Reviewer's report

Title: Long-term CPAP treatment partially improves the link between cardiac vagal influence and delta sleep.

Version: 4 Date: 11 March 2013

Reviewer: Scott A Sands

Reviewer's report:

The authors have provided a comprehensive response to my comments, and I am pleased with the changes. I have a few new comments that are intended as helpful suggestions. The authors can be trusted to make the corrections/alterations as appropriate or ignore the discretionary comments if they feel strongly otherwise.

The authors work and responses have been a pleasure to review.

Regards,
Scott Sands, PhD

Major Compulsory Revisions
None

Minor Essential Revisions
(1) Change “...22:30 hours and waked spontaneously...” to “...22:30 hours and woke spontaneously...”
(2) Change “...converted in minutes” to “...converted to minutes”.

Discretionary Revisions
(3) Consider changing “relative influence of one system on the other” to “relative influence of one system versus the other on HRV”, if this is truly the intended message.
(4) Consider changing “Moreover, CPAP machine calculated the mean use duration” to “Moreover, the CPAP machine documented the mean duration of use”.
(5) Consider changing “...the link between cardiac vagal influence and delta sleep is mainly altered even in the absence of significant changes in spectral HRV components between apneic patients and healthy men” to “...the link between cardiac vagal influence and delta sleep is altered even in the absence of significant differences in mean spectral HRV components between apneic patients and healthy men”.
(6) Consider changing: “Our patients treated by nCPAP did not differ from
healthy controls in terms of HRV components across sleep stages and during the night. Nevertheless, all spectral HRV components were decreased in comparison to healthy men, except for an increase in HFnu. Across sleep stages, HFnu was increased while the LF/HF ratio was lower than that of controls. ...”

to

“Our SAHS patients treated by nCPAP did not differ significantly from healthy controls in terms of mean HRV components. Nevertheless, in treated SAHS compared to healthy subjects, there were strong trends towards lower absolute HRV values and increased HFnu (hence lowered LF/HF). Indeed, assessment within sleep stages revealed that treated SAHS patients exhibited consistent trends towards greater HFnu (lower LF/HF ratio) in each sleep state. ...”

Comments: Changes are suggested to (a) clarify that these comments are based on trends that were not confirmed statistically (but were large and consistent enough to warrant discussion), (b) LF/HF results were placed in parentheses since they are not independent confirmatory results from HFnu data, (c) “during the night” and “across sleep stages” were a little confusing as written (clarified below)

(7) Re: “In our results, cardiac sympathovagal activity of CPAP treated patients did not differ from that of healthy men, although HFnu, which reflects cardiac vagal predominance, increased during the night and across sleep stages compared to healthy controls without reaching statistical significance.”

Note that as written “…increased during the night and across sleep stages…” implies that the parameter of interest changed with time during the course of the night, and changed with sleep state. However the intended comparison is instead the subject population (treated SAHS vs controls). Please clarify e.g. :

“In our results, cardiac sympathovagal activity of CPAP treated patients did not differ from that of healthy men. However, HFnu, which reflects cardiac vagal predominance, tended to be greater compared to healthy controls without reaching statistical significance, a trend that was apparent whether we assessed HRV within individual sleep states or assessed the first 3 cycles of the night as a whole.”

(8) Consider changing:

“Thus, long-term nCPAP ameliorates the interaction between the relative cardiac vagal predominance of HRV and delta sleep EEG but did not improve the tightness of this link.”

to

“Thus, long-term nCPAP increases the strength of the interaction between the relative cardiac vagal predominance of HRV and delta sleep EEG but does not improve the tightness of this link.”

Comment: Can be helpful to provide directional descriptors (e.g. increases)
rather than qualitative ones (e.g. improves).

(9) Consider changing:
“Similar controversy was reported during first days of CPAP treatment use in apneic patients”
to
“Similar controversy was reported during the first days of CPAP treatment use in SAHS patients”

Comment: Minimizes the chance of readers thinking you are referring to apneic patients now as somehow different to SAHS patients, whereas the paragraph instead assesses ‘first few days’ effects as distinct from ‘long-term’ effects. I was guilty of this misinterpretation. Consistent terminology as suggested may be helpful.

(10) It might be helpful to place pseudo ‘units’ on Figure 2 panel b for gain (e.g. #DeltaPower/#HFnu) to make it faster for readers to know which variable is the input (#HFnu) and which is the output (#DeltaPower). I suggest this despite recognizing that there are no units for ratios of normalized parameters.

(11) Re. Figures: When the objective is to make between-group or time comparisons I prefer to see variability (error bars etc) described in the form of standard errors, rather than the SD values, so that the confidence in the mean of the sampled population is presented – standard errors enable readers like myself to see at first glance whether differences between means of group data are likely to be significant.

Level of interest: An article of importance in its field

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