

LETTERS TO THE EDITOR

Author response

Response to McCall WV. Alpha-1 adrenergic antagonists use increases the risk of sleep apnea: implications for understanding the role of prazosin in posttraumatic stress syndrome. *J Clin Sleep Med*. 2020;16(4):643. doi: 10.5664/jcsm/8296

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McCall highlights the controversial effect of prazosin in the treatment of post-traumatic stress disorder (PTSD) and its possible correlation with the development of sleep apnea.¹ There is growing evidence on the correlation between obstructive sleep apnea (OSA) and PTSD. The prevalence of OSA was ~50–67% among soldiers who experienced PTSD, which was 2 to 3 times higher than general population and may have aggravated the symptoms of PTSD. OSA has a negative impact on PTSD and the effective treatment of OSA is beneficial in symptom control of PTSD. A prospective cohort study enrolled 177 veterans with newly diagnosed moderate to severe OSA who received treatment with continuous positive airway pressure therapy. In a subgroup of patients with PTSD, the mean total PTSD Checklist score and reported nightmare frequency in the PTSD cohort decreased significantly after treatment.² The screening of OSA is therefore important among patients with PTSD.

In our nationwide population-based cohort study, we demonstrate that the use of α 1-adrenergic antagonists is associated with an increased risk of OSA. The possible mechanism is decreased genioglossus muscle activity secondary to decreased activity of the hypoglossal nerve. In a study focused on the human single motor unit (SMU) of genioglossus muscle, the discharge rate of genioglossus inspiratory phasic and inspiratory tonic SMUs was significantly slower and shorter during the phasic rapid eye movement (REM) stage compared with stage N2.³ It is reasonable to predict that the genioglossus muscle activity during REM sleep will be more vulnerable to the suppressive effect of α 1-adrenergic antagonists. The severity of sleep apnea during REM sleep has an important role in PTSD. In the study focused on the relationship between OSA and PTSD, patients in the PTSD subgroup had a significant apnea-hypopnea index (AHI) level during the REM stage.² Moreover, in a prospective case-control study, the AHI level in the REM stage was significantly higher in patients with nightmares than patients without nightmares. With logistic regression analysis, the AHI level in the REM stage is an

independent predictor for development of nightmares, which may further aggravate the symptoms of PTSD.⁴ In addition, the nocturnal hypoxia during an apnea episode in the REM stage may lead to a decline in hippocampal activity, which is also a possible trigger factor for nightmares and PTSD symptoms in patients with untreated OSA.⁵ In summary, the use of α 1-adrenergic antagonists may cause significant OSA events during REM sleep, which further lead to aggravated PTSD symptoms via significant hypoxia and increased nightmares.

However, our study is only focused on the association between the use of α 1-adrenergic antagonists and OSA; whether there is a causal relationship remains unknown. Further prospective study on the effect of α 1-adrenergic antagonists on the symptoms of PTSD and its correlation with data from polysomnography is needed.

CITATION

Su P-L, Lin C-Y, Lin S-H. Author response. *J Clin Sleep Med*. 2020;16(4):645–646.

ABBREVIATIONS

AHI, apnea-hypopnea index
OSA, obstructive sleep apnea
PTSD, post-traumatic stress disorder
REM, rapid eye movement
SMU, single motor unit

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SUBMISSION & CORRESPONDENCE INFORMATION

Submitted for publication December 13, 2019

Submitted in final revised form December 13, 2019

Accepted for publication December 13, 2019

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DISCLOSURE STATEMENT

This was not an industry-supported study. The authors report no conflicts of interest.