



Rebuttal to “Sleep EEG Signatures in COVID-19 Survivors: A Facemask/COVID-19-Induced Comment”

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Although wearing mask may alter physiological emotions which may include yawning [3]. As per recent study by Shein et al., there is no evidence that mask induces hypoxia or hypercarbia and risk of pathologic gas exchange impairment with cloth masks and surgical masks is near-zero in the general adult population [4].

Yawning behavior in humans remains undeciphered mysterious physiology. Behavioral studies and electroencephalographic (EEG) recordings of brain activity before and after yawning have provided consistent evidence that yawning occurs during states of low vigilance; thus, often yawning is correlated with sleepiness. However, studies analyzing autonomic nervous activity and EEG-based indices of vigilance in yawning subjects did not find specific autonomic activations or increased arousal levels after yawning [5]. Walusinski O have described evolutionary similarities with onset of yawning as well as course and duration of REM sleep [6]. However, quality of REM and EEG wave patterns associated with reduced yawning could not be found on extensive data search.

The EEG changes seen in patients with COVID-19 in our study were not commonly seen in patients with OSA and hypersomnia before pandemic. So, we do not agree with your hypothesis of “yawning-induced bias”, otherwise

patients with OSA (who do not nap during day) should also have similar changes in EEG. Correlation between yawning and its effects on normal and abnormal EEG wave pattern and its clinical significance may require extensive animal as well as human studies but cannot be denied as rightly mentioned by the author [2].

Author Contributions KS: manuscript writing. AG: manuscript writing.

Declarations

Conflict of Interest KS: no financial support or conflict of interest. AG: no financial support or conflict of interest.

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This reply refers to the comment available online at <https://doi.org/10.1007/s41782-021-00186-w>. Dear Dr. Rastmanesh, Thank you for your analytical views regarding our research paper “Sleep EEG Signatures in COVID-19 Survivors” [1]. We thank you for suggesting and adding useful points to our conclusion and providing a consolidated overview [2].

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