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Spectrum of Clinical Presentation of Intracranial Tuberculoma

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ABSTRACT

Objectives: To describe the clinical presentation, radiological findings in 15 patients with intracranial tuberculoma.

Design: Consecutive cases admitted with tuberculoma to the MBGH Hospital, Udaipur, Rajasthan, were included in the study. The diagnosis was based on clinical and neuro-imaging features.

Results and Conclusions: The commonest presenting features were generalized convulsion (86.66%) and altered consciousness (80%). Computerised axial tomography/magnetic resonance imaging (CT/MRI) revealed single or multiple lesions that showed intense contrast enhancement and perilesional edema. After receiving 6 months of ATT all patients were symptom free. We advocate early empirical trial of anti-tuberculosis drugs for intracranial tuberculoma even after a presumptive diagnosis.

Key Words: Anti-tuberculosis drugs, Intracranial tuberculoma

INTRODUCTION

Tuberculosis (TB), which is caused by bacteria the Mycobacterium tuberculosis complex, is one of the oldest disease known to affect humans and is a major cause of death worldwide. This disease most often affects the lungs, although other organs are involved in up to one-third of cases.¹

Central nervous system (CNS) tuberculosis is a serious form of TB, due to haematogenous spread of Mycobacterium tuberculosis, manifest as meningitis, cerebritis and tuberculous abscesses or tuberculomas.²

Intracranial tuberculomas are the least common presentation of CNS TB, found in 1% of these patients.³ They are multiple in 15%-33% of the cases.⁴

Tuberculomas often present with symptoms and signs of focal neurological deficit without evidence of systemic disease.⁵ Our study highlights the spectrum of clinical presentations of intracranial tuberculomas with the role of magnetic resonance imaging, a noninvasive tool, in prompt diagnosis and thereby early clinical management of such cases with a positive outcome.

STUDY DESIGN

A retrospective cross sectional study was done in 15 patients in whom neuroimaging shows ring enhancing lesion and was suspected as tuberculoma lesion.

MATERIAL AND METHODS

This study was done retrospectively by analyzing patients presenting with tubercular infection of the CNS in the form of tuberculoma under the author in last one and half years (July 2015-dec. 2016) in medicine department.

Inclusion criteria

- Only adult patients (more than 16 year of age) were included
- All patients with ring enhancing lesions on neuroimaging who were suspected as tuberculoma analyzed in the view of their clinical presentation.

Exclusion criteria

- HIV positive patients

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METHODS

A detailed clinical history was noted as described in the study Performa in all patients in which neuroimaging study was suggestive of tuberculoma lesion. A detailed past, family and personal history was taken in all patients. A thorough general and systemic examination was done.

Laboratory tests done included a complete blood count with erythrocyte sedimentation rate(ESR), electrolytes and routine biochemical tests. Specific laboratory tests for establishing etiology were performed like screening for HIV-1 and 2, blood cultures, sputum microscopy and culture. Cerebrospinal fluid analysis for protein, sugar, cell count and morphology, Cerebrospinal fluid ADA, IgM toxoplasma antibodies, cryptococcal antigen were done when indicated. Imaging studies done included computed tomography (CT) brain or magnetic resonance imaging (MRI) brain with contrast as was indicated. Ancillary investigation like X-ray chest and USG abdomen was done whenever the clinical situation demanded.

RESULTS

Fifteen indoor patients admitted to medical ward satisfying the inclusion criteria were selected for the study, all of them from rural area near Udaipur. Table 1 showing the age and sex wise distribution of the patients. The age group of patients were ranged from 16-75 years. Majority of patients were in the age group of 46-60years. Out of 15 patients in the study group,9 patients were male (60%) and 6 were female (40%). The overall sex ratio was 1.5:1. All patients were laborers by occupation and nonvegetarian.

Table 1: Age and Sexwise Distribution of the patients (n = 15)

Age	Male	Female	Total
16-30	1	0	1
31-45	3	2	5
46-60	5	3	8
61-75	0	1	1
Total	9	6	15

Clinical features of are summarized in Table 2. Seizure was the most common presenting feature. 13 patients (86.66%) out of 15 were presented with one or more episodes of seizure. The type of seizure was generalized tonic and clonic in all of them. History of altered consciousness was also present in 12 patients (80%). 11 patients (73.33%) were having complaint of headache. 8 patients (53.33%) out of 11 who were having headache also have associated vomiting. History of fever was present in 9 patients (60%).

Table 2: Clinical Features of Tuberculoma

Clinical feature	n (%)
Seizure	13(86.66)
Altered consciousness	12 (80)
Headache	11 (73.33)
Vomiting	8 (53.33)
Fever	9(60)
Cranial nerve palsy	2(13.33)
Neck stiffness	1 (6.66)

Past History

There was no previous history of pulmonary or extrapulmonary TB in any patient and none of them was diabetic.

Examination

11 patients (73.33%) had pallor. There was no lymphadenopathy, icterus, pedal edema or clubbing.

On CNS examination 2 patients were having cranial nerve palsy but none of patient have papilloedema. Neck stiffness was present in 1 patient.

Investigations

Mean hemoglobin was 9.6 g/dl and ESR 68 mm at end of first hour. None of patient was HIV positive. chest x-ray was done in all the patients and there was no any patch except in one patient, in which it was showing millitary shadows in bilateral lung fields. Cerebrospinal fluid analysis for protein, sugar, cell count and morphology shows no abnormality in any of the patient. Cerebrospinal fluid ADA, IgM toxoplasmosis antibodies, cryptococcal antigen were negative.

MRI brain was done in all the patients which was showing tuberculoma lesion in all the patients at different locations.

DIAGNOSIS AND TREATMENT

Probable etiological diagnoses were based on the presence of supportive findings detected after clinical evaluation and above mentioned battery of investigations. The diagnosis remained probable be cause in none of the patients histopathological verification was obtained. Patients were provided appropriate symptomatic treatment (corticosteroids, mannitol, antiepileptic drugs and/or analgesics if required). Appropriate specific treatment according to the diagnosis was given. Some of above mentioned laboratory investigations were periodically repeated during hospitalization and on outdoor follow-up to monitor the disease activity on modifying the ongoing treatment.

DISCUSSION

The mean age of patients was 47.2 years with 53.33% of pa-

tients between 46-60 years of age. The mean age obtained in various studies is as shown in Table 3 which is in accordance with our observation. Males predominated in all age groups. The sex wise incidence in various other studies is as shown in Table 3.

Table 3: Peak age and sex wise incidence in Tuberculoma patients

Investigator	Age incidence	Sex incidence
Enberg et al (n=53) ⁶	39 years (mean)	Males-47.9% Females-52.1%
Cagatay et al (n=52) ⁷	33.9 years (mean)	Males-33.3% Females-66.6%
Fan et al (n=100) ⁸	31 years (median)	Males-49% Females-51%
Our study (n=15)	47.2 years (mean)	Males-60% Females-40%

In our study Seizure was the most common presenting feature which was present in 13 patients (86.66%), loss of consciousness in 12 patients (80%), headache in 11 patients (73.33%), vomiting in 8 patients (53.33%) and fever was present in 9 patients (60%). Table 4 shows comparison of presenting clinical feature of previous studies and our study.

Table 4: Presenting feature in patients with tuberculoma

Presenting feature	PS Mahato, AS Dabhi, PB Thorat ⁹	In present study
Fever	52.3%	60%
Headache	66.6%	73.33%
Vomiting	42.8%	53.33%
Convulsion	47.6%	86.66%
Altered consciousness	52.3%	80%

None of the patient was having history of tuberculosis. Chest X-ray shows millitary TB in only one patient. On neuroimaging, 60% shows multiple ring enhancing lesions. We use following criteria to differentiate tuberculoma from other causes of ring enhancing lesion in MRI¹⁰:-

1. ring enhancing lesion in neurocysticercosis usually shows multiple lesions in different stages of evolution.
2. ring enhancing lesions in abscesses are restrict on DWI.
3. ring enhancing lesions in neoplasm shows elevated choline peak on MRS.

The distribution of these lesions compared with other studies is shown in Table 5.

Table 5: Distribution of Intracranial Tuberculomas

Location	Kumar et al ¹¹ 36% patients had multiple lesions	Present study 60% patients have multiple lesions
Supratentorial	55%	73%
Infratentorial	56%	18%

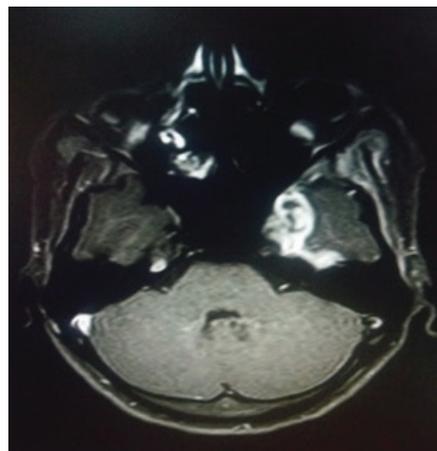


Figure 1: MRI brain showing Cavernous tuberculoma with perilesional edema.

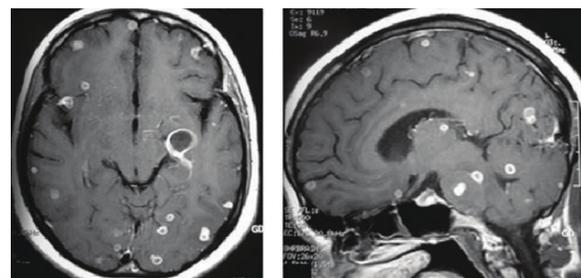


Figure 2: MRI Brain showing multiple tuberculoma in supra as well as infratentorial regions.

CONCLUSION

Brain tuberculoma is one of the neurological manifestation of tuberculosis, usually occur in immunocompromised individuals due to haematogenous spread from a primary focus, mainly from the lungs. In this study we studied 15 patients, all of them immunocompetent and none of them was having past history of tuberculosis. Only 1 out of 15 patients had chest x-ray suggestive of millitary tuberculosis.

We emphasize here that tuberculoma can be occur in immunocompetent patients without past history of TB and without any active lesion in lungs. In past various studies have been done on tuberculoma but only few of them was suggesting tuberculoma without any immunocompromised status and without any active lung lesion. So we should suspect brain tuberculosis in patients presenting with above mentioned

clinical features despite good immune status, without any active lung lesion or negative tubercular history of patient.

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