

COVID-19 Infected Woman with Tuberculous Meningitis: A Case Report

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Case Report

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Abstract

Background: Several factors have been reported for COVID-19 disease. In addition, patients with COVID-19 are also susceptible to suffer from other problems. In this study, a case suffering from TB meningitis is reported to have developed COVID-19 disease, eventually showing symptoms of psychological disorders.

Case presentation: A young Afghan woman was hospitalized with TB meningitis who did not respond to treatment. After a while, she was hospitalized again with diagnosis of COVID-19. The patient showed symptoms of postpartum depression and anxiety. She also had pseudoseizure attacks several times, so antidepressants and anti-anxiety medications were started for the patient. In order to treat conversion disorder and panic disorders.

Conclusion: Tuberculous meningitis, postpartum depression and other factors can increase the risk of COVID-19 infection leading to psychological disorders like conversion disorder in susceptible.

Introduction

Coronaviruses are classified under the Coronaviridae family (order Nidovirales and subfamily Orthocoronavirinae). The subfamily of Orthocoronavirinae includes four genera: the alpha, beta, gamma and delta coronaviruses. Coronaviruses primarily can infect birds and mammals (eg. bats) but in the last decades, evidences have shown that they also have the capability of infecting the human (1). In late 2019, a novel flu-like coronavirus disease was discovered in Wuhan, China, which is relevant to the Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS) coronaviruses. The virus can be transmitted through close human-to-human contact. Currently, the absence of a definitive treatment or a vaccine for this disease has been sensed (2). Fever, nonproductive cough, myalgia, dyspnea, fatigue, decreased leukocyte counts and pneumonia shown in radiographs are some of the clinical manifestations of the disease. Severe cases may encounter organ dysfunction (eg. shock, acute respiratory distress syndrome, acute cardiac injury and acute kidney injury) and death (3).

Inflammation of the meninges, the three membranes that cover the brain and the spinal cord, due to mycobacterial species is called Tuberculous Meningitis (TBM). TBM is indeed a severe form of TB and may cause death (4). Clinical manifestations of TBM include headache, fever, vomiting, altered conscious level and sometimes convulsions (5). Diagnosing TBM, even with advanced imaging techniques and anti-tuberculosis drugs is time-consuming and difficult because of its rarity; which is why the morbidity and mortality of TBM is still high (6).

Conversion disorder or functional neurological symptom disorder is a psychiatric disorder that results from a stressful event and the onset of the symptoms is sudden. The disease is characterized by a physical defect related to a neurological and psychological disorder (7). This conversion of psychiatric disorder to somatoform disorder (if other medical disorders are ruled out) is termed conversion disorder (8). This disorder is more common in women and young people, but it is not usually seen under the age

of 10. The disorder is mainly caused by a stressful incident, rape, physical abuse, depression and anxiety (9). The patient's common symptoms include blindness, dystonia, anesthesia, paralysis, difficulty in speaking, incontinence, balance problems, hallucinations and psychogenic non-epileptic seizures. The physician should be aware of differentiating the patients who are intentionally producing symptoms (which we can see in patients with factitious disorders and malingering) from the one who are really struggling with conversion disorder (10).

Postpartum depression is a serious psychological health problem that is prevalent during the postpartum period, especially in the first year after delivery (11). Maternal health, marital relationships and newborns can be affected by postpartum depression and if left untreated, these effects will last for a long time (12).

In a literature review, people's mental health burden during the epidemic of COVID-19 was examined and it demonstrated that young people, people who are focused and concerned about the COVID-19 epidemic and healthcare workers were at a high risk for developing mental illness (13). In our literature, we intend to report a treatment-resistant tuberculous meningitis case who had become infected with COVID-19 and undergone several anxiety attacks. In fact, this is a rare and interesting case with comorbidities and complications.

Case Presentation

A young Afghan woman living in Iran was referred to the hospital due to depression, headache, myalgia, malaise and fever after delivery. Subsequently, she underwent standard anti-tuberculosis treatment by diagnosing tuberculous abscess and meningitis, but she did not respond to the treatment. Then, she had several tonic-clonic seizures. The patient was referred to a more specialized center and was treated for tuberculosis with multi-drug regimen. She was hospitalized again with respiratory symptoms diagnosed with pulmonary tuberculosis, and treatment began for her. A few days later, she was hospitalized with a recurrence of respiratory symptoms and diagnosis of COVID-19 infection. Then, she suffered from severe anxiety attacks and shortness of breath, feeling suffocated. After that, she had pseudoseizure attacks several times which was treated with anti-anxiety and anti-depressant medications with diagnosis of conversion disorder (functional neurological symptom disorder) and panic (table 1). Followed by that situation, she experienced nausea and vomiting due to a rise of ICP, for which she was hospitalized again and then shunt placement was performed.

Discussion

The most destructive type of extrapulmonary tuberculosis is tuberculous meningitis, which causes death and nerve damage in infected people, especially in low-income countries. One of the most common clinical manifestations of TBM is seizure, which can occur at any stage of the disease (with a probability of 17 to 93%). Seizures related to TBM infection can be either acute symptomatic or unprovoked seizures. The collected data indicated that one of the most important causes of seizures due to central nervous system infection is inflammation of the brain and nerve damage and the reactivation of glial cells (14).

Seizures caused by TBM can be focal or generalized tonic-clonic seizures (15); which was in the form of tonic-clonic seizure in of our patient.

Wenya Lin et al. findings mentioned that in 10 systemic lupus erythematosus (SLE) patients with TBM, the mean age was 35.2 years (range 19.8 – 45.2), and the mean duration of SLE was 34.6 months (range 4-84 months). This study showed that patients with TBM had notable longer SLE duration, higher ESR and CRP level and their CD4+ cell counts and albumin levels was lower than uninfected people (16). Based on the results of this study, we concluded that TBM might suppress the immune system. In addition, patients with weakened immune system are not able to fight the infection when exposed to the virus. So, a suppressed immune system can make an individual more susceptible to infection and develop the severe form of the disease more. In our case, tuberculous meningitis increased the risk of infection due to the weakened immune system. Hospitalization in a referral hospital for treatment of COVID-19, low socioeconomic status, malnutrition, depression and anxiety were other reasons of weakening the immune system, making the patient more likely to be infected with corona virus.

Stressful, traumatic events or mental illnesses usually cause psychological symptoms. One of the common symptoms is psychogenic non-epileptic seizure (PNES) (10). In our case, we could clearly see some of the important features of conversion disorder, such as the manifestation of a physical disorder following an unfavorable psychological condition, which is exactly in line with the definition of conversion disorder. In fact, according to psychoanalytic theory, one of the causes of conversion disorder is the unconscious suppression of internal psychological conflicts, and the reason of naming the disease is the conversion of anxiety or stress into physical symptoms. Organic brain diseases can cause epileptic seizures, while non-epileptic seizures are not caused by a brain disease and are as the result of experiencing a stressful event and psychological problems (10). This case report showed that childbirth stress, postpartum depression, frequent seizures caused by TBM, lack of response to primary treatment and being infected by novel coronavirus played the role of psychological stressors and pseudoseizures (or psychogenic non-epileptic seizures) were considered as a clinical indicator of physical symptoms. Eventually we should mention that psychiatric diagnoses were made according to the DSM-5 criteria.

Conclusions

Tuberculous meningitis, postpartum depression and other immunosuppressive factors can increase the risk of being infected with coronavirus. All of these stressors may cause conversion disorder and manifest as physical symptoms. Psychogenic non-epileptic seizures can also be considered as one of the physical manifestations of conversion disorder; however, diagnosis of this disorder after ruling out the other medical disorders is a challenging subject. Early and timely diagnosis of the disease can prevent lots of secondary problems.

Abbreviation

MERS: Middle East Respiratory Syndrome; SARS: Severe Acute Respiratory Syndrome; TBM: Tuberculous Meningitis; CRP: C- Reactive Proteins; PNES: psychogenic non-epileptic seizure; CD4+: Cluster of Differentiation 4.

Declarations

Ethics approval and consent to participate

The patient signed an informed consent form prior to participation in the study.

Consent for publication

Not applicable.

Availability of data and materials

All data generated or analyzed during this study are included in this published article.

Competing interests

The authors declare that they have no competing interests regarding the publication of this paper.

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Authors' contributions

Analysing and interpreting the patient case: Reza Bidaki and Fatemeh Saghafi; Writing the manuscript: Mahshid Nadershabaz and Saeid Azimi; Reading and approving the final version of the manuscript: All authors.

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Tables

Table 1: Medications taken by the patient

Medications	Order	Medical uses
Nortriptyline 25 mg	Half a pill every night	Anti-anxiety and anti-depressant
Ondansetron 4 mg	1 before breakfast	Prevent nausea and vomiting
Propranolol 10 mg	1 in the morning and 1 in the evening	Used to treat irregular heart rate and anxiety
Risperidone 1 mg	Half a pill every noon	Antipsychotic ,Used to treat certain mental/mood disorders
Gabapentin 100 mg	1 every night until 3 nights then , 1 every noon and 1 every night	Anti-convulsant and used to treat neuropathic pain

Table 2: Paraclinical findings

Date of report	Imaging performed	Paraclinical findings
2019/09	Spiral brain CT scan	Everything is normal and no SDH, EDH, parenchymal hemorrhage, intracranial mass and midline shift was seen.
2019/09	Brain MRI with and without contrast	<p>-Evidence of multiple ring enhancement lesion in right hemispheres and left frontoparietal lobe and right side of pons and right cerebellar hemisphere are seen.</p> <p>-Findings could be related to metastatic lesion or infection process such as toxoplasma.</p> <p>-No evidence of space occupying lesion in supra and infratentorial structures is seen.</p>
2019/12	Brain MRI without contrast injection	<p>-Evidence of 20*14 mm low intensity in T2 FLAIR with peripheral edema is seen in right frontal lobe.</p> <p>-Evidence of multiple iso intense in T2 and high in FLAIR foci lesion in gray white matter junction in both cerebral hemispheres and right aspect of pons are seen which could be due to secondary brain or infection process and infratentorial structures is seen.</p>
2020/01	MRI of cervical with and without contrast	-After contrast injection, leptomeningeal enhancement in cervical region and in post fossa is noted due to meningitis.
2020/01	MRI of thoracic spine with and without contrast	After contrast injection leptomeningeal enhancement in lower thoracic level as well as enhancement in fillum terminalis is seen could be due to leptomeningitis.
2020/01	Sonography of breast and axillary spaces	<p>-Some circumscribed hypoechoic masses are seen at 12 o'clock in mild zone of right breast)largest measured 24*12 mm(that can be in favor of intramammary lymphnode or fibro adenoma or lactating adenoma.</p> <p>-Evidence of an intramammary lymphnode measured 10*6 mm is seen at 11 o'clock of right breast.</p> <p>-Evidence of mild ductal ectasia with internal echo is seen in right breast.</p>
2020/01	Lumbar spine MRI with and without contrast	<p>-Minimal disc bulging at L4-L5 level with canal stenosis is seen</p> <p>-Enhancement to fillum terminalis is noted which can be due to leptomeningitis, evaluation for R/O of TB, sarcoidosis and neoplastic (infiltration is recommended).</p>

Table 3: Laboratory tests

Date of report	Test	Result
2020/01	WBC	20
	Neutrophils	20
	Lymphocyte	60
	Glucose CSF	45
	LDH CSF	94
	Protein CSF	108
2020/01	Smear	In direct smear no bacteria seen
2020/01	Culture	No bacteria growth
2020/01	Urea	29
	Creatinine	0.9
2020/01	Urea	32
	Creatinine	0.9
	Sodium	136
	Potassium	4.1
2020/02	AST	43
	ALT	214
	Alkaline P	220
2020/02	AST	54
	ALT	209
	Alkaline P	201
2020/02	LDH	336
	CRP	26
2020/02	Color	Yellow
	Appearance	Clear
	PH	5
	Specific gravity	Normal
	Glucose	2+
	Protein	Negative

	Blood	Negative
	Ketones	Negative
	Bilirubin	Negative
	Urobilinogen	Negative
	Ascorbic acid	Negative
	Nitrite	Negative
	WBC	2-3
	RBC	0-1
	EP cell	3-4
	Bacteria	Negative
	Mucus	Negative
2020/03	AST	17
	ALT	22
	Alkaline P	182
2020/03	AST	24
	ALT	26
	Alkaline P	205