

## Research Article

# Study of clinical profile of childhood extra pulmonary tuberculosis

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## ABSTRACT

**Background:** Tuberculosis is the second most common cause of death from infectious disease at the global level, being second only to AIDS. Good data on the burden of all forms of TB amongst children in India is not available; most surveys conducted have focused on pulmonary TB. The present study was designed to study clinical profile of various forms of childhood EPTB. Objective of current study was to study clinico-epidemiological profile of various forms of childhood EPTB.

**Methods:** Retrospective analysis of clinical profile of 100 patients of childhood EPTB in the age group of 6 months to 12 years.

**Results:** Age distribution in our study showed that 62% cases falling in the age 0-5 years and 38% cases in 5-12 years ( $P = 0.041$ ) with male to female ratio of 1.9:1. 96% ( $P = 0.016$ ) of the patients belonged to the lower socio-economic class ( $P = 0.01$ ). The distribution of EPTB was - TBME (46%), disseminated TB (21%), pleural effusion (12%), abdominal TB (10%), TB lymphadenitis (7%), Osteoarticular (4%). 28% of the patients had mild to moderate malnutrition (PEM Grade-I,II) and 46% (PEM Grade-III,IV) were severely malnourished. 66% of the patient were BCG vaccinated & history of Koch's contact were present in 28% of the all cases. In CNS tuberculosis, fever was present in 97% followed by altered sensorium & convulsion in 80%, tonic posturing in 60% & abnormal movements in 4% and in most common sign was tonic posturing in 60%, crack pot sign positive in 41%. In abdominal tuberculosis - fever (100%), anorexia (90%), weight loss (80%) abdominal pain (50%) & hepatomegaly was common finding seen in 100% of abdominal tuberculosis.

**Conclusion:** Childhood EPTB is commonly seen in children age more than 1 year, lower socioeconomic class & in severely malnourished. CNS tuberculosis commonly present with fever, altered sensorium, convulsion, abnormal movements while abdominal TB present with fever, anorexia, weight loss & abdominal pain.

**Keywords:** Clinical profile, Childhood, Extra pulmonary tuberculosis

## INTRODUCTION

TB is one of the most ancient diseases. It had been mentioned in the Vedas and Ayurvedic Samhitas. Tuberculosis is described in Greek literature around the time of Hippocrates (460 -377 BC), the term phthisis first appeared in Greek literature around 460 BCE.<sup>1</sup> Tuberculosis is one of the world's most serious infectious threats. It is the second most common cause of death

from infectious disease at the global level, being second only to HIV/AIDS. In 2009, out of estimated global annual incidence of 9.4 million TB cases, 1.98 million were estimated to have occurred in India, thus accounting for a fifth of the global burden of TB.<sup>2</sup> Tuberculosis still is one of the deadliest diseases in the world killing nearly 2 million people every year.<sup>3</sup> Tuberculosis, the only infectious disease to be declared a 'global emergency' by the WHO, is major cause of death in adult and children

worldwide but the brunt is borne by developing countries with 95% of cases and 98% of deaths.<sup>4</sup> In India, two deaths occur every three minutes from tuberculosis.<sup>4</sup> It is estimated that about one third of current global population is infected asymptotically with tuberculosis.<sup>5</sup>

The definition of EPTB disease under the RNTCP follows the international classification. EPTB is defined as TB of organs other than the lungs, such as pleura, lymph nodes, abdomen, genito-urinary tract, skin, joints, bones, tubercular meningitis, tuberculoma of the brain, etc. The problem of EPTB is still high, both in developing and developed countries. In India, EPTB forms 10 to 15 percent of all types of TB, in comparison to 25 percent in France and 50 percent in Canada, partly due to the dual infection of TB with human immunodeficiency virus (HIV).<sup>6</sup>

## METHODS

This study was conducted in the department of pediatrics, Shri Sayaji general hospital and medical college Baroda, between December '08 to June '10 for a period of one & half years including OPD & ward patients. The total numbers of 100 patients in the age group 6 months to 12 years were included in this study and all of them presented with clinical features of extra pulmonary tuberculosis. This is retrospective analytic study with simple randomization with sample size of 100 with prior informed consent of parents of children of our study. A detailed clinical history including presenting symptoms, family history of contact with Koch's disease, history of BCG vaccination of each child was recorded. Socioeconomical status of children was classified according to modified Prasad classification. A complete examination was carried out and findings regarding the general and systemic examination were recorded in each patient. The nutritional status was assessed and classified according to IAP classification of under nutrition.

## RESULTS

Age distribution in our study showed that 62% cases falling in the age group 6 months - 5 years and 38% cases in the age of 5-12 years with P value = 0.041 which shows higher incidence in children <5 years.

Male to female ratio in our study was 1.9:1 with P value = 0.016, statistically higher incidence in male. In our study, 96% belonged to lower socioeconomical class. 28 % of the patients had mild to moderate malnutrition (PEM Grade- I,II) & 12% under nutrition, and 46% (PEM Grade-III,IV) were severely malnourished. 46% of patients were severely malnourished.

66% patients were immunized with BCG vaccine and only 34% did not receive any BCG vaccine. 69% of TBME, 71% of TB lymphadenitis, 25% of osteoarticular TB, 75% of TB pleural effusion, 60% of abdominal

kochs, 61% of disseminated TB cases were BCG vaccinated.

History of Koch's contact was positive in 28 % children (P=0.00001). BCG scar was present in 66% cases (P=0.001), which was significant to reduce incidence of extrapulmonary tuberculosis.

Distribution of EPTB was - TBME (46%), disseminated TB (21%), pleural effusion (12%), abdominal TB (10%), TB lymphadenitis (7%), osteoarticular (4%).

**Table 1: Age wise distribution of various forms of extrapulmonary tuberculosis.**

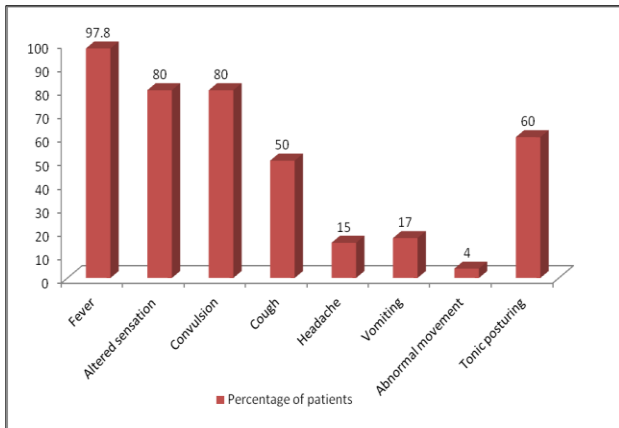
Type of TB	<1 year	1-5 years	5-12 years	Total
TBME	11	23	12	46
Disseminated TB	5	4	12	21
Abdominal TB	2	6	2	10
Pleural effusion	0	7	5	12
TB lymphadenitis	0	5	2	7
Osteoarticular TB	0	0	4	4
Total	18	45	37	100

In CNS tuberculosis, fever was the most common symptom, present in 97% patients followed by altered sensorium & convulsion in 80%, history of tonic posturing in 60% & abnormal movements in 4%. Most common neurological finding was tonic posturing in 60%, crack pot sign positive in 41%, hemiplegia in 26%, facial palsy 23%, quadriplegia in 15%, abducens palsy in 13%, abnormal movements in 6%, oculomotor palsy in 6%.

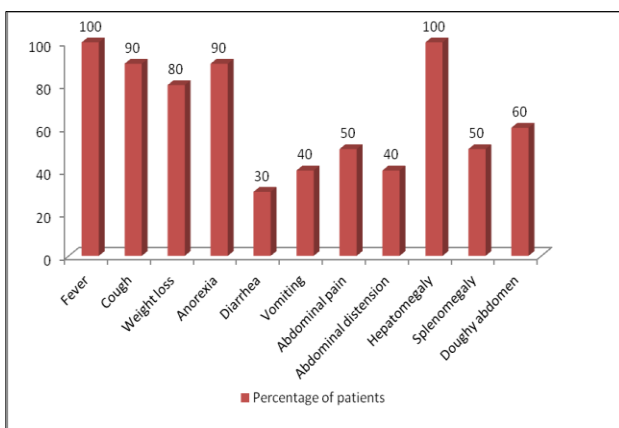
**Table 2: Clinical signs of CNS tuberculosis.**

Signs	%
<b>Motor paralysis</b>	
Hemiplegia	26
Quadriplegia	15
<b>Cranial nerve involvement</b>	
(VII) Facial	23
(VI) Abducens	13
(III) Oculomotor	6
<b>Other cranial nerves</b>	0
<b>Crack pot sign (Macewan sign)</b>	41
<b>Tonic posturing</b>	60

Common symptoms of abdominal tuberculosis were - fever (100%), anorexia (90%), weight loss (80%) abdominal pain (50%), followed by abdominal distension (40%), vomiting (40%) & diarrhea (30%). Hepatomegaly was the most common physical finding observed in 100%, followed by doughy feel of abdomen on palpation in 60%, splenomegaly in 50% & abdominal distension in 40% in our study. Consolidation was most common chest X ray finding seen in 73%.



**Figure 1: Clinical symptoms of CNS tuberculosis.**



**Figure 2: Clinical profile of abdominal tuberculosis.**

## DISCUSSION

The present study assessed clinicoepidemiological profile in patients of extra pulmonary childhood tuberculosis. We aimed to assess age wise distribution of the various forms of EPTB in children. We aimed to know common presenting symptoms & signs of various forms of EPTB with special reference to CNS & abdominal tuberculosis. We aimed to assess various predisposing factors like malnutrition, lower socioeconomic status, children who had not received BCG vaccine.

Age distribution in our study showed that 62% cases falling in the age group 6 months -5 years and 38% cases in the age of 5-12 years with P value = 0.041 which shows higher incidence in children <5 years while study by Van Well GT et al. 82% of TBME cases were <5 years<sup>6</sup> & Cherry Lyn P et al. showed 16.5% were less than 1 year old; 33% were 1 to 5 years old; 22% were 11 to 15 years old and majority of pediatric TB occurred in children less than 5 years of age.<sup>7</sup> In the study by Anis-ur-Rehman, at Ayub medical college, Abbottabad, Pakistan, 8% of the patients were below 3 years and 22% of the patients belonged to 3-6 years and 48% of the patients were between 6-12 years.<sup>8</sup> In the study by Garg P, at department of pediatrics, Shanti Manglik hospital,

Agra, maximum number of children were seen in the age groups 3-5 years (48.8%) followed by 21.4% in the 5-7 years age group.<sup>9</sup>

Male to female ratio in our study was 1.9:1 with P value = 0.016, statistically higher incidence in male as compared to 0.94 :1 by Fawzia et al.<sup>10</sup> & 1.6:1 by Tahmeed et al.<sup>11</sup> In our study, 96% belonged to lower socioeconomic class in comparison to 73% by Thilothammal et al.<sup>12</sup>

96% of the patients belonged to the lower socio-economic class of III, IV, and V of Modified Prasad's classification (P =0.01) .73% belonged to lower socioeconomic status in the study of N. Thilothammal et al.<sup>12</sup> Anis-ur-Rehman at Ayub medical college, Abbottabad, Pakistan, showed that TB is common problem of poor community, majority of the cases belonged to backward district.<sup>8</sup> Poverty, ignorance, over-crowding decreases immunity in growing children making them more vulnerable to TB. High incidence of TB in children aged 0-5 years in an area of South Africa correlated with lower level of parental education, low annual household income.<sup>13</sup>

28% of the patients had mild to moderate malnutrition (PEM Grade- I,II) & 12% under nutrition, and 46% (PEM Grade-III,IV) were severely malnourished. 46% of patients were severely malnourished in comparison to 52.3% by Cherry Lyn P et al.<sup>7</sup>

66% patients were immunized with BCG vaccine and only 34% did not receive any BCG vaccine. 69% of TBME, 71% of TB Lymphadenitis, 25% of Osteoarticular TB, 75% of TB pleural effusion, 60% of abdominal Koch's, 61% of disseminated TB cases were BCG vaccinated.

History of Koch's contact was positive in 28% children (P = 0.00001). In the study by Nooshin Baghaie et al. pediatric respiratory disease research centre, Tehran, Iran, family history was positive in 28% of EPTB, which coincides with our study.<sup>14</sup> In the study by Vimlesh Sheth, AIIMS, New Delhi, positive family history present in 17% cases.<sup>15</sup> In the study by Matloob Azam et al. J. Ayub medical college, Abbottabad, Islamabad, 41% cases had positive family history.<sup>8</sup> Schaaf et al. at Baylor college of medicine, Houston, Texas showed that contact with infectious tuberculosis adult was recorded in 49.5%.<sup>16</sup> Garg P. at Agra showed that history of contact with tuberculosis was given by only 13.1% relatives.<sup>6</sup> Lower history of adult contact reflects social stigma attached to the disease. Tahmeed Ahmed et al. at Dhaka, Bangladesh, had found the history of contact with TB patient in only 40% of cases.<sup>11</sup>

BCG scar was present in 66% cases (P = 0.001), which was significant to reduce incidence of extrapulmonary tuberculosis while it was 41% in study by Matloob Azam, et al.<sup>17</sup> Nelson et al. showed that the efficacy of BCG

vaccination in the prevention of TB has varied from 0% to 80%; its overall effect is 50%, the effect being greatest in preventing TB meningitis and Miliary TB or disseminated TB.<sup>18</sup> Therefore, even if it cannot reduce the disease burden in general, the vaccine can reduce severity of disease. For this reason, the WHO continues to recommend BCG vaccination of infants.<sup>19</sup>

Distribution of EPTB was - TBME (46%), disseminated TB (21%), pleural effusion (12%), abdominal TB (10%), TB lymphadenitis (7%), osteoarticular (4%). while in the study by Fawzia, Al Otaibi Malek et al., most common sites were lymph nodes (42%), Osteoarticular (13.7%), abdominal (13.3%), pleural (12.1%), CNS (4.4%), urogenital (3.6%), milliary (2.1%), paravertebral abscess (1.2%).<sup>10</sup> In study of V. Sheth, et al., distribution of EPTB was TBME (4%), TB lymphadenitis (78%), osteoarticular (4%), disseminated TB (8%) & others (6%).<sup>18</sup> In study of V. Sheth, AIIMS, New Delhi, distribution of EPTB was TBME (4%), TB lymphadenitis (78%), osteoarticular (4%), disseminated TB (8%) & others (6%).<sup>20</sup> As we had done study at higher centre so percentages of severe forms of EPTB like TBME, disseminated TB & abdominal TB are higher.

In CNS tuberculosis, fever was the most common symptom, present in 97% patients followed by altered sensorium & convulsion in 80%, history of tonic posturing in 60% & abnormal movements in 4%. Van Well GT et al., study showed that most common symptom was altered sensorium & convulsion in 96% followed by fever, weight loss & anorexia 91%.<sup>7</sup> Most common neurological finding was tonic posturing in 60%, crack pot sign positive in 41%, hemiplegia in 26%, facial palsy 23%, quadriplegia in 15%, abducens palsy in 13%, abnormal movements in 6%, oculomotor palsy in 6% as compared to, motor deficit in 63%, signs of meningeal irritation 98%, signs of raised ICT 23%, brainstem dysfunction 39%, and cranial nerve palsy 27% in study of Van well GT et al.<sup>7</sup>

Common symptom of abdominal tuberculosis were - fever (100%), anorexia (90%), weight loss (80%) abdominal pain (50%), followed by abdominal distension(40%),vomiting (40%) & diarrhea (30%) & In the study by Yadav K. et al., shows that most common symptom was weight loss (84%), abdominal pain (81%), anorexia (77%), fever (68%), cough (57%), vomiting (31%), bowel disorder (23%).<sup>21</sup> Hepatomegaly was the most common physical finding observed in 100%, followed by doughy feel of abdomen on palpation in 60% , splenomegaly in 50% & abdominal distension in 40% in our study. Garg P at Agra observed commonest presentation of Abdominal Koch's as ascites,<sup>9</sup> which matches with our study. Consolidation was most common chest X ray finding seen in 73% as compared to 20% in the study by Cherry Lyn P. et al.<sup>7</sup>

We concluded from our study that childhood extra pulmonary tuberculosis is common in pediatrics

population, more common in children <5 years of age. Extrapulmonary tuberculosis is commonly seen in lower socioeconomical class, with moderate to severe malnutrition. BCG vaccine is recommended to reduce severe forms of EPTB. In our study, TBME, disseminated TB & abdominal TB were commonly seen as we had done our study at higher centre. The diagnosis of tuberculosis is usually based on high index of suspicion with supportive evidence of clinical symptoms. & signs, & contact history.

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