



LETTER TO THE EDITOR

New trends in otoneurological dysfunctions in OSA patients concerning “The balance of sleep: Role of the vestibular sensory system”



Dear Editor,

We have read the study by Besnard S et al. regarding mutual relationships between sleep deprivation and vestibular/postural impairment [1]. This topic has been discussed quite extensively in the review “The Balance of Sleep: Role of the Vestibular Sensory System” [1]. The review is in fact coherent with the notions that the vestibular system not only represents exclusive peripheral end-organ encoding for linear and angular head motion, but also that its inflows are involved in many high-level cortical functions involving spatial cognition and that influence neurovegetative and circadian rhythms via specific vestibulo-sympathetic efferences [2,3].

In this scenario, and on the basis of clinical/experimental studies describing influences of sensory consolidation and the impaired neuroplasticity on sleep deprivation [4,5], the authors indirectly confirmed that sleep acts on vestibular sensory information, since learning processes and neuroplasticity may modulate this information, along ascending pathways towards the vestibular and/or multisensory cortices.

In turn, when highlighting top-down postural and vestibular consequences originating from sleep-depriving conditions such as obstructive sleep apnea (OSA) in the review, the authors clearly found very few clinical studies. However, some advances have been recently found in a clinical research study in which Micarelli et al. described vestibulo-oculomotor reflex (VOR) and postural rearrangements for the first time, in a sample of moderate-to-severe OSA patients [6]. In this study, the quantitative analysis of VOR gain and spectral analysis of body sway on a force platform made it possible to discover postural impairments related to sleep deprivation. In particular, 32 moderate-to-severe OSA patients were found to be affected by a reduction in VOR gain when studied by means of video-head impulse test and by an increase in the power spectra of body oscillations within low-frequency domain when compared with matched healthy subjects. These findings have also been found to be related to vestibular discharge impairment in other peripheral and central vestibular illnesses [7]. These aspects have been further corroborated, in the above mentioned sample of OSA patients, by a positive and a negative correlation between mean SaO₂ and VOR gain and power spectra in a low frequency domain, respectively. These findings reinforced previous theories assessing 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 a hypoxic state [6].

In this scenario, we believe that the present findings might have been discussed in the review by Besnard et al. in order to extensively clarify possible mechanisms underpinning the relationship between sleep deprivation and postural control impairment, especially envisioning that prospective studies may shed further light on whether OSA treatment may also ameliorate otoneurological performances, as a consequence of the hypoxic state restoration phenomena [8].

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.smr.2018.12.002>.

References

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