

COMMENTARY

Sleep touches everything

Commentary on Mok EM, Greenough G, Pollack CC. Untreated obstructive sleep apnea is associated with increased hospitalization from influenza infection. *J Clin Sleep Med*. 2020;16(12):2003–2007. <https://doi.org/10.5664/jcsm.8744>

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Sleep medicine has a peculiarity that does not seem to exist in other medical specialties. Although being very narrowly focused on sleep and its effects, the number of other organ systems and processes that affect and are affected by sleep is very wide. This is reflected in the number of primary specialties represented in sleep medicine. In this issue of the *Journal of Clinical Sleep Medicine*, we have another example of sleep impacting the immune system.

Mok et al¹ report their retrospective study of the effect of obstructive sleep apnea (OSA) on hospitalization from influenza. The interaction of sleep and the immune system has been evaluated before,^{2–7} but these studies are generally limited in their importance because they demonstrate only that markers of good immune function and response to antigens are impaired with sleep deprivation and fragmentation. An increased risk of infection or poor patient outcomes because of immunologic impairment related to sleep disorders is scant. To our knowledge, only 1 human study has previously demonstrated an adverse patient outcome—increased susceptibility to the common cold—related to immune dysfunction and sleep deprivation.⁸

This study uses the presence of OSA as a marker for sleep disruption, which is a reasonable choice. OSA is well known to cause fragmented and nonrestorative sleep. Mok and his co-authors looked at patients that had OSA and were diagnosed with influenza infection and evaluated the relationship between continuous positive airway pressure (CPAP) adherence and hospitalization for influenza and other complications. The most important finding was that the patients that were nonadherent to CPAP were more likely to be hospitalized than those adherent to CPAP. The odds ratio of 4.7 (95% confidence interval, 1.3–19.5) is impressive, although because of the relatively small numbers, the confidence interval is wide. A more precise estimate of the risk of influenza hospitalization with CPAP non-adherence will need a larger study to further answer this question.

We know that the effects of OSA vary based on the severity level.⁹ An interesting finding in this study was that the odds of influenza hospitalization did not vary significantly with OSA severity. This lack of a differential effect could be because of small sample sizes in this study, or there may be another unidentified factor unrelated to or poorly related to OSA severity.

The documented influenza vaccination rates in the 2 study groups did not vary significantly, and the CPAP nonadherent group actually had a higher vaccination rate than the CPAP adherent group. Interestingly, this finding is at odds with the healthy-user effect seen in other CPAP adherence studies, where CPAP adherent patients were more adherent to other health care recommendations. That the vaccine did not protect these patients from hospitalization is somewhat expected because data on the influenza vaccine during the time these data were collected showed that the influenza A vaccine component was somewhat less effective than expected,¹⁰ and most of the hospitalizations in the study were caused by influenza A infection.

One of the biggest hurdles to overcome when conducting retrospective research is what to do with incomplete data. This study had complete and accurate data for only 53 of the 231 medical records they reviewed. There were 24 patients with OSA and influenza that lacked CPAP adherence information; of these, 5 (21%) were admitted for influenza infection. If it is assumed that these patients were nonadherent to CPAP use, the true odds ratio would be decreased somewhat.

Overall, this article is a welcome addition to the medical literature on sleep and immunology. It provides evidence of an additional benefit of CPAP and demonstrates the importance of high-quality sleep in adequate quantity. With this study, future research on the impact of sleep on immune function has a firm foundation. One wonders what impact CPAP use might have on the outcomes of other respiratory infections. In particular, data on patients hospitalized with SARS-CoV-2 infections are abundant and would be interesting to evaluate. Studies using that information may shed light on the variability of outcomes in patients with COVID-19 infections. Mok et al are to be commended for sharing this evidence of the wide-ranging importance of restful sleep.

CITATION

Robertson BD, Collen JC. Sleep touches everything. *J Clin Sleep Med*. 2020;16(12):1997–1998.

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DISCLOSURE STATEMENT

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