

# Psychiatric Manifestations in COVID-19 Patients Presenting to a Tertiary Care Center: A Case Series

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## ABSTRACT

Coronavirus disease-2019 (COVID-19) pandemic has emerged as a public health emergency and has led to economic, occupational, and social disruption. Along with physical illness, it is also associated with disruption of mental health. In this case series, we have presented six different case reports of persons with COVID-19 illness, who presented to or were referred to the psychiatric assessment. These include panic disorder, mania, depressive episode, acute psychosis, delirium, and organic catatonia.

**Keywords:** Catatonia, COVID-19, Delirium, Depressive episode, Mania, Psychosis.

*Indian Journal of Private Psychiatry* (2022): 10.5005/jp-journals-10067-0101

## BACKGROUND

Coronavirus disease-2019 (COVID-19) has caused due to new coronavirus, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2),<sup>1</sup> that originated in later parts of 2019 which was declared as pandemic by the World Health Organization on January 30, 2020. Economic and social disruption caused due to pandemic is so devastating that it has pushed a section of population toward the edge of poverty.<sup>2</sup> Till date, 2.9 crore people were infected in India and 2.22 lakh have succumbed to COVID-19.<sup>3</sup> It mainly presents with fever, cough, myalgia, headache, anosmia, and breathlessness.<sup>4</sup> Along with physical symptoms, there is a concern regarding the mental health, as it is associated with fear, anxiety, restlessness, and depression which might be due to fear of contracting the illness, economic, and social disruption.<sup>5</sup> Studies have demonstrated bidirectional correlation between COVID-19 and psychiatric manifestation, i.e., COVID-19 will increase the chances of patients to suffer mental illness and vice versa. This is due to lack of awareness about the disease, poor COVID-19 appropriate behavior, poor personal care, cognitive deficits, and poor financial support. A retrospective cohort study in the United States of America (USA) has found an increased risk of psychiatric sequelae in survivors of COVID-19.<sup>6</sup>

So, in this case series, we have highlighted six COVID-19 patients who were presented with or developed psychiatric manifestations after diagnosis to tertiary care center. Written information was taken from the patients and from their guardians. Institutional Ethical Committee (IEC) clearance was obtained (GIMS/IEC/73/2021 dated June 23, 2021) and no financial assistance was given.

## CASE 1

A 32-year-old female with no past psychiatric illness was presented with episodes of fearfulness and chest pain. She had fever, cough, and myalgia 6 weeks back, for which reverse transcription polymerase chain reaction (RT-PCR) was done and it was positive for COVID-19. She was treated on outpatient basis. After diagnosis, she started experiencing episodes of fearfulness which were abrupt in onset. Episodes were associated with discomfort in chest, palpitations, shivering, sweating, and choking sensation. She would experience 2–3 episodes a day, mostly when she was alone, lasting for 5–10 minutes. Episodes were associated with extreme fear of

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**How to cite this article:** Ganiger FB, Bijjal S, Mugali JD. Psychiatric Manifestations in COVID-19 Patients Presenting to a Tertiary Care Center: A Case Series. *Ind J Priv Psychiatry* 2022;16(1):38–41.

**Source of support:** Nil

**Conflict of interest:** None

death due to COVID-19 complications that were out of her control and would wean off only after multiple reassurances. She had no medical comorbidities.

## Management

Patient's blood biochemistry investigations and blood counts were normal. Magnetic resonance imaging of the brain (MRI-brain) revealed no parenchymal pathology. Diagnosis of panic disorder—International Classification of Diseases (ICD10) was made and was started on escitalopram and clonazepam. On follow-up, she reported a decrease in the frequency of such episodes and dose of escitalopram was increased to 20 mg/day and cognitive behavioral therapy (CBT) was initiated.

## CASE 2

A 45-year-old married male, a medical representative, was presented with increased talk, abusive and assaultive behavior, overfamiliarity, overreligiosity, and decreased sleep for 15 days. He was diagnosed with COVID-19 1 month back and was discharged after 10 days of treatment. He had no medical comorbidities and no past psychiatric history, however, was an occasional alcohol user. Family history was negative for mood disorders. Mental status examination revealed increased psychomotor activity. Speech was increased in tone, volume, and decreased in reaction time. He had delusion of grandiosity. Mood was reported happy and had elated affect. Cognitive functions were intact. His personal and social judgments were impaired.

## Management

His routine blood investigations were within normal limits. Computed tomography of the brain (CT brain) detected no parenchymal abnormality. No focal neurological deficits were elicited. Diagnosis of first episode mania with psychotic symptoms (ICD10) was made, and Young Mania Rating Scale (YMRS) score was 36, indicating a moderate degree of mania. He was started on valproate and olanzapine. Doses were increased to 1000 and 20 mg, respectively. Oral lorazepam was started for sleep disturbance and was gradually tapered. During follow-up after 2 weeks, he was reported of improvement in sleep and psychomotor activity.

## CASE 3

A 28-year-old single male, an accountant, was presented with low mood, loss of interest, disturbed sleep, and loss of appetite for the last 3 weeks which started after diagnosis of COVID-19. He was treated on outpatient basis. However, he continued to have a low mood that was pervasive in nature, anhedonia, difficulty concentrating and decreased sleep, and appetite. He had no previous history of low mood or euphoria. On mental status examination, psychomotor activity was decreased. Speech was decreased in tone and volume with normal reaction time. Mood was reported sad and was noted to be depressed during interview. Cognitive functions were intact.

## Management

Blood counts and other blood biochemistry investigations were within normal limits. Diagnosis of mild depressive episode (ICD10) was made and his Beck's Depression Inventory (BDI) score was 13. He was started on sertraline 50 mg and clonazepam 0.5 mg. During follow-up after 3 weeks, there was a slight improvement and dose of sertraline was later increased to 100 mg/day.

## CASE 4

A 24-year-old, unmarried female was presented with intermittent fever, headache, and cough for 5 days. She also had suspiciousness, hearing voices, and disturbed sleep for 2 days. RT-PCR for COVID-19 was positive. She was started on antibiotics, paracetamol, cetirizine, and multivitamins. Patient's oxygen saturation was monitored. Patient improved symptomatically, however continued to report of suspiciousness and hearing voices, for which psychiatry referral was sought. She had no organicity. Family history and past history were significant for psychiatry disorders. On mental status examination, she was found agitated with adequate personal hygiene. Delusion of persecution and second person auditory hallucinations were present, which were polymorphic and fleeting in nature. Her cognitive functions and judgment were intact.

## Management

Complete blood counts revealed elevated total count. No focal neurological deficits were elicited and signs of meningitis were absent. MRI-brain revealed no parenchymal abnormalities. Diagnosis of acute and transient psychotic disorder (ATPD) (ICD10) was made and she was started on olanzapine and lorazepam. On follow-up, her family reported an improvement in symptoms, and in view of response, dose of olanzapine was increased to 20 mg/day.

## CASE 5

A 55-year-old married male was presented with breathlessness, cough, and intermittent fever for 2 days. Oxygen saturation was 85% and total counts and C-reactive protein (CRP) was elevated. He was started on 10L/minute oxygen. MRI-brain revealed no abnormalities. High-resolution computed tomography of the chest (HRCT-chest) revealed ground glass opacities with CT severity score of 14/25. He was started on antibiotics, steroids, enoxaparin, and multivitamins. During hospital stay, he had irrelevant speech, disorientation, and sleep disturbance, for which psychiatry referral was sought. There was no past psychiatry illness. On mental status examination, he had fluctuating levels of consciousness and psychomotor activity was decreased. Speech was noncomprehensive. Mood status was not reported and affect was blunted. He was not oriented to time, place, and person, and memory was impaired.

## Management

An arterial blood gases (ABG) analysis showed decreased pO<sub>2</sub> with respiratory alkalosis and metabolic acidosis. Noninvasive ventilation (NIV) with 30 L/minute was started. A diagnosis of delirium (ICD10) hypoactive type (hypoxia as most likely cause) was made and he was started on a low dose of quetiapine. During hospital stay, his saturation improved and was weaned off from NIV. His cognitive functions improved and he was discharged with oral antibiotics, quetiapine, and multivitamin supplementation.

## CASE 6

A 32-year-old married female was presented with fever and headache for 4 days and withdrawn behavior, decreased interaction, and poor personal hygiene for 2 days. RT-PCR was positive and HRCT-chest revealed ground glass opacities with CT severity score of 5/25. Psychiatry referral was sought in view of decreased interaction and poor hygiene. MRI-brain revealed no parenchymal abnormalities.

On mental status examination, the patient had decreased psychomotor activity with poor personal hygiene. She had mutism, staring, and negativism. Mood status was not reported and her cognitive functions could not be assessed.

## Management

A diagnosis of organic catatonia (ICD10) was made and Bush Francis Scale was administered to assess the severity of symptoms. Blood investigations revealed elevated total counts. She was continued on intravenous antibiotics. Lorazepam challenge test was given after informed consent from family members and oxygen saturation was monitored. Patient's interaction improved following test confirming the diagnosis. She was started on oral lorazepam 6 mg/day (in three divided doses) and olanzapine. Dose of olanzapine was increased to 20 mg/day. On follow-up, the patient was maintaining well and olanzapine was continued.

## DISCUSSION

To our knowledge, this is the first case series on psychiatric manifestations in COVID-19 patients. It involves six COVID-19 patients who were presented to tertiary care center with psychiatric manifestations or who developed the same during hospital stay. First case is a female with panic disorder. She started experiencing panic

attacks after diagnosis of COVID-19 acting as a stressor. A study by Mazza et al. found that, after 1 month of diagnosis of COVID-19, 23% of the patients experienced panic attacks that significantly impaired functioning.<sup>7</sup> However, the role of COVID-19 in pathophysiology of panic attack is scarce and needs further causality studies. Yoshimura et al. presented a case report of panic disorder induced by COVID-19 and treated by vortioxetine.<sup>8</sup> Frohman et al. hypothesized that hyperinflammatory status in the form of elevated interleukin-6 (IL-6) has a vital role in neurobiology of panic attack.<sup>9</sup>

Second case is a 45-year-old male, who presented with first episode mania with no family history of mood disorder. Underlying mechanisms are not clearly understood and possible mechanisms can be infection-associated immune activation and subsequent release of inflammatory factor as reported by Benros et al. and Reus et al.,<sup>10,11</sup> and direct effect of the virus on the central nervous system was evidenced by Lu et al., who reported a case report on manic symptoms in a COVID-19 patient with no previous history of psychiatric illness.<sup>12</sup>

Third case reports a 28-year-old male who developed depressive symptoms after being diagnosed with COVID-19 with significant socio-occupational impairment. Diagnosis of COVID-19 can act as a life stressor impacting mental health. Ettman et al., in their study involving 1,470 COVID-19 patients in the USA, found that 64% of the samples experienced psychiatric symptoms, among which 24.6% had depression. Risk factors involved were lower social support, poor economic status, and stressors like loss of job, and COVID-19 increased the risk of developing psychiatry disorders by three times.<sup>13</sup> A meta-analysis, including the 31 studies, found that the pooled prevalence of depression was 45%, the pooled prevalence of anxiety was 47%, and the pooled prevalence of sleeping disturbances was 34%.<sup>14</sup>

Fourth case is a 24-year-old female, who was diagnosed to have COVID-19 and ATPD. The underlying mechanism involved was not clear, but there are case reports, in which COVID-19 diagnosis acts as a significant stress for the development of ATPD.<sup>15</sup> COVID-19 can also cause encephalitis<sup>16</sup> and this neuroinflammation has been hypothesized in the development of psychosis.<sup>17</sup> However, CNS involvement triggering ATPD requires further research.

Fifth patient is a 55-year-old male who was diagnosed with delirium. Altered consciousness seen in delirium can be a presenting symptom of COVID-19, even before fever and cough, according to WHO.<sup>18</sup> The underlying mechanisms include hypoxemia,<sup>19</sup> elevated levels of interleukins,<sup>20</sup> and encephalitis, which causes brain tissue edema.<sup>16</sup> Kennedy et al. found that 16% of the COVID-19 patients presented with delirium and risk factors were old age, living in nursing home, prior use of psychoactive medication, vision impairment, hearing impairment, stroke, and Parkinson's disease.<sup>21</sup> Prevention is by maintaining hydration, effective communication, and orientation; ensuring adequate lighting; and explaining to those providing care.<sup>22</sup>

Our last case is a 32-year-old female diagnosed with organic catatonia. It can be due to organic cause or associated with a primary psychiatric disorder as psychotic symptom. Catatonia associated with virus illness like influenza is well known.<sup>23</sup> Individuals with acute illness may be at especially high risk of developing catatonia.<sup>24</sup> Marissa et al. reported a case of catatonia with no previous history of psychiatric illness.<sup>25</sup> Catatonia may appear as neurological sequelae of COVID-19 and Zain et al. reported a case of catatonia that developed after 2 months of COVID-19. However, the underlying mechanisms for the development of catatonia with no prior history of psychiatric illness are still not understood and require further research.<sup>26</sup>

## CONCLUSION

Along with physical illness, COVID-19 is associated with disruption of mental health. COVID-19 diagnosis can act as a major psychosocial stressor leading to various psychiatric manifestations like anxiety, depression, sleep disturbances, and psychosis. This case series highlights different neuropsychiatric manifestations in COVID-19. Association between stress due to COVID-19 and psychiatric symptoms is well established, but CNS involvement of COVID-19 in neurobiology of psychiatric disorders is still unclear. Epidemiological studies are required to understand the causes and risk factors for the development of psychiatric illness in COVID-19 patients with no prior history of mental illness.

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