Lessons learned from a fatal case of tuberculosis meningitis: A case report

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Background

In 2023, 10 million cases of Tuberculosis were reported by the WHO. Tuberculous meningitis (TBM) may be the sole manifestation of Tuberculosis (TB) and does not require prior pulmonary or extrapulmonary disease [1]. Approximately one-half of all TBM infections lead to severe neurological disability with a mortality rate of 30% with death in 6 months and 50% overall [2-4]. Despite being inarguably the most devastating clinical presentation of TB, frequent diagnostic delays are common due to low clinical suspicion or misdiagnosis as current diagnostic tests still have a limited yield [5]. The best way to reduce mortality and morbidity associated with TBM is by maintaining a high index of suspicion, timely diagnosis, and initiation of treatment. This case report aims to highlight the clinical presentation, imaging findings, and diagnostic pitfalls in the diagnosis of TBM.

Case Presentation

A 36-year-old Indian man with no significant medical, social, or travel history initially sought treatment at a private hospital in Abu Dhabi for fever, intermittent headaches, and confusion. Investigations at the hospital included a negative QuantiFERON TB gold (QTF) test and a negative cerebrospinal fluid (CSF) culture, but the CSF analysis was not included in the provided reports. Consequently, he received acyclovir treatment for suspected viral encephalitis but was discharged without complete symptom resolution.

Following discharge, he experienced worsening confusion over three days. Upon presentation to our Emergency Department (ED), he was febrile, disoriented, and difficult to rouse, with a GCS score of 11/15, displaying terminal neck stiffness. There were no signs of lateralization, cranial nerve deficits, or cerebellar abnormalities.

A computerized tomography (CT) scan conducted in the ED revealed hydrocephalus with diffuse leptomeningeal enhancement. Laboratory results indicated significant hyponatremia at 121 mmol/L. He was started on broad-spectrum antibiotics and anti-tuberculosis medication empirically based on the clinical scenario and CT findings. During his Intensive Care Unit (ICU) stay, a CSF analysis suggested TB meningitis, and a positive Mycobacterium tuberculosis polymerase chain reaction (MTB-PCR) confirmed the diagnosis. An MRI of the brain showed meningoencephalitis with tuberculoma formation in the left cerebellar hemisphere.

Unfortunately, despite treatment, his condition deteriorated, necessitating endotracheal intubation, multiple EVD revisions, and ventriculoperitoneal shunt placement. A follow-up MRI revealed worsening hydrocephalus and cerebral vessel thromboses, ultimately leading to his unfortunate demise in the ICU.

Conclusion

This case highlights that Tuberculous meningitis is a highly lethal, under-recognized disease with characteristic clinical and imaging features in which delay in diagnosis and subsequent treatment can lead to fatal consequences. Emergency Medicine physicians should maintain a high index of suspicion for TBM in patients with fever and vomiting and signs of altered mental status and keep in mind that a normal CXR, negative QuantiFERON test, and the absence of TB exposure history does not exclude TBM from the differential when clinical and Brain imaging findings raise concern. Prompt identification prevents delay in initiation of management and ultimately may lead to better long-term outcomes.