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Case Report

A Case of Catatonia in a Man With COVID-19

Marissa P. Caan, M.D., Christopher T. Lim, M.D., Mark Howard, M.D.

Introduction

Catatonia is a psychomotor syndrome associated with a range of psychiatric and medical illnesses and can entail increased, decreased, and abnormal psychomotor activity.[1] Catatonia has been associated with over 100 medical conditions, including metabolic, autoimmune, inflammatory, infectious, and neoplastic conditions generally involving diffuse cerebral dysfunction, and numerous substances, including antipsychotics, immunosuppressants, antibiotics, and recreational drugs.[2,3] Individuals with severe acute illness may be at especially high risk of developing catatonia.[4] Among infectious causes of catatonia, many are known to be neurotropic pathogens; the pathogenesis may be through a direct toxic effect or an immune response.[5]

Coronavirus disease 2019 (COVID-19), the disease caused by severe acute respiratory syndrome coronavirus 2, has contributed to considerable morbidity and mortality in 2020.[6] While respiratory symptoms are predominant in COVID-19, there have been reports of neurologic sequelae, including peripheral nervous system abnormalities such as hypogeusia and hyposmia and central nervous symptoms such as dizziness, headache, stroke, and delirium.[7,8] The neurotropism of severe acute respiratory syndrome coronavirus 2 is theoretically conferred by the binding of glycoproteins on its surface to the angiotensin-converting enzyme 2, which is present in neurological tissue.[9,10] The virus may enter the central nervous system from the nares through the cribriform plate or via hematogenous spread across the blood-brain barrier.[10] It is hypothesized that brainstem involvement of the virus may partially contribute to the acute respiratory failure of patients with COVID-19.[11] Although a variety of neuropsychiatric manifestations have been reported, COVID-19 has not previously been associated with catatonia to our knowledge. We present a case of catatonia occurring in the absence of any preexisting neuropsychiatric condition in a patient medically hospitalized for COVID-19.

Case

Mr. G, a 43-year-old man without a significant past medical, substance use, or personal or family psychiatric history, presented to the emergency department for a headache and fever. At that visit, he was noted to have a temperature of 100.0°F; oxygen saturation was 99% on room air; and other vital signs were within normal limits. It was noted that it was possible he had COVID-19, but he did not meet criteria for testing at that time. He was discharged and advised to quarantine at home.

Nine days later, he re-presented to the emergency department for fever and shortness of breath. He was febrile to 102.3°F and had tachycardia of 110 beats per minute; oxygen saturation was 99% on room air; and other vital signs were within normal limits. A chest x-ray was performed, which showed no acute cardiopulmonary abnormality. A COVID-19 nasopharyngeal swab polymerase chain reaction test was sent to an external laboratory. He was sent home with prescriptions for a 5-day course of oral azithromycin (500 mg on day 1, and then 250 mg on days 2–5), as-needed

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benzonatate for cough, and an as-needed albuterol inhaler.

Three days later (12 d after his first emergency presentation), he came to the emergency department for a third time, reporting upper back pain and spasms. He also noted anxiety and insomnia due to his concern about COVID-19. He was afebrile; oxygen saturation was 96% on room air; and all other vital signs were within normal limits. He was notified during this visit that his previous COVID-19 polymerase chain reaction test was negative. He reported he had been compliant with the azithromycin and was encouraged to finish the course at home. His back pain was thought to be musculoskeletal, secondary to persistent coughing, and he was discharged home with a prescription for methocarbamol 750 mg 4 times a day for 7 days.

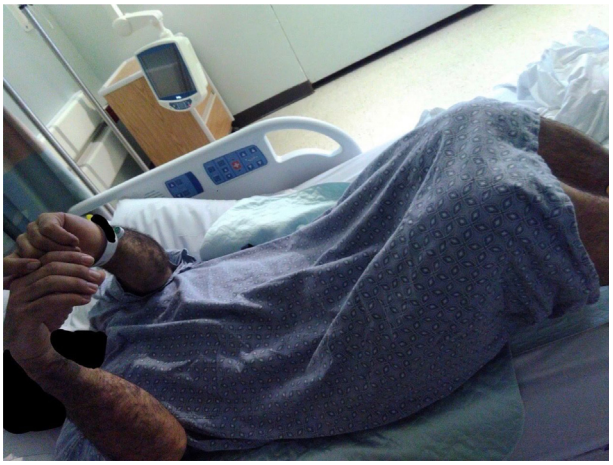
Four days later (15 d after his first emergency presentation), Mr. G's wife called his primary care physician's office. She told the office she was concerned that he had been acting strangely since he was tested for COVID-19 in the emergency department 1 week prior. She noted that he had been talking to himself, not eating or drinking properly, and not showering. She was also concerned that he was frequently staring at the wall, and she reported that he was shaking and sweating without a fever. A televisit with a primary care provider took place later that day, but Mr. G did not come to the phone because of concern that the provider was "the devil." Together, his primary care provider and wife decided to bring him back to the emergency department.

In the emergency department for the fourth time, Mr. G was noted to require a 2-person assist to transfer from a wheelchair to his stretcher because of weakness. His temperature was 100.2°F and heart rate was 107 beats per minute; oxygen saturation was 96% on room air; and other vital signs were within normal limits. His blood glucose was normal, as were serum electrolytes, procalcitonin, C-reactive protein, creatine kinase, and lactic acid. Serum drug screen was negative. Hematologic testing showed a normal total white blood count with 3% immature granulocytes as well as an elevated platelet count of 551 TH/μL. Hepatic function tests showed an alanine transaminase of 281 U/L and an aspartate transaminase of 79 U/L. His international normalized ratio was prolonged at 1.5. Repeat COVID-19 polymerase chain reaction testing was positive. Chest x-ray showed no acute cardiopulmonary process. He underwent computed tomography of his head without contrast which showed no acute intracranial abnormality. He then underwent a lumbar puncture after being medicated with 1 mg of intravenous midazolam, and his cerebrospinal fluid was unremarkable with no polymorphonuclear leukocytes or organisms seen on gram stain; 2 red blood cells/μL and 1 white blood cell/μL on cell count and differential; and protein of 32 mg/dL and glucose of 69 mg/dl. Mr. G was admitted that evening to the medical floor for further workup and treatment of altered mental status.

The psychiatry consultation-liaison team was consulted the next day (hospital day 2). On that day, Mr. G was noted to be alert and oriented to person, place, and time, but he showed delayed verbal responses, profound muscle rigidity, and difficulty resisting gravity in all limbs, as well as profuse diaphoresis. His vital signs were also notable for temperature ranging up to 99.3°F, labile blood pressures (ranging from 107/70 to 156/103 over a 12-h period), an episode of tachypnea with a respiratory rate of 36 breaths per minute, and an oxygen saturation of 93 to 95% on room air. Per hospital policy at the time, to minimize exposure and transmission, the psychiatric team did not evaluate Mr. G in person because of his severe acute respiratory syndrome coronavirus 2 infection status and instead attempted to contact him via the phone in his hospital room. However, Mr. G did not answer, and his nurse reported he was too weak to hold a phone to his ear. Based on the information available at the time, the psychiatry team recommended 50 mg of oral quetiapine at bedtime to treat insomnia and potential psychotic symptoms. Mr. G ultimately did not receive the medication because he was unable to take oral medications. A urinary catheter was placed because Mr. G had not urinated during the hospitalization. His urine drug screen, obtained after catheter placement, was positive for benzodiazepines only.

The following morning (hospital day 3), Mr. G's nurse noted him to be resting in bed in an abnormal posture, with his feet hovering above the bed and his arms in a decorticate position (Figure 1). Intravenous lorazepam 1 mg was administered in preparation for magnetic resonance imaging of the brain and spine, and Mr. G was observed 30 minutes after administration. He was sitting up in his bed and conversing with his roommate. He was no longer sweating and requested something to drink. At that point, he reported to his nurse that he had been hearing voices "trying to bring [him] to hell." He did undergo the magnetic resonance imaging scans, which demonstrated no fluid-attenuated

FIGURE 1. Mr. G posturing with arms and legs on hospital day 2 before administration of lorazepam.



inversion recovery or T2 signal, leptomeningeal contrast enhancement, white matter disease, or atrophy.

Mr. G was treated initially with 1 mg of intravenous lorazepam 3 times daily, and by hospital day 5, he was stabilized on oral lorazepam 1 mg 4 times a day. During this time, he demonstrated no further signs of catatonia; he remained nonrigid, conversant, and eating and drinking adequately.

Lorazepam was tapered to 1 mg 2 times a day by the day of discharge, hospital day 10, at which point Mr. G was speaking fluently, moving all extremities without difficulty, and no psychosis was evident. He was evaluated by the psychiatry team via telephone 4 days after discharge; he was having no difficulty with movement or speech, and no psychosis was evident, but he was experiencing difficulty sleeping. Oral lorazepam was further reduced to 1 mg at bedtime. Mr. G was evaluated by his primary care physician via telephone 6 days after discharge, and he continued to report sleep disturbance, as well as sadness and anhedonia. His wife reported he remained improved but not fully recovered as he needed encouragement to engage in conversation and his occupation. On further psychiatric follow-up, he was continued on 1 mg of oral lorazepam nightly for residual psychomotor retardation as well as 6 mg of melatonin nightly for insomnia.

Discussion

In the Diagnostic and Statistical Manual of Mental Disorders Fifth Edition,[12] catatonia is diagnosed when 3 or more signs are present. In this case, Mr. G displayed stupor, mutism, staring, rigidity, withdrawal, posturing, and autonomic abnormalities. A full assessment including a physical examination was not performed given the electronic consultation format in the setting of the COVID-19 pandemic; however, based on the information available, Mr. G would have scored at least a 12 on the Bush-Francis Catatonia Rating Scale.[13] The rapid resolution of both Mr. G's sensorium and motor symptoms with lorazepam further supported the diagnosis of catatonia. Other diagnoses, including hypoactive delirium, were considered. Delirium and catatonia often overlap in severely ill patients, and Mr. G likely met criteria for both before he was treated with lorazepam.[4] As Mr. G had not taken any neuroleptic or serotonergic agents, neuroleptic malignant syndrome and serotonin syndrome were not considered likely.

Given catatonia is associated with a wide range of psychiatric and medical conditions, it can be difficult to know which conditions contributed to the development of the syndrome in an individual case. In the case described in this report, accordingly, there were several factors potentially contributing to the emergence of catatonia.

First, although Mr. G did not have a known psychiatric history, he appeared to have psychotic symptoms before his hospitalization, including delusions about "the devil" and auditory hallucinations. It is possible that he developed a brief psychotic disorder in the setting of anxiety about COVID-19, which has been described in case reports.[14] His brief psychotic disorder may have contributed to precipitating a catatonic state.

Mr. G had also recently initiated multiple medications associated with catatonia. Specifically, he had taken azithromycin for 5 days, with the course ending 2 days before his final emergency department presentation. Macrolide antibiotics, including azithromycin, have been associated with catatonia.[2] In addition, he had taken methocarbamol for 4 days, and his wife expressed concern that in his confused state, he may have taken more than what was prescribed. Methocarbamol itself has not previously been associated with catatonia, but the muscle relaxant baclofen has.[15,16] Finally, while it is unknown if Mr. G took any doses of benzonatate, it has been associated with neuropsychiatric side effects such as confusion and hallucinations.[17] Based on the timeline of the medications and the development of symptoms, all 3 medications may have been contributing factors.

Medically, Mr. G's primary problem was COVID-19, a viral respiratory illness that can progress to pneumonia. Other viral illnesses, including influenza, have been associated with catatonia.[5] In terms of objective medical data, including vital signs and laboratory tests, Mr. G's case was typical for COVID-19: fever, tachycardia, transaminase elevation, markers of inflammation such as elevated platelet count, and an elevated immature granulocyte count without leukocytosis. Mr. G's cerebrospinal fluid and brain magnetic resonance imaging were unremarkable, which is consistent with an early observation that most COVID-19 patients with neurologic features have unremarkable cerebrospinal fluid and nonspecific magnetic resonance imaging findings.[18] Mr. G's decorticate posturing was consistent with a finding that many COVID-19 patients with neurologic findings have corticospinal tract signs.[18]

Thus, while it is not possible to identify a single etiology of Mr. G's catatonia, several potential, nonmutually exclusive etiologies have been explored previously. We believe that this represents the first case in the literature of catatonia associated with acute COVID-19 infection. Of note, it is possible that cases of catatonia in COVID-19 go undetected because of the unique challenges of assessment that this infection poses on health care systems. In our case, the diagnosis of catatonia may have been delayed as a result of hospital policy to minimize in-person encounters. It is plausible that this case would not have been found had it not been for the frontline nurse who took pictures of the unusual posture and alerted colleagues of concerning signs.

Conclusion

In this report, we describe the first case to our knowledge of catatonia associated with acute COVID-19. Mr. G's catatonia responded to lorazepam. We highlight the importance of considering a diagnosis of catatonia in medically hospitalized patients who display altered mental status and motor abnormalities. We also add catatonia to the growing list of neuropsychiatric phenomena observed in patients with COVID-19. Further research on the effects of severe acute respiratory syndrome coronavirus 2 and COVID-19 on the central nervous system is indicated.

Conflicts of Interest: The authors declare that they have no conflict of interest.

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