



RESEARCH ARTICLE

FIVE YEAR RECORD BASED STUDY OF PAEDIATRIC TUBERCULOSIS (TB) FROM A DIRECTLY OBSERVED TREATMENT SHORT-COURSE (DOTS) CENTRE OF SOUTH DELHI

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ARTICLE INFO

Article History:

Received 21st April, 2017
Received in revised form
15th May, 2017
Accepted 11th June, 2017
Published online 26th July, 2017

Key words:

Paediatric Tb,
Dots Centre,
Record Based Study.

ABSTRACT

Background: TB continues to be a public health problem in India despite the government-run nationwide control programme. Till now the focus has been on adult TB, be it preventive or curative, with very little thrust on paediatric TB. Children are particularly vulnerable to severe disease and death following infection, and children with latent infections become reservoirs for future transmission following disease reactivation in adulthood, thus contributing to future epidemics. Research on understanding of paediatric TB is urgently needed. This paper attempts to study the epidemiology, prevention and treatment of paediatric Tuberculosis.

Objective: To study the socio-demographic profile, pattern of TB, treatment completion rate and associated factors amongst paediatric TB patients from a DOTS centre of South Delhi

Material and Methods: 5 year record based from 2011-2016 (June). DOTS centre located at a Public sector hospital of South Delhi. Data acquired from New Delhi Municipal Corporation (N.D.M.C) Chest Clinic, ShahidBhagatSingh Marg, New Delhi. Paediatric age group taken as 0-14 years as described in the Revised National Tuberculosis Control Program (RNTCP). Data entered and analysed in Microsoft Excel spreadsheets.

Results: Out of the total number of patients enrolled in the same time period (5 years) 8.62 % of the patient load was of paediatric TB. Total paediatric patients in 5years were 153, out of which 42 (27.45 %) were males and 111 (72.55 %) were females. Out of the 153 cases, 143 were treated as Category I patients while only 10 were treated as Category II patients. Out of the 10 Cat II patients, 1 patient was due to failure of treatment by Cat I, 1 was due to relapse, and the rest were default/ other reasons. 51 (33.33 %) cases were of Pulmonary TB while 102 (66.67 %) cases were of Extra-pulmonary TB. Treatment completion rate was 98.69 % (151 cases) with 1 case defaulting on treatment (0.65 %) and 1 case being transferred out (0.65 %). Among the patients who completed the treatment (151), 149 patients were reported as treatment completed/cured (98.67 %), while 2 cases (1.32 %) ended up with Multi-drug Resistant (MDR) TB. For patients not reporting for treatment/collection of medicines on the scheduled date, phone calls were made to the patient-provided phone number for a response, failing which, a house visit was done by the health worker to ensure minimum number of defaulters. INH prophylaxis was given to children less than 6 years of age, who were close contacts of the patients. However, no data was available regarding the same.

Conclusion: Treatment completion rates are high under RNTCP (98.69 %) but follow up action for defaulters and INH prophylaxis for less than 6 year old close contacts of patients with Cat 1 TB leaves a lot of scope for improvement.

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Citation: Saxena, A., Khokhar, A., Gupta, D. and Mate, C. K. 2017. "Five year record based study of paediatric Tuberculosis (TB) from a directly observed treatment short-course (DOTS) centre of South Delhi", *International Journal of Current Research*, 9, (07), 54174-24176.

INTRODUCTION

Tuberculosis continues to be one of the most important public health problems worldwide. It infects one third of the world's population at any point of time. Children are especially vulnerable to the effects of tuberculosis, which is often difficult to diagnose and therefore difficult to treat effectively. Paediatric TB results from failure of TB control in adults. Children are particularly vulnerable to severe disease and death following infection with TB and children with latent infections become reservoirs for future transmission following disease

reactivation in adulthood, thus contributing to future epidemics. (Technical and Operational Guidelines for TB Control in India 2017; Global Tuberculosis Report, 2016; Hanumantappa *et al.*, 2013) Research on understanding of paediatric TB is urgently needed. This paper attempts to study the epidemiology and treatment outcomes of paediatric Tuberculosis.

Objectives

To study the:

- Socio-demographic profile
- Pattern of tb
- Treatment completion rate

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- Associated factors amongst paediatric tb patients from a dots centre of delhi

MATERIALS AND METHODS

Study Design: Retrospective chart review

Study Area: DOTS centre located in a public sector hospital of Delhi.

Study Population: Paediatric age group - taken to be 0-14 years as described in RNTCP. (Technical and Operational Guidelines for TB Control in India 2017)

Sample: 153, all paediatric TB cases included for period between Jan 2011-Jun 2016. Definitions for the related terms were taken from the official website of Ministry of Health & Family Welfare (MoHFW). (Technical and Operational Guidelines for TB Control in India 2017) Data was entered and analysed in Microsoft Excel spreadsheets.

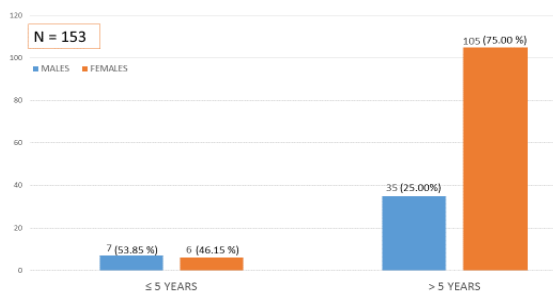


Fig 1. Age and Sex distribution of study subjects

Table 3. Pre treatment Sputum Smear Positivity amongst Pulmonary TB cases

	< 5 YEARS OF AGE		5-14 YEARS OF AGE		TOTAL
	M	F	M	F	
NEGATIVE/ SCANTY	3 (9.09%)	3 (6.06%)	3 (9.09%)	23 (75.76%)	32 (64.71%)
1+	0 (0%)	0 (0%)	3 (23.08%)	10 (76.92%)	13 (25.49%)
2+	0 (0%)	0 (0%)	0 (0%)	3 (100%)	3 (5.88%)
3+	0 (0%)	0 (0%)	0 (0%)	2 (100%)	2 (3.92%)

RESULTS

- Out of the total number of patients enrolled in the same time period, which was 1,775 (Jan 2011-Jun 2016), 153 (8.62 %) of the patient load was of paediatric TB.
- Out of the 153 paediatric TB patients, 111 (73 %) were females and 42 (27 %) were males.
- 13 cases were aged ≤ 5 years (8.5%) while 140 (91.5%) were > 5 years of age.
- Out of 153 paediatric TB cases, 151 (98.69%) were recorded to have COMPLETED treatment.
 - 149 (98.67%) : treatment completed/cured (for pulmonary TB cases)
 - 2 (1.32%) : MDR TB after complete Cat I treatment
- 1 case : transferred out
- 1 case : defaulter
- No record was available for:
 1. Patients not reporting for treatment/collection of medicines on the scheduled date.
 2. INH prophylaxis given to children less than 6 years of age, who were close contacts of the patients.

DISCUSSION

Six countries account for 60% of the total number of new TB cases, with India leading the count, followed by Indonesia, China, Nigeria, Pakistan and South Africa. (Global Tuberculosis Report, 2016) Diagnosis of TB in young children is challenging, as they are less likely to produce adequate specimens for microscopy and culture and more likely to present with extra-pulmonary TB and the paucibacillary nature of childhood TB. Therefore, a lot of paediatric TB cases remain undiagnosed, especially children aged <5 years. Reasons for this are only speculative and may be related to non-diagnosis and/or treatment outside the program setting of paediatric TB cases. This study is one of the few in India which look into the profile of paediatric TB over a period of 5 years. According to the WHO Global TB report 2016, 8.97% of the total TB cases in India were of paediatric TB, which corresponds with the 8.62% found in this study. According to the same report, 53.33 % of paediatric TB cases in India were females, although this study shows a much higher percentage (73%) of female patients. The reason for this variation from national statistics is hard to ascertain at the moment. 91.5% of cases in this study were aged between 5-14 years, while 8.5% of the cases in this study were <5 years of age, which is similar to other studies from India. However, in a study from Kerela, a much higher percentage (43.7%) of paediatric TB cases aged <5 years was reported. (Hanumantappa *et al.*, 2013) 67.32% of cases were of extra-pulmonary TB, while 32.68% of cases were of pulmonary TB which corresponds with other studies in similar age groups. Statistical significance was found only in

Table 1. Distribution of the subjects as per site of TB

	< 5 YEARS OF AGE		5-14 YEARS OF AGE		TOTAL
	M	F	M	F	
PULMONARY	3 (6%)	3 (6%)	6 (12%)	38 (76%)	50 (32.68%)
EXTRA-PULMONARY	4 (3.89%)	3 (2.91%)	29 (28.16%)	67 (65.04%)	103 (67.32%)

Table 2. Distribution of the subjects according to category of treatment

	< 5 YEARS OF AGE		5-14 YEARS OF AGE		TOTAL
	M	F	M	F	
CATEGORY I	7 (4.87%)	6 (4.16%)	30 (20.83%)	101 (70.14%)	144 (94.11%)
CATEGORY II*	0 (0%)	0 (0%)	5 (55.56%)	4 (44.44%)	9 (5.89%)

* 1 - Relapse
1- Failure of Cat I/t
8 - Defaulters

the sex-wise distribution of the cases ($p < 0.05$) which can be attributed to the large number of female patients. Statistical significance could not be established for other characteristics like Pulmonary/ Extra-pulmonary TB and Category I/Category II treatment. Out of the 50 pulmonary TB cases, 64.71% cases gave a negative/scanty report for pre-treatment sputum smear positivity, which highlights the fact that diagnoses of pulmonary TB remains a challenge in the paediatric age-group. The reasons may include poor access to diagnostic services (such as chest radiography, culture facilities, etc.) or poor access to treatment services. The referral of paediatric cases, particularly children under 5 years of age, may not be as effective as it should be because these children may often have disseminated or severe disease. Paediatricians may often prefer to keep these children under their care for a more comprehensive management of their other attendant morbidities which cannot be managed under the programmatic conditions by the DOT provider. Further the programme does not provide patient wise boxes for very small children weighing less than 6 Kg. This further may be affecting the enrolment of children in the age group of 0–5 years. Treatment completion rate in this study was found to be at an acceptable 98.69% which is higher than the 95% expected under RNTCP. (Technical and Operational Guidelines for TB Control in India, 2017)

Conclusion

The results clearly show that if the problem of early diagnosis and detection are promptly rectified for paediatric tuberculosis, and with treatment completion rates as high as 95% under

RNTCP, the burden of disease in this vulnerable age-group can be greatly reduced. This can be done by following the “Standards for TB care in India” which have been laid down by the MoHFW and WHO. The study also proves DOTS to be an effective strategy to combat paediatric TB.

However, there are no records available for

- i. Follow up action for treatment defaulters.
- ii. INH prophylaxis for < 6 year old close contacts of TB patients.

This part of the program needs to be strengthened.

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