EARLY DIAGNOSIS OF INTRACEREBRAL TUBERCULOMA IN CHILDREN (A Case Report)

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Introduction

Robert Whytt in 1768 described a case where he met "with a hard tumour within the right thalamus nervorum opticum; it was almost as large as a hen's egg, of a yellowish colour within, and of a firm consistence". This was perhaps the first description of a tuberculoma of the brain [1]. Analysis of autopsy material from the JJ Group of Hospitals over a period of 11 years, revealed that 66.5% of children dying due to tuberculosis had involvement of the central nervous system (CNS). 18.5% of these had tuberculoma of the brain; 13.7% had tuberculoma with tubercular meningitis and 4.8% had tuberculoma alone [2].

Prior to the advent of computerised tomographic (CT) scanning, the diagnosis of intracranial tuberculoma was confirmed either at surgery or at autopsy.

The clinical profiles of four children with intracerebral tuberculoma without tuberculous meningitis are presented.

Patients and Methods

Four children with intracerebral tuberculoma, each with a different presentation, were seen over a period of one year at Command Hospital (WC) Chandimandir. They were diagnosed on CT scan and treated with antitubercular treatment (ATT) using the SHRZ-regimen for 12 months. Streptomycin,

isoniazid, rifampicin and pyrazinamide were used for 2 months and isoniazid and rifampicin continued for a further period of 10 months in dosages as recommended by the WHO [3]. The response to anti-tubercular chemotherapy was prompt and complete in all 4 patients. Although one patient was lost to follow up, repeat CT scans of the other 3 showed complete regression of the lesions within 12 weeks. During the follow up period of one year all 3 remained symptom free.

CASE REPORTS

Case 1

A boy aged 8 years presented with history of seizures involving the left arm and left side of the face. There had been no fever or vomiting. He had two similar episodes of seizures, while in hospital, associated with loss of consciousness but not followed by Todd's palsy. The child had been given BCG vaccination at birth. There was no positive clinical finding on examination between the seizure episodes. Electroencephalogram (EEG) revealed multiple spike-and-wave pattern from the left temporo-parietal region. CT of the brain showed a hypodense area in the left parietal region, with a central zone 14.8 x 11.6 mm which enhanced on contrast (Fig 1). CT scan done 6 weeks after starting ATT showed marked reduction in the size of the lesion and complete resolution after 12 weeks.

Case 2

A boy aged 5 years was admitted with history of high grade fever, vomiting and refusal to feed of 3 days duration. The child had often complained of headache in the past and had lost interest in play. He had not been vaccinated with BCG at birth. There was no history of tuberculosis in the family. On examination, the child was febrile with equivocal neck rigidity. There were no neurological signs. Cerebrospinal fluid (CSF) study was

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Fig. 1 : Contrast enhanced CT (CECT) scan of the brain showing a hypodense area in the left parietal region, with a central zone 14.8 x 11.6 mm which enhanced on contrast.

normal. CT of the brain showed multiple hypodense areas the largest one in the right occipito-parietal region (Fig 2A), which enhanced on contrast (Fig 2B). After a clinical diagnosis of tuberculoma, he was started on ATT to which he showed a dramatic response and was discharged on the 14th day. However the child was lost to follow up.

Case 3

A girl aged 8 years presented with history of repeated episodes of headache of 6 months duration. There was no history of syncope, vomiting, dimness of vision, fall in scholastic performance or family history of migraine or tuberculosis. She was fully immunised and appeared well adjusted in school and at home. CT of the brain revealed a hypodense area in the right parasagittal region which enhanced on contrast (Fig 3). The frequency of headaches diminished 8 weeks after starting ATT and she became asymptomatic after 12 weeks. A repeat CT scan showed complete regression of the lesion.

Case 4

A boy aged 9 years was brought by the school authorities after he fell down during assembly. There was no history of fits, headache, vomiting or similar syncopal incident in the past. On examination, he was fully conscious and alert with no neurological deficit. The child was brought again by the parents two weeks later with history of a similar syncopal attack. Clinical examination including psychiatric assessment was within normal limits. BCG scar was visible. Since there was a family history of tuberculosis, a Mantoux's test was done which was strongly positive (20 mm). ESR was 46 mm fall in the first hour. Radiograph of the chest, ECG and EEG were normal. CT of the brain showed multiple hypodense areas in the left parietal and occipital regions, suggestive of tuberculoma. A repeat CT scan done after 12 weeks of ATT showed complete regression of the lesions.

Discussion

Tuberculomas of the brain may be solitary,

Fig. 2A : Plain CT scan of the brain showing multiple hypodense areas. The largest lesion is in the right occipito-parietal region.

Fig. 2B : CECT scan of the same child, showing an enhanced central area 6.1 x 7.6 mm.

Fig. 3 : CECT scan of the brain showing a hypodense area in the right parasagittal region with a contrast enhanced central zone 9.4 x 5.9 mm

multiple or of the small infiltrating variety. Their size may vary from 3 mm to 80 mm in diameter. Consistency may be solid or cystic,

and location may be sub-cortical or deep in the paraventricular regions involving the thalamus and hypothalamus, cerebellum or the brain stem. In contrast to tuberculomas in adults where two thirds are supra-tentorial, two thirds of the tuberculomas in children are infra-tentorial [4]. However, all our patients had sub-cortical, supra-tentorial lesions.

Tuberculomas in children have a varied presentation, the signs and symptoms depending upon their size and location in the brain. Although they commonly present as intracranial space occupying lesion with features of raised intracranial tension, seizures and localizing neurological signs, they may at times come with prolonged low grade fever with or without vague behavioral disturbances or may remain silent, or deteriorate rapidly due to sudden, massive oedema around a small silent lesion [5].

Each of our four patients presented differently and their early diagnosis was possible because of a high index of clinical suspicion and early CT examination. CT of intracranial tuberculomas show a variety of lesions corresponding to the pathological events of the evolving granuloma. The oedema and necrosis appear as low attenuation areas while the granuloma shows high attenuation, contrast enhancement and finally calcification. Central necrosis and peripheral organisation produce ring appearances [6]. Magnetic resonance imaging (MRI) is more characteristic and specific [7] as compared to CT in the diagnosis of tuberculoma [8]. MRI was, unfortunately, not available to us.

If diagnosed early, tuberculomas respond well to chemotherapy alone. Serial CT scans allow an objective assessment of the effect of

medical treatment on both the tuberculoma and the surrounding oedema [7,8]. Short course chemotherapy is very effective in childhood tuberculosis. Studies done on tubercular meningitis suggest that short course therapy may be possible in CNS tuberculosis [9], however, until further information is available, one-year therapy has been recommended [10].

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