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CASE REPORT

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COVID-19–infected woman along with tuberculosis and psychogenic non-epileptic seizures: A case report

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Abstract

During the COVID-19 pandemic, we should not forget about chronic, underlying and important diseases, especially diseases that cause immune system deficiency, of which TB is one and may be missed. Also, we should pay attention to the past medical history of the patients and their drug-drug interactions during the treatment period of COVID-19. Our main clinical message is that diseases such as TB, which weaken the immune system, may predispose a person to COVID-19 infection and COVID-19 may exacerbate TB and it's mortality. On the other hand, diseases that target the lung tissue such as TB and COVID-19, may have synergistic effects and increase mortality (for a patient whose lung capacity is reduced due to TB, superimposed COVID-19 can worsen the situation). In addition, it may be necessary to take more serious considerations for COVID-19 in low socio-economy countries, such as Afghanistan, where TB is more prevalent

KEYWORDS

convulsion, COVID-19, non-epileptic, tuberculous meningitis

1 | INTRODUCTION

A young married Afghan woman suffering from chronic resistant tuberculosis meningitis who was reported to infect with the COVID-19 virus, eventually showing symptoms of psychological disorders. Tuberculous meningitis, postpartum depression, and other factors can increase the risk of COVID-19-related psychological disorders like conversion disorder insusceptible. Coronaviruses are classified under the Coronaviridae family (order Nidovirales and subfamily Orthocoronavirinae). Coronaviruses primarily can infect birds and mammals (eg, bats), but in the last decades, pieces of evidence 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 definitive treatment or a vaccine for this disease has been sensed.[2] The COVID-19 manifestations include fever, non-productive cough, dyspnea,

myalgia, fatigue, and paraclinical findings like leukopenia and radiological findings that support pneumonia are among the symptoms of this disease. Severe cases may encounter organ dysfunction (eg, shock, acute respiratory distress syndrome, acute cardiac injury, and acute renal 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 its treatment with anti-tuberculosis (TB) drugs is time-consuming and difficult because of its rarity, which is why the morbidity and mortality of TBM are 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 nonepileptic 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 ones who are 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 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. We should mention that we visited this case just 4 months after the COVID-19 pandemic. This is a rare and interesting case with comorbidities and complications.

2 | CASE PRESENTATION

A young Afghan immigrant, married woman of Iran was referred to the Shahid Sadoughi hospital of Yazd with chief complaint of depression, headache, myalgia, malaise, and fever after delivery, but her COVID-19 polymerase chain reaction (PCR) was negative at the time of admission. For many years, she has lived in a rented house in Iran with large number of relatives, where the low socioeconomic level prevails. Subsequently, she underwent standard anti-TB regimen 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 TB with a 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 her COVID-19 PCR test was positive. 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

TABLE 1 Medications taken by the patient

Medications	Order	Medical indication
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 and 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

a 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. Paraclinical findings were summarized in Table 2.

3 | DISCUSSION

Tuberculosis is one of the most prevalent disease in low-income countries, and TBM is one of the most destructive extra pulmonary form of TB which can lead to nerve damage.[14] It should be noted that TB is common among Afghan immigrants population of Iran.[15] 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%–93%). Seizures related to TBM infection can be acute either 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.[16] Seizures caused by TBM can be focal or generalized tonic-clonic seizures,[17] which was in the form of tonic-clonic seizure in our patient.

Wenya Lin et al. findings mentioned that in ten 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 notably longer SLE duration, higher ESR and CRP level and their CD4+ cell counts and albumin levels were lower than uninfected people.[18] Based on the results of this study, we concluded that TBM might suppress the immune system. In addition, patients with a weakened immune system are not able to fight the infection when exposed to the virus. Therefore, a suppressed immune system can make an individual more susceptible to infection and develop a severe form of the disease more. In our case, TBM could increase the risk of infection due to TBM-related immunosuppression. Hospitalization in a referral hospital for treatment of COVID-19, low socioeconomic status, malnutrition, exposure to other COVID-19 hospitalized or non-hospitalized silent carriers, depression, and anxiety are also caused of weakening the immune system, making the patient more likely to be infected with the coronavirus.[19-22]

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 were seen.
2019/09	Brain MRI with and without contrast	Evidence of multiple ring enhancement lesions in the right hemispheres and left frontoparietal lobe and right side of the pons and right cerebellar hemisphere are seen. Findings could be related to metastatic lesions or infection processes such as toxoplasma. No evidence of space-occupying lesions in supra- and infratentorial structures is seen.
2019/12	Brain MRI without contrast injection	Evidence of 20*14 mm low intensity in T2 FLAIR with peripheral edema is seen in the right frontal lobe. Evidence of multiple isointense in T2 and high in FLAIR foci lesion in gray-white matter junction in both cerebral hemispheres and right aspect of the pons is seen which could be due to secondary brain or infection process and infratentorial structures are seen.
2020/01	MRI of cervical with and without contrast	After contrast injection, leptomeningeal enhancement in the cervical region and 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 filum terminal, is seen could be due to leptomeningitis.
2020/01	Sonography of breast and axillary spaces	Some circumscribed hypoechoic masses are seen at noon in a mild zone of the right breast) largest measured 24*12 mm that can be in favor of intramammary lymph node or fibroadenoma or lactating adenoma. Evidence of an intramammary lymph node measured 10*6 mm is seen at 11 o'clock of the right breast. Evidence of mild ductal ectasia with internal echo is seen in the right breast.
2020/01	Lumbar spine MRI with and without contrast	Minimal disk bulging at the L4-L5 level with canal stenosis is seen Enhancement to filum terminalis is noted, which can be due to leptomeningitis, evaluation for R/O of TB, sarcoidosis, and neoplastic (infiltration is recommended).

In an article on TB and COVID-19 co-infection, Tadolini M et al asked whether COVID-19 could reactivate TB, or whether it was possible for a patient with TB to become more infected with SARS-COV-2 and what was the effects of co-infection on the mortality in patients. In this study, patients were classified according to the time of TB diagnosis (before, at the same time, or after COVID-19 diagnosis). Tadolini et al. mentioned that it is possible that the early diagnosis of COVID-19 than TB may be due to the onset of acute respiratory symptoms of SARS-COV-2 and also the early referral for radiological examinations because of COVID-19 pandemic. However, they did not deny that COVID-19 or the drugs used may accelerate the progression of previous TB infections. So, COVID-19 can increase the incidence of TB infection and its mortality rate, while further studies are required.[23] So, we think this is a probable association between the two infections, and it is possible that this co-infection might affect each other.[24] Aside from the evaluation of association, another major concern about this co-infection is its concomitant mortality, which is much higher than COVID-19 alone.[25,26] In addition, the population of people with post-TB treatment complications needs further evaluation, because of potential impact of TB and COVID-19 on quality of life and the social and personal rehabilitation needs subsequently.[27]

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 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 for 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 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.

4 | CONCLUSION

Tuberculous meningitis, postpartum depression, and other immunosuppressive factors can increase the risk of being infected with the 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 complications.

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CONFLICT OF INTEREST

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

AUTHOR CONTRIBUTIONS

Reza Bidaki and Fatemeh Saghafi involved in analyzing and interpreting the patient case. Mahshid Nadershahbaz and Saeed Azimi involved in writing the manuscript. All authors involved in reading and approving the final version of the manuscript.

ETHICAL APPROVAL

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

DATA AVAILABILITY STATEMENT

The authors confirm that the data supporting the findings of this case are available within the article.

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