypovitaminosis D
3. Title and abstract are appropriate
4. Appropriate disclosures

Major issues:
1. Poorly written. The English language is at times informal and occasionally incorrect. The study would benefit from major editing before further decisions can be made.
2. Although the large number of study subjects allows fine differences between the cases and controls to be detected, the clinical significance is uncertain.
3. Even though the data adds to the body of knowledge, it does not change the approach to clinical practice. Regardless of this finding the Vit D levels need to be measured and any deficiencies to be corrected as standard of care, which is not affected.
   a. Would be interested to see if setting the cut off of deficiency at a lower range would affect the frequency of the back pain, and if these findings would necessitate change in the “normal cut off”.
4. There are missing data that are essential to full understanding of the study.

Detailed suggestion:

1. Scientific quality of the work
   a. Need to indicate the brief description of the original study.
   b. The number of the excluded cases and the number of the final group used for
analysis in this study is not mentioned.

c. Please indicate how the cut off for normal levels of Vit D was determined.

d. Is the frequency of the Vit D insufficiency and deficiency in the study population consistent with general population?

e. Are the patients with osteoporotic fractures (non-vertebral) included? If so, would it be possible to re-assess, excluding the patient with any axial fractures? Any axial fracture can distort the biomechanics of the body, and resulting in back pain, hence introducing bias.

f. Please change muscle weakness to “muscle fatigability” or a similar term. Muscle weakness is not a normal part of aging and indicates a pathological process, which is not the case here.

2. Presentations

a. Writing needs major editing by a professional to optimize scientific tone and grammatical accuracy. The current writing is informal, and with numerous errors.

b. Figures: None. Would include a schematic of subject selection

c. Tables: please include relevant variables that were not statistically significant

d. Please use consistent terminology for a single concept. Sarcopenia, muscle weakness and muscle fatigue cannot be used interchangeably.

The article is overall an interesting study and would be appropriate for publication after these issues are addressed.

Thanks

**Level of interest:** An article of importance in its field

**Quality of written English:** Not suitable for publication unless extensively edited

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

No competing interests.