

To Brain Injury Markers COVID-19 Causes Lasting Cognitive Impairment Tied

Researchers assessed one-year cognitive, biomarker, and neuroimaging outcomes in post-hospitalization [coronavirus disease 2019](#) (COVID-19) patients and identified factors linked to cognitive deficits and recovery.



Study

Patients aged 16 and older were recruited over 19 months (March 2021-October 2022) from 17 United Kingdom (UK) sites through the COVID-Central Nervous System (CNS) study, part of the [National Institute of Health Research](#) (NIHR) COVID-19 BioResource. Informed consent was provided by participants or their next of kin.

The study included hospitalized COVID-19 patients without prior neurological diagnoses, with or without acute neurological or psychiatric complications (NeuroCOVID and COVID groups, respectively). The NeuroCOVID group was identified through neurology referrals or clinician notification, while the COVID group was matched by age, ethnicity, sex, [COVID-19 severity](#), and admission epoch. Some patients attended the emergency department but were not hospitalized.

Participants completed a cognitive assessment (Cognitron) between 1 to 26 months post-discharge. This included computer-based cognitive tasks across five domains, blood sampling for brain injury markers, and [Magnetic Resonance Imaging](#) (MRI) scans. Subjective cognitive impairment was assessed through a binary question. Brain injury markers, such as Neurofilament Light Chain (NfL), Ubiquitin Carboxyl-terminal Hydrolase L1 (UCH-L1), Tau Protein (Tau), and Glial Fibrillary Acidic Protein (GFAP), were measured in serum using specialized kits. Cognitive performance was compared to a normative community sample of 2,927 individuals matched for demographic factors. Neuroimaging analysis involved grey matter, white matter, and cerebrospinal fluid volume measurements from MRI scans. Data were analyzed using standardized protocols, and multiple regression models were developed to assess cognitive outcomes.

Findings

The study analyzed 351 COVID-CNS participants alongside a control group of 2,927 individuals matched by age, sex, first language, and education. Participants had no prior neurological diagnoses and were assessed at a median of 384 days post-COVID-19, with evaluations including cognitive testing, self-reported measures, [neuroimaging](#), and serum sampling. The cohort had a median age of 54 years, with 58% male and 78% white ethnicity. Among them, 29% experienced severe COVID-19 symptoms. At the time of post-acute assessment, 84% had received two

vaccine doses, while 54% had neurological or psychiatric complications (NeuroCOVID group), and 46% did not (COVID group).

Based on their demographics, cognitive testing revealed that both groups performed significantly worse than expected. The deficits were global, spanning multiple cognitive domains, with those affected by encephalopathy showed the greatest deficits, followed by [cerebrovascular](#) and inflammatory complications. Memory concerns were significantly associated with greater objective deficits in both groups, with a notable increase in memory concerns post-COVID. Both subjective concerns and objective impairments in memory were strongly concordant, supporting the reliability of self-reported symptoms. Cognitive impairment was found to be generalized across all domains without evidence of domain-specific deficits. Recovery of cognitive performance showed some improvement early after discharge but plateaued during follow-up, with no significant further recovery observed between later assessments, indicating persistent cognitive deficits.

Conclusion

To summarize, this prospective national study of 351 hospitalized COVID-19 patients, with and without neurological complications, found significant post-acute cognitive deficits compared to 2,927 matched controls. These deficits were associated with elevated [brain injury](#) markers and reduced grey matter volume.

Unlike earlier studies that focused on dysexecutive syndromes, this research revealed broad, global cognitive impairment, even in patients without neurological complications. Cognitive deficits were linked to the severity of the initial infection, post-acute [mental health status](#), and COVID-19-associated encephalopathy. Despite some improvement at early follow-ups, recovery plateaued, leaving patients with persistent impairments one year after infection. The findings suggest immune-mediated brain injury and highlight the need for targeted therapies.

Source:

<https://www.news-medical.net/news/20240926/COVID-19-causes-lasting-cognitive-impairment-tied-to-brain-injury-markers.aspx>