

Risk Factors and Clinical Presentations of Central Nervous System Tuberculosis in a Population Attending a Tertiary Care Hospital

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ABSTRACT

Objective: The aim of this study was to see the risk factors and clinical manifestations of the central nervous system tuberculosis in the patients attending teaching hospital of Gujranwala.

Study Design: Observational / descriptive study

Place and Duration of Study: This study was conducted at the Indoor Department of Medicine of District Teaching Hospital, Gujranwala from February 2015 to September 2015.

Materials and Methods: Total 110 cases of TBM were included in our study. The clinical details of these patients were taken and particularly the details of the patient, the history (present, past related), the clinical features were recorded. Data was analyzed by SPSS v.18 and result formulated in the form of tables and figures.

Results: Past history of tuberculosis was present in 23 (25.55%) patients and 10 (11.11%) had family history of tuberculosis. In 44 (48.88%) cases there were no significant risk factors. The main symptoms of brain tuberculosis were convulsions (65.60%), headache (56.25%), fever (37.5%), vomiting (25%), visual impairment (9.3%) and weakness (25%). Motor deficits were found in (37.5%), urinary incontinence in (3%) ptosis in (12.5%) and cranial nerve palsy in (18.75%) patients.

Conclusion: The already suffering from tuberculosis was the major risk factor of Central Nervous tuberculosis. So the proper management of tuberculosis is necessary so that future risk factor for CNS tuberculosis should be reduced. Convulsions and headache were the most common symptoms of CNS tuberculosis.

Key Words: Tuberculosis; Granulomatous disease; Risk Factors; Complication

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INTRODUCTION

Tuberculosis is a granulomatous disease that caused by slow growing Mycobacterium tuberculosis, Gram-positive bacteria which not easily acid decolorization with aniline dye staining. The quality of acid-resistant is due to its lipid wall, while its tubercle proteins are related with tissue allergic features of granulomatous reaction.¹ Tuberculosis is prevalent in developing countries, but also even in developed countries after the first decline up to 1980s, the incidence of tuberculosis is on the rise.² It is the 7th major cause of death worldwide.

According to WHO there were 9.27 million new cases worldwide in 2007 and 1.3 million deaths in developing countries due to tuberculosis. 0.5 million cases of multidrug-resistant tuberculosis (MDR-TB) also reported in 2007.³

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The interaction of HIV with tuberculosis, income inequality, and the emergence of MDR-TB is the key driver of the re-emergence of Tuberculosis in under developed countries.⁴⁻⁶ The 55% of total cases Tuberculosis are presented in Asia followed by Africa that is 31%.⁷ To solve the global threat of tuberculosis, MDGs 2015 was introduced halving the incidence of tuberculosis disease and death.⁸

In 2007 there were estimated 181 / 100,000 new cases & 223 / 100,000 epidemic cases in Pakistan. According to WHO Pakistan is on 8th in the list of countries having Tuberculosis in huge numbers. Pulmonary tuberculosis is the most common manifestation of tuberculosis, although it can involve any organ of the body. Extra Pulmonary tuberculosis is defined as the occurrence of isolated tuberculosis in any part of the body outside the lungs. Mycobacterium may spread to any body organs through lymphatic or hematopoietic transmission and remain inactive for many years before a particular site causes disease to occur. The manifestation may involve systematic involvement or just as prolong fever and non-specific systematic symptom.⁹ so the diagnosis may be vague and frequently late.

The proportion of EPTB in all tuberculosis cases varies from one country to another. The out-of-lung manifestation of tuberculosis is prevalent in 34% of non-HIV cases in Pakistan¹⁰, WHO estimates 34,000

(15%) of newly reported cases, In 2007, an additional number of outbreaks of the extra pulmonary TB.¹¹ EPTB report range from one quarter to one third of all tuberculosis patients to the GP clinics in Karachi and hospitals of Rawalpindi.¹²⁻¹³

In our part of the world, tuberculosis is common although a lot of researches on this subject have been done on the central nervous system tuberculosis but only a few prospective studies are available. There is an urgent need for such researches in our country.

MATERIALS AND METHODS

This study was conducted for a period of eight months from February 2015 to September 2015 at Indoor department of Medicine of District teaching hospital Gujranwala.

Total 110 cases of TBM were included in our study. The clinical details of these patients were taken and particularly the details of the patient, the history (present, past related), the clinical features were recorded. In this prospective study all the confirmed cases of central nervous system tuberculosis were included. Cases of Bacterial meningitis and encephalitis were excluded from this study. Blood and cerebrospinal fluid PCR was performed for Mycobacterium tuberculosis.

RESULTS

Total 110 cases of TBM were included in this study.

Risk Factors: The previous history of Tuberculosis was present in 28(25.45%) cases and 13(12%) patients had positive family history of tuberculosis. In 9(8.18%) cases Extra Central nervous system tuberculosis was present out of which 3 had active lung disease. The 7(6.36%) patients in our study had diabetes. In our study there were no case of immune depression and AIDS. No important risk factor was observed in 54(49%) patients. (Table No 1)

Sign and Symptoms (Central nervous Tuberculosis)
The main symptom of Central nervous Tuberculosis was Convulsion (64%), Headache (55.5%), fever (36.5%), vomiting (26%), and visual impairment (8%) & weakness (24%). (Table No 2)

Table No. 1: Risk Factors of Central nervous Tuberculosis

Risk Factors	No of Patients	Percentage of patients
Past History	28	25.45
Family History	13	12
Diabetes	7	8.18
Extra CNS Tuberculosis	9	7
No Important Risk Factors	53	49

On clinical evaluation 26% patients were normal. In (38%) patients there were Motor deficit, Urinary incontinence in (10%), ptosis in (13%), and in (19%) cases Cranial nerve palsies were observed. (Figure 1)

Table No. 2: Symptoms of Central nervous Tuberculosis

Symptoms	No of Patients	Percentage of patients
Convulsions	70	64
Headache	61	55.5
Fever	40	36.5
Visual impairment	9	8
Vomiting	29	26
Weakness	26	24

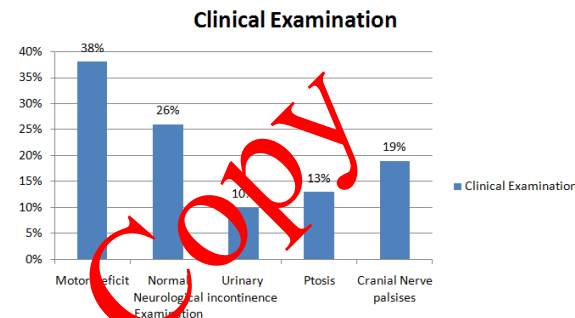


Figure No.1: Clinical Examination of Central nervous Tuberculosis

DISCUSSION

Central nervous system tuberculosis is very common in developing countries with high morbidity and mortality. Tuberculosis is prevalent not only in developing countries, but even in developed countries after the first decline up to 1980s, the incidence of tuberculosis is on the rise.¹³ The interaction of HIV with tuberculosis, income inequality, and the emergence of MDR-TB is the key driver of the re-emergence of Tuberculosis in under developed countries. The diagnosis of central nervous system tuberculosis is based on clinical and laboratory findings. CT, MRI preoperative diagnosis of tuberculosis is very sensitive, and routine histopathological diagnosis of tuberculosis is needed.

Past history of tuberculosis (25.55%) was the major risk factor in our study, followed by family history (11.11%), (7.77%) of Extra-central nervous system tuberculosis and diabetes (66.6%). There were no significant risk factors present in 48.88% of the cases. Neeru Vithalani et al¹⁴ found that most of the children had central nervous system disease cause by spread disease or miliary tuberculosis (34%) and only 21.8% of cases had the isolated central nervous system diseases, while isolated central nervous system diseases in adults were present in 50% of cases. The total 41% of cases had family history of tuberculosis that was reported from Matloob Azams' study¹⁵ in Pakistan. In Ramdurg SR et al¹⁶ study, the history of tuberculous

meningitis was found in 20% cases and old pulmonary tuberculosis in (66.6%) of cases. Martinez¹⁷ found Extra-central nervous system tuberculosis in (62.5%) patients with tuberculous pericardites in 12.5% of the cases. In his study 12.5% of cases found active lung disease. We did not find any case of HIV infection in our study that was consistent with Bayinder¹⁸. 25% HIV-positive patients were present in the study that was conducted by Martinez. In study by Cormican¹⁹ 4.76% of cases were found with HIV positive. 20% of tuberculosis cases are related with HIV-positive infections in sub-Saharan Africa. Tuberculosis is prevalent in our country and past history and family history were important risk factors in our research, as in other studies in this geographic domain. In addition to this, people are different from the West, the subcontinent people live in joint family system who has a strong contact with person to person spread that contributing to family history of tuberculosis.

In our study convulsions (65.60%) and headache (56.25%) were the most common symptoms, followed by fever (37.5%), weakness (25%), vomiting (20%), visual impairment (9.3%). seizure was the main symptoms by the study of Garg RK²⁰, El Sayedd MM et al²¹ found that most common cause of seizures was tuberculous tumor. According to Martinez et al study headache was the most frequent symptom, followed by focal neurological deficit and seizures. Cicek Bayinder et al found the most common symptoms headache, fever, and vomiting similar to that of the Lakatos B et al²² study. The 9.3% of the cases with visual impairment were present in our study based on the results of the study by EL Sayed MM et al.

In our study, spinal tuberculosis rigid spine (9.65%), pain (79.33% L.C.S), neuronal deficits (62.5%) were the most common symptoms, followed by fever (17.24%). HSU et al²³ also found pain and stiffness as the most important symptom. Yanaraog H et al²⁴ found back pain and sweating as the most common symptom. Le page et al²⁵ found neurological deficits in 74% cases. Ehsaei M²⁶ Owolabi L.F²⁷ found the nerve deficit was 63.8% and 100% respectively.²⁸ In the nerve deficit we found limb paralysis (1.7%), limbs weakness (1.7%), paraplegia (25.80%) and paraparesis (34.48%). Mohn chang et al²⁸ found 25% of cases had paraplegia. L Cormican et al found a neurological deficit in 100% of cases.

CONCLUSION

The already suffering from tuberculosis was the major risk factor of Central Nervous tuberculosis. So the proper management of tuberculosis is necessary so that future risk factor for CNS tuberculosis should be reduced. Convulsions and headache were the most common symptoms of CNS tuberculosis.

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

1. David GR, Cardona PJ, Kim MJ, Allain S, Altare F. Foamy macrophages and the progression of the human TB granuloma. *Nat Immunol* 2009; 10(9): 943-948.
2. Raza S, Sadaf A, Fecto F, et al. Patterns of tuberculosis in the central nervous system. *Infect Dis J Pak* 2004; 13:99-104.
3. World Health Organization, The global burden of disease: 2004 update. World Health Organization, Geneva, Switzerland, 2004.
4. World Health Organization. Global tuberculosis control: surveillance, planning, financing. WHO report 2008. HO/HTM/TB/2008.393. Geneva, Switzerland: WHO, 2008.
5. Ilgazli A, Boyaci H, Basyigit I, Yildiz F. Extrapulmonary tuberculosis: clinical and epidemiologic spectrum of 636 cases. *Arch Med Res* 2004; 35: 435-441.
6. Yang Z, Kong Y, Wilson F, Foxman B, Fowler AH, Marrs CF, et al. Identification of risk factors for extrapulmonary tuberculosis. *Clin Infect Dis* 2004; 38: 199-205.
7. Broekmans J, Caines K, Paluzzi JE. Investing in strategies to reverse the global incidence of TB. London: UN Millennium Project, United Nations Development Programme; 2005.
8. UNDP.org [homepage on the Internet]. Millennium Development Goals. New York: United Nations Development Program; c2006 [Online] 2009 [Cited 2009 Jan 18]. Available from URL: <http://www.undp.org/mdg/>.
9. World Health Organization, Treatment of tuberculosis: guidelines for national programmes, World Health Organization, Geneva, Switzerland, 2003.
10. Ozvaran MK, Baran R, Dilek I, Demiryontar D, Arinc S, et al. Extrapulmonary tuberculosis in non-human immunodeficiency virus-infected adults in an endemic region. *Ann Thorac Med* 2007; 2: 118-21.
11. Eastern Mediterranean Regional Office (World Health Organization) [homepage on the Internet]. Cairo: STOP TB: TB situation in region - Country Profile Pakistan; [Online] 2008 [Cited 2009 Jan 18]. Available from URL: <http://www.emro.who.int/STB/TBSituation-CountryProfile.htm>.
12. Butt T, Kazmi SY, Ahmad RN, Mahmood A, Karamat KA, Anwar M. Frequency and antibiotic susceptibility pattern of mycobacterial isolates from extra-pulmonary tuberculosis cases. *J Pak Med Assoc* 2003; 53: 328-32.
13. WHO. 2007. Global tuberculosis control: surveillance, planning, financing. WHO report

2007. World Health Organization, Geneva, Switzerland
14. Waaler HT. Tuberculosis and poverty. *Int J Tuberc Lung Dis* 2002; 6:745-746.
 15. Azam M, Bhatti N. Intracranial tuberculomas and caries spine:an experience from children's hospital Islamabad. *J Ayub Med Coll* 2004;16(4):7-11.
 16. Ramdurg SR, Gupta DK, Suri A, Sharma BS, Mahapatra AK. Spinal intramedullary tuberculosis: a series of 15 cases. *Clin Neurol Neurosurg* 2009;111(2):115-8.
 17. Martínez Lacasa JT, Burillo J, Niubo R,et al. Cerebral tuberculoma. Report of 8 cases; *Medicina Clinica* 97(6):218-223
 18. Bayinder C, Mete O,Bilge B. Prospective study of pathologically proven cases of CNS tuberculomas, March 2005.
 19. Cormican L, Hammal R,Messenger J, Milburn HJ. Current difficulties in the diagnosis and management of spinal tuberculosis *Postgrad Med J* 2006; 82(963): 46–51.
 20. Garg RK. Diagnosis of intracranial tuberculoma. *Ind J Tub* 1996, 43, 35
 21. El sayed MM, Adeuja AO. Intracranial tuberculomas, in Saudi Arabia experience. *Afr J Med Sci* 2006;35(1):21-7.
 22. Lakatos B, Prinz G, Sárvári C, Kamotsay K, Molnár P, Abrahám A, et al. [Central nervous system tuberculosis in adult patients]. *Orv Hetil* 2011;152(15):588-96.
 23. HSU LCS, Leong JLY. Tuberculosis of lower cervical spine, report of 40 cases. *J Bone Joint Surg* 1984;66(1).
 24. Yanardag H, Canbaz BA. Pott's Disease: The Clinical Features And Treatment Outcomes Of Eight Patients Of Spinal Tuberculosis. *Int J Int Med* 2004;4(2).
 25. Page LE, Feydy L. Spinal tuberculosis: Longitudinal study with clinical, laboratorial & imaging outcomes 2006;36(2);124-91
 26. Ehsaei M, Samini F, Bahadorkhan G. POTT'S Disease: a review of 58 cases, *Med J Islamic Repub Iran* 2010;23(4):200-206
 27. Owolabi LF, Nagoda MM, Samaila AA, and Aliyu I. Spinal tuberculosis in adults: A study of 87 cases in Northwestern Nigeria. *Neurol Asia* 2010; 15(3):239–244
 28. Mahn Chung SM, Kim NH, Kim YA, Kam ES. Clinical studies of tuberculosis of spine. *Yonsei Med J* 1978;19(2).

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