Reviewer’s report

Title: Association of body mass index with amnestic and non-amnestic mild cognitive impairment risk in elderly

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Reviewer: Kjeld Andersen

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Review:

The authors present data for an interesting question; a possible association between Body Mass Index and the risk of Mild Cognitive Impairment (both anamnestic (aMCI) and non-anamnestic (naMCI)). This pertains to lifestyle and a possible modifiable risk factor for dementia.

I have some concern about the design and paper.

The patients included are 240 patients with aMCI, 240 patients with naMCI, and 480 controls. The participants enrolled from a geriatric department (aMCI and naMCI) and from a department of medical examination (controls). It is stated that the participants were randomly selected but no information is provided about the procedure by which they actually were selected, thus pertaining to the generalization of results, why not consecutive patients? How were the controls selected? By the way, no information is provided why the participants have been admitted, neither for the MCIs nor for the controls.

The authors then go "about 6 years back" to gather information at "baseline" collecting baseline data from medical records or medical examination reports. Thus, I assume a participant had to have "6-year-old" data available otherwise this participant was excluded, but this is not clear from the paper. No information is provided about the follow-up time (mean, standard deviation), and why a 6-year period of follow-up?

The participants were examined by MMSE and MoCA, why both? The wording on page 8 (line 167-173) is unclear to me, does 20/24 point cut pertain to MMSE and 25/26 to MoCA or both to MMSE? The diagnosis of MCI was determined according to two psychologists (page 8, line 175-176), was that done both at baseline and admission? It is stated that subjects who had any types of cognitive disorder at baseline were excluded (page 8, line 161), thus were all participants examined by psychologists at baseline? I think this needs clarification.

Some information about BMI is also unclear to me. On page 9 (line 186-187) it is stated that the definition of increased BMI is > 4% per year (and decrease < 4% per year). Is that over the 6-
year period of follow-up? And is it then 4%+4%+4%+4%+4%+4% = approx. 24% increase (decrease)?

Further, analyses pertaining to this is presented in table 5. Decreased BMI for subjects with normal weight at baseline yielded an increased risk of 3.95. Is this then per 4% increase in BMI? A detail: the risk is calculated by logistic regression that provides an OR and not a RR. I also think that the authors may consider the numbers upon which the analyses are based. The multivariate analyses include 8 variables and in some of the categories (cells) there is only one, two, three, four, and five subjects. Is the material strong enough for such elaborate model?

I think the discussion needs some revision. A baseline underweight was only related to an increased risk of aMCI but not naMCI. This is explained by weight loss may improve vascular disorders, but the sentence only state that cross-sectional baseline underweight is associated with increased risk not weight loss! (Page 12, line 254-256) Again, the numbers upon which this is stated are very small and with elaborated multivariate model with many variates in the model (table 4).

On page 11-12, line 242-243, it is stated that aMCI and naMCI were more likely to develop several geriatric diseases. Does this means that this is incident geriatric disease during the follow-up? Or not, because on page 10, line 206 it is stated that aMCI and naMCI had more subjects with geriatric diseases? This pertains to the time aspect of this study, which I am unclear about. Is this a cross-sectional study or a follow-up study? Sometimes you get the impression of a cross-sectional study and sometimes an impression of a follow-up study. Therefore, it becomes unclear about the direction of "causality": does MCI affect the risk in changes in BMI or does BMI (changes in BMI) affect the risk of MCI? I am not fully convinced that "the direction of time" is fully accounted for.

A revision of the language may also improve the paper, for example: "Subject who did not find any cognitive disorder was defined as "normal cognitive function" (page 8, line 173-174).

Minor points:

Table 1: What is Han? (race?)

Page 6, line 115-115: "more than seven million people suffer from dementia annually all around the world". Is it incidence or prevalence, if the later I think the number is much higher than 7 mill.

**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.

No

Are the conclusions drawn adequately supported by the data shown?  
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No

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