Case report of patient with SARS-CoV-2 infection, encephalopathy and psychiatric comorbidity

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Abstract:

Neurological and neuropsychiatric manifestations of the coronavirus disease 2019 (COVID-19) have been widely described, but yet the pathophysiology underlying these presentations is still unclear. COVID-19 encephalopathy is a common neurological manifestation of SARS-CoV-2 infection and has been associated with poorer outcomes so it is crucial to be recognized early for further decision making regarding medical procedures and treatment. That can be challenging since the brain MRI scan can be normal or nonspecific as well as the EEG reports and analysis of cerebrospinal fluid is unremarkable. It is especially challenging in patients with a prior psychiatric diagnosis because symptoms can overlap

We present the case of COVID-19 associated acute encephalopathy in patient with a history of organic delusional disorder who presented with symptoms of delirium, minimal speech production which progressed to mutism and stupor.

Due to the wide range and overlapping of clinical presentation, nonspecific diagnostic findings and unclear therapeutic goal retrospectively, multidisciplinary approach is important in patients with neuropsychiatric manifestation of SARS-CoV-2 infection.

Further investigation is paramount in order to determine the potential central nervous system effects of infection with SARS CoV 2 and the optimal therapeutic approach.

Keywords:

COVID-19, SARS-CoV-2, Delirium, Encephalopathy, Mutism

Sažetak:

Prikaz slučaja pacijentice s infekcijom SARS-CoV-2, encefalopatijom i psihijatrijskim komorbiditetom

Neurološke i neuropsihijatrijske manifestacije infekcije koronavirusom(COVID-19) naširoko su opisane, no ipak su patofiziološki mehanizmi u podlozi ovih prezentacija još uvijek nejasni. Encefalopatija COVID-19 uobičajena je neurološka manifestacija infekcije SARS-CoV-2 i povezana je s lošijim ishodima pa je ključno rano prepoznavanje zbog daljnjeg odlučivanja o medicinskim postupcima i liječenju. To može biti izazovno budući da MR mozga može biti uredan ili nespecifično promjenjen, kao i EEG i analiza cerebrospinalne tekućine koji mogu biti bez posebnosti. Navedeno je osobito izazovno kod pacijenata s prethodnom psihijatrijskom dijagnozom jer se simptomi mogu preklapati. Predstavljamo slučaj akutne encefalopatije povezane s COVID-19 infekcijom kod pacijentice s anamnezom organskog sumanutog poremećaja koja se prezentirala simptomima delirija, minimalne govorne produkcije koja je napredovala do mutizma i stupora.

Zbog širokog raspona i preklapanja kliničke slike, nespecifičnih dijagnostičkih nalaza i nejasnog terapijskog cilja, multidisciplinarni pristup je važan u liječenju bolesnika s neuropsihijatrijskom manifestaci-

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jom SARS-CoV-2 infekcije. Daljnje istraživanje je ključno kako bi se odredili mogući učinci infekcije sa SARS CoV 2 na središnji živčani sustav i optimalan terapijski pristup.

Ključne riječi: COVID-19, SARS-CoV-2, delirij, encefalopatija, mutizam

Introduction

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is a novel virus from the same group of viruses as SARS-CoV-2 and Middle East respiratory syndrome coronavirus, responsible for the subsequently named coronavirus disease 2019 (COVID-19). This disease spread all over the world and caused a pandemic which caused great threat and disruption in the global health system. Although the symptoms are primarily respiratory this disease can be presented with neurological and neuropsychiatric(Garg 2020).

This case report describes a patient with a history of organic delusional disorder that developed symptoms of acute encephalopathy during SARS-CoV-2 infection.

Case Report

Mrs B. is a 58-year-old woman with a history of left amygdalohippocampectomy performed in 1984 as a treatment of pharmacoresistant epilepsy and organic delusional disorder as a consequence for many years. Patient's clinical presentation of organic delusional disorder is dominated by psychoorganically conditioned character changes, mild cognitive impairment and chronic paranoid delusions towards spouse. At baseline, she is living mostly independent, she is oriented and in adequate verbal contact.

Prescribed therapy included clozapine (daily dose 75 mg); clonazepam (daily dose 4 mg); gabapentin (daily dose 100 mg).

She was admitted to the emergency department complaining of fever, fatigue and cough which began 5 days earlier. At that visit, she was afebrile, and other vital signs were within normal limits. She was tested with polymerase chain reaction (PCR) test for SARS-CoV-2 and the test returned positive. A chest x-ray was performed which showed no acute cardiopulmonary abnormality. C-reactive protein slightly increased (14 mg/L) with white blood count within reference intervals. Other laboratory tests were unremarkable. After diagnostic workup the patient was discharged to home care.

After 2 days, on the seventh day from the onset of symptoms, she represented to the emergency department with deterioration of the general condition with acute changes in mental status including decreased speech output and disorientation. the C-reactive protein increased (48 mg/L) (and hepatic function tests were slightly increased (aspartate transaminase of 100 U/L, alanine transaminase of 52 U/L and gamma glutamyl transferase of 69 U/L)) . Others laboratory findings were within reference intervals. After examination and diagnostic processing she was admitted to the hospital.

Next day neurologist consultation was obtained. On neurology examination it was noted that she was disorientated, had tremor of the upper extremities with cogwheel rigidity in bilateral upper extremities. She had minimal speech production despite normal verbal output at baseline.

Laboratory finding which included thyroid function test, levels of vitamin B12 and folate, and electrolytes, were normal.

Non-contrast head computed tomography was performed which showed left temporal gliomalation after previous neurosurgical treatment

Lumbar puncture was performed. Results of cytological and biochemical cerebrospinal fluid (CSF) analysis were unremarkable. CSF cultures, neurotropic virus panel and CSF Listeria monocytogenes polymerase chain reaction (PCR) assay were negative. The CSF autoimmune panel for came back negative.

Electroencephalogram (EEG) showed residual changes due to left amygdalohippocampectomy without interictal epileptiform discharges.

Magnetic resonance imaging (MRI) and magnetic resonance angiography (MRA) showed stationary finding considering her earlier operation.

Figure 1. Magnetic resonance imaging showed stationary finding considering her earlier operation.

She was examined by a psychiatrist. It was noted that non-verbal eye contact was established, but without responding to inquiries. She was stuporous and mutistic with occasional rare restless behaviour. The rest of the mental status was difficult to assess due to the absence of verbal contact, but the impression was that the patient was confused and disorientated.
Considering the further development of the clinical presentation, it was concluded that the patient's diagnosis is encephalopathy (subsyndromal delirium with symptoms of catatonia).
She was given therapy which includes intravenous Methyprednisolone 250 mg for 3 days.
After receiving therapy, slight improvement was observed and after 20 days of hospital treatment patient was discharged to a nursing home. She was still mutistic, but the impression of the medical staff was that she was establishing better non-verbal eye contact and understood orders without reacting to them.
A follow-up was planned, but patient died within 1 month after discharge, and the exact cause of death was not determined.

Discussion

COVID-19 encephalopathy is frequent neurological manifestation, according to one study in 31.8% of 509 patients (Liotta et al. 2020) and can be presented in early stages of the SARS-CoV-2 infection, even as initial symptom (Al-Ramadan et al.2020). Further more, encephalopathy has been associated with poorer outcome compared with patients without encephalopathy.
Diagnosing COVID-19 encephalopathy can be challenging since the brain MRI scan can be orderly. According to a study involving 64 patients with COVID-19 and symptoms of encephalopathy, 46% of patients had a normal findings (Kremer et al. 2020). The EEG reports in COVID-19 patients showed normal or nonspecific results (Helms et.al 2020). So far, no study had described specific EEG abnormalities of the SARS-CoV-2 infection in the context of encephalopathy. The majority of currently reported EEGs showed generalized slowing, focal slowing, epileptiform discharges with seizures, and status epilepticus (Vellieux et al, 2021).
In vast majority of COVID19 assosiated encephalopathy patients, CSF was reported normal (Neumann et al. 2020).However, elevated CSF WBC, protein levels, and positive oligoclonal bands were described in case reports (Garg et al. 2021)
The therapeutic approach includes symptomatic therapy. One study described drastic regression of symptoms in patients with severe encephalopathy treated with methylprednisolone (Pugin et al. 2020). However, the role of glucocorticoids and immunomodulatory therapy still remains unclear.

Conclusion

Due to the broad spectrum and overlapping of clinical presentation, nonspecific diagnostic findings and unclear therapeutic approach, multidisciplinary collaboration is extremely important in patients with neuropsychiatric manifestation of SARS-CoV-2 infection.
Also, the assessment of clinical presentation in patient with psychiatric disorder should occur in the context of their known symptomatology. It is very important to ensure adequate communication between patient's family members and healthcare providers with the aim of distinguishing from previous symptoms in those with preexisting psychiatric condition.
Further research is needed in order to clarify the mechanism of occurrence and determine the most adequate therapeutic approach.

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