



# Comorbid insomnia and sleep apnea: a prevalent but overlooked disorder

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Dear Editor:

Comorbid insomnia and obstructive sleep apnea (OSA) was first described 45 years ago and was well characterized by Krakow and colleagues in 2001 [1–3]. Despite the realization that this comorbidity was under-recognized and had implications for disease-related outcomes, little has changed in the ensuing years [4]. In this issue of *Sleep and Breathing*, there are three articles in veteran populations which substantially further our understanding of this disorder.

Using a modification to the Insomnia Severity Index (ISI), Wallace et al. reported that 47% of US veterans who underwent an initial evaluation for OSA had insomnia. Specifically, they required a score  $\geq 6$  on the first three questions, which assesses difficulties in falling asleep, staying asleep, or awakening too early and are consistent with moderate insomnia symptoms. Another major finding from their study is that patients with comorbid early and late insomnia symptoms and OSA are less adherent to positive airway pressure (PAP) at 6 months. In the paper by El-Solh et al., the effect of insomnia on US veterans with posttraumatic stress disorder (PTSD) and OSA was assessed. They also used the ISI with the standard threshold score  $\geq 15$  to classify patients as having insomnia. In this study, veterans with comorbid insomnia were more likely to have depression, decreased quality of life, and worse sleep quality on polysomnography (PSG). Similar to the findings of Wallace et al., the veterans with comorbid insomnia, OSA, and PTSD were significantly less adherent to PAP and also had no

improvements in overall sleep quality. In the third paper, Rezaeitalab et al. found that insomnia, diagnosed by clinical interview, was the most frequent symptom in Iranian veterans with PTSD and OSA; this was despite nearly all patients taking medications for insomnia at the time of their evaluation.

There are a number of studies which report on the prevalence of comorbid insomnia and OSA with rates ranging from 13.8% in patients with moderate to severe OSA in a general sleep clinic to as high 90.9% in crime victims with nightmares and PTSD [2, 3, 5, 6]. The wide range in prevalence is in part due to the difference in patient populations, but another reason is the variation in study methodology. Studies assessing this comorbidity have typically taken one of two approaches, evaluating patients with known OSA for insomnia or patients with insomnia for the presence of sleep disordered breathing. The patient populations differ based on which diagnosis was initially studied and thus, which diagnosis is considered comorbid. The overlap of shared symptoms between the two conditions further complicates making the diagnosis. Utilization of different criteria to diagnose sleep apnea [7] as well as differing nocturnal and daytime features to diagnose insomnia, including self-reported symptoms [8] and objective PSG parameters [9], has also contributed to this variability.

The high prevalence of comorbid insomnia and OSA and significantly lower PAP adherence in patients with both disorders compared to OSA alone underscore the need for a standardized systematic approach to identifying and treating these sleep disorders when they co-occur. Several barriers to standardization exist. First, the nosology in the literature is inconsistent with terminology including OSA-insomnia [9], complex insomnia [2], and comorbid insomnia and OSA among others. This inconsistency creates confusion and further highlights the variability that exists in diagnosing comorbid insomnia and OSA. The recently used acronym “COMISA” for comorbid insomnia and sleep apnea conveys the presence of both conditions in a memorable and potentially unifying term [10].

Another barrier to recognizing COMISA is the absence of standard diagnostic criteria for this disorder. Wallace et al.

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This article is part of the Topical Collection on *Comorbid Insomnia and OSA (COMISA) in Veterans*

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used questions from the ISI that focused on nocturnal manifestations of insomnia as opposed to daytime characteristics that often overlap with symptoms of OSA whereas El-Solh used the standard cut-off score. Either of these straightforward approaches could be implemented for all patients undergoing a PSG for suspected OSA. Validating the method used by Wallace et al. or a similar questionnaire that assesses insomnia symptoms at the time of a PSG could ultimately lead to standardized diagnostic criteria for COMISA. However, the question remains regarding the corollary to this, as to how patients with insomnia should be evaluated for OSA. Is the best way to evaluate OSA in insomnia patients to use a validated questionnaire such as the Berlin or STOP-BANG, an attended in-lab PSG, or do we continue with current practice of obtaining a PSG when occult sleep disordered breathing is suspected and/or patients prove refractory to standard insomnia treatment?

Overall, adherence to PAP therapy in OSA remains sub-optimal, with most studies reporting rates of approximately 50% [11]. Certain populations have even lower adherence rates, noting adherence to PAP in patients with OSA and PTSD was 30.2 versus 55.1% in those with OSA alone [12]. Further, El Solh et al. revealed that patients with COMISA and PTSD had markedly less PAP adherence (32.9%) than those with OSA and PTSD (49.5%). Thus are the low rates of PAP adherence in patients with OSA and PTSD from PTSD, insomnia symptoms, or a combination of these disorders?

The assessment of comorbid insomnia, which is highly prevalent in OSA patients, both with and without behavioral medicine disorders, is not routine nor necessarily recommended in patients who are not adherent to PAP. In articles specifically addressing PAP adherence, references to insomnia are infrequent and limited, noting that “insomnia complaints are common in older adults and patients with insomnia may also have difficulty adapting to CPAP” or that insomnia can be a side effect of PAP [13, 14]. Similarly, many patients with insomnia have an inadequate response to pharmacologic therapy, as was present in the article by Rezaeitalab et al., and cognitive behavioral therapy for insomnia (CBTi). In a meta-analysis of CBTi in comorbid medical and psychiatric disorders, only 36% of patients were in remission after treatment [15]. Supporting the role that “occult” sleep disordered breathing is present in many patients with refractory insomnia is an article by Krakow et al. that reported 90% of nocturnal awakenings in patients with chronic insomnia only (no suspicion of OSA) were due to respiratory events [16]. Clearly, a higher clinical suspicion for COMISA is required in patients with sleep disturbances as their presentation is not always classic.

The optimal way to treat COMISA once it is identified has been an area of debate with evidence supporting a stepwise treatment approach beginning with OSA with PAP [17] or insomnia with CBTi [18] as well as concurrent combined therapy [19]. There is currently one

ongoing study evaluating CBTi followed by PAP, compared to concurrent CBTi and PAP versus PAP alone [20]. However, pending this and future studies, a multidisciplinary approach integrating behavioral sleep medicine would seem the most effective way to ensure that symptoms of both insomnia and OSA are addressed [21, 22]. Future research and guidelines should focus not only on a standardized approach to diagnose COMISA but also on determining the optimal way to treat this increasingly recognized phenomenon in sleep medicine. As insomnia and OSA are the two most prevalent sleep disorders, it may be appropriate to evaluate all patients with sleep disturbances for COMISA.

**Compliance with ethical standards** No clinical trial was performed.

**Conflict of interest** The authors declare that they have no conflict of interest.

**Disclaimer** The opinions and assertions in this manuscript are those of the authors and do not represent those of the Department of the Air Force, Department of Defense, or the US government.

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