CASE REPORT

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A Rare Clinical Presentation of Coronavirus in a Demential Patient: COVID-19 Encephalopathy Case

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ABSTRACT The coronavirus disease-2019 (COVID-19) has become a global public health problem. Although it often causes symptoms such as fever, cough, dyspnea, and respiratory failure, there is increasing knowledge about atypical neurological symptoms. Atypical symptoms complicate diagnosis. In this case report, we present a female patient with Alzheimer's disease using antipsychotic medication for treatment of behavioral problems. She was brought to the emergency department for acute onset seizures and clouding of consciousness. The patient was transferred to the intensive care unit because the nasopharyngeal swab specimen was positive for COVID-19. Here, we aimed to examine the possible pathogenesis of neurological symptoms of COVID-19 infection and samples of COVID-19 cases presenting with neurological symptoms.

Keywords: Encephalopathy; COVID-19; neuroleptic malignant syndrome; delirium

"Severe acute respiratory syndrome-coronavirus-2 (SARS-CoV-2)" causes various symptoms as fever, cough, fatigue, anorexia, and diarrhea in patients.[1] In severe cases, nervous system involvement has also been reported, it can cause anosmia, stroke, cranial nerve damage, encephalopathy, delirium, meningitis, and seizures.[2] Atypical symptoms complicate early diagnosis.[2] This article aims to present a case diagnosed with coronavirus disease-2019 (COVID-19) after admitting to the emergency service with loss of cooperation and clouding of consciousness and to review the literature for COVID-19 patients with neuropsychiatric symptoms.

CASE REPORT

An 84-year-old female patient with a diagnosis of Alzheimer's disease was brought to the emergency department with complaints of unresponsiveness, drowsiness, rejecting oral intake, and seizures that started in the morning. At the time of admission, vital signs were found as follows: temperature 38 °C, SpO_2 85%, blood pressure 80/50 mmHg, heart rate 90/min. The patient's initial laboratory results were as follows: creatinine 1.28 mg/dL, creatine kinase 620 U/L, white blood cell 5,970/μL.

In the neurological examination, her cooperation was impaired. Her Glasgow coma score was calculated as 7.

Cranial computed tomography and diffusion magnetic resonance imaging, ruled out acute cerebrovascular events. The patient's urine analysis resulted normal. According to medical records, she was diagnosed with Alzheimer's disease for about 8 years, has been receiving various treatments for behavioral problems. The patient was prescribed haloperidol 1.5 mg/day and quetiapine 200 mg/day in 2018 in similar doses since then. There has been no change in medication recently. Although delirium was considered primarily during differential diagnosis since the symptoms continued similarly from the

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beginning with no fluctuation and deterioration of consciousness was more than expected. Due to the use of antipsychotics, neuroleptic malignant syndrome was considered in differential diagnosis. Elevated creatine kinase supported neuroleptic malignant syndrome diagnosis, while white blood cell count was within normal limits. The lack of rigidity in the neurological examination and the absence of any recent change in antipsychotic medications took us away from neuroleptic malignant syndrome diagnosis. As a part of the emergency assessment, thorax computed tomography was performed revealed minimal reticular opacities and minimal nonspecific ground glass densities. Thoracic computed tomography angiography did not reveal any filling defect consistent with embolism. Nasopharyngeal swab sample was taken. COVID-19 positivity was detected. The patient was considered to have encephalopathy due to COVID-19 infection, admitted to intensive care. The patient died due to cardiac arrest on the first day of her admission to intensive care. Patient consent has been taken from the children of the patient. Informed consent was obtained from the parents of the patient for this study.

DISCUSSION

Although some patients with COVID-19 infection are asymptomatic, a wide range of symptoms including cough, fever, myalgia, fatigue, dyspnea, diarrhea, and nausea/vomiting have been reported.[3] Increasing data show that SARS-CoV-2 can cause several neurological problems such as anosmia, seizures, paralysis, confusion, and encephalopathy.[1] Encephalopathy is typically reversible impairment of one or more brain functions (altered consciousness, seizures, confusional state, acute focal deficiencies) caused by a systemic disease or a condition affecting the central system (ischemia, metabolic disorders, etc.).[4]

Elderly individuals are at risk of developing more severe forms of the disease due to factors related to aging, with a greater prevalence of comorbidity. Therefore, they are more vulnerable to potential long-lasting neuropsychiatric and cognitive impairments, particularly older COVID-19 patients with chronic illnesses like dementia. The first symptoms may be atypical like altered mental state (confusion, agitation, disorientation, denial of care, loss of appetite).[5] Neuropsychiatric symptom development has been reported to be associated with poor outcomes.[6] Cytokine storm triggered by SARS-CoV-2 is one of the most accused mechanisms for neuropsychiatric complications.[1] It has long been hypothesized that this type of inflammation contributes to psychiatric disorders, particularly neurocognitive disorders.[7]

Hypoxic/metabolic changes are known to trigger cytokine storm and multi-organ failure and may cause encephalopathy. The susceptibility to these metabolic changes is also affected by the underlying comorbidity. In our case sample, the patient had an underlying dementia picture. Again, examining the literature reveals that most cases are over 50 years old, as in ours.[8,9] Recent studies also emphasize the importance of demonstrating frontal hypometabolism and cerebellar hypermetabolism with fluorodeoxyglucose-positron emission tomography/computed tomography for diagnostic consistency.[10]

Neuropsychiatric complications have been explained by increased severity of immune response, with increased disease severity and damage to the blood brain barrier by cytokines.[1] Another explanation relates to the angiotensin-converting enzyme 2 receptor. SARS-CoV-2 binds to angiotensin-converting enzyme 2 receptors and enters the cell.[11] Angiotensin-converting enzyme 2 is an enzyme with a wide distribution in many organs such as the immune system and the brain.[12]

Patients with impaired consciousness and mental status changes are often consulted with psychiatrists. Evidence on neuropsychiatric symptoms such as delirium and encephalopathy that may be caused by COVID-19 infection is quite new and these findings are evaluated as relatively atypical. Thus, physicians should keep alert for the possibility of COVID-19 infection in patients presenting with changes in consciousness like confusion.[1]

Neuroleptic malignant syndrome is among the neuropsychiatric syndromes reported with COVID-19. Neuroleptic malignant syndrome cases with psychotropic or dopaminergic drug use are known to be triggered by acute infection.[13] Moreover, research re-

ports neuroleptic malignant syndrome cases developing after the use of risperidone, midazolam, or fentanyl due to the presence of delirium or agitation due to COVID-19 infection.[14,15] Therefore, in the management of COVID-19 patients, careful evaluation of neuroleptic malignant syndrome development is necessary.

In our case, an evaluation for delirium and neuroleptic malignant syndrome was made due to the patient's clinical picture and the diagnosis was clarified by taking a swab for COVID-19 after ground-glass opacities were detected in the lungs in further etiology-related examinations. Further epidemiological studies with large samples are needed on the acute and long-term neuropsychiatric symptoms of COVID-19 infection.

Patients with atypical neuropsychiatric symptoms in particular delay the diagnosis of COVID-19 disease, resulting in an increase in spread and delayed initiation of treatment. The case presented here suggests that patients admitted to the hospital with neuropsychiatric symptoms may exhibit atypical symptoms due to COVID infection. Thus, it is crucial to approach such patients with caution, to initiate early treatment, and to take rapid isolation measures in positive cases.

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Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

All authors contributed equally while this study preparing.

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