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## **Original Research Article**

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# Association of type of tuberculosis with treatment outcome among paediatric tuberculosis patients in Bhopal city

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#### **ABSTRACT**

Background: Tuberculosis causes ill-health among millions of people each year and ranks as the second leading cause of death from an infectious disease worldwide, after the human immunodeficiency virus (HIV). The younger the child, the more are the chances of complications and death from the disease. The objective of the study was to find out the association of type of tuberculosis with the treatment outcome of paediatric TB patients registered under RNTCP in Bhopal city.

Methods: A longitudinal study was conducted in all tuberculosis treatment units (TU) of Bhopal city. All paediatric patients in the age group of 0 to 14 years diagnosed as TB and registered under RNTCP and fulfilling inclusion criteria during January 2013 to June 2013 were included in the study. Data regarding paediatric TB patients was collected by using a structured questionnaire. Information was also obtained in two subsequent visits of the patient, one at the end of intensive phase to know the response of treatment and other at the end of the treatment for treatment outcome. The data was analysed on statistical software SPSS vs.20.

Results: The present study was conducted on 165 paediatric Tuberculosis patients who were registered for DOTS treatment under RNTCP. Pulmonary TB is common in all the age group of <1 and 1-10 years. Out of 165 paediatric patients,93.33% of patients were treatment completed in which 54.54% were pulmonary cases and 45.45% were extra pulmonary while 4.84% were declared cured, thus showing statistically significant association ( $X^2$ =9.758 and p=0.04, df=4) between type of Tuberculosis and treatment outcome.

Conclusions: Pulmonary TB is common in the age groups of <1 and 1-10 years while in 11-14 years of age group extra pulmonary TB is more common. There is statistically significant association between type of Tuberculosis and treatment outcome.

Keywords: Paediatric tuberculosis, RNTCP, Treatment outcome

## INTRODUCTION

Tuberculosis causes ill-health among millions of people each year and ranks as the second leading cause of death from an infectious disease worldwide, after the human immunodeficiency virus (HIV). The younger the child, the more are the chances of complications and death from the disease. Most cases in children are sputum smear negative and considered to be relatively minor

contributors to the transmission of the disease. Consequently lower public health priority is given to childhood TB as it rarely presents with smear positive disease.<sup>2</sup> Infected children represent the pool from which a large proportion of future cases of adults TB will arise. In addition, childhood TB is a sentinel event, indicating on-going transmission of TB within communities. Though an estimated 1 million new cases of TB occur in children worldwide each year, paediatric TB has not

given the same priority as its adult counterpart. Prevalence of childhood TB has been reported to be between 3 and 25% in different countries.<sup>3</sup> Prompt identification and treatment of infectious cases will prevent TB in the community.<sup>4</sup>

## **Objectives**

To find out the association of type of tuberculosis with the treatment outcome of paediatric TB patients registered under RNTCP in Bhopal city.

#### **METHODS**

A Longitudinal study was conducted in all Tuberculosis treatment units (TU) of Bhopal city. There were three Tuberculosis treatment units at the commencement of the study. All paediatric patients in the age group of 0 to 14 years diagnosed as TB and registered under RNTCP during Jan.2013 to June 2013 (six months) and fulfilling inclusion criteria were included in the study.

#### Inclusion criteria

An inclusion criterion was age group of 0-14 years diagnosed as paediatric TB and registered under R.N.T.C.P. with parents' consent.

#### Exclusion criteria

Exclusion criteria were extremely ill patients – patients with severe complications like haemoptysis etc; those patients whose parents did not give consent to participate in the study.

As far as type of tuberculosis is concerned, sputum smear positive pulmonary TB i.e. having at least one sputum sample positive for AFB and sputum smear negative pulmonary TB i.e. both sputum sample are negative for AFB were considered as pulmonary tuberculosis patients while TB of organs other than lungs were considered as extra pulmonary TB.

A structured questionnaire was used to collect the data of paediatric TB patients after obtaining informed consent from parents/guardians during their visit to designated microscopic centre (DMC) cum DOTS centre. Information was also obtained in two subsequent visits of the patient, one at the end of intensive phase to know the response of treatment and other at the end of the treatment for treatment outcome. The data was analysed on statistical software SPSS vs.20.

## **RESULTS**

The present study was conducted on 165 paediatric tuberculosis patients who were registered for DOTS treatment under RNTCP from January 2013 to June 2013 in Bhopal city. Table 1 shows that pulmonary TB is common in all the age group of <1 and 1-10 years while

in 11-14 years of age group extra pulmonary TB (55.31%) is more common than pulmonary TB. In this study 56.36% of the study population had pulmonary tuberculosis in which 60.21% female and 39.78% males were affected. Extra-pulmonary tuberculosis was found in 43.63% of the paediatric patients in which 56.94% were female and 43.05% were males as shown in Figure 1

Table 1: Distribution of patients according to the age and type of tuberculosis.

Age in years	Pulmonary (%)	Extra pulmonary (%)	Total (%)
<1	09 (100)	00 (00)	09 (5.45)
1-10	63 (58.33)	46 (42.59)	108 (65.45)
11-14	21 (44.68)	26 (55.31)	47 (28.48)
Total	93 (56.36)	72 (43.63)	165 (100)

 $X^2=9.667$  and p=0.008.

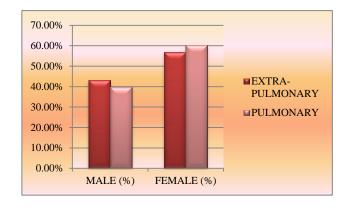


Figure 1: Gender wise distribution of patients with different types of Tuberculosis.

In our study 62.42% of the patients had a weight gain of 1-3 kg; followed by 17.57% gained 3-5 kg, 16.96% patients gained 0-1 kg, 03% gained more than 5 kg. Thus most of the patients at the end of the treatment gain on an average1 to 3 kg of weight as shown in Figure 2.

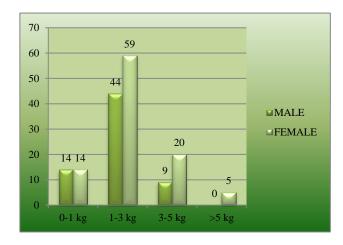


Figure 2: Distribution of patients according to weight gain at the end of treatment.

**Treatment outcome** Type of Treatment Defaulter Treatment Transferred Total (%) Cured tuberculosis Died (%) (%) completed (%) (%) failure (%) out (%) 84 (90.3) 08 (8.6) 00(00)01 (1.1) 00(00)00(00)93 (100) **Pulmonary** Extra-00(00)70 (97.2) 00(00)00(00)01 (1.4) 01 (1.4) 72 (100) pulmonary 08(4.8)154 (93.3) 00(00)01(0.6)01(0.6)01(0.6)165 (100) **Total** 

Table 2: Association between treatment outcome and type of tuberculosis.

 $X^2=9.758$  and p=0.04 df=4.

As far as the association of type of tuberculosis with treatment outcome is concerned, Table 2 shows that 93.33% of paediatric patients were treatment completed in which 84 i.e. 54.54% were pulmonary cases and 70 i.e. 45.45% were extra pulmonary, 4.84% were declared cure and one pulmonary patient i.e. 0.60% was treatment failure while one extra pulmonary patient i.e. 0.60% was transferred out and one i.e. 0.60% died. In our study it is observed that favourable response up to 97% is achieved with the treatment irrespective of type of tuberculosis. There is statistically significant association  $(X^2=9.758)$ and p=0.04 df=4) between type of Tuberculosis and treatment outcome.

#### **DISCUSSION**

In the present study Pulmonary TB is common in all the age group except in 11-14 years of age group in which extra pulmonary TB is more common. Similar findings were observed in Ruchi et al study in which out of 1016 registered childhood TB cases, pulmonary TB (66%) was more common in childhood TB than extra pulmonary TB.5 Jain et al in his study reported 46% of extra pulmonary cases.<sup>6</sup> In a prospective study done by Sushmabai, most common type of tuberculosis was primary pulmonary complex occurring alone or in combination with other lesions (72.6%). In the observation of Nelliyanil et al 43.5% of the study population had extra pulmonary tuberculosis.8

In our study pulmonary TB and extra pulmonary TB, both are more common in female as compared to male paediatric patients. Similar findings were observed in Nelliyanil et al study in which out of 118 pulmonary cases, 71 were females and out of 91 extra pulmonary cases, 60 were females' paediatric patients.8

In the present study 93.33% of study population completed treatment, 4.84% was declared cure and 0.60% child died, 0.60% was declared treatment failure and 0.60% were transferred out. Similar findings were observed in the study of Kabra et al in which out of 459 patients were started on anti-tuberculosis drugs and were available for analysis 365 (80%) children completed the treatment. Of these, 302 (82.7%) were cured with the primary regimen assigned to them in the beginning.<sup>9</sup> Sharma et al did a retrospective analysis of 1098 children at paediatric pulmonology department, TB, Institute, New Delhi. 10 They observed a cure rate of 92.4% for new and 92% for retreatment cases. But the treatment completion rate was significantly higher for new cases (97%) than retreatment cases (53.6%). The overall success rate was 95.4% and 82.6% for new and retreatment cases respectively. Overall, the rate for default, failure and death were 3%, 1.95% and 1% respectively. 10 In a study done by Sivanandan, retrospective review of records was done in 541 children (315 boys) suffering from tuberculosis, 459 (84.8%) children were cured and 82 (15.5%) had treatment failure. 11

As far as the association of type of tuberculosis with treatment outcome is concerned, our study shows significant association between type of tuberculosis and treatment outcome. Similar findings were observed in a study of Ramesh, Shobha et al, showing significant association between treatment outcome and type of tuberculosis. 12

## **CONCLUSION**

Pulmonary TB is common in the age groups of <1 and 1-10 years while in 11-14 years of age group extra pulmonary TB is more common. Majority of the patients at the end of the treatment gain on an average 1-3 kg weight and having statistically significant association between type of tuberculosis and treatment outcome.

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#### **REFERENCES**

- World Health Organization. Global Tuberculosis Report, 18 edition. WHO Geneva; 2013: 1.
- Mukherjee A, Chowdhury R, Singla R, Saha I, Dutta R, Das T. Comparison between childhood and adult tuberculosis in a rural tuberculosis unit of

- West Bengal: A retrospective study. Lung India. 2014;3(2):116-20.
- Nelson LJ, WELLS CD. Global epidemiology of childhood tuberculosis. Int J Tubercular Lung Dis. 2004;8:636-47.
- 4. Guidance for National Tuberculosis Programmes on the management of tuberculosis in children WHO/HTM/TB/2006.371.
- 5. Ruchi, Thakur HP. Characteristics of Childhood Tuberculosis Patients Registered under RNTCP in Varanasi, Uttar Pradesh. Indian J Public Health. 2013;57(1):36-9.
- Jain SK, Ordonez A, Kinikar A, Gupte N, Thakar M, Mave V, et al. Pediatric Tuberculosis in Young Children in India: A Prospective Study. BioMed Res Int. 2013;2013:783698.
- 7. Sushmabai S, Lekshmi Devi R. Clinical Spectrum of Tuberculosis in BCG Vaccinated Children. Indian Pediatr. 2002;39:458-62.
- 8. Nelliyanil M, Sharada MP, Joseph N, Basagoudar SS, Jayaram S, Patil DC. A Study of the Socio-Demographic Profile and Treatment Outcome of Paediatric Tuberculosis Patients in Bangalore

- Mahanagar Palike Area. Indian J Tuberc. 2012;59:207-13.
- 9. Kabra SK, Lodha R, Seth V. Category-based Treatment of TB in Children. Indian Paediatr. 2004;41:927-37.
- Sharma S, Sarin R. The DOTS strategy for treatment of Paediatric Pulmonary Tuberculosis in South Delhi, India. Int J Tuberc Lung Dis. 2008;12:74-80.
- 11. Sivanandan S, Walia M, Lodha R, Kabra K. Factors Associated with Treatment Failure in Childhood TB. Indian Paediatr. 2008;45:769-71.
- 12. Ramesh, Shobha A, Manjula VD. Treatment Outcomes of Childhood Tuberculosis with Dots Strategy in Kottayam, Kerela. Indian J Community Health. 2012;24(4):280-4.

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