Reviewer’s report

Title: Behavioral symptoms in patients with Alzheimer's disease and their association with cognitive impairment.

Version: 1 Date: 26 August 2009

Reviewer: Robert Perneczky

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The authors report results of a study on behavioral and psychological symptoms of dementia (BPSD) in mild to severe Alzheimer’s disease (AD). The topic of the study is of general interest, although not very innovative. The large study sample is definitely a major advantage; however, I have some concerns regarding the study design, which are detailed below.

Major compulsory revisions:

1. Introduction: The introduction is quite short. I would suggest giving some more detailed information on the nature of BPSD in AD and elaborating on the rationale for the study. How could the enhanced understanding of BPSD improve the diagnostic and treatment of dementia? In my opinion, results of previous studies using the ADAS-noncog or the NPI scales to rate BPSD in AD (and their association with cognitive impairment) should also be referenced. The main aim of the study should be stated more precisely. Please use 'patients with AD' instead of 'AD patients' throughout the manuscript.

2. Methods (patient population): Was every eligible patient included in the study or where there any reasons for exclusion? How was the cut-off value for having or not having BPSD according to the ADAS-noncog defined?

Methods (Variables): Where the MMSE and ADAS-noncog scales applied at the same visit? If not, this could be a significant bias due to the alternating nature of BPSD. It is not entirely clear to me, why and when the three mentioned MMSE scores were obtained. How where the cut-off values on the MMSE defined? A value of 27 as the upper limit for AD seems quite high.

3. Results (population description): Did the group of patients who were excluded from the study due to missing ADAS-noncog scores differ from the population used for the statistical analyses? In my opinion, only between-group differences that survive a correction for multiple testing should be reported as significant. This is a major concern. There are definitely correlations between the reported BPSD (as shown in table 4).

4. Result (AD treatment): I am not sure how to interpret the last sentence of this section. Does it imply that there were no significant differences in medication use between the two study groups (with and ‘without’ BPSD). I am not entirely convinced that this suffices to exclude medication effects on BPSD frequencies and severities. This limitation should at least be discussed in more detail.
5. Discussion: In my opinion, the limitation section should be expanded (no correction for multiple testing, probable medication effects, …)

**Level of interest:** An article whose findings are important to those with closely related research interests

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

**Statistical review:** Yes, and I have assessed the statistics in my report.

**Declaration of competing interests:**

I declare that I have no competing interests.