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Sleep apnea associated with increased risk for long COVID

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Sleep apnea may significantly increase the risk for long COVID in adults, according to a study led by the National Institutes of Health's RECOVER Initiative and supported by NYU Langone Health as home to

the effort's Clinical Science Core (CSC).

As of April 2023, more than 100 million Americans had been infected with the virus that causes COVID-19. As of April the U.S. Government's Household Pulse survey estimated that about 6 percent of U.S. adults are experiencing symptoms associated with long COVID, including brain fog, fatigue, depression, and sleep problems.

Past studies have shown that patients with obstructive sleep apnea (OSA) tend to have more severe illness when initially infected with COVID-19. OSA affects about 1 in 8 adults but is often underdiagnosed.

To better understand links between sleep apnea and long-term COVID symptoms, the research team reviewed data across three RECOVER research networks of patients who had tested positive for COVID-19 between March 2020 and February 2022, according to their health records.

Two networks included adult patients—the National Patient-Centered Clinical Research Network (PCORnet) with 330,000 patients—and the National COVID Cohort Collaborative (N3C) with 1.7 million patients. The third patient cohort in the study analysis included the pediatric-focused network PEDSnet, made up of 102,000 children.

Published in the journal *Sleep*, this study found that a prior diagnosis of sleep apnea in the PCORnet group came with a 12 percent increase in risk for long-term symptoms months after patients' initial infections. In the N3C patient group, in which patients had higher levels of other chronic conditions than those in PCORnet, sleep apnea came with a 75 percent increase in risk for long COVID compared to those without sleep apnea.

The observed increases in risk for long COVID in adults with sleep

apnea remained significant even when the research team accounted for obesity, hypertension, diabetes, and hospitalization at the time of their initial COVID infection, all known to independently contribute to risk for long COVID.

The researchers hypothesize that the differences in the percentage increases in long COVID risk between the study groups may be further explained by variations in definitions of long COVID, study populations, and in analysis methods of patient records, across the large study. In contrast to the patterns seen in adults, the contribution of sleep apnea to the risk of long COVID disappeared in children when the researchers controlled for other risk factors, including obesity.

"A strength of the work is that the link between sleep apnea and long COVID persisted regardless of how the researchers in our study defined long COVID or gathered data," says senior study author Lorna Thorpe, Ph.D., MPH, Professor and Director of the Division of Epidemiology at NYU Langone Health.

She is also co-lead of efforts to understand long COVID using electronic health record networks for the RECOVER CSC at NYU Langone. "This study is the first collaboration of this focus and scale to find that adults with sleep apnea are at greater risk for long COVID."

RECOVER—Researching COVID to Enhance Recovery—is dedicated to understanding why some people develop long-term symptoms following a COVID infection, and how to detect, treat, and prevent long COVID. As the CSC, NYU Langone Health is charged with integrating research activities of clinical sites around the country.

"There's still so much to uncover about long COVID, but this study will inform clinical care by identifying patients that should be watched more closely," says corresponding author Hannah Mandel, a senior research

scientist for the electronic health record studies arm of the RECOVER CSC at NYU Langone Health. "People with sleep apnea who get infected with COVID should seek early treatment, pay attention to their symptoms, and keep up with their vaccinations to lower the risk of infection in the first place."

Interestingly, in the N3C study group, long COVID risk was higher among women with sleep apnea compared to men with sleep apnea. Investigators identified an 89% increased likelihood for having long COVID in women, compared to a 59% increased chance for men. The reasons for this are not clear, but women with diagnosed sleep apnea in their medical records may have more severe conditions than men, in part because women with sleep apnea tend to go undiagnosed with OSA for longer.

More information: Hannah Mandel et al, Risk of post-acute sequelae of SARS-CoV-2 infection associated with pre-coronavirus disease obstructive sleep apnea diagnoses: an electronic health recordbased analysis from the researching coronavirus disease to enhance recovery initiative, *Sleep* (2023). DOI: 10.1093/sleep/zsad126

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