Reviewer's report

Title: The Effect of Body Mass Index on Global Brain Volume in Middle-Aged Adults: a cross sectional study

Version: 2 Date: 18 August 2005

Reviewer: Deborah Gustafson

Reviewer's report:

General

Responses to reviewers and corresponding changes in the text were, for the most part satisfactory. Most of my remaining questions have to do with the Methods and clarification of the study sample. While the description of the sample has improved, I bring forth the following.

Major Compulsory Revisions (that the author must respond to before a decision on publication can be reached)

1. Methods
   a. It is difficult to understand your study design. Are you describing a baseline cross-sectional analysis of a case-control study, where caseness is having a family history of AD? As part of this, you ‘matched’ WRAP participants to community participants on the basis of ‘demographics’, yet also refer to ‘age-matched controls’. Can you please explain the matching? In addition, if this is a case-control study of some sort, you basically combine the 2 groups, and adjust for caseness and other potential differences between the groups. This is OK, but you need to do a better job of describing what exactly you are doing, and the study design for the reader. In addition, your ‘control’ (and I do not like using this term) group is not a community-based group, but rather a convenience sample of UWM non-faculty staff (born XX? etc.). In addition, in a case-control study, usually participants are recruited somewhat simultaneously over time. When were your study group participants in relationship to each other recruited?
      i. A better way to describe the study population, may be that this is a cross-sectional analysis of factors related to global brain volume, and that participants were recruited from WRAP and from the UWM community. WRAP participants were recruited to enrich the sample with those having a family history of AD, and UWM participants were selected with a similar age distribution as WRAP participants for adequate study comparisons. (Age must have been one of your inclusion criteria, yes?) Then the analyses proceed as you have them, and there is no discussion of cases and controls. You never do case-control analyses, and thus, do not mention cases and controls unless of course, this is a baseline analysis of a newly created case-control study.

   2. It is difficult to understand the sample size. In Methods, there are n=116. Then on page 8 there is a listing those who had incomplete data for various assessments. I am assuming these individuals were subtracted from the 116, but there are no sample numbers presented in the tables. In fact, the number of individuals included in the BMI classification in Table 1, totals 114.

   3. Eligibility requirements mentioned on p. 5, 4th line - are these the same as the criteria for inclusion in the paragraph at the bottom of page 5? If so, put these things together.

   4. New paragraph, page 5 – All subjects completed a detailed health q’re.....

   5. Information on stepwise regression analyses and the Baron method should be described in the
Statistics section and not in Results.

------------------------------------------------------------------------------------------------------------------------
Minor Essential Revisions (such as missing labels on figures, or the wrong use of a term, which the author can be trusted to correct)

1. Given the above discussion, an optional first sentence of the Results: ‘116 participants with a mean age of.... and cognitive testing for a cross-sectional study analyzing the brain and cognitive effects associated with risk factors for AD.’

2. New paragraph, page 5 – All subjects completed a detailed health q’re.....
3. Stat Analysis. It is the effect of BMI not affect.
4. Discussion, 2nd sentence. ‘.... the possible effect of on cerebral atrophy had not influenced cognition in participants with a high BMI.’ Not obese subjects. The analytical description suggests that BMI is entered as a continuous variable in regression models, and not categorical.
5. Table 1. Title could be clearer. E.g., Demographic and Cognitive Measures in 116 Men and Women.
6. Table 2. Why is age not included in Table 2? Also, why is BMI asterisked? Again, a better title would help to clarify contents of the table, and perhaps state that these results are based on a stepwise model.
7. Figure 1. Can you include the r and p-values?
8. Please use the term participants or subjects. Both are used in the current version.

------------------------------------------------------------------------------------------------------------------------
Discretionary Revisions (which the author can choose to ignore)

What next?: Unable to decide on acceptance or rejection until the authors have responded to the major compulsory revisions

Level of interest: An article of importance in its field

Quality of written English: Needs some language corrections before being published

Statistical review: No

Declaration of competing interests:

I declare that I have no competing interests.