**Reviewer’s report**

**Title:** Higher serum 25(OH)D level is associated with decreased risk of impairment of glucose homeostasis: data from Southwest China

**Version:** 0  **Date:** 09 Dec 2017

**Reviewer:** Paula O'Shea

**Reviewer's report:**

Dear Authors

The subject matter of this paper is topical and adds to the current knowledge regarding the association between 25-hydroxyvitamin D concentrations and markers of glucose metabolism in a subpopulation from Southwest China.

However, I think it would be important that it is made clear to the reader that 25(OH)D is a biomarker of exposure and not a biomarker of effect and is not validated as a clinical outcome measure or as a surrogate of clinical outcomes.

My main issue with the current version of this manuscript is the use of the English language, which in my view negatively impacts the clarity, and understanding of the manuscript. The poor use of the English language in parts detracts from the study's valuable findings. However, I feel this is easily corrected and will greatly improve this relevant and interesting paper.

Additionally, I think that input from a biostatistician may assist with optimising the statistical methodology employed and providing a better explanation of the statistical approach employed. Such input is likely also to improve the manner in which the study findings are presented.

Abstract

Conclusion - I am unclear as to what point is being made. ? decrease the risk of glucose dysglycaemia?
Laboratory methods.

The authors state that blood was collected into EDTA-plasma then refer to serum 25(OH)D. Please revise the section on sample handling and processing to reflect the sample type used for the respective analyte measurements.

Please state the analytical coefficient of variation (CV%) for the HPLC vitamin D assay at low, medium and high concentrations and the limit of quantitation for 25(OH)D2 and 25(OH)D3. Please clarify that the reported result total 25(OH)D, is the sum of both the measured 25(OH)D2 and 25(OH)D3.

Does the laboratory participate in a proficiency testing scheme for 25(OH)D?

Please state the analytical Coefficient of Variation at low, medium and high concentrations of glucose and insulin for the hexokinase and ECLIA assays respectively.

Statistical analysis

P-value and level deemed statistically significant: The authors employ two different thresholds for statistical significance, a P-value <0.05 and a P-value <0.1?

If we accept the former - surely the result is either significant or it is not significant?

Tables

Table 3: Least square means and 95%CI were used to evaluate the relationships between Tertiles of 25(OH)D & the markers of glucose metabolism (the variables).

Table 4: Odds ratios and 95%CI were used to evaluate the relationships between Tertiles of 25(OH)D and BMI

Why the difference in statistical approach? Why not a single approach and merge these 2 tables?

Multivariate linear regression needs to be better explained, e.g., Stepwise regression to ensure that there is no collinearity between independent variables?

I think Pearson's correlation may be more accessible to readers? Perhaps a matrix table showing Pearson correlation & P-value for each pair of variables?

Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.

No
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

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 recommend additional statistical review

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Please indicate the quality of language in the manuscript:

Needs some language corrections before being published

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