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Original Article

Intracranial Tuberculomas: Presenting Symptoms and Outcome with Anti Tuberculosis Drugs Treatment

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ABSTRACT

Background: Tuberculosis is still common in developing countries, and sometimes involves central nervous system, proper diagnosis and early treatment effectively reduces the mortality and morbidity associated with this disease

Objective: Observe presenting symptoms and outcome on anti-tuberculosis drug treatment

Material and Methods: This prospective study was conducted in the Department of Neurosurgery in collaboration with Department of Pathology, Ayub Teaching Hospital Abbottabad from March 2010 to December 2016. 22 patients; 8 females and 14 males were studied for their signs & symptoms and outcome after anti-tuberculosis drug treatment.

Results: The most common location of tuberculous lesions was supratentorium (81%) particularly in parietal lobe (50%) followed by frontal lobe (22.7%) and occipital lobe (18.2%). 45% patients had prior history of tuberculosis. Headache was the predominant complaint (72.7%) followed by altered sensorium (31%), seizures (27.3%) and cranial nerve palsies (22.7%). After 12 months of anti-tuberculosis treatment ATT, about 87% of patients had either resolved or regressed tuberculoma.

Conclusion: Brain tuberculomas are benign lesions with" malignant" behavior. Early diagnosis and anti-tuberculosis drug treatment can effectively treat this lesion forever. So in developing countries like Pakistan, when there is cystic, nodular or multiple lesions, there should be suspicion for brain tuberculoma and work up should be done because of very good prognosis associated with anti-tuberculosis drug treatment.

Keywords: Intracranial Tuberculoma, Anti-tuberculosis Drug Treatment, Brain space occupying lesion,

Introduction

Tuberculosis is a common infectious disorder in a developing country like Pakistan.[1] It can involve any part of body including brain. Tuberculosis of brain mainly presents as a space occupying lesion which is known as tuberculoma[2,3]. Intracranial tuberculomas presents as a neurological disorder and constitute about 10-30% of all the intracranial masses. Early diagnosis is mandatory for this potentially curable disorder otherwise it can result increased morbidity and mortality[4].

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Material & Methods

This prospective study was conducted in department of neurosurgery in collaboration with pathology department Ayub teaching hospital Abbottabad from March 2010 to December 2016. The inclusion criteria was single or multiple loculated lesions both supra tentorially and infratentorially on CT or MRI. Thorough clinical examinations of the patient were performed. Complete work up to confirm the diagnosis of tuberculosis was done like CT, MRI, ESR, CSF analysis and the PCR for the mycobacterium tuberculosis. After the diagnosis of tubercloma confirmed, then the patents were put on anti tuberculous drugs following regimen were followed 12 months anti TB therapy initially four drugs (rifampicin, isoniazid, ethambutol and pyrazinamide) for three months followed by rifampicin and isoniazid

for 9 months. The patients were followed clinically and by MRI at 6 months and one year respectively to see the regression of lesion or expansion

Results

Among the 22 patients included in this study 8 were males and 14 were females. Age of the patients was in the range of 9 to 39 years with mean being 18.3 years. Out of this 10 patients (45%) were having prior history of tuberculosis. Headache was the predominant complain in 16 (72.7%) of the patients, 7(31%) of the patents were having altered sensorium. 27.3% of the patients were having seizures, with cranial nerve palsies in 5 (22.7%) of the patients, the commonest nerve involved was abducent while in 1 patient optic nerve was involved and facial nerve also involved in one patient while in 2 patents multiple cranial nerve were involved.

Table-1: Clinical Presentation of Patients

Symptom	No. of patients	Percentages
Headache	**16**	**72.7%**
Altered Sensorium	**7**	**31%**
Seizures	**6**	**27.3%**
Cranial Nerve Palsies	**5**	**22.7%**

ESR was raised in 13 (60%) of the patients. Lumber puncture was done in 18 patients It was avoided in 4 patients due to risk of coning. CSF analysis showed pleocytosis in 18 (81.8%) of the patients with neutrophilic predominance in 4 (18.2) of the patients. Proteins were raised in 15 (68.1%) of the patients while glucose was decreased In 13 (60%) of the patients.

Polymerase chain reaction was positive for mycobacterium tuberculosis in 9 (40.9%0) of the patients. Chest X-rays showed signs of old tuberculosis in 5(22.7%) of the patients MRI showed multiple tuberculous lesions in 14 patients while single lesion in 8. Lesions were supratentorially located in 18 (81%) and infratentorial in 1 (4.5%) and combined supra and infratentorially in 3 (13.6%) of the patients. Commonest location for lesion was parietal lobe in 11 (50%), followed by frontal lobe in 5 (22.7%) and occipital in 4 (18.2%) of the patients.

Patients were given anti-TB therapy for 12 months initially 4 drugs for three months followed by 2 drugs for 9 months.

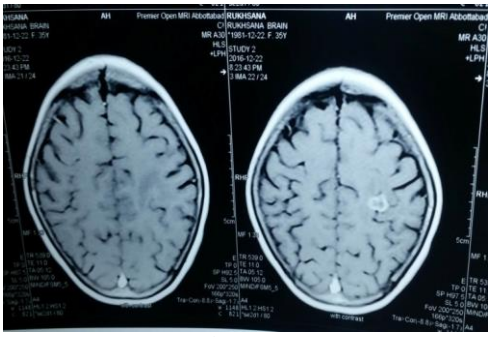

Figure-1

The Patient presented with severe headache associated with vomiting, with fever diagnosed as brain tuberculoma and was put on anti-tuberculosis drug treatment, on followup after 6 weeks her headache was severe in intensity with associated fascial palsy, repeat MRI showed multiple tuberculomas in occipital, frontal and temporal lobes.

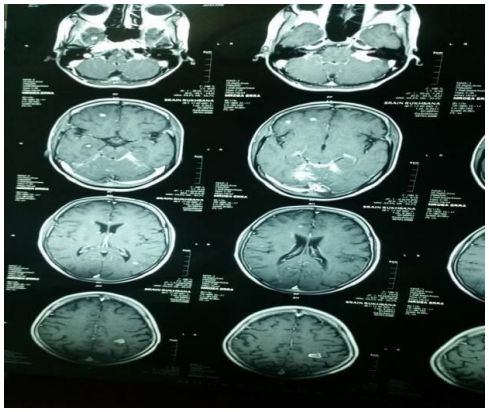

Figure-2

This patient presented with severe headache and drowsiness with associated fits, diagnosed as having tuberculous meningitis with associated hydrocephalus and tuberculoma in frontoparietal region.

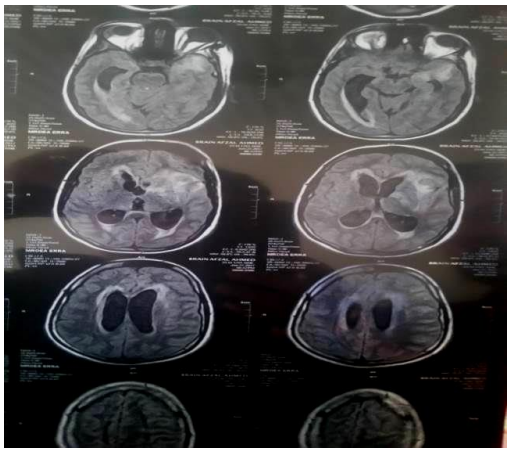

Figure-3

On follow up MRI the lesion was regressed in 19 (86.3%) of the patients while 1 (4.5%) was having the same sized lesion with no regression on anti-TB therapy. So the Anti TB was continued up to 24 months follow up imaging was done up to 30 months and the lesion was expanded and leading to multiple lesions in 2 (9.09%) of the patients with one patient needed surgery for hydrocephalous with Ventriculo-peritoneal shunting done and one patient was biopsied and the lesion came out to be tubercloma as shown in table 2.

Table2: follow up MRI findings

Lesion	No of Patients	Percentages
Lesion Regressed	19	86.3%
Lesion Static	1	4.5%
Lesion leading to multiple lesions	2	9.09%

Discussion

CNS tubercloma are frequently encountered lesions, may occur with or without tuberculous meningitis. A non-caseating tuberculoma usually appears hypointense on T1 and hyperintense on T2 weighted images while caseating tuberculoma appears iso-to hypointense on T1 weighted with iso to hyperintense on T2 weighted images. On contrast tuberculomas appears as nodular on ring enhancing lesion[5,6]. CNS tuberulomas constitutes about 33% of intracranial space occupying lesions in patients in developing countries[5]. Calcification may be present within the contrast enhanced ring, creating a target sign which probably is a sign of reactivation[6]. Diagnosis of brain tuberculomas is usually difficult because of its variety of clinical presentation, therefore clinical findings and special tests are needed. A sensitivity and specificity of CT scan is reported to be 100% and 85.7% respectively, and still MRI should be technique of choice followed by histological diagnosis[7] the diagnosis should be supported by findings such as history of fever, high ESR, positive tuberculin test and positive response to anti TB treatment[8].

As our study showed that 45% of our patients with brain tuberculoma were having fever and 60% of patients were having raised ESR so in developing countries like Pakistan with these two signs like prolonged low grade fever and raised ESR should be suspected for tuberculosis and confirmatory test should be done before starting an empirical treatment. Similarly 72.7% of our patients were having signs and symptoms of raised intra cranial hypertension with 22.7% of having focal neurological deficits in the form of cranial nerve palsies which is comparable to the study done by Garg[9] who showed in his study that 56-93% of the patients were having signs of raised intracranial hypertension and 33-68% were having focal neurological deficit. Cranial nerve involvement occurs due to vascular compromise, ischemia, a nerve entrapment in the basal exudates, most commonly effecting second, third, fourth and seventh cranial nerves[10], just like our study showed that optic nerve was involved in 4.5% of the patients and multiple nerve in 9% of the patients. Our study showed that 81% of the patients were having tuberculomas in supratentorial compartments with most commonly frontoparietal region. Our study showed that after 12 months of ATT, about 86.6% of patients has either resolved or regressed tuberculoma on repeat scans and clinically while 4.5% were having the same lesions on 12 months of ATT so their ATT has been prolonged upto 18-24 months. 9% of these patients deteriorated with time that might be because they lost follow up in the mid treatment and came back with enlarged tuberculoma. One was having hydrocephalus for which he was shunted while the one in posterior fossa needed decompression. Our results closely match to the study done by Idris[11] Et al who also showed that 80% of the patients had improved with ATT treatment upto 12 months. Whole some studies done in developing countries showed completed resolution (80-100%) of intracranial mass lesion in short care (06-12 months) Anti-tuberculosis drug treatment. [12,13] On country the study done in india showed it to be 54 % complete resolution.[14]

Conclusion

Brain tuberculomas are benign lesions with malignant behavior mainly due to their locations, so early diagnosis and with proper duration of anti-tuberculosis drug treatment can effectively treat this lesion forever. So in developing countries like Pakistan, when there is cystic, nodular or multiple lesions, there should be suspicion for brain tuberculoma and work up should be done because of very good prognosis associated with anti-tuberculosis drug treatment.

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