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First Episode Psychotic Disorder and COVID-19: A Case Study

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Abstract

Coronavirus disease 2019 (COVID-19) often does not require hospitalization. Various neuropsychiatric findings have been associated with COVID-19 cases that require hospitalization. However, data on psychiatric disorders following outpatient treatment for COVID-19, in cases not requiring hospitalization, are limited. Psychotic disorders are characterized by disturbances in emotion, thought, perception, and speech. There are many causes associated with neuropsychiatric or psychiatric conditions after COVID-19 infection. The clinical manifestations of neuropsychiatric conditions are more frequently headache, migraine depression, anxiety and panic attack but rarely psychosis can occur, too. In our case, we described an acute psychotic disorder that started during the period when clinical symptoms disappeared after COVID-19 infection. In studies on psychotic disorder etiopathogenesis, COVID-19 infection may also be considered as a contributing factor to the development of acute psychotic disorders. For this reason, I think that reporting a psychotic disorder that started after the COVID-19 infection has passed is important and will raise awareness about the etiology in patient questioning in primary care or psychiatric outpatient clinic evaluations.

Keywords: COVID-19, Acute psychotic disorder, Neuropsychiatric symptoms, Hospitalization

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Introduction

Psychotic disorders are characterized by disturbances in emotion, thought, perception, and speech. Many causes such as genetic and environmental factors, autoimmune reactions, and neuroinflammation may play a role in etiopathogenesis [1]. Sero-epidemiologic studies have frequently focused on viral infections, especially on psychiatric pictures caused by specific pathogen infections such as Herpes simplex virus, Epstein-Barr virus, and Coronavirus (severe acute respiratory syndrome Coronavirus and Middle East respiratory syndrome Coronavirus) [2, 3]. Neuropsychiatric findings such as headache, migraine, stroke, and dementia were frequently reported during the Coronavirus disease 2019 (COVID-19) infection, but psychiatric disorders such as anxiety, depression, panic attacks, posttraumatic stress disorder, and obsessive compulsive disorder were also reported during and after the infection [4, 5]. However, studies investigating acute psychotic disorders during or after COVID-19 infection are scarce [4, 6-9].

The current literature has revealed that there are many causes associated with neuropsychiatric or psychiatric conditions after COVID-19 infection. These include ischemic, hemorrhagic, and thrombotic cerebrovascular strokes resulting from infection, the use of steroid-containing drugs in treatment, and direct involvement of the virus in the cerebrospinal fluid (CSF). However, no

clear conclusion has been reached about the etiopathogenesis [1].

This case study reported an acute psychotic disorder that developed in a male patient who had no previous organic and psychiatric illness, had COVID-19 infection 2 weeks ago, was treated symptomatically, and did not use any antiviral medication during the illness.

Case presentation

The patient, a 26-year-old single man, had been serving in the military for 1 month. It was observed that the person had been withdrawn for the last 3 days, did not answer the questions asked, froze, and started crying when asked what was happening, and when it was determined that his sleep was disturbed at night, he was brought to the emergency room by his commanders. It was determined that the patient had a COVID-19 infection 3 weeks ago when he was examined by a general practitioner in the emergency room according to his past information, no active symptoms were detected regarding the infection, and it was stated that the soldier might be in the adaptation process and that hydroxyzine 25 mg 1x1 was given for his sleep. 1 week after the emergency room examination, thinking that the person fears of being harmed, displaying aggressive behavior, and hearing voices, he visited the psychiatry outpatient clinic, accompanied by his commander. The mental status examination revealed that the patient's affect was limited, his mood was depressed, his speech rate was slow and blocked, his speech intonation was low, and his thought process was disorganized. He reported occasionally seeing bloody corpses and talking to himself. Although his consciousness was clear, his judgment was partially impaired. It was revealed that the patient had contracted COVID-19 infection 4 weeks ago, with no pulmonary involvement. Also, he had received symptomatic treatment for his fever and cough (paracetamol 500 mg 2 × 1) and had no medical treatment including antibiotics, antivirals, or steroids. During an interview with the patient's father, it was revealed that the patient had no prior psychiatric or physical illness and had not been diagnosed with COVID-19. Additionally, he had not been vaccinated against COVID-19. It was noted that he was actively engaged in his job, had no issues in human relations, and had no history of psychiatric illness in the family. The patient was hospitalized in the psychiatric ward for diagnosis and follow-up.

Laboratory examination and imaging

Various tests were ordered to determine the organic etiology of the patient's condition. These included a complete blood count, biochemical examinations (liver, kidney, and thyroid functions, blood electrolyte values, and lipid profile), serologic tests for COVID-19 IgM and IgG antibodies, anterior chest radiography, and cranial magnetic resonance imaging. No pathology requiring intervention was detected as a result of the hematologic tests, and the COVID-19 IgG antibody was positive **(Table 1)**. The brain imaging examination revealed no active pathology **(Figure 1)**.

The patient was assessed using the Brief Psychiatric Rating Scale (BPRS), Diagnostic and Statistical Manual of Mental Disorders (DSM-5) Psychosis Scale, and Hamilton Depression Rating Scale (HDRS), yielding scores of 78, 28, and 10, respectively.

Table 1. Laboratory examination

Results of hemogram									
WBC	**RBC**	**HB**	**HCT**	**PLT**	**MCV**	**MCHC**	**NEU (%)**	**LYM (%)**	**MON(%)**
9.36	5.14	15.80	45.20	262	87.9	34.9	64.5	19.9	6.2
	BAS%	NEU	LYM	MON	EOS	BAS	PCT	RDW	PDW
	0.3	6.03	2.75	0.86	0.06	0.04	0.23	13	15.6
Results of biochemical and immunological evaluation									
GLC	Urea	BUN	Creatinine	eGFR	Na	K	Cl	Ca	Mg
72	38	18	1.09	97	138	4.4	102	9.4	2.5
Phosphorus	Uric acid	Protein	Albumin	Bilirubin	ALT	AST	GGT	ALP	CK
3.7	5.6	73	41.7	1.7	9	37	21	82	745
CK-MB	Fe	TG	Cholesterol	HDL	LDL	Lipase	Ferritin	Folate	Vitamin B12
29	161	59	103	36	55	43.1	103	7.1	172
TSH	sT4	Anti-Hbs	HBsAg	Anti-HCV	Anti-HIV	CRP	COVID-19 IgM	COVID-19 IgG	

2.83	0.9	0	0.19	0.12	0.18	0.7	Negative	Positive

WBC: White blood cell, RBC: Red blood cell, HB: Hemoglobin, HCT: Hematocrit, PLT: Platelet, MCV: Mean corpuscular volume, MCHC: Mean corpuscular hemoglobin, LYM: lymphocyte, MON: Monocyte, BAS: Basophil, NEU: Neutrophil, PCT: Procalcitonin, RDW: Red cell distribution width, PDW: Platelet distribution width, GLC: Glucose, Na: Sodium, K: Potassium, Ca: Calcium, Cl: Clorine, Mg: Magnesium, ALT: Alanine transferase, AST: Asetil transferase, GGT: Gama glutamic transferase, ALP: Alkaline Phosphatase, CK: Creatine kinase, CK-MB: Creatine kinase -cardiac muscle, Fe: ferritin, TG: Triglyceride, HDL: High-Density Lipoprotein, LDL: Low- Density Lipoprotein, TSH: Thyroid stimulating Hormone, CRP: Serum reactive protein

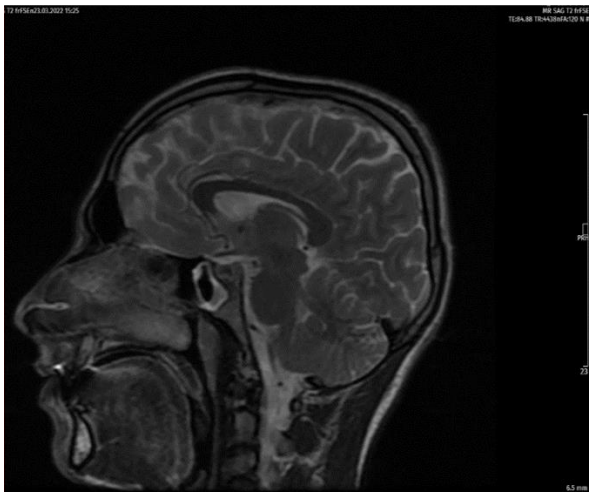

Figure 1. Brain imaging examination

Follow-up, diagnosis, and treatment

In subsequent follow-ups, the patient's affect remained limited, his mood was anxious, he spoke slowly with occasional blockages, and exhibited aggression toward the treatment team. He expressed fears of harm saying "you will harm me too, you want to kill me" and "there are images of slaughtered animals everywhere, you will slaughter me too."

The patient was diagnosed with an acute psychotic episode. Intramuscular haloperidol 5 mg 1 × 1 treatment was started because he refused oral treatment. By the end of the first week, it was observed that the patient had limited his interactions with the other treatment team. He reported that the bloody corpses he saw had risen and started talking to him, and he felt he was being followed and would be harmed. He also expressed that he trusted only his father. During the medical treatment of the patient, the haloperidol dose was increased to 10 mg and biperiden 5 mg 2 × 1 was added. DSM 5 psychosis scale and HDRS were found to be 25 and 5, respectively.

In the evaluation in week 3, the patient described encountering a man he had never seen before, who collected and buried the corpses he previously saw. He perceived this man as his savior and claimed that he spoke to him at every corner. The patient agreed to use oral medication, and the treatment was continued with risperidone 2 mg 2 × 1 and biperiden 2 mg 2 × 1. The patient's DSM-5 psychosis scale was evaluated as 19.

During the evaluation in week 4-week the patient expressed a desire to attend the interviews with his perceived rescuer. According to him, his rescuer had assured him that the treatment team members were friends and would not harm him. The DSM-5 psychosis scale of the patient was evaluated as 12.

The patient demonstrated good compliance with the departmental guidelines and medication regimen, leading to his discharge for continued follow-up at the outpatient psychiatry clinic with the diagnosis of acute psychotic disorder.

Materials and Methods

This study is a case report study. The author has conducted general research collected results of domestic and foreign research related to the research topic. With this result, suggestions were made that could attract the attention of researchers when conducting clinical inquiries.

Results and Discussion

In this article, we will discuss the management of the psychiatric disorder that occurs in a person who has not previously been diagnosed with a mental or physical illness and diagnosed with adjustment disorder, evaluated by emergency physicians, after having COVID-19 infection, which was resolved with symptomatic treatment and without pulmonary involvement.

Studies indicate that neuropsychiatric findings in patients during COVID-19 infection often include agitation, impaired taste and smell, visual and tactile hallucinations, and impaired consciousness and orientation [10-12].

A UK study reported that out of 153 patients with COVID-19 presenting with neuropsychiatric symptoms, 125 had complete clinical data. Twenty-three (59%) of these 125 patients experienced a change in mental status, as diagnosed by a psychiatrist. Of these 23 patients, 10 (43%) exhibited first-episode psychosis, 6 (26%) showed dementia-like symptoms, and 7 (30%) displayed potential for other psychiatric conditions such as catatonia and manic states [9]. A retrospective descriptive study conducted in Italy examined the records of 10,000 patients who had no respiratory distress and whose main problems were fever, cough, malaise, myalgia, diarrhea, and anorexia. The study found that 10 patients who had no previous psychotic disorder were diagnosed with acute psychotic disorder. In addition, the study emphasized that 50% of these patients especially had persecution and reference delusions, 40% had auditory hallucinations, and 10% had visual hallucinations with no confusion [13]. Another study detailed three cases of positive COVID-19 infection associated with brief psychotic disorders, all

without systemic involvement. However, the study also emphasized that these patients had histories of psychiatric disorders [10]. Another case report examined a patient with no previous psychiatric history, who began experiencing disease symptoms in their middle age. After starting hydroxychloroquine, a drug known for its incomplete neurologic examination and frequent neuropsychiatric side effects, the patient reported hearing voices directing them to commit suicide, coinciding with the beginning of drug use [14]. In COVID-19 infection and secondary psychotic disorders, cerebrovascular events, vasculopathy, coagulopathy, sepsis, neurodegenerative diseases, hypoxia, multiple treatment, and sedative drugs have been evaluated as the causes of secondary psychotic disorders [9, 15-17]. However, studies investigating primary psychotic disorder are few [8, 13]. The direct invasion of the virus into areas such as the olfactory nerve, cribriform region, cerebrospinal fluid, and frontal lobe is frequently emphasized in primary psychotic disorder [10, 12]. Nevertheless, the virus can trigger severe systemic inflammation and cytokine dysregulation, potentially leading to a cytokine storm. It may also provide an immunologic response by crossing the blood brain barrier and facilitating the migration of peripheral immune cells [13]. Previous studies have reported that the presence of additional systemic diseases in which hyperinflammation may lead to increased coagulation and hypoxia may also be effective in the emergence of psychotic disorder [10, 12, 14].

The case in this study involved a psychotic disorder without any etiologic organic cause, emerging after the clinical symptoms of COVID-19 had subsided. This was the first reported case of its kind based on the literature review conducted, which was the strength of the study. However, a limitation of the study was the lack of virus examination in the CSF. It is speculated that this condition could be caused indirectly via immunologic mechanisms after COVID-19 infection or directly by the virus entering the CSF. However, the data to explain this situation are inadequate. Longitudinal multicenter and large–sample size studies are needed to investigate the relationship between COVID-19 and acute psychotic disorder.

Conclusion

Considering that the majority of COVID-19 infection occurs in outpatients with a symptomatic course, it is important to predict that the patient may develop an acute psychotic disorder 1 month after the infection symptoms disappear completely, both in primary care healthcare professionals and in psychiatric outpatient clinic research. I think our case report is valuable because studies often focus on neuropsychiatric symptoms that develop during hospitalization due to COVID-19 or in patients with psychiatric diseases.

In studies on psychotic disorder etiopathogenesis, COVID-19 infection may also be considered as a contributing factor to the development of acute psychotic disorders. However, to substantiate this, further systematic multicenter studies are necessary in this area.

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