



LETTER TO THE EDITOR

Reply to Micarelli et al. Commentary on The Balance of Sleep: Role of the Vestibular Sensory System



Dear Chief-Editor, Professor Vitiello,

We thank you for your request and for offering us the opportunity to send a response to the correspondence you received from Prof. Micarelli about our article « The Balance of Sleep: Role of the Vestibular Sensory System » [1].

In our article, the paragraph about the consequences of OSAS for vestibular function and posture is well supported by the literature even if the number of papers remains low. Consequently we did not cite all of the references relating to it but only some of them, in order to substantiate our claims.

We acknowledge Prof. Micarelli's request for further discussion of this issue and agree that it would have been ideal to add his recent paper [2] to the discussion in the article. His work adds a supplemental set of data that shows the consequences for the VOR and basic brainstem vestibular function and posture, of mild to severe OSAS. These authors showed a reduced VOR gain and an increase of body oscillation in a cohort of OSAS patients, combined with a positive correlation between the level of O₂ saturation and VOR gain and a negative correlation with low frequency body oscillation, and confirmed previous work on posture [3] cited in our article, and on vestibular function [4], not referenced in our paper, for example.

The second paper mentioned [5] has only just appeared on PubMed on Nov. 19th and could not be included before the publication of our review. This new paper reports interesting results as well.

Prof. Micarelli states that functional alterations of the vestibular nuclei may be an indicator of abnormal activity of the respiratory nuclei, considering their anatomical contiguity and the susceptibility of the posterior labyrinth to an hypoxic state. Here we have to be careful in dealing with this point: OSAS originates from a peripheral obstruction of the oropharyngeal airway, leading to central respiratory disturbances so that VOR impairments may only be an indirect indicator of respiratory nuclei activity. As he mentioned, vestibular nuclei interact with the respiratory muscles and nuclei through a complex brainstem network for postural breathing modulation, previously investigated [6–8] and reported in numerous others papers by Yates et al. Vestibular dysfunctions might be more related to a direct hypoxic effect (vestibular organ and nuclei) and/or sleep deprivation in OSAS. We did not mention data relating to sleep central apnea syndrome.

Yours Faithfully,

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.smr.2018.12.003>.

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