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OSA as a probable risk factor for severe COVID-19.

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LETTERS TO THE EDITOR

OSA as a probable risk factor for severe COVID-19

Response to Salles C, Mascarenhas Barbosa H. COVID-19 and obstructive sleep apnea. *J Clin Sleep Med*. 2020;16(9):1647. doi:10.5664/jcsm.8606

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It is prudent to examine whether patients with obstructive sleep apnea (OSA) are at risk for severe COVID-19. Salles et al,[1] we, and others believe there are mechanistic links between OSA and COVID-19 severity. First, severe COVID-19 and OSA share common risk factors: obesity, cardiovascular disease, hypertension, diabetes, age, and male sex. In severe COVID-19 cases, pulmonary infection by the SARS-CoV-2 virus results in massive infiltration of proinflammatory monocytes and neutrophils, leading to acute respiratory distress syndrome, sepsis, and death. As Salles et al[1] pointed out, sleep deprivation increases interleukin-6, interleukin-17, and tumor necrosis factor-α that promote inflammatory activity in neutrophils. Elevated interleukin-6 and tumor necrosis factor-α are implicated in severe COVID-19. Mechanistically, sleep disruption promotes the infiltration of neutrophils and monocytes to the sites of inflammation.[2] In various animal models of sepsis, sleep disruption by sleep fragmentation, intermittent hypoxia, or rapid eye movement sleep deprivation led to high mortality after septic challenge. Furthermore, mice deficient in a neuron-specific receptor responsible for homeostatic sleep were more susceptible to influenza viral challenge.[3] Adequate sleep is protective during sepsis and pulmonary infection, which is a notion supported by epidemiologic studies. Last, OSA leads to dysregulation of the renin-angiotensin-aldosterone axis, further providing a potential link in viral entry through angiotensin-converting enzyme (ACE)-2 receptors. Taken together, there is a strong biological plausibility linking OSA with an increased risk of severe COVID-19.

The Coronavirus Sars-Cov2 & Diabetes Outcomes study (CORONADO) is one of the first studies that provides evidence associating OSA to the severity of COVID-19.[4] CORONADO is a multicenter observational study in France that analyzed data from 1317 patients with diabetes hospitalized for COVID-19. Patients classified as treated OSA before admission had a higher odds ratio of death by day 7 (adjusted odds ratio, 2.65), suggesting that a diagnosis of OSA is an independent risk factor for poor COVID-19 outcome. It is important to note that the patients in this study were not evaluated for undiagnosed or untreated OSA. One would hypothesize a worse outcome if patients with COVID-19 have underlying untreated OSA. If the evidence supports the hypothesis that OSA worsens COVID-19 outcomes, then we have tools to intervene. Newly diagnosed patients with somnolent OSA should be treated. Screening patients who have been hospitalized with COVID-19 with tools such as the STOP-BANG questionnaire could identify patients at risk for adverse outcomes. Finally, adequate sleep is essential for developing a robust and long-lasting adaptive immunity.[5] Optimal sleep is crucial for survivors of COVID-19 and for our society in building herd immunity with vaccination against the SARS-CoV-2 virus. Research into links between OSA and COVID-19 is thus urgently needed.

CITATION

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