Author's response to reviews

Title: Leisure time physical activity in middle age predicted the metabolic syndrome and diabetes in old age: A 28-year follow-up of men in the Oslo Study.

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Author's response to reviews: see over
Please find attached the revised manuscript entitled

Leisure time physical activity in middle age predicts the metabolic syndrome and diabetes in old age: Results of a 28-year follow-up of men in the Oslo Study.

We appreciate the valuable comments from the reviewers and we have made the following changes in response to their comments.

1) We have revised our definition of the metabolic syndrome in 2000 to correspond as closely as possible to that of the NCEP guidelines. The following changes have been made:
   The cut-off for BMI is raised from 25 to 30 kg/m\(^2\) to match a waist circumference of 102 cm.
   The time since last meal adjusted glucose cut point has now been reduced from 7.0 to 6.1 mmol/l. HDL-C below 1.03 mmol/l is used. The blood pressure cut point has also been lowered to \(\geq 130/85\).

2) We have omitted the metabolic syndrome in 1972/3. It seems to create more confusion than clarity and we lacked HDL cholesterol levels. Instead we have adjusted for the four single variables in 1972/3 as continuous covariates: glucose, BMI, triglycerides, and systolic blood pressure. These changes led to somewhat weakened results in regard to diabetes and changes in the text now reflect that. Smoking becomes even less of an important risk factor and the discussion is drastically revised and shortened and the title has been changed.

3) We have done a subgroup analysis of only the Oslo II study group participants as requested by the reviewer. Results were rather similar. Based on 4490 participants the LTPA ORs were for MS: 0.80, 0.61 and 0.29, whereas for diabetes the ORs are 0.80, 0.66, 0.27, adjusted for age and education. We have added a sentence to the discussion to say that results were similar (data not shown).

4) In 1972/3 middle aged Oslo men participating in the Oslo study were rather active, and that may be a reason for the good predictive ability of 1972/3 LTPA.

5) All analyses in Tables 2 and 3 are now adjusted for age.

6) More baseline cut point variables have now been listed in Table 1.

We have followed the recommendations of the 2\(^{nd}\) reviewer point by point:
1. Tables 2 and 3 texts have now specified the terms included in the models.

2. Done

3. A split in two sentences is done.

4. Per cent fasting have been given and associations between length of time and LTPA is also tested and given.

5. We now use proportion.

6. Corrected.

7. Corrected

8. A comment on possible conservative estimates is given.

We hereby hope that our comments and revisions are satisfactory for you to approve of our revised ms.

Best regards,

Ingmar Holme PhD