

Impacts of the COVID-19 Pandemic and Gender Differences on Sleep Test Results

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Objective: The COVID-19 pandemic not only casted massive impacts on the general medical conditions of global populations, but also raised great concern about mental health (Vindegaard and Benros, 2020). In a meta-analysis that comprised 345,270 participants from 39 countries, prevalence of sleep problems was reported to be 18% among the general population (Alimoradi et al., 2021). However, there are limited reports regarding gender differences of sleep test results under the impact of COVID-19 pandemic.

Methods: 200 participants who received in-laboratory sleep studies at our sleep center were recruited before and after the onset of pandemic respectively (i.e. 31th May, 2021). Participants were only included for age between 20 to 70 years old. Participants who only received continuous positive airway pressure (CPAP) titration during their visits and those who kept habit of alcohol-drinking were excluded. Participants did not have active COVID-19 infection when they received sleep tests. Different parameters were collected from the sleep tests, which included Pittsburgh Sleep Quality Index (PSQI), Epworth Sleepiness Scale (ESS), Insomnia Severity Index (ISI), total sleep time (TST), time in bed (TIB), sleep onset latency (SOL), rapid eye movement sleep onset latency (ROL), wake time after sleep onset (WASO), sleep efficiency (SE), apnea-hypopnea index (AHI), leg movements (LM), periodic limb movement index (PLMI), percentage of N1/N2/N3/REM sleep, and arousal index. The participants were then stratified by gender, and adjusted for age and body mass index (BMI). General linear model was performed to examine if the results of sleep tests were different before and after the onset of pandemic.

Results: 166 male participants (76 before and 90 after pandemic) and 75 female participants (38 before and 37 after pandemic) were included in the analysis. After correcting for age and BMI, there was no significant difference in sleep test results before and after the pandemic among male participants. Significant differences before and after the pandemic in TIB (mean before pandemic: 433 min, after pandemic: 423 min, $p=0.038$), LM (mean before pandemic: 17.8, after pandemic: 32.7, $p=0.039$), arousal index (mean before pandemic: 19.0, after pandemic: 21.6, $p=0.013$) were found among female participants.

Conclusion: As compared with baseline before pandemic onset, statistically significant reduction in TIB, increase in LM and arousal index were found in female participants who received sleep tests at our sleep center after pandemic onset.

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