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:** 07 Dec 2017

**Reviewer:** Mohamad Mustafa

**Reviewer's report:**

In summary this paper describes the association between vitamin 25OH D level and risk of Glucose homeostasis impairment.

Overall good study, the Authors carefully conducted their work; put great efforts in to it. However I would have the following specific points to suggest.

1-  **The Abstract:**

Well written, however grammar and punctuation could be improved.

2-  **Introduction :**

The Hypotheses of the study could be improved, the authors hypothesis is that there is inverse association between vitamin D and Glucose homeostasis, which has been already identified in previous study, thus it would be more helpful if clarification about the novelty of the topic, and its importance.

It would also be better to clarify the Hypothesis more with clear primary outcome

The Primary outcome is not defined clearly in the study, aim of the study was stated to be the assessment of weather higher vitamin D level is associated with favorable glycemic status, but there is no specific definition of what is favorable Instead the authors opted to test for multiple surrogate outcomes.

3-  **Methods:**

Great work done in methodology of study including reporting the Ethical approval, and population demographics, however other points need more clarifications such as the how the sample size was calculated, why this special cohort was selected and whether they adjusted to that in regard setting the significance levels.
Also if they can specify the minimal clinical importance difference.

Furthermore it would be helpful to state the study design in the methods part, inclusion or eligibility criteria and any potential confounders or effect modifiers.

4- Statistical analysis:

The phrase (except for interaction tests, where p < 0.1 was considered significant) will need more clarification.

Based on the authors report the predictable variable (Vitamin D level) and the outcome variables were non-normally distributed continuous variables. Log-transformed values of insulin, FPG, HbA1c and HOMA2-IR were used in the models; however, it has not been used on the predictable variable, it would be better to further explain.

In addition, there is a lot of confounders in the study, the authors decide to use adjustment strategy to cope with the confounders (multivariate linear regression model),

Were any other strategies considered such as stratification or propensity score?

It will also be of great value if the authors address any approach to rule out Effect-cause association.

5- Results

The results reporting could be improved, for instance (association between vitamin , vitamin D and fasting plasma glucose was not statistically significant (P value >0.05 after adjusting for age, gender, average personal income per month, smoking status and season of blood drawn).

The difference in the association (Vitamin D and glucose homeostasis) between the three proposed groups "deficiency, insufficiency and sufficiency were again not statistically significant in regards FBG or HBA1C and several other variables.

6- Discussion

It would be great address the generalizability (external validity) of the study results.

7- Conclusion
The authors conclude importance of improving vitamin D status in the general population for the prevention of adverse long-term health risks such as pre-diabetes and T2DM however this study was aimed to identify association rather than causation. Thus it would be better to rephrase it.

**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

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Needs some language corrections before being published

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