

Original article

Profile of paediatric TB cases in Ahmedabad Municipal Corporation area during year 2007 to 2009

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Abstract:

Background: Children are especially vulnerable to the effects of tuberculosis, which is often difficult to diagnose in young children and therefore difficult to treat effectively.

Objective: To study profile and trend of paediatric TB cases in AMC area during year 2007 to 2009.

Methodology: Study: Record based. Sample: 2253 treatment cards of 0-14 years age group. Inclusion: All TB units (10 units) in AMC area. Analysis: SPSS

Results: Incidence of Paediatric TB in AMC was 0.48, 0.46 and 0.34/1000 in the year 2007, 2008 & 2009 respectively. East zone showed highest number of cases (701 cases, 31.1%). Incidence increased in north and west zones from 2007 to 2009. Below 8 years, males suffered more than females. In 8-14 year age group, females suffered more. Amongst the Extra-pulmonary TB cases, (1279, 56.1%), most common sites in both groups were Lymph nodes (F:50.63%, M:47.30% p=0.25) followed by Abdomen (F:18.19%, M:14.52% p=0.08). Brain-meninges (M:14.37%, F:10.76%, p=0.06) & Pleura (M:12.21%, F:10.60%, p=0.41). The gender differences in different sites were insignificant. Category-3 showed decreasing trends in all age groups. 8-10% of all cases have previous history of anti-TB treatment. Treatment success rate (cured + treatment completed) showed an increasing trend every year during 2007-2009 (94.63%, 95.02%, 95.55%). Deaths due to TB was apparently more in females than in males, but insignificant (F:1.38%, M:0.54% p=0.07). **Conclusion:** Functioning of RNTCP in AMC has shown encouraging results in last three years in the form of decreasing trend in incidence and increasing trend in treatment success rate.

Key Words: Paediatric-TB, Trends, AMC, Extra-pulmonary TB, RNTCP

Introduction:

India is the highest TB burden country accounting for one fifth of the global incidence and it is 17th among 22 high TB burden countries in terms of TB incidence rate.¹ Every

year, approximately 1.8 million persons develop tuberculosis, of which about 0.8 million are new smear positive highly infectious cases. Tuberculosis kills about 0.32 million people every year. Two out of every five Indians are infected with TB bacillus. Every day about 5000 people develop the disease.^{2,3} Most of new cases of TB and deaths due to TB occur in developing countries where infection is often acquired in childhood.² Children are especially vulnerable to the effects of tuberculosis, which is often difficult to diagnose and therefore difficult to treat effectively. Pediatric TB results from failure of TB control in adults.⁴ No other chronic infection of childhood comes anywhere close to TB. It is one of the giant killers of children. Childhood deaths from TB are usually caused by disseminated disease.²

Aims and Objectives:

To study profile and trend of paediatric TB cases in AMC area during year 2007 to 2009.

Methodology:

A record based study was carried out including all treatment units (10 units) of TB in Ahmedabad municipal corporation area. Study period was of 4 months (September to December 2010). Total 2253 treatment cards of 0-14 years age group during 3 years (2007-2009) were studied and analyzed using appropriate statistical software. Old categorization of TB under RNTCP has been taken into consideration looking at the study design and period from 2007 to 2009.

Results and Discussion:

Ahmedabad Municipal Corporation area is divided into six zones namely North zone (NZ), South zone (SZ), East zone (EZ), Central zone (CZ), West zone (WZ) and New West zone (NWZ). According to distribution of cases among various zones, during 2007-2009, highest number of cases were from East zone (31.1%) followed by South zone (22.6%), North zone (20.9%), Central zone (10.9%), West zone (8.3%) and New West zone (6.2%). Zones on the eastern side of Sabarmati river viz., East, South and North zones comprised nearly 75% of all paediatric TB cases. The reason could be industrialised area, more dense population,

overcrowding, more migratory population and poverty in these three zones. Contrary to other zones, increasing trend in occurrence of disease was observed in NZ and WZ during these three years. The reason could be greater coverage of outreach population by RNTCP in the recent years.

Table 1: Age group wise distribution of Paediatric TB cases

Age Groups (years)	Females	Males	Total
0 to 2	88 (3.9)	116(5.2)	204(9.1)
2 to 4	114 (5.1)	167(7.4)	281(12.5)
4 to 6	137 (6.1)	177 (7.9)	314(13.9)
6 to 8	155 (6.9)	177 (7.9)	332(14.7)
8 to 10	178 (7.9)	157 (7.0)	335(14.9)
10 to 12	225 (10.0)	145 (6.4)	370(16.4)
12 to 14	259 (11.5)	158 (7.0)	417(18.5)
TOTAL	1156 (51.3)	1097 (48.7)	2253(100)

(Figures given in parentheses are percentages.)

Mean age : 8.24 years

SD: 3.99 years (p<00.1)

Note : Age was recorded in months for each child and Mean & SD were calculated in months. Then both were converted to years.

Out of total (2253) children studied, 48.7% were males while 51.3% were females. (Age range : 15 days to 14 years) 668 (29.6%) paediatric patients were in 0-5 (pre-school) age group, whereas 798 (35.4%) and 787 (34.9%) belonged to 6-10 (primary school) and 11-14 year (adolescent) age groups respectively. Thus occurrence of disease was equal in both primary school and adolescent age groups. In the study carried out by V K Arora et al 63% of children were female. They also observed that disease was more common in adolescents.⁵

In our study mean age of male children was 8.1± 3.8 years and mean age of female children was 9.3± 3.8 years. Incidence of TB was higher in males below the age of 8 years. However, it was higher in females in the 8-14 years age group. This age difference in the two sex groups was highly significant. (p< 0.01) (Table-1) In the study carried out by S.K. Kabra et al mean age of the children was 7.75 years and sex distribution was almost equal.⁶

These paediatric TB cases were divided into three categories. Category-1 constituted 1190 (52.8%). Category-2 and Category-3 cases were

197 (8.7%) and 866 (38.4%) respectively. (Figure. 1).In the study carried out by S.K. Kabra et al Category-1 constituted 70.4%. Category-2 and Category-3 cases were 2.6% and 27.0% respectively.⁶

Figure1: Distribution of cases according to category

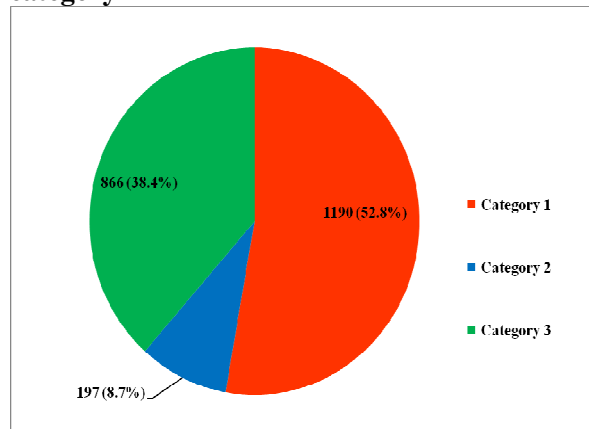


Table 2: Category wise distribution of cases in defined age group

Age groups	Category I	Category II	Category III	Total
Preschool (0-5 years)	375 (31.5) (56.1)	28 (14.2) (4.2)	265 (30.6) (39.7)	668 (29.6) (100)
Primary (6-10 years)	398 (33.4) (49.9)	69 (35.0) (8.6)	331 (38.2) (41.5)	798 (35.4) (100)
Adolescent (11-14)	417 (35.0) (53.0)	100 (50.0) (12.7)	270 (31.2) (34.3)	787 (34.9) (100)
Total	1190 (100) (52.8)	197 (100) (8.7)	866 (100) (38.4)	2253 (100) (100)

Notes:-Figures given in parentheses are percentages of total cases in different age groups in the specific category.Figures given in parentheses in **Bold** are percentages of total cases in different categories in the defined age group.

In our study Category-3 TB cases were higher in primary school age children (38.2%). Category-1 (35%) and Category-2 (50%) were more common in adolescents. (Table.2) whereas in study of V K Arora et al, Category-1 TB dominated the adolescent group. Category-3 TB case percentage was higher in pre-school and primary school age groups.⁵

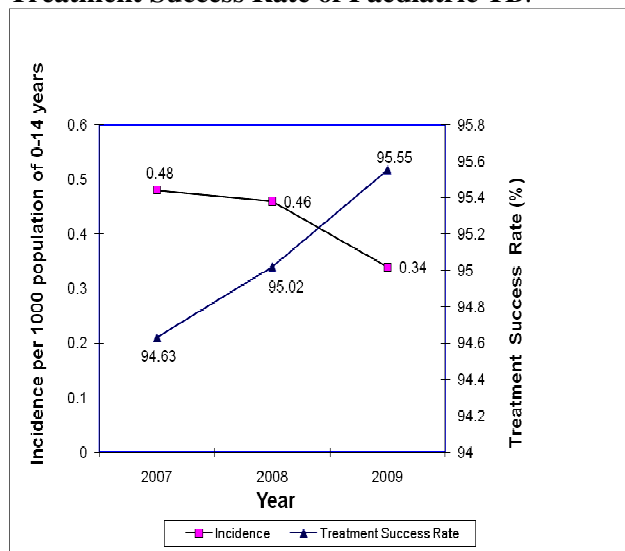
There were 56.8% cases of Extrapulmonary TB (EPTB) (as compared to 15 percent of adults⁷ during this period) followed by 42.8% cases of

Pulmonary TB and 0.4% cases of Extrapulmonary+ Pulmonary TB. Thus, despite a predominance of the pulmonary form in adult, the prevalence of EPTB was noticeably high in children. (Table. 3)

Table 3. Distribution of cases according to disease types

Disease types	Cases	Percentage	p-value
Pulmonary TB (PTB)	965	42.8	---
Extapulmonary TB (EPTB)	1279	56.8	<0.01
EPTB + PTB	9	0.4	< 0.01
TOTAL	2253	100	

Figure 2: Trend of Incidence per 1000 population of 0-14 years age- group and Treatment Success Rate of Paediatric TB.



Note: Paediatric TB incidence rate per 1000 children of 0-14 years age group and Treatment Success rate in percentage during the year 2007 to 2009.

Of all the extra-pulmonary TB cases, (1279, 56.1%), most common sites in both sex groups were Lymph nodes (F:50.63%, M:47.30%, p=0.25) followed by Abdomen (F:18.19%, M:14.52%, p=0.08). Brain-meninges (M:14.37%, F:10.76%, p=0.06) & Pleura (M:12.21%, F:10.60%, p=0.41) were more affected sites in males as compared to females. In the study of V K Arora et al, Extrapulmonary TB (EPTB) was seen in 47 percent of children. Among EPTB, lymphadenopathy was seen in 75 % of cases in their study.⁵ Whereas in the study carried out by Saumya swaminathan et al lymphadenopathy is the most common (67%), among extrapulmonary manifestations.⁷

Incidence of Paediatric TB among the reported cases at Tuberculosis Units in AMC was 0.48, 0.46 and 0.34 per 1000 children of 0-14 years age group in the year 2007, 2008 & 2009 respectively. (Figure. 2)

In year wise distribution of cases according to category, Category-3 showed decreasing trend in all age groups. {383 (17%) in 2007, 252 (11.2%) in 2008, 231(10.3%) in 2009}. In age group wise distribution of cases according to category, cases of Category-1 and Category-2 increased as age increased.

Distribution according to disease type revealed that highest number of cases were of extrapulmonary TB (51.6%) followed by sputum smear negative (31.9%), sputum smear positive (7.8%), others (6.7%), treatment after default (0.9%), relapse (0.7%) and failure (0.5%). (Figure.3).

Detection of smear positivity in new cases was found to be the lowest for the preschool age group (1.7 percent) and relatively increased with age for primary school (18.8 percent) and adolescent (79.5 percent) groups. The finding reflects difficulties in obtaining a sputum sample in very young children. In the study of V K Arora et al, the relative prevalence of new smear-positive TB was 5 percent in the paediatric age group. In their study detection of smear positivity in new cases was found to be the lowest for the preschool age group (17 percent) and relatively increased with age for primary school (30 percent) and adolescent (54 percent) groups.⁵ S. K. Kabra et al, reported that identification of AFB was possible only in 11% of the patients.⁶

Every year 8.7% patients have history of anti-TB treatment taken previously. This was observed more in private sector (5.9%) than in government sector (2.6%). Weight gain of 1 to 4 Kg. was observed in two-thirds of the patients at the end of treatment which may be physiological or due to effect of treatment. 72.5% patients had taken regular treatment and rest had missed 1 or more doses.

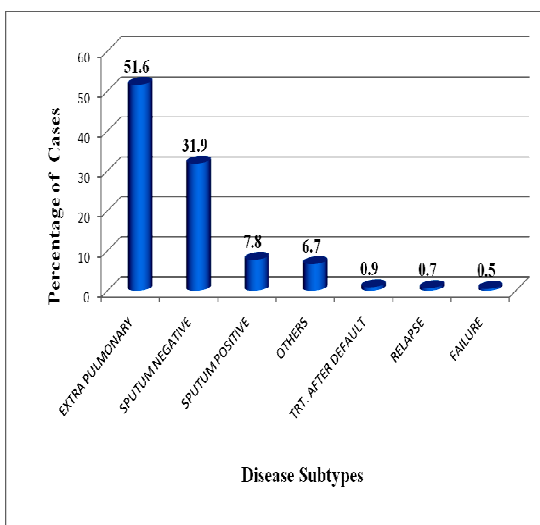
As far as treatment outcome is concerned, treatment completed cases were 86.7 % and 8.3 % cases were cured according to definition of treatment completed and cured of RNTCP⁹ followed by treatment defaulted (2%), failure (0.8 %), transferred out (1.2%) and died (1%). (Table 4).

Table 4: Treatment outcome of Paediatric TB according to definition of RNTCP in either sex.

Treatment outcome	Female	Male	TOTAL
Treatment completed	966 (83.6)	988 (90.1)	1954(86.7)
Cured	132 (11.4)	55 (5.0)	187 (8.3)
Defaulted	21 (1.9)	25 (2.3)	46 (2.0)
Transfer out	10 (0.9)	16 (1.5)	26 (1.2)
Died	16 (1.4)	6 (0.5)	22 (1.0)
Failure	11 (1.0)	7 (0.6)	18 (0.8)
Total	1156 (100)	1097 (100)	2253 (100)

(Figures given in parentheses are percentages)

Figure 3: Distribution of cases according to disease subtypes.



Treatment success rate (cured + treatment completed) showed a marginal increasing trend during the study period. (94.63% in 2007, 95.02% in 2008, 95.55% in 2009.) (Figure.2) and this treatment success rate is similar in both male and female paediatric cases.

Conclusions:

Overall case distribution was nearly equal in males and females, but cases were higher in males in 0-8 years age group while cases were higher in females in 8-14 years age group. Increasing trend of disease was observed in NZ and WZ during the study period. Extra-pulmonary (EP) cases constituted 56.8 % of

total cases. Sputum smear negative cases were 31.9 % and only 7.8 % cases were sputum smear positive.

The EP sites were similar both in males as well as females. Commonest EP site was lymph node followed by abdomen.

Overall annual occurrence of TB showed a declining trend.

In yearwise trend according to category, category-3 showed decreasing trend in all age groups, but category-1 and category-2 showed increasing trend as age increased.

Every year 8 to 10 % cases have previous history of Anti -TB treatment.

Two thirds of the patients gained 1 to 4 Kg. weight at the end of treatment.

72.5% patients have taken regular treatment.

Over 87% cases were treatment completed and nearly 8 % cases were cured.

Treatment success rate (cured + treatment completed) showed an increasing trend from 94.6% to 95.6% during 2007-2009.

The results of RNTCP in paediatric age group in AMC shows decreasing trend in the occurrence of TB and increasing trend in the treatment success rate during this period.

Recommendations:

BCG vaccination status and / status of scar - of the patient should be included in the treatment card.

Family history of TB should be inquired in all patients and needs to be documented in the treatment card.

Mantoux test should not be considered as a diagnostic tool for starting anti TB drugs. Rather, detailed investigation should be done before the child is put on treatment.

Emphasis should be given on sputum disposal training for adults and elder children.

Nearly 28% of cases had missed one or more doses which indicates that the parents need to be motivated for compliance to regular and complete treatment of their children.

Regular follow-up during continuous phase of treatment should include growth monitoring of the children and nutritional education to the parents.

Acknowledgement:

We are highly thankful to Dr. R.M. Leuva, City TB Officer, Ahmedabad City TB Control Society, Ahmedabad for facilitating in data collection and helping to get permission from Director of RNTCP to conduct this study

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