## **Original Research Article**

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# Health profile of paediatric tuberculosis patients on directly observed treatment short course therapy

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#### **ABSTRACT**

**Background:** Children are especially vulnerable to tuberculosis due to close contact with family members and it is often difficult to diagnose and treat it in young children. The objective of this study was to study clinical profile of paediatric TB patients. To assess outcome of directly observed treatment short course (DOTS) among paediatric TB patients.

**Methods:** A descriptive longitudinal study conducted in all paediatric (1-15 years) patients registered for tuberculosis treatment in city tuberculosis center Solapur during 1<sup>st</sup> November 2010 to 31<sup>st</sup> December 2012. A pre-designed, pretested structural questionnaire was used for data collection. Physical examination was undertaken after the interview was over.

**Results:** 93 paediatric TB patients were registered for DOTS. Male to female patient's ratio was almost equal. Most of the TB patients (35.56%) were in 01 to 05 years of age group. Most of the patients (91) presented with cough for more than two weeks; with other symptoms like evening rise of fever, dyspnea, loss of appetite, swelling over neck. Out of 93 patients 70 patients had protein energy malnutrition (PEM). 84.95% patients were completed the DOTS treatment, while 3.22% were defaulter and outcome in 1.05% was treatment failure.

**Conclusions:** DOTS completion rate among paediatric TB patients is considerably high, protein energy malnutrition have the association with paediatric tuberculosis.

Keywords: DOTS, Default, Outcome, PEM, Relapse, TB, Treatment failure

## INTRODUCTION

Tuberculosis (TB) remains one of the world's deadliest communicable diseases. In 2013, an estimated 9.0 million people developed TB and 1.5 million died from the disease; Among children, there were an estimated 550 000 new cases in 2013 and 80000 deaths among children who were HIV-negative which is equivalent to about 7% of the total number of TB deaths among HIV-negative people. TB is among the top 10 causes of death among children worldwide; however, children with TB are given low priority in most national health programs and are neglected in this epidemic. TB in children is a direct

consequence of adult TB and is a good marker of current transmission in the community. Although advances have been made in diagnostics and new drugs for treatment of TB in adults, development in children has lagged behind.<sup>2</sup> Children are susceptible to infection with mycobacterium tuberculosis in community, at greater risk of progressing to active disease when infected at very young age.<sup>3</sup> There is however limited information about the basic demographic, clinical characteristics and program defined outcomes of these children with TB. Present study is carried out at city tuberculosis centre, Solapur with purpose to study clinical profile and treatment outcome in children with tuberculosis treated under directly observed

treatment short course chemotherapy under routine operational condition. The objective of this study was to study clinical profile of paediatric TB patients. To assess outcome of directly observed treatment short course (DOTS) among paediatric TB patients.

#### **METHODS**

Present longitudinal study conducted at Solapur city tuberculosis centre from 1st November 2010 to 31st December 2012. Inclusion criteria were all children between ages (1-15 years) registered for tuberculosis treatment in city tuberculosis centre, Solapur. All the registered cases were selected and followed up until their complete treatment. Data was obtained using semi structured pretested questionnaire and followed RNTCP guidelines for evaluation and treatment of suspected TB case. Exclusion criteria were all TB patients associated with HIV infection and old TB cases. All the questions were explained to the children and total confidentiality was assured. Physical examination was undertaken after the interview was over. It included local and systemic examination with anthropometric measurements such as height, weight mid-arm circumference. Outcome was assessed as cured, treatment completed, extension of treatment or change in regimen, transferred out or lost to follow-up default and treatment failure.

Prior approval from the ethical committee of college was taken to precede the study.

## Statistical analysis

Data was entered in Microsoft excel sheet and analysis was done using Statistical software SPSS. Chi square ( $\chi^2$ ) and Fisher exact test was used for statistical analysis.

### **RESULTS**

In the present study total 93 paediatric new TB cases were registered at Solapur city TB centre; 01 to 05 years of the age group children (34) were most commonly affected due to TB followed by 05 to 10 and 10 to 15 years of age group (27 each); while infants (05) were least commonly affected. Male to female patient's ratio was 1.02:1 (Figure 1).

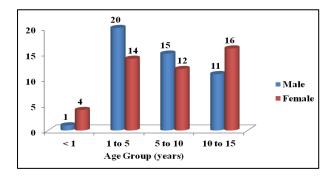


Figure 1: Age and sex wise distribution of patients.

Cough for more than two weeks was most common symptom among most of the patients followed by fever, loss of appetite, dyspnea, failure to gain body weight, swelling over neck, convulsions, pain in abdomen and vomiting (Table 1).

Table 1: Clinical profile of patients.\*

Presenting symptoms	No. of cases
Cough more than 2 weeks	91
Fever	41
Loss of appetite/failure to gain body weight	33
Dyspnea	14
Swelling over neck	13
Convulsions	05
Pain in abdomen	03
Vomiting	01
Total	201

<sup>\*</sup> Multiple responses.

In the history it was observed that out of 93 paediatric TB patients 36 patients had history of contact with tuberculosis infection while 57 had no history of contact (Figure 2).

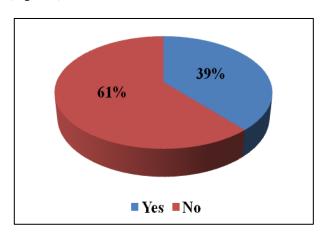


Figure 2: History of contact with TB among cases.

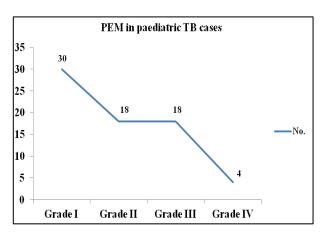


Figure 3: Distribution of cases according to PEM (IAP grading).

In the present study amongst the total 93 paediatric TB cases 70 cases had protein energy malnutrition (PEM); 30 (42.86%) had grade I, 18 (25.71%) each in grade II and III and 04 (05.72%) had grade IV PEM as per Indian Academy of Paediatric (IAP) classification (Figure 3).

Table 2: Type of TB patients who received BCG vaccine.

Type of TD	BCG vaccination		Total
Type of TB	Yes	No	Total
Pulmonary TB	58 (92.63)	05 (7.93)	63 (100)
Extra pulmonary TB	09 (30)	21 (70)	30 (100)
Total	67 (72.04)	26 (27.96)	93 (100)

\*Parentheses show group-wise percentages;  $\chi 2$  value 38.87; d.f. = 1; p < 0.0001 highly significant.

Table 3: DOTS treatment outcome in paediatric TB cases.

Outcome	Pulmonary TB	Extra pulmonary TB	P value
Treatment completed+cured	60 (95.24)	29 (96.67)	> 0.05
Defaulter	03 (4.76)	00	> 0.05
Failure	00	01 (3.33)	> 0.05
Death	02 (3.17)	01 (3.33)	> 0.05
Total	63 (100)	30 (100)	

<sup>\*</sup> Parentheses show group-wise percentages

Among 93 tuberculosis patients 63 (67.74%) had pulmonary TB and remaining 30 (32.26%) had extrapulmonary TB; out of 63 pulmonary TB cases 58 (92.63%) had received BCG vaccine at birth while 05 pulmonary TB cases not and 70% (21) of extrapulmonary TB cases not received BCG vaccine at birth which was statistically found to be highly significant (Table 2). Among 30 extra pulmonary tuberculosis cases TB lymphadenitis [17 (56.67%)] was most common followed by TB meningitis [06 (20%)], abdominal TB [04 (13.33%)] and TB pleural effusion [03(10%)] (Figure 4).

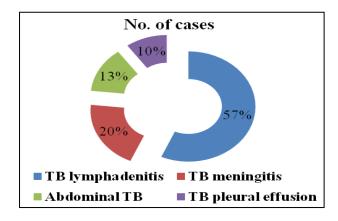


Figure 4: Types of extra pulmonary TB cases.

In the present study 79 (83.87%) patients completed the DOTS treatment, 10 (10.75%) were cured, so treatment success was seen in 94.60% of total cases, 03 (3.22%) cases were defaulter and outcome in one case was treatment failure. Reason for default was drug intolerance in two cases and one patient was transferred out. There were 3 deaths, of which 1 was a case of failure, 2 were defaulter (Table 3).

#### DISCUSSION

In the present study we observed that 01-05 years of age group was most commonly affected due to tuberculosis which was similar to other studies done by Sushma et al and Ramesh et al.<sup>4,5</sup> In our study patients presented with symptoms like cough, fever, loss of appetite, failure to gain body weight, dyspnea, swelling over neck, convulsions, pain in abdomen and vomiting. In Anmol Goyal et al study patients presented similar symptoms which are comparable to the present study.<sup>6</sup>

Similarly Sreeramareddy et al and S Shrestha et al observed similar symptoms in patients of their respective study. 7.8 We noticed history of contact with TB infection in 39% of patients while 61% had no history of contact with TB; a study conducted at ICH Chennai by Vijayasekaran et al has shown history of contact in 30.4% of patients, while Vimlesh seth et al study had shown positive contact history in 19% of children. 9.10 Protein energy malnutrition was observed in 75.26% of TB cases in the present study among which grade I PEM was most commonly noticed in them followed by grade II, III and IV. Thakor N et al study and Sushmabai S et al study also observed grade I PEM as most common form of PEM among TB patients. 4.11

In the present study we have observed that there was variation in protective efficacy of BCG vaccine against pulmonary and extra-pulmonary TB cases. Such variations in the protective efficacy of BCG against all forms of TB have been widely documented in different studies. 12-14 We observed that lymph node was the most common extra pulmonary site which has been affected by TB; Arora VK et al, Gocmen A et al, Ramesh et al and Sreeramareddy et al also shown similar findings as current study. 5,7,15,16 In the present study 83.87% patients completed the DOTS treatment, 10.75% were cured, so treatment success was seen in 94.60% of total cases. Various studies done by Sharma S et al, Satyanarayan et al, Arora VK et al and Indumati CK et al also DOTS treatment success rate more than 94%. 17-19

#### **CONCLUSION**

There is high treatment completion and cure rate in patients treated with DOTS under RNTCP, but there was no any significant difference in outcome between pulmonary and extra-pulmonary TB treated with DOTS. BCG vaccine showed more effective against extra-pulmonary TB as compared to pulmonary TB.

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Ethical approval: The study was approved by the

Institutional Ethics Committee

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