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Original Research Article

A five year retrospective study of paediatric tuberculosis patients registered in Nanded Municipal Corporation

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ABSTRACT

Background: Tuberculosis (TB) is one of the most serious infections in the world contributing one third of the world's population. Near about 11% of the childhood mortality and morbidity caused by tuberculosis worldwide, especially in developing countries. The aims and objectives of this study were to study retrospectively the clinical profile and treatment outcome of paediatric TB cases treated under RNTCP.
Methods: An observational record based study was conducted among paediatric patients registered under Revised National Tuberculosis Control Programme (RNTCP) in NANDED city to know their disease profile from 2011- 2015.
Results: In this study, the mean age of the study subjects was 10.58 years, most of them were in the 11-14 year age group (62.9%) followed by 6-10 years (25%) and 0-5 years (12.1%) respectively. with a female to male ratio of 6.1: 3.8. There were more cases of tuberculosis among female children with significantly more girls (61.4%) than boys (38.6%) {$\chi 2$=8.924, p< 0.01154 (S)} and 46.2% of them had extra pulmonary TB. Out of total (132), pulmonary TB cases were (53.8%) and among the extra pulmonary TB cases, tuberculous lymphadenitis (26.5%) was the commonest form for all ages followed by Abdominal Koch's in 9.1%. Category I and II was started on 91.7% and 8.3% patients respectively. Overall, treatment completion rate was 82.5% and the default rate was 2.3% with a cure rate of 15.2%. More than one fourth of the study subjects gave a history of contact with tuberculosis patient.
Conclusions: The probable reason for more prevalence of TB among females may be due to, neglected female child's nutrition and health status in society. Paediatric tuberculosis still continues to be a major problem in 1-5 years of age who are undernourished and belonging to lower socioeconomic status.

Keywords: PHI-peripheral health institute, Revised national tuberculosis control programme

INTRODUCTION

Tuberculosis (TB) is one of the most serious infections in the world contributing one third of the world's population and about nine million TB patient each year develop, causing two million death. Near about 11% of the childhood mortality and morbidity caused by TB worldwide, especially in developing countries. TB is among the top 10 causes of death in children worldwide. Millennium development goal, number six focuses on prevention and control of TB along with HIV and malaria epidemics.[1]

India is 17th among 22 high burden countries in terms of overall TB incidence rate.[2,3]

In 2010, about 40% of the world's notified cases of TB were found in India and China, further 24% in Africa and overall 22 high TB burden countries accounted for 82%.[4]

In the year 2013, World Health Organization (WHO) estimated 9.0 million new cases of TB worldwide and 1.5 million deaths attributable to TB, 80 % of which were occurring from 22 high-burden countries (HBCs).[5] This included up to 15 % burden of paediatric cases. About

74,000 children die of TB every year and there are around half a million new cases annually .the majority (70–80%) of child TB cases present with pulmonary tuberculosis (PTB).[6] In low-burden countries, childhood TB constitutes 5% of the TB caseload, as compared with 20-40% in high-burden countries.[7] It is estimated that about 9% of the TB cases globally occur among children less than 15 years of age. The same proportion in low-income countries is 15%.[8] Prevalence of childhood TB has been reported to be 3 - 25% in different countries.[9] Worldwide prevalence of paediatric tuberculosis is an indicator of the recent transmission of TB in the community hence it is important for public health professionals.[10,11] But it remains underreported in India due to diagnostic difficulties and poor reporting and recording systems. Diagnostic methods followed for childhood TB may vary depending on the available resources in the health-care setting.[12] Diagnosing paediatric TB as well as monitoring treatment response is challenging, as collecting respiratory specimens is difficult in children. Again it is more difficult in case of extra-pulmonary. Childhood tuberculosis is a neglected aspect of the tuberculosis epidemic.

Considering the seriousness of the overarching impact of tuberculosis on the health status of children and lack of data regarding the clinical profile of paediatric tuberculosis in Nanded city, this study was conducted with the following objectives:

- To study the clinical profile and treatment outcome of paediatric TB cases registered and treated under RNTCP.

METHODS

This was a retrospective record based study. The Study was conducted in Nanded city of Maharashtra. The study was done by using the tuberculosis registers and treatment cards maintained at Municipal Corporation in Nanded district. Prior permission was obtained from the concerned authority to access the records. Children included in study were 1 to 14 years of age, at the time of diagnosis and registration for DOTS under RNTCP. Data was collected from January 2011 to December 2015. Data collected about demographic characteristics (age, sex and religion), disease profile status (sputum examination, HIV status, type of tuberculosis i.e. pulmonary/extra pulmonary and its subtype). Data was entered in Microsoft excel 2013 and analysed using Epi Info 7.

RESULTS

Total 132 children were reviewed who were registered during January 2011 to December 2015. More no. of paediatric patients 35 (26.5%) were found in 2013, followed by 31 (23.5%) in 2015 (Table 1). In this study, the mean age of the subjects studied was 10.58 years, the most number were in the 11-14 year age group (62.9%) followed by 6-10 years (25%) and 0-5 years (12.1%) respectively. In our study more females 81 (61.4 %) and 51 (38.6%) males .Female to male ratio was 6.1: 3.8. There were more cases of tuberculosis among female children with significantly more girls (61.4%) than boys (38.6%) {$\chi 2=8.924$, $p<0.01154$ (S)} and 46.2% of them had extra pulmonary TB. In our study population, majority of the cases were Hindus (40.9%) and Muslims (40.9%) followed by Buddhist (14.4%) and Sikh (3.8%). More cases were from DMC Itwara PHI 65(49.2%) and no of cases from rest PHI were as follows: GMC, Nanded -23, DMC Jangumwadi-31, DMC, Shivaji Nagar-13. Among the registered TB children, HIV co-morbidity was found in 20 cases and 112 were HIV negative. Among the 132 cases, 46.97% were pulmonary case and 63.03% were extra pulmonary cases. Among total tuberculosis cases, pulmonary TB were 53.8% and extra pulmonary TB were 46.2%. There were more cases of pulmonary tuberculosis in female children with significantly more girls (61.4%) than boys (38.6%) ($\chi 2=8.924$, $p<0.01154$) (Table 1) and 46.2% of them had extra pulmonary TB. Out of 132 only 20 (15.2%) were sputum positive. From total of 132 paediatric cases, 121 and 11 cases were of category 1 and category 2 respectively. There were 125 new cases and 7 others cases. In extra pulmonary TB cases, Tuberculosis lymphadenitis (26.5%) was the commonest form for all ages, next to that was abdominal Kochs in 9.1%. Category I and II was started on 91.7% and 8.3% patients respectively. Overall, treatment completion rate was 82.6% and the default rate was 2.3% with a cure rate of 15.2%. Twenty seven percent gave a history of contact with tuberculosis patient .There was significant association between HIV status and tuberculosis (Degree of freedom =1, Chi square=6.257, p=0.01237) (Table 2). 15 HIV cases of total 20 cases were of pulmonary tuberculosis. Sputum positive rate in pulmonary cases was also greater in 11-15 years age group. (Chi Square=9.197, degrees of freedom=2, p=0.01007) (Table 3).

DISCUSSION

In this study the mean age of the subjects studied was 10.58 years, the most number were in the 11-14 year age group (62.9%) followed by 6-10 years (25%) and 0-5 years (12.1%) respectively.

This finding of our study was similar to the study which was done by Arora et al and Sharma et al which showed the maximum number were in the age group of 11 to 15 years i.e. 51.1% and 55.1% respectively.[13,14]

In contrast to our study, in a hospital based study done by Sushamabai et al in 1998 in Kottayam the maximum number of cases were in the 1 to 6 years age group (49.5%).[15]

In our study, the mean age of the population studied was 10.58 years. Indumathi et al observed mean age of 7.6 years in their study.[16]

Table 1: Clinical, demographic profile and treatment outcome of paediatric TB cases.

Variables		Tuberculosis					χ2	P value
		%	Cumulative %	Total	Male	Female		
Year wise case distribution	2011	17.4	17.4	23	9	14	1.34	0.85
	2012	18.2	35.6	24	7	17		
	2013	26.5	62.1	35	15	20		
	2014	14.4	76.5	19	7	12		
	2015	23.5	100.0	31	13	18		
	Total	100.0		132	51	81		
Age wise distribution	0-5	12.1	12.1	16	9	7	8.92	0.01
	6-11	25.0	37.1	33	18	15		
	11-15	62.9	100.0	83	24	59		
		100.0		132	51	81		
Religion wise distribution	Buddhist	15.39	15.39	19	8	11	1.8	0.61
	Hindu	40.09	55.48	54	22	32		
	Muslim	40.09	96.57	54	18	36		
	Sikh	3.43	100.0	5	3	2		
	Total	100.0		132	51	81		
DMC/phi wise distribution	GMC	17.4	17.4	23	11	12		
	Itwara	49.2	66.7	65	25	40		
	Jangumwadi	23.5	90.2	31	7	24		
	Shivaji Nagar	9.8	100.0	13	8	5		
	Total	100.0		132	51	81		
Hiv status	HIV +Ve	15.2	15.2	20	11	9	2.66	0.10
	HIV-Ve	84.8	100.0	112	40	72		
	Total			132	51	81		
Type of tuberculosis	Pulmonary	46.97	46.97	65	27	38	8.9	0.5
	Extra pulmonary	63.03	100	67	24	43		
	Total	100		132	51	81		
Sputum AFB	Negative (EP +P –ve)	84.8	84.8	112	45	67		
	Positive	15.2	100.0	20	6	14		
Total	Total	100.0		132	51	81		
Sputum AFB of pulmonary	Sputum +Ve	30.76	30.76	20	6	14	1.03	0.31
	Sputum –Ve	69.24	100.0	45	21	24		
	Total	100.0		65	27	38		
Treatment category	CAT-1	91.7	91.7	121	45	76	1.28	0.25
	CAT-2	8.3	100.0	11	6	5		
	Total	100.0		132	51	81		
Treatment outcome	Treatment completed	82.57	82.57	109	43	66	1.65	0.43
	Cured	15.16	97.73	20	6	14		
	Default	2.27	100.0	3	2	1		
	Total	100.0		132	51	81		
Extra-pulmonary tuberculosis	Abdominal Koch's	9.1		12	6	6	8.27	0.40
	TB lymphadenitis	26.5		35	12	23		
	TB meningitis	1.5		2	1	1		
	TB elbow	0.8		1	0	1		
	TB cutaneous	0.8		1	1	0		
	Pott`s spine	1.5		2	0	2		
	Pleural effusion	3		4	2	2		
	TB of hip	0.8		1	1	0		
	Cold abscess	2.3		3	0	3		
	Total	100.0	100.0	132	51	81		

Table 2: Association between HIV status and type of tuberculosis.

HIV status	Tuberculosis		
	P	EP	Total
HIV +ve	15	5	20
HIV -ve	50	62	112
Total	65	67	132

Degree of freedom=1, Chi square=6.257, p=0.01237.

Table 3: Association between age groups and sputum positive rate.

Age groups (in years)	Pulmonary		
	Sputum +ve	Sputum –ve	Total
0-5	0	5	5
6-10	2	17	19
11-14	18	23	41
Total	20	45	65

Chi square=9.197, Degrees of freedom=2, p=0.01007.

Our study revealed that there were more girls (61.4%) than boys (38.6%). Similar findings were observed in a study which was done by Sharma et al reported more girls (61.7%) than boys (38.3%).[14] In a study done by Indumathi et al revealed a boys to girl's ratio of 0.8:1.[16]

In our study population, majority of the cases were Hindus (40.9%) and Muslims (40.9%) followed by Buddhist (14.4%) and Sikh (3.8%). In our study 96.3% study population belonged to low socioeconomic status. While in a study which was done by Sushmabhai et al in Kottayam district of Kerala reported that slightly more than half (55.8%) of the population belonged to low, 38.9% to middle and 5.3% to high socio-economic groups.[15] In our study, 27% of the patients had a history of contact with tuberculosis patients, similar to the findings observed by Madhi et al 22%.[17]

However in a hospital based study by Maltezou et al 47% o and in a study by Uysal et al in children, a positive family history of active TB was reported in 39% of the cases.[18,19] It may be due to better education and proper contact tracing.

In our study it was found that 50.75% of the study population had extra pulmonary tuberculosis and 49.25% pulmonary tuberculosis, which was similar to a study done by Arora et al who also observed that extra pulmonary tuberculosis was seen in 47% of children.[13] Among the extra pulmonary TB, tuberculous lymphadenitis (26.5%) was the commonest form for all ages followed by abdominal Kochs in 9.1%. In a study by Maltezou et al also showed that lymphadenitis (47%) was the most common manifestation of extra-pulmonary tuberculosis, followed by pleural effusion (26%).[18]

CONCLUSION

More prevalence of TB in females may be due to female child's nutrition and health may be neglected. Paediatric tuberculosis still continues to be a major problem in 1-5 years of age who are undernourished and belong to low socioeconomic status and specifically to those who are in contact of family having confirmed TB cases.

Recommendations

- New diagnostic technique should be introduced to diagnose paediatric TB in addition to gastric lavage, broncho alveolar lavage and Mantoux test and all these things should be provided in each DMC.

- Contact tracing should be strengthened. Counsel them especially about preventive measure in families having children less than 5 years.

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