Original article

The Pattern Of Neurological Manifestations Of Tuberculosis Among Adult Sudanese Patients

A.Hussein[1], A.E. M.Eltahir[1], Eltayeb.A. Elamin[1], A. Sidig[2], H. El Turabi[1], MOEH Gadour[3]

ABSTRACT:

Objective: To study the pattern of neurological manifestations of tuberculosis among adult Sudanese tuberculous patients seen at El-Shaab Teaching Hospital (Sudan).

Methods: This study was performed on 179 Sudanese patients with tuberculosis admitted at El-Shaab Teaching Hospital during the period from May 2005 to January 2006.

Demographic and clinical data were obtained. Investigations including CXR, sputum for acid alcohol fast bacilli [AAFB], Mantoux test, complete haemogram were done. Screening for HIV, NC Study, EMG, CT, MRI of the brain or spinal cord were performed when indicated.

Results: Fifty seven out of 179 tuberculous patients had neurological complications. 22 presented with Pott's paraplegia, 18 with peripheral neuropathy, six had tubercloma, three with tuberculous meningitis, three had quadriplegia, two had hemiplegia, two had proximal myopathy and one had multiple cranial nerves palsies

CONCULSION: The study revealed high incidence of Pott's paraplegia and peripheral neuropathy, this is most probably due to late presentation.

Key wards: Pott's paraplegia, peripheral neuropathy, tubercloma, tuberculous meningitis, quadriplegia, hemiplegia, proximal myopathy

Tuberculosis (TB) is an ancient disease. Egyptian mummified remnants dated to 3400 BC showed evidence of Pott's disease[1]. A recent resurgence of TB in both developing and developed countries had been observed. Several factors had contributed to this serious phenomenon including the increasing prevalence of HIV infection[2]. TB of the central nervous system is a common clinical problem in developing countries. Its incidence is directly proportional to the prevalence of TB infection[2]. It is almost always secondary to a primary lesion else where and constitutes 4-6 % of the extra pulmonary cases[1].

1. Faculty of Medicine. University of Khartoum Sudan
2. Elshaab Teaching Hospital. Federal MOH.
3. Umdorman Islamic University. Khartoum
Correspondence: to Dr .Abbashar Hussein. Tel. +249-9123456722. E-mail: abbashar59@yahoo.com

No part of central nervous system is spared. Infection of the meninges by tubercle bacilli is usually caused by rupture of subependymal tubercle into subarachnoid space rather than by haematogenous seeding in the meninges. The clinical manifestations of central nervous system involvement depend on the site affected.

Objective: To study the pattern of neurological complications among adult Sudanese tuberculous patients seen at a tertiary hospital at Khartoum Sudan.

Material and methods: This study was conducted at El-Shaab Teaching Hospital, which is a 243 bedded tertiary hospital, located in Khartoum town. The study population included tuberculous patients admitted or referred to the hospital in the period from May 2005 to January2007. Patients below 18 years of age were excluded. History and clinical examination were performed for all patients by the authors. The physical signs were grouped into general, systemic and neurological. The following

investigations were done for each patient: Chest X Ray [CXR], Sputum for Acid and Alcohol Fast Bacilli [AAFB], Mantoux test, ESR, total and differential WBCs, urine analysis. CT brain, spinal or brain MRI, CSF studies, Nerve Conduction Studies [NC], EMG, Muscle biopsy, and HIV serology were done when indicated. Standard regiments of antituberculous drugs according to the WHO guidelines were used in the treatment. Some patients with Pott's disease underwent surgical decompression. Data were analyzed using statistical package program for social science (SPSS).

Results: Out of 179 patients with TB seen in the hospital, 57 had neurological complications, 34 of them were males. Age distribution was shown in table 1. Past medical history of tuberculosis was seen in 50% of patients with paraparesis/paraplegia [table2].

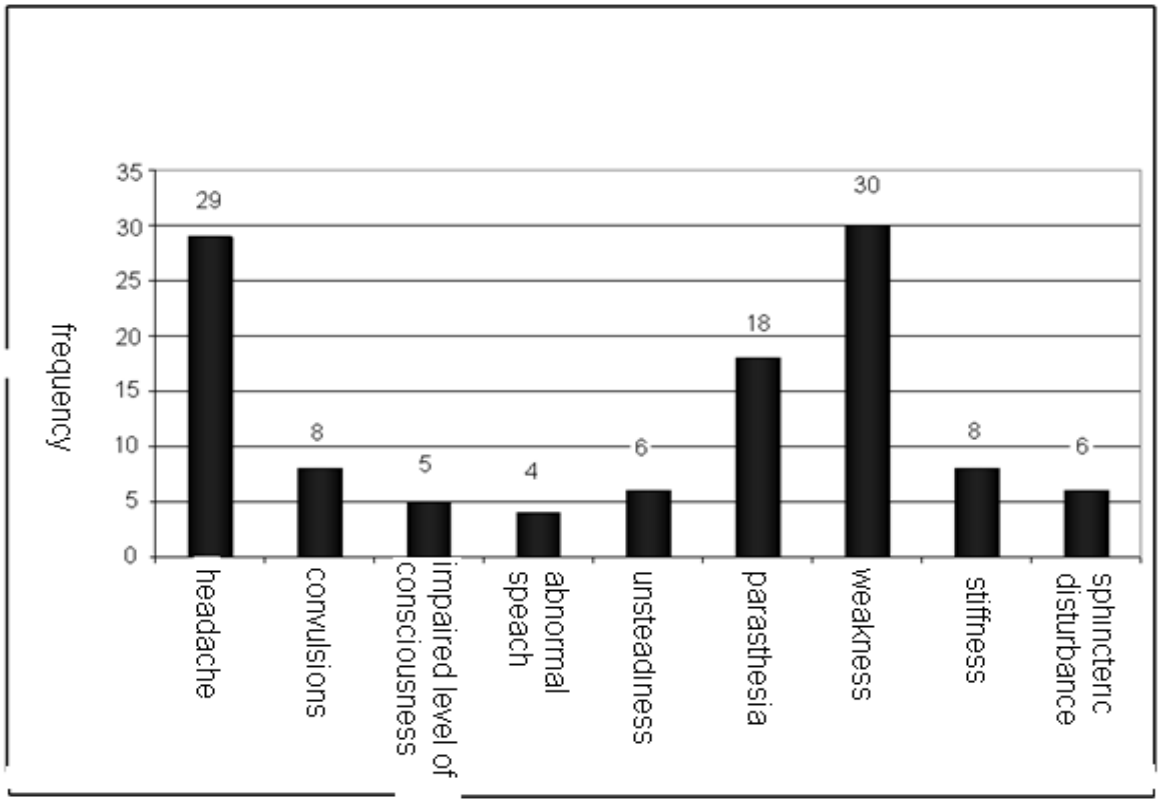
Table 1: TB with andwithout NC according to age distribution

Age	TB without NC [n=122]	TB with NC [n=57]	% With NC
>18 - 29	64	17	30%
30 - 39	17	10	18%
40 - 49	15	7	12%
> 50	26	23	40%

TB= tuberculosis, NC= neurological complications

Table 2: Past medical history of tuberculosis and neurological complications

Neurological Manifestations	NO of patients	P.H of TB (%)
Paraparesis/Paraplegia	22	11(50%)
Peripheral neuropathy	18	5(28%)
Tuberculoma	6	5(83%)
Tuberculous meningitis	3	2(67%)
Hemiplegia	2	0(0%)
Quadriplegia	3	2(67%)
Craniopathy	1	1(100%)
proximal myopathy	2	2(100%)



Figer 1: The neurological symptoms

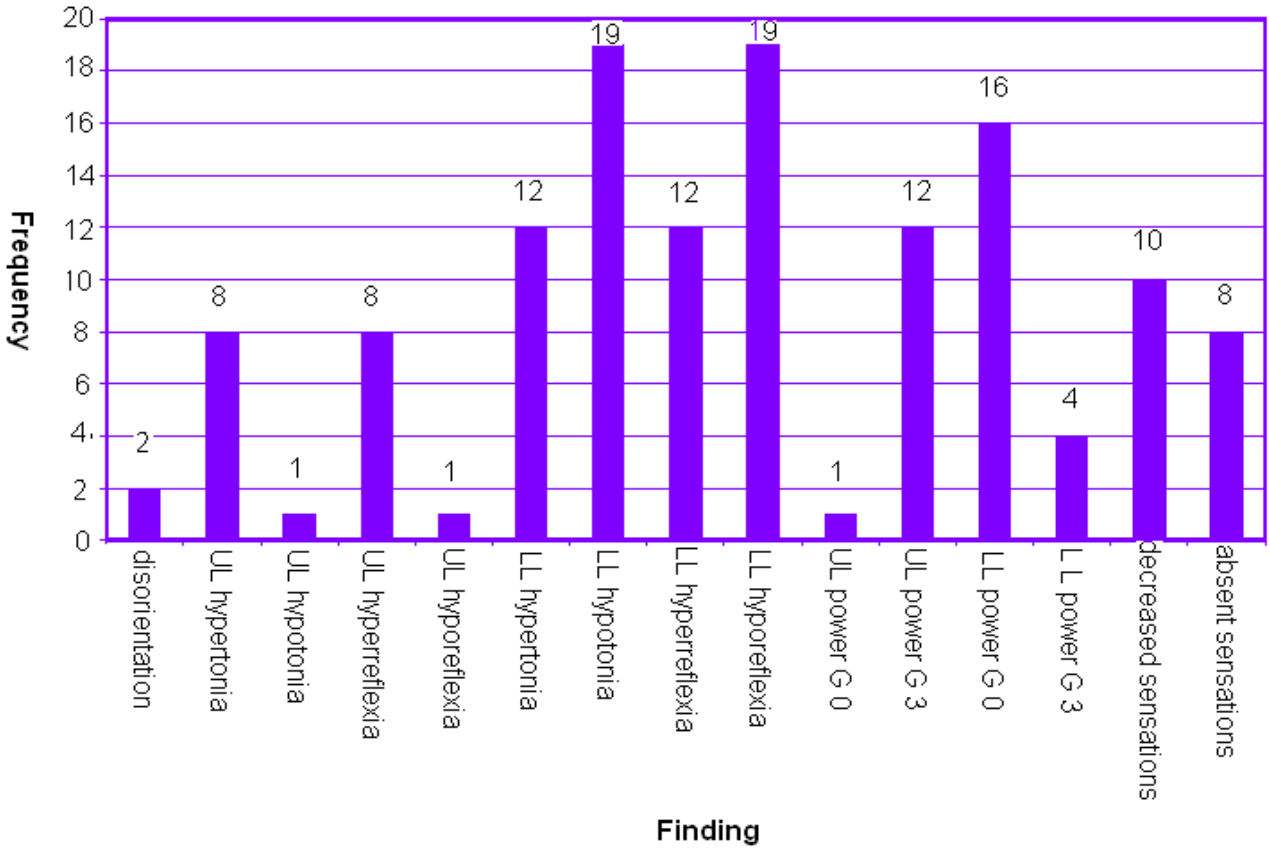


Fig 2: Neurological Findings

The presenting symptoms and the clinical signs were shown on figure1and 2 respectively. Head ache, weakness and parasthesia were the common presenting symptoms [Fig 1]. Contrary to the upper limbs, hypotonia and hyporeflexia were dominant in the lower limbs [Fig.2].

It was found that 101 (82%) out of 122 tuberculous patients without neurological complications had positive sputum test for AAFB, 89 (72%) had positive Mantoux test and 88 (72%) showed CXR findings suggestive of pulmonary TB where as only 21 out of 57 (36%) patients who had neurological complications had positive sputum, 36 (63%) had positive Mantoux and 38 (66%) had positive CXR findings.All patients (100%) with Pott's disease, hemiplegia and craniopathy were found to have MRI findings in consistent with the diagnosis, whereas no patients with peripheral neuropathy, tuberculous meningitis and proximal myopathy had abnormal MRI findings [Table 3].

Table 3: The correlation between MRI findings and neurological manifestations

neurological manifestations	NO of patients	Abnormal MRI (%)
Pott's disease	22	22 (100%)
peripheral neuropathy	18	0 (0%)
tuberculoma	6	5 (83%)
tuberculous meningitis	3	0 (0%)
Quadriplegia	3	2 (67%)
Hemiplegia	2	2 (100%)
proximal myopathy	2	0 (0%)
craniopathy	1	1 (100%)

Discussion:

The predominance of central nervous system TB in males in this study is not consistent with the literature where no sex predilection was noted[3]. Similar to reports, patients in the age group (18-29) constituted 30% of those who had neurological complications[4]. However, the late presentation with neurological complications in 40% of our patients [above 50 years of age] may be due to "lack of attention" when the symptoms were mild, flare up of the disease with reduced immunity as in cases of superadded HIV infection or the case may simply be misdiagnosed and mismanaged. This finding is similar to what was reported by Rieder et al[5].

The most common symptoms of tuberculosis including, fever, weight loss, nocturnal sweating, and cough were seen in patients with neurological complications (85%, 78%, 64%, and 49 %,) respectively. As reported from elsewhere, the correlation between these symptom and neurological complications was highly significant especially with the latter[6]. This indicates the co-existence of symptomatology of tuberculosis in patients with neurological complications, which is similar to other studies[6,7]. The existence of significant past medical history of

tuberculosis [P < 0.045] in our patients [Table 2] supports the high prevalence of the reactive type of tuberculosis rather than the active disease. In patients with tuberculous meningitis, past history of TB was found in 67% of patients. This contrasts the literature where it was found in only (10%). The small number of patients with tuberculous meningitis included in our study may partially explain that[8-9]. Convulsions which may be due to increase intracranial pressure in cases of tuberculoma, abscess formation, hydrocephalus complicating tuberculous meningitis, or coexistent HIV infection were seen in six of our patients[9]. Fife of our patients had impaired level of consciousness which indicates bad prognosis[10-11]. Cranial nerves palsies were detected in 36% of our patients; this is similar to previous findings[12]. Going with earlier reports, facial nerve was the commonest cranial nerve to be involved in our population [28%] followed by the optic nerve[13]. Cranial nerves involvement may be part of the manifestations of tuberculous meningitis especially basal meningitis, tuberculoma or may be due to coexistent diseases like HIV infection[14]. In consistence with literature, out of 22 patients presented with Pott's paraplegia fifteen (69%) had the spastic type[15-16]. Loss of sensation varied from impairment in fourteen patients (64%), to absent sensation in eight patients (36%).

The paraesthesias -seen in 31% of patients who presented with neurological complications- may be due to antituberculous chemotherapy, neuropathic numbness, or concomitant HIV infection[17]. Sphincteric disturbance in form of urine retention occurred in 10% of our patients; it is associated with Pott's paraplegia and indicates severe damage to the spinal cord[18]. Chest X-ray findings in favor of tuberculosis were found in (66%) of tuberculous patients with neurological complications, this is more than what was mentioned in the literature (30%). The high prevalence of TB could explain that[15].

MRI was reported to have high sensitivity and specificity for tuberculoma. Our finding that five out of sex patients with tuberculoma (83%) had positive MRI findings supported that[11].

MRI for patients with Pott's disease accurately localizes the lesions. The spines which were involved more were thoracolumbar, thoracic, lumber, and cervical spine respectively. This does not go with reports from Russia[16].

In patients with tuberculosis and neurological complications sputum for AAFB was found to be positive in twenty one patients (36%) while Mantoux test was positive in thirty five patients (63%).The increased positivity of Mantoux is related to hypersensitivity reaction[16].

Patients who had acquired immune deficiency syndrome and pulmonary tuberculosis complicated with neurological manifestations showed lower zonal lesions on CXR, increased incidence of negativity of mantoux test and sputum for acid alcohol fast bacilli. This is compatible with literature[14].

Conclusion:

Neurological manifestations are common in patients with TB. However, high index of suspicion is needed to avoid delay in diagnosis and management. Pott's paraplegia and peripheral neuropathy were highly prevalent in our patients and this is probably due to late presentation.

References

1-Morse D, Broth Well DR, and Uoko PJ. Tuberculosis in ancient Egypt. Am Re Resp Dis 1964; 93: 524–530.

2-Wood M, Anderson M. Tuberculous meningitis. Neuro Dis1998; 16:169-248.

3-BergerJR.Tuberculous meningitis. Curr Opin Neurol 1994; 7:191-200.

4-Rajajee S and Narayanan PR. Immunological spectrum of childhood tuberculosis. J Trop 1992; 21: 490 - 496.

5- Rieder HL, Snider DE Jr, Cauthen GM. Extra-pulmonary tuberculosis in the United States. Am Rev Respir Dis 1990; 141:347-351.

6-Sheller JR and Des prez RM. CNS tuberculosis. Neurol clin 1996; 4:143-158.

7-Newton RW.Tuberculous meningitis. Arch Dis1994; 70:364 366.

8-Leonard JM and Des prez RM. Tuberculous meningitis infections disease clinic north Am 1995; 4:769 – 787.

9-Ahuja GK, Mohan KK, Prased K et al. Diagnostic criteria for tuberculous meningitis and their validation.Tubercle Lung Dis1994; 75:149 –52.
10-Monteyne P and.Sindic CJM. The diagnosis of tuberculous meningitis. Acta Neurol Belg 1995; 95:80-87.
11-Rajshekhar V and Chandy MJ. Tuberculomas presenting as isolated intrinsic brain stem masses.BRJNeurosurgery1997; 11:127–133.
12-Jinkins JR, Gupta R. MR imaging of CNS Tuberculosis .Radiol clin north Am 1995; 33:771 – 786.
13-Naidoo.DP, Desia.D, Kranidiotios L.Tuberculousmeningio myeloradiculitis.Case report. Tubercle 1991; 72(1): 65-69
14- Cantwell MF, McKenna MT, McCray E, Onorato IM. Tuberculosis and race/ethnicity in the United States. Am J Respir Crit Care Med 1998; 157:1016-1020.
15-Dastur DK, Manghani DK, and Udani PM. Pathology and pathogenic mechanism in neurotuberculosis. Radiol clin north Am 1995; 33: 733 – 752.
16-Vidysagar C and Murthy HK. Peripheral neuropathy associate with tuberculosis. Rev neurol1996; 24(131): 841 – 842.
17-Krambovitis E. Rapid diagnosis of tuberculous meningitis by latex particle agglutination.Lancet1984; 4:1229–1231.
18-Nguyen LN, Fox LFF, and Phon LD. The potential contribution of polymerase chain reaction to the diagnosis of tuberculous meningitis. Arch Neurol1996; 53:771–776.