COVID May Have Broken Every Brain On Earth

A planet of madmen caused by COVID's permanent brain damage

Have you noticed that there are more ‘crazy” people around? More looney toons politicians...More public outbursts on public transport... More nut cases wandering around the streets... More social violence in relationships. More marital murders?

Long COVID can lead to significant brain damage, including cognitive impairments such as memory problems and reduced brain volume. Studies have shown that individuals who have had COVID-19 may experience long-lasting effects on brain health, resembling cognitive decline associated with aging.

Months after a bout with COVID-19, many people are still struggling with memory problems, mental fog and mood changes. One reason is that the disease can cause long-term harm to the brain.

"A lot of people are suffering," says Jennifer Frontera, a neurology professor at the NYU Grossman School of Medicine.

Frontera led a study that found that more than 13% of hospitalized COVID-19 patients had developed a new neurological disorder soon after being infected. A follow-up study found that six months later, about half of the patients in that group who survived were still experiencing cognitive problems.

The current catalog of COVID-related threats to the brain includes bleeding, blood clots, inflammation, oxygen deprivation and disruption of the protective blood-brain barrier. And there's new evidence in monkeys that the virus may also directly infect and kill certain brain cells.

Studies of brain tissue suggest that COVID-related changes tend to be subtle, rather than dramatic, says Geidy Serrano, director of the laboratory of neuropathology at Banner Sun Health Research Institute. Even so, she says, "Anything that affects the brain, any minor insult, could be significant in cognition."

Some of the latest insights into how COVID-19 affects the brain have come from a team of scientists at the California National Primate Research Center at UC Davis.

When COVID-19 arrived in the U.S. in early 2020, the team set out to understand how the SARS-CoV-2 virus was infecting the animals' lungs and body tissues, says John Morrison, a neurology professor who directs the research center.

But Morrison suspected the virus might also be infecting an organ that hadn't yet received much attention.

"Early on, I said, 'let's take the brains,' " he says. "So we have this collection of brains from these various experiments and we've just started to look at them."

One early result of that research has generated a lot of interest among scientists.

"It's very clear in our monkey model that neurons are infected," says Morrison, who presented some of the research at the Society for Neuroscience meeting in November.

Neurons are the brain cells that make thinking possible. But studies of human brains have produced conflicting evidence on whether these cells are being infected by the virus.

The monkey brains offer an opportunity to learn more because they come from a close relative of humans and are easier to study and scientists know precisely how and when each animal brain was infected.

The monkey model isn't perfect, though. For example, COVID-19 tends to produce milder symptoms in these animals than in people.

Even so, Morrison says, scientists are likely to find infected human neurons if they look closely enough.

"We're looking at individual neurons at very high resolution," he says, "so we can see evidence of infection."

The infection was especially widespread in older monkeys with diabetes, he says, suggesting that the animals share some important COVID-19 risk factors with people.

In the monkeys, the infection appeared to start with neurons connected to the nose. But Morrison says that within a week, the virus had spread to other areas in the brain.

"This is where you get into some of the neurologic symptoms that we see in humans," he says — symptoms such as cognitive impairment, brain fog, memory issues and changes in mood. "I suspect that the virus is in the regions that mediate those behaviors."

That hasn't been confirmed in people. But other researchers have found evidence that the virus can infect human brain cells.

A draft of a study of brains from 20 people who died of COVID-19 found that four contained genetic material indicating infection in at least one of 16 areas studied.

And, similar to monkeys, the virus seemed to have entered through the nose, says Serrano, the study's lead author.

"There's a nerve that is located right on top of your nose that is called the olfactory bulb," she says. That provides a potential route for virus to get from the respiratory system to the brain, she says.

Serrano says the virus appears able to infect and kill nerve cells in the olfactory bulb, which may explain why many COVID patients lose their sense of smell — and some never regain it.

In other brain areas, though, the team found less evidence of infection.

That could mean that the virus is acting in other ways to injure these areas of the brain.

For example, studies show that the virus can infect the cells that line blood vessels, including those that travel through the brain. So when the immune system goes after these infected cells, it could inadvertently kill nearby neurons and cause neurological problems, Serrano says.

COVID-19 can also damage the brain by causing blood clots or bleeding that result in a stroke. It can damage the protective cells that create what's known as the blood-brain barrier, allowing entry to harmful substances, including viruses. And the disease can impair a person's lungs so severely that their brain is no longer getting enough oxygen.

These indirect effects appear to be a much bigger problem than any direct infection of neurons, Frontera says.

"People have seen the virus inside of brain tissue," she says. "However, the viral particles in the brain tissue are not next to where there is injury or damage," she says.

Frontera suspects that's because the virus is a "bystander" that doesn't have much effect on brain cells. But other scientists say the virus may be cleared from brain areas after it has caused lasting damage.

Researchers agree that, regardless of the mechanism, COVID-19 presents a serious threat to the brain.

Frontera was part of a team that studied levels of toxic substances associated with Alzheimer's and other brain diseases in older COVID-19 patients who were hospitalized.

"The levels were really high, higher than what we see in patients that have Alzheimer's disease," Frontera says, "indicating a very severe level of brain injury that's happening at that time."

It's not clear how long the levels remain high, Frontera says. But she, like many researchers, is concerned that COVID-19 may be causing brain injuries that increase the risk of developing Alzheimer's later in life.

Even COVID-19 patients who experience severe neurological problems tend to improve over time, Frontera says, citing unpublished research that measured mental function six and 12 months after a hospital stay.

"Patients did have improvement in their cognitive scores, which is really encouraging," she says.

But half of the patients in one study still weren't back to normal after a year. So scientists need to "speed up our processes to offer some kind of therapeutics for these people," Frontera says.

In a study called: Long-term Effect of COVID on the Brain: Systemic Review and Meta-analysis (P10-15.004) by scientists Toka Elboraay, Hadeer Elsaeed AboElfarh, Mohamed Elmallahy, Lena Said Mansour, Heba Ahmed Aboeldahab, Ahmed Khaled Abd Eltawab, Rehab Adel Diab, Shrouk F. Mohamed, Ahmed Negida, and Mahmoud A. Ebada; they uncovered the horrible facts.

They aimed to systematically evaluate the long-term neurological effects of COVID-19 among recovered patients, to help in planning in the pandemic recovery phase.

During the early stages of the COVID-19 pandemic, neuropsychiatric symptoms emerged as a prominent feature of coronavirus outbreaks. However, the persistence of neurological symptoms in the post-acute and chronic phases remained unclear.

They conducted comprehensive searches in five electronic databases. Out of 6,570 titles, they included 55 studies that reported neurological symptoms in the post-acute or later phases after COVID-19 infection. This comprised data from a total of 360,272 patients within the first 6 months after infection. They calculated pooled prevalence using Open-Meta[analyst].

Their results showed that the most frequent neuropsychiatric symptom within the first 6 months after infection was fatigue, with a pooled prevalence of 45.1% (95% CI, 41.5%–48.6%). This was followed by memory disorders at 35.3% (95% CI, 23% to 47.6%), objectively measured sleep disorders at 32% (95% CI, 26%–38.1%), concentration impairment at 22.3% (95% CI, 15.8%–28.8%), stress at 20% (95% CI, 11.4%–28.6%), anxiety at 17.8% (95% CI, 14.5%–21.2%), and dizziness at 17.6% (95% CI, 15.5%–20.1%). Between-study heterogeneity was high (I2 =96.99%–99.83%). A subgroup analysis of the studies was conducted based on the study design, but this heterogeneity was not resolved. After conducting a meta-regression analysis of studies based on age, they found that there was no significant correlation between the age of patients and the effect estimate in terms of the prevalence of these conditions.

Their advanced imaging reveals that COVID-19 causes lasting brain changes, even in people without ongoing symptoms, pointing to hidden neurological effects that could persist long after recovery.

COVID-19 affects more than the lungs. Research shows that even after people have fully recovered from the infection, the virus can cause significant changes in the brain, underscoring its lasting effects on neurological health.

COVID-19 is widely recognized for its impact on the lungs, but growing evidence shows that the virus can also cause lasting changes in the brain, even in people who have fully recovered. These findings point to potential long-term neurological consequences that extend beyond the acute phase of the illness.

In a new study, researchers from Griffith University's National Centre for Neuroimmunology and Emerging Disease (NCNED) used advanced MRI techniques to examine brain health in individuals who had previously been infected with COVID-19 and compared the results with those from people who had never contracted the virus.

The results revealed clear signs that a past COVID-19 infection can leave detectable changes in the brain, even when individuals report no ongoing symptoms, suggesting that the effects of the virus may persist quietly after recovery.

Effects Seen Beyond Long COVID

Lead author, Dr Kiran Thapaliya, said: "We used multimodal MRI techniques to examine both grey and white matter brain regions critical for memory, cognition and overall brain health and found clear differences across all participant groups."

"The unique MRI approach identified significant alterations in brain neurochemicals, brain signal intensity, and tissue structure not only in individuals with Long COVID but also in those who considered themselves fully recovered," he said.

"The research also reported that altered brain tissue was associated with symptom severity in individuals with Long COVID, suggesting the virus may leave a silent, lasting effect on brain health."

Implications for Cognitive Symptoms

These findings offer vital insights into how COVID 19 affects the central nervous system and may help explain the cognitive problems, such as memory and concentration, reported both shortly after infection and months or even years later.

NCNED Director, Professor Sonya Marshall-Gradisnik, said: “The NCNED brings together a critical mass of talented researchers and clinicians committed to improving the lives of the patients.”

“We are privileged to access state-of-the-art technologies which drive transformative scientific discoveries.”

Reference: “Altered brain tissue microstructure and neurochemical profiles in long COVID and recovered COVID-19 individuals: A multimodal MRI study” by Kiran Thapaliya, Sonya Marshall-Gradisnik, Maira Inderyas and Leighton Barnden, 25 November 2025, *Brain, Behavior, & Immunity – Health*.
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