

A Scarce Presentation of *Mycobacterium tuberculosis*, Case Report

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Abstract

Here, we report a case of 24-year-old female who experienced fever, weight loss, and headache by the termination of her pregnancy after 24 weeks. She was admitted due to multiple generalized tonic clonic (GTC) seizures and loss of consciousness. Her lab data and histological findings were insignificant as well as negative mycobacterium culture. Her brain MRI detected multiple enhanced brain lesions on T2 weighted images. Overall, she went under empiric anti-TB treatment for a year and had a complete recovery. To our knowledge, this is the first reported case of brain tuberculoma with negative histological findings and brain tissue culture who responded to an empiric anti-TB regimen.

Keywords

Mycobacterium Tuberculosis, Pregnancy, Brain, Seizure

1. Introduction

Tuberculosis (TB) infection is a global trending concern, which is responsible for higher mortality rate among middle-aged women [1] [2]. About 25% of cases who developed TB were female in 2012 who inhabited mostly in low socio-economic countries such as India and South Africa [1] [3] [4] [5] [6] [7]. One third of mortality among reported active TB cases in 2013 were women in reproductive age. Nowadays, TB is accounted for approximately 30% of indirect causes of maternal death worldwide [1]. Extra-pulmonary presentations of TB are mostly prevalent among immune compromised patients [7] [8]. Similar to HIV patients with immune suppression [2] [9] [10], pregnancy and post-partum state adversely affects women's immune system that exposes them to higher risk of quiescent infections reactivation. Studies regarding pregnant women reported

that the risk of TB infection and its related post-partum complications are twice compared to other women [1] [3] [9]. Despite the fact that CNS TB infection induces further mortality and neurological sequela, around 1% of all TB reported cases involve the nervous system [7] [11]. In this report, we propound an odd display of CNS tuberculoma in a young post-partum female who had been referred to us with seizure and altered mental status.

2. Case Presentation

A 24-year-old female housewife was referred to our infectious diseases department with seizure and high fever. During previous 4 months, she has had intermittent high fever, chills, malaise, anorexia, severe dizziness, unexplained weight loss, and inability to walk. The symptoms had started gradually after she had been hospitalized after sudden vaginal bleeding and inevitable abortion of 24-weeks pregnancy. She had experienced no respiratory symptoms of productive cough or dyspnea although she has lived in a TB endemic region. Her condition had worsened to the point that she suffered from several episodes of generalized tonic clonic (GTC) seizures two hours before her admission in our department.

Regarding physical examination, her vital signs demonstrated tachycardia, tachypnea, low blood pressure, and oral temperature of 38c. Moreover, her neurological evaluation showed altered mental status, slurred speech, normal pupil reaction to light, 2/5 force of lower limbs, and disorientation to time, location, and person. Her lung exam revealed no wheezing, stridor, or decreased pulmonary sound. Lab analysis illustrated the following data: WBC 8800/ μ l, Hb 9.7 gr/dl, Plt 360,000/ μ l, MCV 79.1 fl, ESR 49 mm/hr, CRP++, BS 236 mg/dl, BUN 21 mg/dl, Cr 0.8 mg/dl, Na 138 meq/l, K 3.7 meq/l, AST 30 IU/l, ALT 10 IU/l, ALP 96 IU/l, HIV Ab negative, and ABG of respiratory acidosis. CSF sample analysis showed protein 69.9 mg/dl, WBC 101/ μ l with PMN > 94%, glucose 79 mg/dl, RBC 4/ μ l, and LDH 59 IU/l. Although CSF analysis suggested septic meningitis, no bacterial growth was detected after 72 hours in CSF culture. Brain MRI with contrast only detected several supra and infra tentorial bilateral ring-enhanced lesions with no diffusion and edema, which were hypointense in T2 window and most likely suggested parasitic or TB infection (**Figure 1**). Brain mass biopsy revealed calcification, tissue inflammation, and reactive gliosis, which were highly suggestive of brain tuberculoma. Chest x-ray revealed bilateral lung pleural effusion and reticulonodular parenchymal pattern. In correlation with CXR findings, chest CT-scan showed diffuse interstitial pneumonia. Moreover, bronchial lavage had been done based on the pulmonologist consult. Acid-fast Bacilli (AFB) smear and bacterial culture were negative.

Based on the unusual clinical presentation and para-clinical findings, a 12-month directly observed therapy (DOTs) anti-TB treatment regimen of Rifampin 10 mg/kg, Isoniazid 5 mg/kg, Ethambutol 15 mg/kg, and Pyrazinamide 20 mg/kg was started. Furthermore, daily 50 mg oral dexamethasone was administered for 14 days and tapered gradually. During the first 2 weeks, patient's

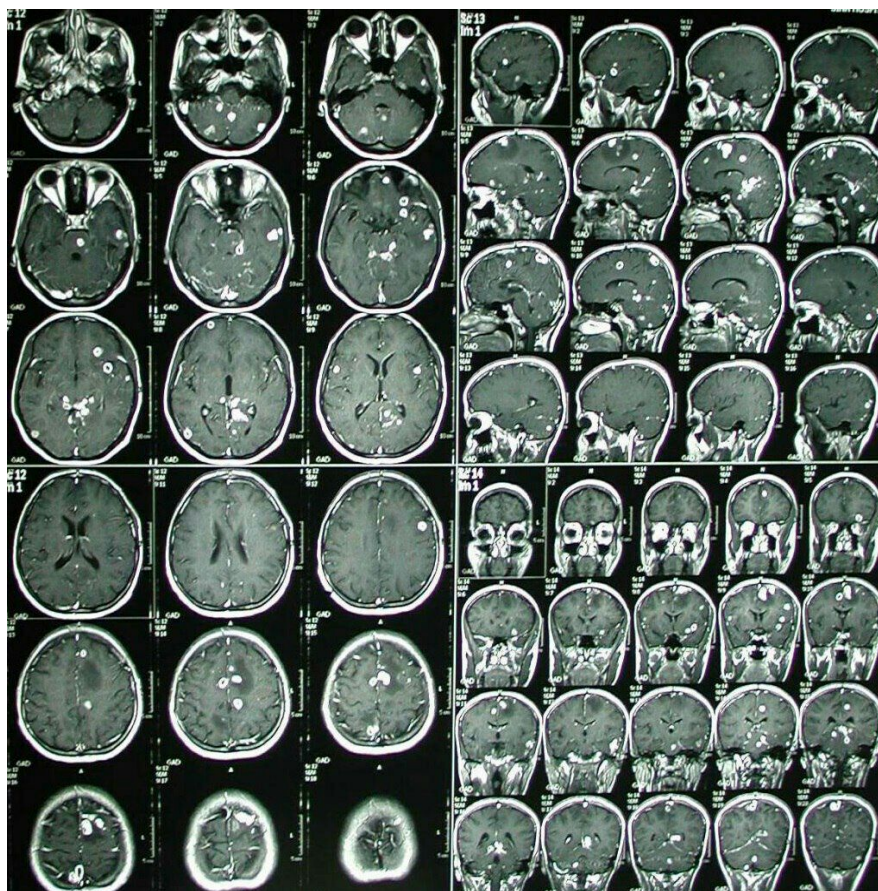


Figure 1. T2 weighted images of the patient's brain MRI.

mental and neurological status has improved and she was able to walk. Due to her stable condition, dramatic recovery, normal post-treatment para-clinical findings, and asymptomatic status, she has been discharged 3 weeks after hospitalization. However, she has been clinically followed every 2 months until the end of anti-TB regimen and she experienced full recovery without further complications after one year (normal brain MRI).

3. Discussion

Concerning the course of TB infection, pregnancy is found to have no impact on disease relapse or stabilization. Nevertheless, studies demonstrated that frequent pregnancies might restore a silent TB infection [3]. During pregnancy, Th1 inflammatory response is suppressed and anti-inflammatory process is induced by Th2, 3. Shift from Th2 to Th1 presentation during post-partum state leads to TB disease reactivation mostly as extra-pulmonary or disseminated presentation. In fact, one study claimed that extra-pulmonary TB disease consisted 90% of post-partum tuberculosis [2]. One study on 50 pregnant women with TB disease revealed 6% brain involvement. These patients had seizure, headache, and altered mental status and diagnosis was made by MRI and CSF analysis. Moreover, it was claimed that fever and seizure were the most common symptoms

while weight loss might be hidden due to weight gain during pregnancy [3]. In 2003, a 17-year-old female had been reported with neurological symptoms. Although her brain CT-scan showed multiple round hypodense cranial masses, her previous CXR and PPD test had been normal [5]. Regarding our patient, she had no previous family history of TB exposure or any clinical indicators of pulmonary TB disease. However, headache and weight loss had started gradually after pregnancy termination and seizures forced her to hospitalization.

The first documented case of TB meningitis has been reported by Rich and McChordock in 1933. CNS involvement is a deadly extra-pulmonary presentation of TB disease among immune-compromised patients [4] [8] [12] [13]. In spite of higher prevalence of TB meningitis, tuberculoma is the second most common manifestation of tuberculosis of brain. Although tuberculomas constitute around 30% of intracranial lesions, it is a rare finding of brain TB in developed countries like US [4] [12]. Intracranial lesions can single or multiple (like our patient). Tuberculoma may be asymptomatic and diagnosed incidentally and mostly with no systemic manifestations like malaise, fever, and weight loss. Nevertheless, increased intracranial pressure presents itself as headache, lethargy and seizure. On the other hand, focal mass effect may induce ataxia or hemiparesis [4] [6] [7] [11] [12] [14]. In order to investigate the presence of tuberculoma, Gadolinium-enhanced MRI is the method of choice for diagnosis [7] [9] [10] [14] [15] [16] [17]. On T2 weighted images, rounded lesions of various sizes with surrounding edema are detected. In relation to mass enhancement, they have hyperintense rim around a hypointense center. Brain CT-scan detects hyper/isodense mass and calcification in 10% of tuberculomas [16]. CSF analysis and other lab findings are useless in obtaining a diagnosis regarding the lack of TB meningitis similar to our patient [2] [3] [16]. Despite the high sensitivity of CT and MRI in diagnosis of tuberculoma, the lesions might be mistaken for high-grade gliomas, lymphoma, and metastasis [9] [11] [14] [16]. Therefore, obtaining a tissue sample and culture is critical in making a definite diagnosis. Surgical intervention is considered in case of empiric anti-TB treatment failure, elevated intracranial pressure, and higher possibility of other diagnosis [16]. On the other hand, medical therapy (anti-TB treatment) is essential for all brain tuberculoma patients. Multiple studies recommend a regimen of 3 or 4 drugs (isoniazid, rifampicin, pyrazinamide, and ethambutol) for a duration of 12 to 18 months. In addition, it is suggested to continue the medical treatment until the resolution of enhanced lesions and surrounding edema [16]. The prognosis of brain tuberculoma is based on its sensitivity to anti-TB medication and drug resistance [2] [6] [7] [8] [11] [12] [16].

4. Conclusion

In conclusion, we reported a case of brain tuberculoma in a post-partum patient. Her diagnosis was based on the MRI and histological findings although no definite proof of TB infection was found in brain tissue culture, sputum, and bron-

chial lavage. However, her CSF analysis was not thoroughly in correlation with bacterial meningitis. She was responsive to our anti-TB regimen and had a full recovery a year after her hospitalization. She experienced no neurological sequelae despite the fact that she was under an empiric anti-TB therapeutic plan. Brain tuberculoma is a rare extra-pulmonary presentation of TB infection. Regarding our case and previous studies on pregnant or post-partum patients with neurological symptoms, it is important to consider brain tuberculoma as a diagnosis in TB endemic regions. Furthermore, an empiric regimen of four drugs (isoniazid, rifampicin, pyrazinamide, and ethambutol) may act as a therapeutic and diagnostic method of brain tuberculoma.

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