



Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.



Letter to the Editor

An early prevention of hypoxemia in COVID-19 patients complaining obstructive sleep apnea



We read with interest the paper of Hariyanto and Kurniawan about obstructive sleep apnea (OSA) and outcomes from COVID-19 disease [1].

The most dreadful complication during of COVID-19 is the cytokine storm (CS). Dr. Machado has called the attention about the close relationship between hypoxemia and the CS, suggesting the needs to prevent periods of hypoxemia in early stages of COVID-19. This is even more crucial in patients who suffer OSA [2,3].

OSA is commonly related to obesity, which is considered an important risk factor for severe COVID-19. OSA leads to repetitive airway collapse with apnea/hypopnea and hypoxia during sleep. Hypoxia/re-oxygenation during each apnea episode in OSA patients worsens hypoxemia aggravating the CS [2].

Nonetheless, considering a day-by-day clinical evolution, short and slight periods of hypoxemia begin even since the first day, when persistent cough and/or short breath begin. Afterward, the breathing difficulty might worsen leading to an augmentation of periods of hypoxemia. Persistent cough, amongst other symptoms, has been considered a strong predictor of disease worsening. Hypoxia-inducible factor-1 α (HIF-1 α) and nuclear factor- κ B (NF- κ B) are two hypoxia-responsive transcription factors fully involved on the triggering effect of hypoxemia on CS development [2–5].

The use of continuous positive pressure (CPAP) equipment is providing growing evidence that this non-invasive (NIV) method may benefit patients early in the disease's progression, preventing acute respiratory distress syndrome (ARDS) and reducing the need for invasive ventilation [2,3].

Hence, we strongly recommend to use CPAP as a NIV ventilation in the early stage of COVID-19 clinical course, when the first respiratory symptoms appear, during care outside of intensive care units. Moreover, it is extremely important an early diagnosis of OSA in COVID-19 patients [2], using simple forms such as the STOP-Bang questionnaire [1].

OSA contributes to increased hypoxemia, further triggering the CS leading to ARDS, multiorgan failure and death [2,3].

Conflict of interest

The ICMJE Uniform Disclosure Form for Potential Conflicts of Interest associated with this article can be viewed by clicking on the following link: <https://doi.org/10.1016/j.sleep.2021.05.045>.

References

- [1] Hariyanto TI, Kurniawan A. Obstructive sleep apnea (OSA) and outcomes from coronavirus disease 2019 (COVID-19) pneumonia: a systematic review and meta-analysis. *Sleep Med* 2021;82:47–53.
- [2] Machado C. Dangers and management of obstructive sleep apnea syndrome in COVID-19 patients. *MEDICC Rev* 2021;23(2). <https://doi.org/10.37757/MR2021.V23.N1.17>.
- [3] Machado C. Early prevention of hypoxemia (Response to Peter S. Kim, Sarah W. Read, Anthony S. Fauci). Therapy for early COVID-19: a Critical need. *JAMA* November 11, 2020. Published online, <https://doi:10.1001/jama.2020.22813>.
- [4] Saeed H, Osama H, Madney YM, et al. COVID-19; current situation and recommended interventions. *Int J Clin Pract* 2021 May;75(5):e13886. <https://doi:10.1111/ijcp.13886>.
- [5] Vanderhaeghen T, Vandewalle J, Libert C. Hypoxia-inducible factors in metabolic reprogramming during sepsis. *FEBS J* 2020;287(8):1478–95.

Calixto Machado*

Institute of Neurology and Neurosurgery, Department of Clinical Neurophysiology, Havana, Cuba

Brandon Brock

Texas Woman's University, Department of Ph.D. Studies, Denton, TX, USA

Yanín Machado, Mauricio Chinchilla

Institute of Neurology and Neurosurgery, Department of Clinical Neurophysiology, Havana, Cuba

* Corresponding author. Institute of Neurology and Neurosurgery, Department of Clinical Neurophysiology, 29 y D, Vedado, La Habana, 10400, Cuba.

E-mail address: braind@infomed.sld.cu (C. Machado).

18 May 2021

Available online 7 June 2021