COVID-19-associated seizures may be common, linked to higher risk of death

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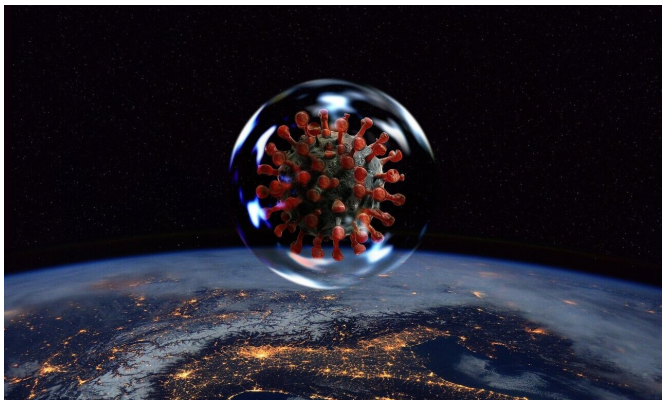

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COVID-19 can have damaging effects on multiple organs in the body, including the brain. A new study led by investigators at Massachusetts General Hospital (MGH) and Beth Israel Deaconess Medical Center (BIDMC) indicates that some hospitalized patients with COVID-19 experience non-convulsive seizures, which may put them at a higher risk of dying. The findings are published in the *Annals of Neurology*.

"Seizures are a very common complication of severe critical illness. Most of these seizures are not obvious: Unlike seizures that make a person fall down and shake, or convulse, seizures in critically ill patients are usually nonconvulsive," explains co-senior author M. Brandon Westover, MD, Ph.D., an investigator in the Department of Neurology at MGH and director of Data Science at the MGH McCance Center for Brain Health. "There is increasing evidence that non-convulsive seizures can damage the brain and make outcomes worse, similar to convulsions."

Westover notes that there have been only a few small reports of seizures in patients with severe COVID-19 illness, and it was previously unclear whether such seizures primarily occur in patients who already have a seizure disorder or whether they can arise for the first time because of COVID-19. The effects of such seizures on patients' health was also unknown.

To provide insights, Westover and his colleagues analyzed medical information for 197 hospitalized patients with COVID-19 who underwent electroencephalogram (EEG) monitoring—tests that detect electrical activity of the brain using small metal discs attached to the scalp—for various reasons at nine institutions in North America and Europe.

The EEG tests detected nonconvulsive seizures in 9.6% of patients, some of whom had no prior neurological problems. Patients who had seizures needed to be hospitalized for a longer time, and they were four times more likely to die while in the hospital than patients without seizures—suggesting that neurological complications may be an important contributor to the morbidity and mortality associated with COVID-19.

"We found that seizures indeed can happen in patients with COVID-19 critical illness, even those without any prior neurologic history, and that they are associated with worse outcomes: higher rates of death and longer hospital stay, even after adjusting for other factors," says co-senior author Mouhsin Shafi, MD, Ph.D., an investigator in the Department of Neurology at BIDMC, medical director of the BIDMC EEG laboratory, and director of the Berenson-Allen Center for Noninvasive Brain Stimulation. "Our results suggest that patients with COVID-19 should be monitored closely for nonconvulsive seizures. Treatments are available and warranted in patients at high risk; however, further research is needed to clarify how aggressively to treat seizures in COVID-19."

More information: Lu Lin et al, Electroencephalographic Abnormalities are

Common in COVID ?19 and are Associated with Outcomes, *Annals of Neurology* (2021). DOI: 10.1002/ana.26060

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