Reviewer's report

Title: Postmenopausal hormones and sleep quality in the elderly: a population based study

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Reviewer: Riitta Luoto

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Tranah GJ et al: Postmenopausal hormones and sleep quality in the elderly: a population based study

Tranah et al study describes results concerning sleep quality indicators in a large population-based sample of elderly women. Although the sample is population based and hormone therapy users seem to be benefit from therapy, there are also major problems in the study. They are: the sample is highly selected due to the facts that only half of the original sample underwent sleep actigraphy and there may also be selective mortality since the age-group considered is quite high. Also there is lacking baseline information concerning sleep quality - not shown in the conclusions or in the text. Overall conclusion does not mention that two out of five sleep parameters favored HT therapy whereas in other three there were no differences between HT users and non-users.

Abstract:

- In results section please mention that actigraphy measurements were performed for approximately half of the original sample.

Introduction

- There are several different expressions concerning sleep quality in second paragraph, page 3. However, the word ‘quality’ is not found anywhere, only ‘sleep architecture’ and other versions. Please specify definition of sleep quality in this case.

- The references 7 and 28 including conflicting results on sleep quality are not described- what were the parameters studied in them and why did they not agree with other studies?

- The data base or methods used in measurements do not belong to the introduction, please delete and concentrate on hypothesis and aims of the study.

Material and methods

- How many women were excluded in the primary stage due to hip replacement or walking problems?
- It seems that there were no information available from sleep in the baseline questionnaires? Please specify.
- For how long current users had used HT (mean time)? How long time approximately past users had from their last use?
- Please give a reference to Sleep-watch-O validation study, now lacking from reference list.
- How large proportion of women were consistent HT users and how many inconsistent? The timing of visit 8 was years 2002-2004, during which time there were new results available concerning cardiovascular risks of HT. This may have influenced the number of current users.
- Physical activity was assessed by asking the number of blocks walked daily. Is it possible that there might be persons living in other surroundings without blocks- were there many missing responses for this question?
- In page 6, last lines it is mentioned that adjusted means of the sleep parameters were analyzed. However, in page 5, 3rd paragraph it is mentioned that parameters were analyzed as categorical.

Results
- In the first paragraph, 4th line- how much higher prevalence non-measured sample had several health conditions? Please specify which conditions they had.
- Since the mean age of the women was considerable high (84 years), the term ‘elderly’ could be changed to a more descriptive word
- In the second paragraph, on 9th line is written that current and past users of HT were more likely diagnosed with depression compared to never users. However, on Table 1 in GDS Score or antidepressant use there were very small differences between groups, not supporting this finding?

Discussion
- In the first paragraph the current study is told to be the first to evaluate sleep characteristics and long-term HT. However, later in the same paragraph the authors mention that majority of studies consider menopausal transition and sleep- but minority may overlap with this study age-group?
- Conclusions could mention the fact that only two out of five sleep parameters differed by HT status, thus more qualitative or other sleep indicators might also be needed to interpret the significance of the finding.
- Please discuss references 7 and 28 mentioned in the introduction- what were the parameters used in these studies?
- Second paragraph has a long discussion on biological mechanism. Although it is relevant for the proposed associations, it is quite lengthy and should be abridged on the basis that there is no empirical data on receptor level.
- Page 11, second paragraph, line 6 states that HT information was collected approximately every two years for 16 years time. This could be explained in the methods as well.
Conclusions

- Although limitations are well described in page 11, last paragraph, they are not conveyed to the conclusions stating that HT usage improves sleep quality. Age-group and limitations concerning 2 out of 5 sleep parameters should be mentioned as well.

- The last sentence has as a reference a study describing quality-of-life indicators, although vascular side-effects are discussed. A more appropriate reference considering cardiovascular effects should be found.

**Level of interest:** An article of limited interest

**Quality of written English:** Acceptable

**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