

Case report on complications of Tuberculous Meningitis

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Abstract:

Introduction: In immune-competent persons, tuberculous meningitis (TBM) accounts for around 1% of all tuberculosis cases and 5% of all extra-pulmonary tuberculosis cases; patients with tuberculous meningitis have a more death rate, and lingering neurologic sequelae can persist despite good therapy. Even without the use of anti-tumor necrosis factor alpha (TNF) medicines, rheumatoid arthritis is linked to a 2-4-fold rise in the incidence of tuberculosis (TB). There have been cases of active tuberculosis linked to the use of TNF-inhibiting therapeutics all over the world. TNF- is involved in the infection and illness of mycobacteria. **Main symptoms and important clinical findings:** Present case was admitted in A.V.B.R. hospital with chief complaints of confusion state, drowsiness, headache, fever and difficulty to walk due to weakness. **The main diagnose, therapeutic intervention and outcomes:** After physical examination and proper investigation doctor diagnosed a case of Tuberculous meningitis. Patient took the medical treatment of antimicrobial agents to treat the Tuberculous infection but Patient condition was poor. **Conclusion:** In Tuberculous meningitis early detection and early treatment is very important. If delay in detection and management prognosis was worse.

Keywords: Tuberculous Meningitis, Antimicrobial agent

Introduction:

Mycobacterium tuberculosis (MTB) is a cause of Tuberculosis, continues to be one of the biggest causes of infection-related death in the world¹. Globally, an estimated 10 million new cases of tuberculosis were reported in 2017, with 1.57 million fatalities¹. Tuberculous meningitis is the most serious complication of MTB infection², which accounts for about 1% of all active tb cases and 5–10% of extra-pulmonary tuberculosis cases^{3,4}. Children and those infected with the human immune deficiency virus are particularly vulnerable to tuberculous meningitis, with dismal consequences^{2,5}. The key determinants of outcome in tuberculous meningitis are early diagnosis, timely anti-tuberculosis treatment, and corticosteroids². Early identification of tuberculous meningitis, however, remains difficult due to the lack of particular symptoms such as fever, headache, vomiting, and so on. The diagnosis of tuberculous meningitis is frequently dependent on clinical suspicion along with empirical decision making because identification of acid-fast bacilli in the cerebrospinal fluid and culture of MTB lack sensitivity³. According to the British Medical Research Council, the severity of the disease is divided into three stages (BMRC)⁶. The stages of treatment are as follows: Stage I: fully conscious patient with no focal neurological deficits; stage II: altered sensorium but not to the point of coma and minor focal neurological deficits such as a single cranial nerve palsy; stage III: coma-like state with minor focal neurological deficits; stage IV: coma-like state with minor focal neurological

deficits; with the Glasgow Coma Scale was introduced⁷, This was changed to grade I (no focal neurological signs; GCS 15), grade II (no focal neurological signs; GCS 11–14, or 15 with focal neurological signs), and grade III (no focal neurological signs; GCS less than 10) disease⁸. This classification is helpful in predicting prognosis. In immune-competent persons, tuberculous meningitis accounts for around 1% of all tuberculosis cases and 5% of all extra-pulmonary TB cases; patients with TBM have a high death rate, and lingering neurologic sequelae can persist despite good therapy.^{9,10} Even without the use of anti-tumor necrosis factor alpha medicines, rheumatoid arthritis is linked to a 2-4-fold increase in the incidence of tuberculosis.¹¹ There have been cases of active tuberculosis linked to the use of TNF-inhibiting therapeutics all over the world. TNF- is involved in the infection and illness of mycobacteria. As a result, with the administration of anti-TNF medications, progression of newly acquired TB infection or reactivation of already acquired infection should be predicted.^{12,13} Early detection is very important because The clinical result is determined by the stage at which treatment is started⁹. 5 cases of tuberculosis in juvenile patients who were using anti-TNF medication were recently documented in a review publication¹⁴. The child's cerebrospinal fluid (CSF) sample tested negative for Mycobacterium tuberculosis on polymerase-chain reaction (PCR), was smear negative for acid-fast bacilli (AFB), and had a low level of adenosine deaminase (ADA).

Patient Information: A 55 years old patient was admitted in A.V.B.R. hospital with chief complaints of weakness in lower limbs since 20 days and disoriented state since 1 day. Patient was managed conservatively at a private based hospital.

Primary concern and symptoms of patient: Patient visited in A. V. B. R. Hospital in OPD bases on date 11-02- 2021 with chief complaint of weakness in lower limbs since 20 days and disoriented state since 1day.

Medical, family, and psychosocial history: Patient had no any past medical history. Patient belong to nuclear family. He was not mentally stable, he was disoriented to date, time and place. Patient not maintained good relationship with his family members and others hospital staff.

Relevant past intervention with outcome: No any relevant past intervention.

Physical examination and important clinical findings: During physical examination he was conscious but disoriented. Patient looked pale and shows difficulty to walk due to the weakness in lower limbs.

Diagnostic assessment: All routine blood test, MRI, CSF examination was done, in that alkaline phosphatase is 492, ALT -31 and AST -59.

Diagnostic challenges: No diagnostic challenges were faced during diagnostic procedure.

Diagnosis: After physical examination and investigation doctor diagnosed a case of Tuberculous meningitis.

Prognosis: Prognosis was poor.

Types of therapeutic Intervention: Medical management was provided to the patient. Isoniazid, Rifampin , Pyrazinamide and Streptomycin are the best antibacterial medications for treating TBM because they all rapidly penetrate the cerebrospinal fluid when there is meningeal inflammation.

Change in therapeutic Intervention: No changes were reported in therapeutic Intervention

Clinical and patient assessed outcomes: Tuberculous meningitis treated with antimicrobial agents and patient outcome was poor.

Adverse and unanticipated events: No adverse events were noted.

Discussion:

Present case was diagnosed a case of Tuberculous meningitis. After physical examination and diagnostic evaluation patient took a treatment of antimicrobial agents and patient outcome was poor.

In 2007, an instance of severe syringomyelia and intradural extramedullary tuberculoma in a 27-year-old patient was reported. This patient finished ATT eight months ago and is now experiencing paraparesis. She had surgery and was put on ATT and steroids for six months, but she did not improve.⁷ Few studies on latest diagnostic approaches for tuberculosis were reported¹⁶⁻¹⁹. Related cases on extrapulmonary tuberculosis were reviewed²⁰⁻²².

Conclusion:

In Tuberculous meningitis early detection and early treatment is very important. If delay in detection and management prognosis is worse.

References:

1. Whalen C, Horsburgh CR Jr, Hom D, Lahart C, Simberkoff M, Ellner J. Site of disease and opportunistic infection predict survival in HIV-associated tuberculosis. AIDS. 1997;11(4):455–60.
2. Thwaites GE, van Toorn R, Schoeman J. Tuberculous meningitis: more questions, still too few answers. Lancet Neurol. 2013;12(10):999–1010.
3. Torok ME. Tuberculous meningitis: advances in diagnosis and treatment. Br Med Bull. 2015;113(1):117–31.
4. Thwaites G, Fisher M, Hemingway C, Scott G, Solomon T, Innes J, et al. British Infection Society guidelines for the diagnosis and treatment of tuberculosis of the central nervous system in adults and children. J Infect. 2009;59(3):167–87.
5. Chiang SS, Khan FA, Milstein MB, Tolman AW, Benedetti A, Starke JR, et al. Treatment outcomes of childhood tuberculous meningitis: a systematic review and meta-analysis. Lancet Infect Dis. 2014;14(10):947–57.
6. Medical Research Council. Streptomycin treatment of tuberculous meningitis. Lancet. 1948;1(6503):582–96.
7. Teasdale G, Jennett B. Assessment of coma and impaired consciousness. A practical scale. Lancet. 1974;2(7872):81–4.
8. Thwaites GE, Tran TH. Tuberculous meningitis: many questions, too few answers. Lancet Neurol. 2005;4(3):160–70.
9. Duque-Silva A, Robsky K, Flood J, Barry PM. Risk factors for central nervous system Tuberculosis. Pediatrics. 2015;136(5):e-1276-84.
10. Yasui K. Immunity against *Mycobacterium tuberculosis* and the risk of biologic anti-TNF- α reagents. Pediatr Rheumatol Online J. 2014;12:45. doi: 10.1186/1546-0096-12-45. [Links] 3.

11. Gardam MA, Keystone EC, Menzies R, Manners S, Skamene E, Long R, et al. Anti-tumour necrosis factor agents and tuberculosis risk: mechanisms of action and clinical management. *Lancet Infect Dis.* 2003;3(3):148-55.
12. Wallis RS. Tumour necrosis factor antagonists: structure, function, and tuberculosis risks. *Lancet Infect Dis.* 2008;8(10):601-11.
13. Dixon WG, Hyrich KL, Watson KD, Lunt M, Galloway J, Ustianowski A, et al. Drug-specific risk of tuberculosis in patients with rheumatoid arthritis treated with anti-TNF therapy: results from the British Society for Rheumatology Biologics Register (BSRBR). *Ann Rheum Dis.* 2010;69(3):522-8.
14. Toussi SS, Pan N, Walters HM, Walsh TJ. Infections in children and adolescents with juvenile idiopathic arthritis and inflammatory bowel disease treated with tumor necrosis factor- α inhibitors: systematic review of the literature. *Clin Infect Dis.* 2013;57(9):1318-30.
15. Concurrent syringomyelia and intradural extramedullary tuberculoma as late complications of tuberculous meningitis. Muthukumar N, Sureshkumar V. *J Clin Neurosci.* 2007;14:1225-1230.
16. Gupta, Vivek, and Arvind Bhake. "Assessment of Clinically Suspected Tubercular Lymphadenopathy by Real-Time PCR Compared to Non-Molecular Methods on Lymph Node Aspirates." *ACTA CYTOLOGICA* 62, no. 1 (February 2018): 4-11. <https://doi.org/10.1159/000480064>.
17. Gupta, Vivek, and Arvind Bhake. "Molecular Diagnosis of Tubercular Lymphadenopathy from Fine-Needle Aspirates in Pediatric Patients." *ACTA CYTOLOGICA* 61, no. 3 (June 2017): 173-78. <https://doi.org/10.1159/000475832>.
18. Modi, S., Agrawal, A., Bhake, A., Agrawal, V., 2018. Role of adenosine deaminase in pleural fluid in tubercular pleural effusion. *Journal of Datta Meghe Institute of Medical Sciences University* 13, 163-167. https://doi.org/10.4103/jdmimsu.jdmimsu_77_17
19. Sharma, S.K., Mohan, A., 2019. Extrapulmonary tuberculosis, Mycobacterium Tuberculosis: Molecular Infection Biology, Pathogenesis, Diagnostics and New Interventions. https://doi.org/10.1007/978-981-32-9413-4_4
20. Jain, J., Banait, S., Tiewsoh, I., Choudhari, M., 2018. Kikuchi's disease (histiocytic necrotizing lymphadenitis): A rare presentation with acute kidney injury, peripheral neuropathy, and aseptic meningitis with cutaneous involvement. *Indian Journal of Pathology and Microbiology* 61, 113-115. https://doi.org/10.4103/IJPM.IJPM_256_17
21. Jadhav, U., Chawla, D., Wagh, P., Ghewade, B., 2020b. A case of pulmonary tuberculosis with stroke: A rare presentation. *Journal of Datta Meghe Institute of Medical Sciences University* 15, 665-668. https://doi.org/10.4103/jdmimsu.jdmimsu_136_20
22. Yadav, V., Kapoor, A., Naqvi, W.M., 2020a. A rare case report on post tuberculosis sequelae with right ventricular failure in young adult and the positive impact of cardio-pulmonary rehabilitation on functional independence. *International Journal of Pharmaceutical Research* 12, 1125-1130. <https://doi.org/10.31838/ijpr/2020.SP1.170>