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Post COVID-19 Cognitive Impairment in a Patient with Bipolar Disorder

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Cover Page Footnote

None

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INTRODUCTION

The COVID-19 pandemic has emerged as a global health emergency that has directly impacted the physical and mental health of the population worldwide. Various mental health problems due to COVID-19 include depression, anxiety, insomnia, sexual disorders, cognitive impairment, and other conditions, thus affecting the quality of life.^[1] COVID-19 emerged mainly as an illness of the respiratory system but recent studies have shown the impact even on other organ systems including the central nervous system.^[1] The impact on the central nervous system has varied presentations most importantly cognitive impairments which can adversely affect pre-existing conditions. There are few studies in this area. Here we report a case of Bipolar Affective Disorder presenting with cognitive decline after COVID-19 infection to tertiary care general hospital.

CASE HISTORY

Mr. G, a 46-year-old gentleman, a vegetable seller, studied till pre-university, married for 15 years, having no child, living in a nuclear family in Mysore was brought to Tertiary Care General Hospital with complaints of disturbed sleep, irritability, anger outbursts, and forgetfulness for the last 2 weeks.

The patient was a known case of Bipolar Affective Disorder for the last 15 years with a history of 5 episodes of mania and 1 episode of depression. The patient also had a history of Alcohol Harmful Use and Nicotine Dependence Syndrome for the preceding 20 years, Hypertension for 8 years, Type 2 Diabetes Mellitus for the last 6 years, Chronic Obstructive Pulmonary Disease (COPD) since 2 years and was recently diagnosed with Ischemic Heart Disease. All the conditions were under control and he was maintaining well, till a month back. However, the patient was noted to overspend money, displayed over religiosity, and overgrooming. His wife reported about his increased sexual desire and he would physically and verbally abuse her if she did not cooperate. Symptoms worsened after the patient tested positive for COVID-19 infection 3 months prior to the date of admission and he was in home quarantine during the infection. Later he was found to be increasingly forgetful and started to search unnecessarily for many things. Hence patient was brought to the hospital and he was admitted. He was started on anti-psychotics Quetiapine 400mg OD and mood stabilizers- Divalproex

Sodium 500mg twice a day. Mental Status Examination revealed Attention and Concentration were impaired as the patient was not able to perform digit forward and backward test. The patient also failed to recall 3 objects after 5 minutes. Intellectual functions were also impaired with poor abstractive thinking and comprehension. Impairment of personal and test judgment was seen. Insight was partial.

Mini-Mental State Examination was 21/30 which showed cognitive impairment and thus brain imaging was planned. CT Scan- Plain Brain was done and marked cerebral atrophy changes inconsistent with age were seen. Along with the management of physical conditions and psychiatric conditions, Tab Donepezil 10mg was initiated at night for cognitive impairments.

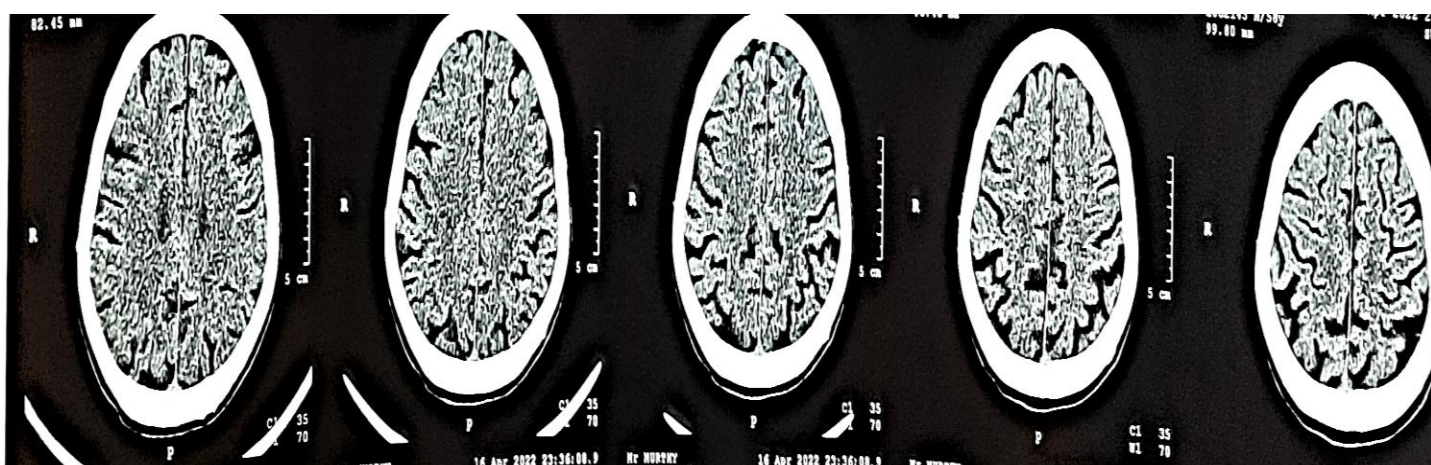


Figure 1- Brain CT scan shows prominent sulci and gyri indicating brain atrophy

DISCUSSION

Cognitive function refers to mental processes that aid in the procurement of knowledge, reasoning, and utilizing information including perception, learning, memory, attentiveness, decision making, and language skills.

Researchers discovered the neuro-invasive potential of COVID 19 via the nasal mucosa. The damage caused can be ischaemic, haemorrhagic, or encephalitic.^{[1][5]} Moreover, due to the inflammatory effects of the virus, there is disruption of the blood-brain barrier and endothelial cell dysfunction.^[3] Other mechanisms for neuropsychiatric disorders include pandemic-related stressors, psychological trauma of fatal illnesses, and autoimmunity although the relative contributions of these mechanisms to neuropsychiatric impairment remain

largely unknown.^{[2][6]} The features of central nervous system infection include headache, dizziness, ataxia, impaired consciousness, acute cerebrovascular disease, and altered mental status, which is said to be the second most common presentation comprising of encephalopathy, affective disorder, and neurocognitive syndrome which are dementia-like. ^[2] SARS-CoV-2 cell attachment and entry are initiated by the attachment of the virus to angiotensin-converting enzyme-2. The expression of ACE-2 at the cell surface is a crucial determinant of viral tropism and pathogenesis of COVID-19. Apart from neuronal and glial cells within the brain, it is also present in the hippocampus and temporal lobe, regions involved in memory and cognition. ^[3]

In this case, with no prior history of forgetfulness, the patient after recovering from COVID-19 presented with memory loss, which was later confirmed by radiological findings. Although Diabetes, Hypertension, Ischaemic Heart Disease, COPD, Alcohol Use, Nicotine Use, and Bipolar disorder can increase the risk of cognitive impairment, COVID-19 infection may have adversely affected cognitive functions

Various studies concluded global cognitive impairment especially attentional and executive functions being affected most in post-COVID 19 patients. Cognitive functions such as reasoning, problem-solving, spatial planning, and target detection are affected whilst sparing tests of simpler functions such as working-memory span and emotional processing. ^[1]

Studies illustrate that patients with prior psychiatric history may experience greater levels of cognitive dysfunction.^[7] Cognitive deficits also may be an indirect consequence of other factors developed as a result of COVID-19 like worsening mood, sleep disruption, and fatigue rather than a direct result of COVID-19 infection. People with pre-existing Mild Cognitive Impairment (MCI) /dementia were mostly affected after COVID 19 infection with worsening of symptoms and increased burden to caregivers.^[4]

It is important that clinicians evaluate the cognitive functions of patients with recent COVID-19 infection, regardless of the severity of the disease, treatment methods, and other sociodemographic parameters. Early identification and tailored rehabilitation will reduce morbidity due to the effects of COVID-19.

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