Reviewer's report

Title: The Relationship Between Microvascular Complications And Vitamin D Deficiency In Type-2 Diabetes Mellitus

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Reviewer: Jessica Kiefte-de Jong

Reviewer's report:

Major compulsory Revisions:

Major concerns:

a. In the abstract authors state that the objective of this study is twofold: firstly, to investigate the frequency of vitamin D deficiency in patients with type-2 diabetes mellitus and secondly, to investigate the relationship between vitamin D deficiency and microvascular complications of diabetes mellitus. However, later throughout the whole manuscript the first objective is left out and only second one is being investigated.

b. Since the first objective is not analyzed the choice of cases and controls for this study is not adequate. To answer the question whether there is a relationship between vitamin D deficiency and microvascular complications in patients with type-2 diabetes mellitus it would be appropriate to assign patients with type 2 diabetes microvascular complications as cases and patients with type-2 diabetes mellitus but without microvascular complications as controls. Please discuss.

c. The statistical analysis for this kind of study is inappropriate- in addition to testing differences between the two groups; to test if there is an association between exposure of interest (vitamin D deficiency) and outcome of interest (microvascular complications) some multivariable regression analysis with appropriate adjustment for confounders should be performed (such as logistic regression, reporting results as odds ratios (OR)).

Minor essential revisions:

- the paper appears sloppy with numerous typos, different fonts throughout the manuscript, the numbers in tables as well as percentages often do not add up, etc.

- Abstract: the aim of this study reported in the abstract does not match the analyses performed and reported in the manuscript. The conclusion does not completely match the results reported in this manuscript.

- Introduction: more information on vitamin D and microvascular complications of diabetes mellitus is needed, what is already known, what is the gap that still needs to be investigated. Also, what is the aim of this study relative to the abstract?

- Methods: it is not clear what is the study design, is it case control or
retrospective cohort study, please clarify. If it is case-control study were the cases and controls matched, and if yes, based on what? Please add more detailed description of the matching process.

Also, the proportion of cases and controls in this study is not correct; in general, there should be more controls than cases (the ratio of cases to controls 1:4). Further, it is not clear when exactly serum 25(OH)D was drawn- before diagnosis of diabetes mellitus or after, please clarify.

- Statistical analysis: as mentioned above, mere analysis of differences between the two groups studied is not enough for this kind of study. Use of some multivariable regression analysis is advised (for example logistic regression).

- Results: Table 1: some of the socio-demographic characteristics and lifestyle factors of the study population should be mentioned here, since these are determinants of vitamin D status and potential confounders. Tables 2-5: as mentioned earlier, only p-values are not informative, regression analysis should be performed here with regression with Odds Ratios and 95%CI as main effect estimate. Table 6: what kind of analysis was performed here and which complication of diabetes was used as an outcome in this analysis? Please clarify.

- Discussion: studies mentioned in discussion (such as Pittas et al and Wolf et al) report odds ratios while the current study does not, so it is not appropriate to compare the conclusions. Also, the limitations of the study such as the potential for reverse causality and residual confounder should be properly discussed

Level of interest: An article of limited interest

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:
I declare that I have no competing interests.