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RESEARCH ARTICLE

OUTCOME OF PAEDIATRIC DOTS TREATMENT AT CITY TUBERCULOSIS CENTRE, SOLAPUR

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ABSTRACT

Introduction: Childhood tuberculosis traditionally had a lower priority than adult tuberculosis (TB) within National Tuberculosis Programmes (NTP's), because it is largely non-infectious; cases have been thought to be few, and assumption that effective control of adult TB could prevent childhood TB. In many countries with high TB incidence, however; childhood TB (i.e. TB among population aged less than 15 years) constitutes a significant proportion (approximately 11-14%) of TB case load and under 5 mortality. However there is limited information of the basic demographic, clinical characteristics and programme defined outcomes of these children with TB. Present study is carried out at city tuberculosis center, solapur with purpose to find out treatment outcome in children with tuberculosis treated under short course chemotherapy.

Aim and Objectives: To assess the outcome of intermittent short course chemotherapy in pediatric tuberculosis. To identify risk factors for non-compliance during intensive phase and continuation phase of DOTS.

Material and Methods: A descriptive longitudinal study conducted on all paediatric (1-15 years) patients registered for tuberculosis treatment in city tuberculosis center solapur during 1st November 2010 to 31st December 2012.

Results: Out of total 93 paediatric patients registered for treatment, 36.56% were between 1- 5 years of age. Male & female patients were distributed in almost equal proportion. Acid fast bacilli i.e. mycobacterium detected in 10.75% of patients. 84.95% patients were completed the DOTS treatment, while 3.22% were defaulter and outcome in 1.05% was treatment failure.

Conclusion: Treatment completion rate in children with tuberculosis treated with DOTS is significantly high.

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INTRODUCTION

Childhood tuberculosis traditionally had a lower priority than adult tuberculosis (TB) within National Tuberculosis Programmes (NTP's), because it is largely non-infectious; cases have been thought to be few, and assumption that effective control of adult TB could prevent childhood TB. In many countries with high TB incidence, however; childhood TB (i.e. TB among population aged less than 15 years) constitutes a significant proportion (approximately 11-14%) of TB case load and under 5 mortality (Nelson, 2004; Marais et al., 2005). Children are susceptible to infection with mycobacterium tuberculosis in community, at greater risk of progressing to active disease when infected at very young age (Marais, 2008). In 2013, globally there were an estimated

550000 TB cases and 80000 deaths among children due to TB (WHO, 2014). In industrialized countries, most childhood TB cases are detected through contact tracing and have good outcomes. This is in contrast to the case in low and middle-income countries, where childhood TB is closely associated with poverty, crowding, and malnutrition, with consequently higher death and lower treatment success rates. Another unique aspect of TB in children is the imperceptible and often rapid progression from infection with Mycobacterium tuberculosis to disease (Swaminathan and Rekha, 2010).

However there is limited information of the basic demographic, clinical characteristics and programme defined outcomes of these children with TB. Present study is carried out at city tuberculosis center, solapur with purpose to find out treatment outcome in children with tuberculosis treated under short course chemotherapy under routine operational condition.

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MATERIALS AND METHODS

Present longitudinal study conducted at solapur city tuberculosis center 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 center, 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. 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.

RESULTS

Out of total 93 patients, 36.56% were in the age group of 1 to 5 years, followed by 5 to 10 years and 10 to 15 years (29.03% each); only 5.38% were below one year of age. Male to female patient's ratio was approximately found to be 1:1 (Table 1). In the present study 36 (38.71%) patients had the history of contact with TB infection while 57 (61.29%) had negative history. In our study we found 64 (68.82%) patients had pulmonary TB and 29 (31.18%) had extra pulmonary tuberculosis (Table 2). Among extra-pulmonary TB cases; TB lymphadenitis was seen in 16 patients, TB meningitis was seen in 06 patients, Abdominal TB was seen in 04 patients and TB pleural effusion was seen in 03 patients (Figure 1). Only 10 patients (10.75%) were diagnosed as AFB positive by sputum smear microscopic examination and 83 patients (89.25%) were AFB negative (96.77%) patients were started on category 1 anti-TB treatment, while 3 patients were started on category 2 treatment.

Table 1. Age and Gender distribution of patients

Sr. No.	Age in years	Gender		Percentage
		Male	Female	
1	<1	1	4	5.38%
2	1-5	20	14	36.56%
3	5-10	15	12	29.03%
4	10-15	11	16	29.03%
Total		47	46	100%

Table 2. Distribution of patient according to type of TB

Sr. No.	Age in years	Pulmonary TB (%)	Extra-pulmonary TB (%)	Total (%)
1	<1	05 (100)	00	05 (100)
2	1-5	24 (70.59)	10 (29.41)	34 (100)
3	5-10	19 (70.37)	08 (29.63)	27 (100)
4	10-15	16 (59.26)	11 (40.74)	27 (100)
Total		64 (68.82)	29 (31.18)	93 (100)

Out of 93 patients, 70 had protein energy malnutrition (PEM) according to IAP classification. Out of 70 patients with malnutrition 42.86% had grade 1 PEM, 25.72% had grade 2 PEM, 25.71% had grade 3 PEM and 5.71% had grade 4 PEM

(Figure 2). In our study 83.87% of patients had completed treatment, 10.75% were cured, so treatment success was seen in 94.6% of cases, 3.22% were defaulter and outcome in 1.05% was treatment failure. There were 3 deaths, of which 1 was a case of failure, 2 were defaulter (Table 3).

Table 3. Distribution of patients according to treatment outcome

Sr. No.	Treatment outcome	Number of patients	Percentage
1	Treatment completed	79	83.87%
2	Cured	10	10.75%
3	Death	03	3.23%
4	Defaulter	03	3.22%
5.	Failure	01	1.05%

$\chi^2 = 180.07$, d.f.= 3, $p < 0.01$

Table 4. Distribution of patients according to treatment outcome & type of TB

S. No.	Treatment outcome	Pulmonary TB	Extra-pulmonary TB	p value
1	Treatment completed + Cured	61 (95.31%)	28 (96.55%)	>0.05
2	Death	2 (3.16%)	1 (3.45%)	>0.05
3	Defaulter	3 (4.69%)	0 (0%)	>0.05
4	Failure	0 (0%)	1 (3.45%)	>0.05
Total		64	29	

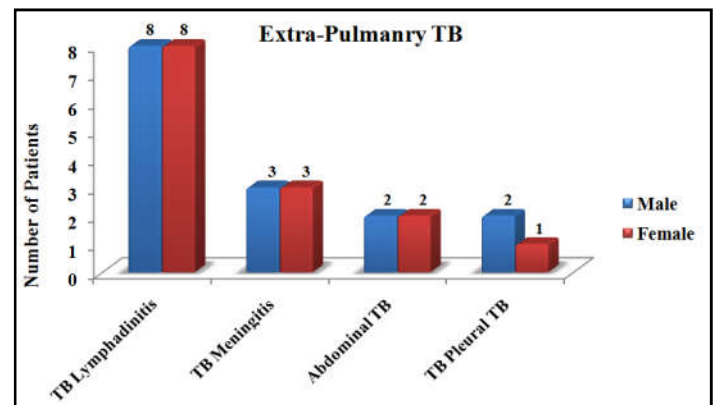


Figure 1. Gender wise distribution of extra-pulmonary TB patients

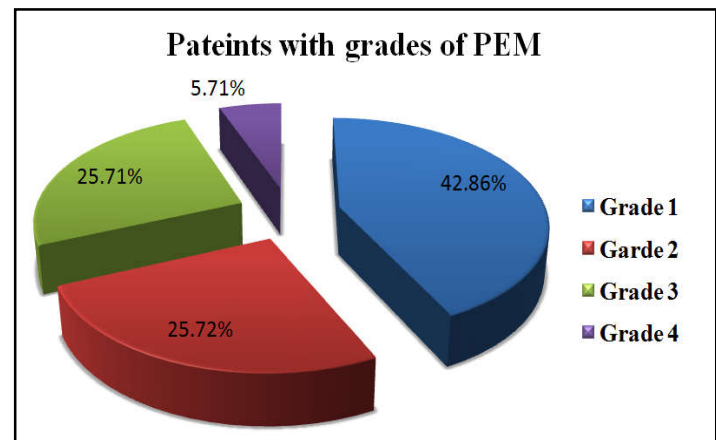


Figure 2. Distribution of patients according grades of PEM (IAP classification)

Statistical values suggest that treatment completion rate in children with tuberculosis treated with DOTS was significantly high. In our study we found that treatment completion and cure rate was 95.31% in pulmonary tuberculosis and 96.55% in extra pulmonary tuberculosis. Treatment failure rate was 3.45% in extra-pulmonary tuberculosis. Default rate was 4.69% in pulmonary tuberculosis. Reason for default in was drug intolerance was drug intolerance in two cases in one patient was transferred out. p value >0.05 suggest that there is no significant difference in outcome in both pulmonary and extra pulmonary treated with DOTS (Table 4).

DISCUSSION

Table no. 1 shows that the maximum number of patients were affected in the age group of 1 to 5 years(36.56%) ,followed by the age group of 5 to 10years and 10 to 15 years i.e.(29.05%) each. Similar findings were reported in hospital based study done by Sushma Bai *et al.*, 2002 in 1998 in Kottayam district of Kerala, where they observed that the maximum number of cases were in the age group of 1 to 5 years ,which was 49.5%.Sharma *et al.*, 2010 found that maximum number of patients were in the age group of 11 to 15 years which was 55.1% in our study there was no any statistically significant sex predominance among TB cases, while Vimlesh Seth *et al.*, 2006 study showed male preponderance with male to female ratio of 1.5: 1. In the present study 36 (38.71%) patients had the history of contact with TB infection. A study conducted at ICH Chennai by Vijayasekaran *et al.*, 2006 has shown that 30.4% of patients had history of contact with TB infection. In our study 96.77% patients were cases started on Category 1 DOTS chemotherapy, whereas 3.23% cases were started on category 2. Kabra *et al.*, 2004 studied the patients referred to pediatric TB clinic of total 459 patients, 70.3% patients were in category 1, 2.6% were in category 2 and 26.1% were in category 3(Cat.1+3=96.4%).

In a study done by C K Indumathi *et al.*, 2010 68% cases were treated as category 1, 6.7% as category 2, 25% as category 3 (Cat.1+3=93%). In the present study extra-pulmonary TB group, TB lymphadenitis was seen in 55.17% cases, TB meningitis was seen in 20.69 % cases, Abdominal TB was seen in 13.80% cases, TB pleural effusion was seen in 10.34%cases. Gocmen *et al.*, 1993 in their study found 75% of study population had pulmonary TB, and 25% had extra pulmonary TB. In our study 72.92% patients were malnourished, out of which 42.86% had grade 1 PEM, 25.715% had grade 2 PEM, 25.715% had grade 3 PEM, 5.71% had grade 4 PEM. Sushamabhai *et al.*, 2002 observed in their study that out 58% percent of cases had normal nutritional status and 42% had protein energy malnutrition (PEM) of which 37% had Grade I or Grade II PEM and 5% had Grade III PEM.

There was no child with Grade IV PEM. In our study 83.87% of patients had completed treatment, 10.75% were cured, so treatment success was seen in 94.6% of cases, 3.22% were defaulter and outcome in 1.05% was treatment failure. There were 3 deaths, of which 1 was case of failure, 2 was defaulter and death rate is 3.23%.Sharma *et al.*, 2010 in their study had overall, treatment completion rate was 94.9% and the default rate was 2.2% with a failure rate of 2.5%. Death rate was 0.3%.A prospective study done by Indumathi *et al.*, 2010 showed The overall cure rate was 95% (94% in pulmonary and 97% in extra-pulmonary TB). There were two failures among pulmonary TB.

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