



The COVID-19 Brain: New Revelations of Neuropsychological Symptoms

COVID-19 Brain Effects

With over a year of pandemic behind us, medical researchers are recognizing that COVID-19 infection affects the brain and may lead to pathological changes in brain physiology. Health care clinicians are documenting that many “recovered” patients are now complaining of persistent neuropsychological symptoms or “brain fog.” These neuropsychological symptoms fall into two domains: cognitive and emotional. Cognitive symptoms can include problems with attention/concentration, memory, processing speed, and executive functions, such as decision-making, problem-solving, planning, reasoning, inhibiting impulses, and multi-tasking. Emotional symptoms may include anxiety, depression, post-traumatic stress, and paranoia.

Recent research has shown a variety of brain abnormalities due to the viral infection.¹ Hypoperfusion, or reduced blood flow, has been observed in the frontal region of the brain, which regulates executive functions. Structural abnormalities have been seen in the temporal brain region, which is often referred to as “the seat of memory.” Also, demyelination, or erosion of the fatty coating that covers the nerves, may be the cause of slowed information processing speed.

Lingering Functional Symptoms for Severe and Mild to Moderate COVID-19

For persons who have experienced severe COVID-19 infection and hospitalization, the residual long-term neuropsychological symptoms may be substantial. Researchers Baker, Safavynia, and Evered have described a “wheel of factors” that can result in long-term functional decline.² These factors include: 1) advanced age, obesity, diabetes, hypertension, and COPD; 2) viral inflammation that is pulmonary, vascular, or neurologic in nature; and 3) the hospitalization course that may have included prolonged sedation, disruption of a normal, biological routine, and social isolation.

What is now alarming is that persons with mild to moderate cases of COVID-19 who did not require hospitalization are also experiencing lingering neuropsychological symptoms or “brain fog.” In a study by Woo and co-authors, 18 young adults who recovered were compared to 10 age-matched healthy controls.³ The authors found that 78 percent of the recovered COVID-19 patients continued to experience mild cognitive deficits (short-term memory, attention, concentration) compared to the healthy controls. The authors concluded that persistent, subclinical cognitive impairment may be a “common complication.” Likewise, in another study, Hellmuth and co-authors concluded that adults with a median age of 39 years

reported cognitive complaints for at least a median of 98 days and detailed neurocognitive testing showed deficits in working memory and executive functions.⁴

Evaluation and Treatment

Due to the large number of those who have recovered from COVID-19, we may expect a significant number to experience lingering symptoms that will affect their cognitive, emotional, and physical well-being; their work performance; and their overall quality of life. We will need to train our health care clinicians to work as a team in early detection, treatment, and prevention of neuropsychological problems due to COVID-19 infection. Proper neuropsychological assessment of the various factors contributing to a patient’s presentation can help identify possible treatments that can ease and improve symptoms. These treatments may include: 1) cognitive rehabilitation of memory, attention, processing, and executive functioning; 2) supportive counseling, behavior therapy, and mindfulness training to manage stress, emotional symptoms, and effects of trauma; and 3) psychopharmacologic/medication treatments to address cognitive and/or emotional symptoms.

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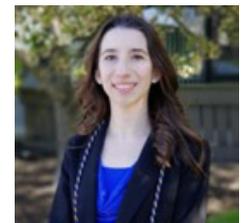
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