Section: Community Medicine

Original Research Article

A FIVE YEARS RETROSPECTIVE DESCRIPTIVE STUDY ON PREVALENCE OF TUBERCULOSIS IN UNDER 15 YEARS AGE GROUP CHILDREN AT A TERTIARY CARE CENTRE IN KURNOOL, INDIA

Uday Teja Juturu[1], Sri Rekha Prasad [2], U Venkateswarlu Uppara[3], Priya Reddy Mallimala[4], Sure Gayathri manasa[5], Dudekonda Sai Sandeep[6]

[14,5,6]Internee, Department of Community Medicine, Medical College, Kurnool, India.
[2]Assistant Professor, Department of Biochemistry, Kurnool Medical College, Kurnool, India.
[3]Assistant professor, Department of Community Medicine, Kurnool Medical College, Kurnool, India.

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Corresponding Author:
Dr. Venkateswarlu Uppara,
Assistant Professor, Department of Community Medicine, Kurnool Medical College, Kurnool, India.
Email: venky.mbbs1@gmail.com

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ABSTRACT

Background: Tuberculosis (TB) is a chronic infectious disease, and its persistent morbidity and mortality burden remains one of the major public health challenges in India. According to estimates provided by the World Health Organization (WHO), there were 10.6 million cases of TB in 2021 globally, 11% of which were in children under the age of 15. **Objectives:** to know the burden of tuberculosis in under fifteen years age group children, its distribution with respect to age, gender, type of TB.

Materials and Methods: A Hospital based Retrospective descriptive study conducted in a tertiary care centre Kurnool, Patient records of children aged less than 15 years of age group who were registered at district tuberculosis centre in the Government General Hospital, Kurnool were collected form January 2017 to December 2021.Collected data was entered in to Microsoft Excel and analysed by using SPPS22 version software.

Results: There were 1266 (63.4%) of pulmonary tuberculosis cases and 730 (36.5%) cases of extra pulmonary cases. There was nearly an equal division of pulmonary tuberculosis cases among males 49.2% and females 50.7%. Even there was similar distribution pattern with extra pulmonary cases as males 50.9% and females as 49%.

Conclusion: Among all the TB cases 4.6%were children aged under 15 years old. Hence compared to the global estimated report which is 11.3% in 2021 there was under diagnosis in India.

Keywords: Paediatric Tuberculosis, Pulmonary Tuberculosis Extra pulmonary tuberculosis, WHO, Mortality.

INTRODUCTION

Tuberculosis (TB) is a chronic infectious disease, and its persistent morbidity and mortality burden remains one of the major public health challenges in India.[1] It is listed as one of the ten most important causes of death from infectious disease in the world.[2]

According to estimates provided by the World Health Organization (WHO), there were 10.6 million cases of TB in 2021 globally, 11% of which were in children under the age of 15. With 28.3% (3 million) of the 10.6 million new TB cases each year, India has one of the largest TB burdens in the world. The incidence of paediatric tuberculosis in India as per 2021 global report of TB is 11.86% (356k). After COVID, tuberculosis is the most common infectious agent-related cause of death, and it comes in at number 13 overall.[3]

The primary global health concern continues to be tuberculosis despite numerous improvements in the medical sciences.

Childhood tuberculosis adds nearly 15–20% of all TB cases worldwide.[4] Generally developing countries tend to show major impact of tuberculosis in children.

Tuberculosis usually requires microbiological confirmation, but paediatric cases tend to show negative results as they were more likely to have TB disease caused by a smaller number of bacteria Hence the diagnosis of TB in Childre are determined based on a combination of the variables like Clinical symptoms, previous history of exposure, chest x-ray showing characteristic TB disease patterns, a positive tuberculin skin test (TST) or tuberculin blood test (IGRA) result. Although pulmonary TB, which also affects adolescents and older people, is the most frequent kind of tuberculosis in children and adolescents, extra pulmonary tuberculosis is more common in children than in adults.[5]

The implementation of Stop TB Strategy, Initiation of the Directly Observed Treatment (DOTS) saved 250,000 children6.There are, however, many who consider that childhood tuberculosis is not significant for the control of tuberculosis, and that the difficulties of diagnosing childhood tuberculosis has made the progress made in prevention less promising.[7-8] Hence, to tackle this problem, WHO developed a road map aiming to achieve zero deaths due to childhood TB by 2025 9and made a call for more studies to be done on childhood TB since they were limited.

This study aims to determine the prevalence of tuberculosis and track down its trend in TB cases among the paediatrics and early adolescents, aged less than 15 years, over the last five years (2017-2021).

MATERIAL AND METHODS

Using Retrospective cross sectional study design, reviewed all children treated for all form of Tuberculosis from January 2017- December 2021. Examined patient records for children aged less than 15 years of age who were registered at district tuberculosis centre in the Government General Hospital, Kurnool. Study included patients admitted age group from 1 month to 15 years with suspected as presumptive case of pulmonary tuberculosis according to NTEP Guideline were included.

Clearance from the Institutional Ethics Committee was obtained prior to the start of the study. After obtaining permission from DTC Medical Officer at GGH Kurnool, TB patients registered at DTC centre were identified through records at DTC centre. The data was collected was in lines with NTEP Guidelines. The data collected was analysed using Microsoft Excel and version of SPSS 22 statistical packages. The data was then presented in proportions and percentages using tables, bar charts and pie charts, etc.

RESULTS

In the past 5 years (January 2017 to December 2021) a total of 43,674 cases were registered in the DTC Kurnool with 1996 (4.6%) cases under 15 years of age.

The above table showing maximum number of cases 587 (5.23%) under 15 years age group reported in the year 2019 and minimum number of cases 282 reported during the year 2020.

Distribution of cases with respect to age over the course of five years, the greatest number of cases were between 11-14 years of age 784 (39.3%) followed by 6-10 years 671 (33.6%), and 1-5 years 541 (27.1 %) respectively. [Table 1]

In the current study, there was nearly an equal division of pulmonary tuberculosis cases among males 624 (49.2%) and females 642 (50.7%). Even there was similar distribution pattern with extra pulmonary cases as males 372 (50.9%) and females as 358 (49%). [Table 3]

In the current study, out of 996 male patients 22 (1.94%) Patients were HIV reactive and 974 (97.79%) patients were HIV non-reactive. Among HIV reactive patients 19(1.91%) were Pulmonary TB and 3 (0.3%) were Extra Pulmonary TB patients. [Table 4]

In the Present study, out of 1000 Female patients 19 (1.19%) Patients were HIV reactive and 981 (98.1%) patients were HIV non-reactive. Among HIV reactive patients 16(1.6%) were Pulmonary TB and 3 (0.3%) were Extra Pulmonary TB patients.

Among the total 1996 cases of tuberculosis 41 (2.05%) cases were HIV Reactive and 1955 cases were HIV non-reactive. Among the HIV Reactive cases males occupies 22 (53.6%), and females have 19 (46.3%).

Out of 1266 pulmonary tuberculosis cases 35 cases were HIV Reactive and 1231 cases were HIV non-reactive. Out of 730 Extra pulmonary tuberculosis 19 cases were HIV Reactive cases and 711 cases were HIV non-Reactive. [Table 5]

Out of the 1996 patients 161 (8.07%) cases were cured, 1797 (90.03%) completed their treatment course and 8 cases were not evaluated. Treatment failure in one case and death is seen in 22 (0.011%). [Table 6]

Table 1: Distribution of TB cases according to the Year

YEAR	Total number of TB Cases	Total Number of TB cases ≤15 Years	% of ≤15 years Cases among Total TB cases
2017	7688	310	4.03
2018	10547	527	4.99
2019	11208	587	5.23
2020	6331	282	4.45
2021	7900	290	3.67
Total	43674	1996	4.57

Table 2: Distribution of cases according to Year wise and age wise

YEAR	AGE (YRS)	MALE (%)	FEMALE (%)	TOTAL (%)
2017	0–5	43 (26.38)	22 (14.96)	65 (20.97)
	6–10	49 (30.06)	48 (32.66)	97 (31.29)
	11–15	71 (43.56)	77 (52.38)	148 (47.74)
	Τοταλ	163 (100)	147 (100)	310 (100)
2018	0–5	82 (30.6)	64 (24.71)	146 (27.7)
	6–10	93 (34.7)	76 (29.34)	169 (32.07)
	11–15	93 (34.7)	119 (45.95)	212 (40.23)
	Τοταλ	268 (100)	259 (100)	527 (100)
2019	0–5	95 (33.45)	72 (23.76)	167 (28.45)
	6–10	101 (35.56)	115 (37.95)	216 (36.8)
	11–15	88 (30.99)	116 (38.28)	204 (34.75)
	Τοταλ	284 (100)	303 (100)	587 (100)
2020	0–5	52 (36.88)	32 (22.7)	84 (29.78)
	6–10	47 (33.33)	47 (33.33)	94 (33.33)
	11–15	42 (29.79)	62 (43.97)	104 (33.33)
	Τοταλ	141 (100)	141 (100)	282 (100)
2021	0–5	46 (32.86)	33 (22)	79 (27.24)
	6–10	51 (36.43)	44 (29.33)	95 (32.76)
	11–15	43 (30.71)	73 (48.67)	116 (40)
	Τοταλ	140 (100)	150 (100)	290 (100)
	Γρανδ Τοταλ	996 (100)	1000 (100)	1996 (100)

Table 3: prevalence of pulmonary and extra pulmonary TB among various genders

YEAR	MALE		FEMALE		Total
	Pulmonary TB	Extra Pulmonary TB	Pulmonary TB	Extra Pulmonary TB	
2017	117	46	110	37	427
2018	192	76	187	72	719
2019	181	103	184	119	768
2020	69	72	75	66	351
2021	65	75	86	64	355
Total	624	372	642	358	1996

Table 4: Association of Pulmonary and Extra Pulmonary TB with HIV among Male Patients

Year	MALE				Total
	Pulmonary TB		Extra Pulmonary TB		
	HIV Reactive	HIV non-reactive	HIV Reactive	HIV non-reactive	
2017	3	114	1	45	163
2018	6	186	1	75	268
2019	5	176	0	103	284
2020	2	67	0	72	141
2021	3	62	1	74	140
Total	19 (1.91%)	605 (60.74%)	3 (0.3%)	369 (37.05%)	996 (100%)

Table 5: Association of Pulmonary and Extra Pulmonary TB with HIV among Female Patients

Year	FEMALE				Total
	Pulmonary TB		Extra Pulmonary TB		
	HIV Reactive	HIV non-reactive	HIV Reactive	HIV non-reactive	
2017	4	106	0	37	147
2018	1	186	1	71	259
2019	6	178	2	117	303
2020	1	74	0	66	141
2021	4	82	0	64	150
Total	16 (1.6%)	626 (62.6%)	3 (0.3%)	355 (35.5%)	1000 (100%)

Table 6: Distribution of Cases according to outcome of the Treatment

Year	Cured		Treatment completed		Treatment Failure		Lost To Follow Up		Not Evaluated		Dead	
	M	F	M	F	M	F	M	F	M	F	M	F
2017	23	22	138	123	0	0	1	0	0	0	2	1
2018	8	14	254	239	1	0	0	2	2	1	1	5
2019	19	26	263	271	0	0	1	1	1	0	1	4
2020	10	20	124	118	0	0	2	0	2	2	2	2
2021	8	11	134	133	0	0	0	0	0	0	1	3
Total	68	93	913	884	1	0	4	3	5	3	7	15

DISCUSSION

In the present study, the past 5 years (January 2017 to December 2021) a total of 43,674 cases were registered in the region with 1996 (4.6%) cases under 14 years of age. Distribution of cases with respect to age over the course of five years is shown in the fig 1-5, the greatest number of cases were between 11-15 years of age 784 (39.3%) followed by 6-10 years 671 (33.6%), and 1-5 years 541 (27.1 %) respectively. male and female share, a near equality with male 996 (49.9%) and female 1000 (50.1%). Male to female ratio was 9.95:10.0. There were 1266 (63.4%) of pulmonary tuberculosis cases and 730 (36.5%) cases of extra pulmonary cases. There was nearly an equal division of pulmonary tuberculosis cases among males 624 (49.2%) and females 642 (50.7%). Even there was similar distribution pattern with extra pulmonary cases as males 372 (50.9%) and females as 358 (49%).

Among the total 1996 cases of tuberculosis 41 cases were HIV positive and 1955 cases were HIV negative. In the HIV positive cases males occupies 22 (53.6%), and females have 19 (46.3%).

Among the male pulmonary tuberculosis patients 19 has HIV as comorbidity and female have 16 cases. When it comes to extra pulmonary tuberculosis patient's male and female share 3 each. Our study shows that transgender patient is negative for HIV.

Out of the 1996 patients 161 (8.07%) cases were cured, 1797 (90.03%) completed their treatment course and 8 cases were not evaluated. Treatment failure in one case and death is seen in 22 (0.011%).

In this study the most number of cases were in the 11–15-year age group 784 (39.3%) followed by 6-10 years 671 (33.6%),1-5 years 541 (27%) and <1year (0.1%) respectively which was similar to the findings in the study done by Pralhad Suresh Rao Potdar which showed the maximum number were in the age group 11-14 year (62.9%).[10] This finding of our study was similar to the studies which were 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.[11,12]

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%).[13]

In our study there were nearly equal number of boys 996 (49.8%) and girls 1000 (50.1%). In contrast to the studies which were done by Pralhad Suresh Rao Potdar and Sharma et al which reported more girls (61.4%) (61.7%) than boys (38.6) (38.3%).[10,12]

Our study revealed boys to girl's ratio of 9.95:10 which is equal to 1 when compared to a study done by Indumathi et at revealed a boys to girl's ratio of 0.8:1.[14]

In our study it was found that 1266 (63.4%) of the study population had pulmonary tuberculosis and 730 (36.5%) extra pulmonary tuberculosis, which was contr3ast to the studies done by Pralhad Suresh Rao Potdar and Arora et al who observed that extra pulmonary tuberculosis was seen in (50.75%), (47%) and pulmonary tuberculosis in (49.25%), (53%) respectively.[10,11] With in the study period a total of 1996 cases age less than 14 years were observed. Of these, treatment outcome was recorded for 1363 (68.2%) cases and no outcome was available for 633 (31.7%) cases.

In the group of treatment outcome recorded 151 (7.5%) cases were cured, 22 (1.1%) cases were died, 1180 (59.1%) cases had completed treatment and 10 (0.5%) cases had treatment failure and was changed to different treatment.

In our study, the number of deaths from tuberculosis 22 (1.1%) cases was less than the study done by Gebremeskel Mirutse.[15]

CONCLUSION

In government general hospital, Kurnool among all TB cases 4.6% are children age less than 15 years old. Hence compared to the global estimated report which was 11.3% in 2021 there was under diagnosis in the region. Therefore, intensified effort should be consider mitigating under diagnosis in the region. As there are many upper respiratory tract infections which are similar to tuberculosis in clinical presentation, suspicion for tuberculosis must be high as diagnosis of paediatric tuberculosis will depends on clinical symptoms sometimes. As there is difficulty in diagnosing paediatric tuberculosis using the diagnostic techniques that we have, a new diagnostic technique should be introduced to diagnose paediatric TB in addition to the available options.

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REFERENCES

1. Pai M, Correa N, Mistry N, Jha P. Reducing global tuberculosis deaths—time for India to step up. Lancet. 2017;389(10075):1174–6.
2. Dhamnetiya, D., Patel, P., Jha, R.P. et al. Trends in incidence and mortality of tuberculosis in India over past three decades: a joinpoint and age–period–cohort analysis. BMC Pulm Med 21, 375 (2021) https://doi.org/10.1186/s12890-021-01740-y
3. Tuberculosis. https://www.who.int/news-room/fact-sheets/detail/tuberculosis.
4. Mirutse, G., Fang, M., Kahsay, A.B. et al. Epidemiology of childhood tuberculosis and factors associated with unsuccessful treatment outcomes in Tigray, Ethiopia: a ten-year retrospective cross sectional study. BMC Public Health 19, 1367 (2019). https://doi.org/10.1186/s12889-019-7732-y.
5. Guidance for National Tuberculosis Programmes on the Management of Tuberculosis in Children. 2nd edition. Geneva: World Health Organization; 2014. 3, Diagnosis of TB in children. Available from: https://www.ncbi.nlm.nih.gov/books/NBK214442/
6. Implementing the WHO Stop TB Strategy: A Handbook for National Tuberculosis Control Programmes. Geneva: World Health Organization; 2008. PMID: 26269864
7. Getahun H, Sculier D, Sismanidis C, Grzemska M, Raviglione M. Prevention, diagnosis, and treatment of

tuberculosis in children and mothers: evidence for action for maternal, neonatal, and child health services. J Infect Dis. 2012; 205:12.
8. Genene Tilahun SG. Treatment outcomes of childhood tuberculosis in Addis Ababa: a five-year retrospective analysis. BMC Public Health. 2016;16(612):10.
9. James AS. Epidemiology and disease burden of tuberculosis in children: a global perspective. Infect Drug Resist. 2014; 7:13.
10. WHO. On the Road to Ending TB Highlights from the 30 Highest TB Burden Countries Global TB Programme. 2016; Available from: www.who.int/tb.
11. Potdar, Pralhad. "A five-year retrospective study of paediatric tuberculosis patients registered in Nanded Municipal Corporation." International Journal of Community Medicine and Public Health5 (2018): 2016.
12. Arora VK, Gupta R. Directly observed treatment for tuberculosis. Indian J of pediatrics. 2003;70(11):885-9.
13. Sharma S, Sarin R, Khalid UK, Singla N, Sharma PP, Behera D. The DOTS strategy for treatment of paediatric pulmonary tuberculosis in South Delhi, India. Int J Tuberculosis Lung Dis. 2008; 12:74-80.
14. Sushamabai S, Lekshmi Devi R. Clinical spectrum of tuberculosis in BCG vaccinated Children. Indian Pediatr. 2002; 39:458-62.
15. Indumathi CK, Prasanna KK, Dinakar C, Shet A, Lewin S. Intermittent Short Course Therapy for Pediatric Tuberculosis. Indian Pediatr. 2010;(47):93-6.