Reviewer's report

**Title:** A Prospective Study of Dietary Selenium Intake and Risk of Type 2 Diabetes

**Version:** 1  **Date:** 19 June 2010

**Reviewer:** mario siervo

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Dear Editor

This study provides a very comprehensive analysis of the association between selenium intake and diabetes risk. The results are original, well presented and could advance scientific knowledge in the field of diabetes, nutrition and public health.

However, I have a few queries regarding the presentation of the results and the approach used to analyze the data.

Major Compulsory Revisions

My initial reaction after reading the manuscript is that the authors have over-emphasized the role of selenium as a risk factor for diabetes and they have not attempted to put selenium intake in context with more established risk factors for diabetes (obesity, aging, refined carbohydrate intake). The results were specifically focused on the association of selenium intake and risk of diabetes but I would have liked if the authors could have also presented the odds ratio of the other independent variables entered in the model in order to understand the magnitude of the contribution of selenium intake to diabetes risk compared to the other risk factors.

I also do not comprehend the choice of entering selenium intake in the model as an ordinal variable and not as a continuous variable. I believe that metabolic risk follows a continuous trajectory and the use of cut offs could create spurious associations by potentially allocating close values of a particular parameter is they are very close to the cut off. Body mass index cut offs are an example as two subjects with a BMI of 29.9kg/m² and 30.1 kg/m² would be in two different groups according to the obesity cut off but they are most likely metabolically similar. Could the authors enter selenium intake as a continuous variable in the model?

The third question is related to the cut offs for energy intake the authors have applied to exclude subjects with not realistic energy intakes. The choice of the two cut offs is questionable as they approximately correspond to ±3SD in a normal distribution and in my opinion these cut offs are too wide to assess the validity of energy intake and a more conservative approach should be used. Previous studies have for example have excluded subjects in the lowest and
highest quintiles (20%) or have used values derived from the PAL to assess the accuracy of EI and using for example PAL cutoffs of 1.35 and 2.00 to estimate the validity of EI. This reasoning is based on the results presented in table since EI in two groups is matched but there is clear difference in BMI (~4 units which would correspond approximately to a difference of about 15kg assuming a height of 1.7m for all subjects). This would have an effect on energy requirements and therefore the presence of underreporting of EI in this sample is very plausible and it may introduce a differential bias.

Minor Essential Revisions

Was physical activity assessed in the health questionnaire? If yes, this should be included in the model.

What was the rationale of including animal proteins, saturated fat but then not including carbohydrates (refined and unrefined)? The latter and in particular refined carbohydrates are an established dietary risk factor for diabetes and they should be incorporated in the model.

The discussion (5 pages) is wordy and should be more concise and simply focused on the interpretation of the results and more concisely tried to understand the potential mechanisms of the association between selenium and diabetes risk.

Level of interest: An article of importance in its field

Quality of written English: Acceptable

Statistical review: Yes, but I do not feel adequately qualified to assess the statistics.

Declaration of competing interests:

I declare that I have no competing interests