Reviewer’s report

Title: Insights into the clinical management of the syndrome of supine hypertension - orthostatic hypotension (SH-OH): The Irish Longitudinal Study on Ageing (TILDA)

Version: 2 Date: 10 April 2013

Reviewer: Joshua Armstrong

Reviewer’s report:

General Points

In this paper, the authors have aimed to characterize orthostatic hypotension using data collected in the first wave of TILDA (The Irish Longitudinal Study on Aging), with particular attention to concurrent symptoms of orthostatic intolerance, prescribed medications, and association with history of faints and blackouts. To create morphological classifications of otherostatic hypotension, the authors the utilized a k-means clustering approach. Once the clusters were derived, trends across clusters were assessed using common statistical tests and multivariate logistic regression models were developed to predict cluster membership and other dependent variables.

While it is important to gain insights into potentially modifiable factors that can be used to prevent faints in older adults, the methods section in the manuscript requires some major revisions. While all of the results are based upon a k-means clustering analysis, the manuscript lacks in information about these analyses. These analyses were also performed in a previous paper (which was cited in the manuscript), however, this previous paper also did not contain enough relevant information on the k-means analyses. There were also some issues with the multivariate logistic regression models, outlined in the section below.

Major Compulsory Revisions

Methods Section: K-means Analyses

• In the manuscript, as well as in the associated paper that is cited in the methods section, it is not clear on how the authors determined the number of clusters (k). Was there a process to arrive at k=3? This information should be included in the methods section.
• For any cluster analyses, the variables that are selected to be included in the analysis greatly influence the clusters that are formed. What was process for determining which variables were included in the k-means analyses?
• Outliers can impact k-means analyses. What steps were taken to avoid the influence of outliers?
• Standardization of variables was reported to not have occurred in preparing the
data for analysis. How does this impact the results? Change in SBP is not in a similar range as the other variables...this may cause some variables to be more influential than others in the analyses. Some discussion of the choice not to standardize variables should be included in the methods. Furthermore, discussion of this problem should also be discussion in the limitations section.

Methods Section: Logistic Regression Models

- For the multivariate logistic regression models, how were the predictor variables chosen? Why they all were included in the model? What approaches to model selection were considered? It seems as if every potential was placed into a model. It may have been more appropriate to look at the predictor variables independently, or controlling for a minimum number of confounders, prior to developing a final model. Alternatively, automatic model selection techniques or other variable selection techniques may have been employed to determine the most powerful predictors of the outcomes of interest.
- With the large number of variables, is multicollinearity an issue? Where any model diagnostics checked? While little interpretation of the results were found within the manuscript, models containing such a large number of predictor variables are very difficult to interpret. How does this impact the findings of the paper?
- It is not clear what the elevated number of variables used in the models has to do with the cut off levels for p-values? Please elaborate.

Discussion Section

- The limitations section should include some points related to the statistical approaches utilized within the study.
- Some of the results from the logistic regression models should be interpreted with more caution due to the nature of how the multivariate logistic models were developed. The presence of the large number of covariates in the regression models should be mentioned when discussing the results.

Level of interest: An article of limited interest

Quality of written English: Acceptable

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

Declaration of competing interests:

I declare that I have no competing interests.