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Original Research Article

Socio-demographic determinants of paediatric tuberculosis patients in an urban city of Central India

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ABSTRACT

Background: Paediatric tuberculosis (TB) indicates presence in the community of sputum -positive pulmonary tuberculosis, presence of childhood risk factors for disease and stage of epidemic. This "orphan disease" exists in the shadow of adult TB and is a significant child health problem, but is neglected. As a result both research and surveillance data in the field of childhood TB has been greatly limited. Objective of the study was to find out the socio-demographic profile of paediatric TB patients registered under RNTCP in Bhopal city.
Methods: A study was conducted in all tuberculosis treatment units (TU) of Bhopal city. All paediatric patients in the age group of 0 to 14 years diagnosed as TB and registered under RNTCP and fulfilling inclusion criteria during January to June 2013 (six months) were included in the study. The data was analysed on statistical software SPSS VS.20.
Results: The maximum numbers of patients (66.06%) were in the age group of 1-10 years. More than half of the mothers and fathers of paediatric patients are either illiterate or having low educational status. In our study 92.72% of patients belonged to low socio economic status and also 69.09% of paediatric patients lived in overcrowded households and were malnourished.
Conclusions: The study concluded that tuberculosis in children affects mainly the age group of 1-10 years and is more common in females. Poor housing conditions contribute to tuberculosis incidence as majority of the paediatric patients lives in semi Pucca and Kaccha house and gave a history of dwelling in overcrowded houses. Majority of children were malnourished.

Keywords: Paediatric tuberculosis, RNTCP, Socio-demographic profile

INTRODUCTION

Paediatric tuberculosis indicates presence in the community of sputum -positive pulmonary tuberculosis, presence of childhood risk factors for disease and stage of epidemic.[1] The global burden of tuberculosis remains enormous, mainly because of poor control in Southeast Asia, sub-Saharan Africa, and eastern Europe, and because of high rates of *Mycobacterium tuberculosis* and HIV co infection in some African countries.[2] Young children carry the greatest burden of disease. They are the most likely to develop disease after infection and are significantly more likely to develop extra pulmonary TB (EPTB) and severe disseminated TB than adults. In children extra pulmonary tuberculosis is more common than pulmonary TB. Common forms of EPTB in children are lymph node TB, miliary TB, meningeal TB, pleural effusion, abdominal TB, pericardial TB.[3] In a previous research study it was found that lymph node TB is the commonest form of EPTB responsible for 71.1% of cases and cervical lymphadenitis is the commonest type of

lymph node infection seen in 88.2% of all lymph node TB cases.[4] Children in the first five years of their life are likely to suffer from serious and fatal forms of TB, more so, if not vaccinated with BCG.[3] This "orphan disease" exists in the shadow of adult TB and is a significant child health problem, but is neglected.[5] As a result both research and surveillance data in the field of childhood TB has been greatly limited.

Objective of the study was to find out the socio-demographic profile of paediatric TB patients registered under RNTCP in Bhopal city.

METHODS

A study was conducted in all tuberculosis treatment units (TU) of Bhopal city. All paediatric patients in the age group of 0 to 14 years diagnosed as TB and registered under RNTCP and fulfilling inclusion criteria during January to June 2013 (six months) were included in the study.

After obtaining informed consent from parents/guardians data regarding socio-demographic and other related factors of the paediatric TB patients registered under RNTCP was collected by using a structured questionnaire during their visit to Designated Microscopic Centre (DMC) cum DOTS centre. Other relevant information such as TB No., category etc. was collected from their treatment cards. The questionnaire was pilot tested on a suitable sample and then used for collection of data for the study. The data was analysed on statistical software SPSS VS.20.

RESULTS

The present study was conducted on 165 paediatric tuberculosis patients who were registered for DOTS treatment under RNTCP and fulfilling inclusion criteria from January to June 2013 in Bhopal city. Figure 1 shows that the maximum number of patients (66.06%) were in the age group of 1-10 years, followed by the age group of 11-14 years (28.48%). Only 5.45% of paediatric patients were below one year. In our observation youngest patient was 4 months old and oldest was 14 years of age. As shown in Table 1, there were 58.78% female paediatric patients as compared to 41.22% male paediatric patients. Among all the cases maximum proportion of the patients belongs to Hindu religion (53.93%) followed by Muslims (45.45%) and Christians (0.60%) but it does not imply that the cases are more in Hindus as the proportion of Hindus is more in the general population. Majority (63.63%) of the patients lived in nuclear families followed by three generation family (24.24%) and joint family (12.1%). As far as birth order of paediatric patient is concerned majority i.e. 44.24% of the patients were of birth order first followed by 27.87% second, 14.54% third, 7.87% fourth and 5.45% had birth order more than five.

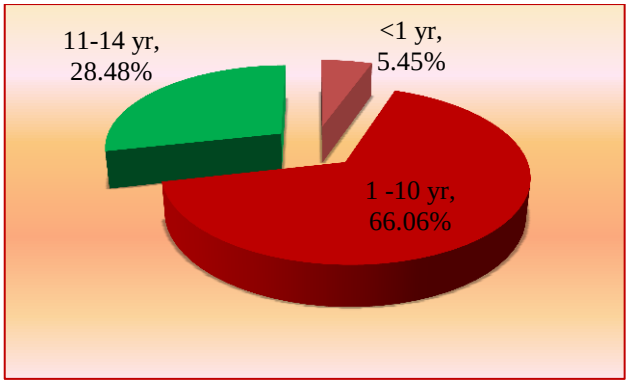

Figure 1: Distribution of patients according to age.

Table 1: Socio demographic distribution of paediatric patients.

Variables		Frequency	%
Gender	Male	68	41.22
	Female	97	58.78
Religion	Hindu	89	53.93
	Muslim	75	45.45
	Christian	01	0.60
Type of Family	Nuclear	105	63.63
	Joint	20	12.1
	Three generation	40	24.24
Birth Order	1	73	44.24
	2	46	27.87
	3	24	14.54
	4	13	7.87
	>5	09	5.45
	Total	165	100

Table 2: Distribution of patients according to educational status of mother.

Educational status	Frequency	%
Illiterate	44	26.66
Primary school	20	12.12
Middle school	25	15.15
High school	53	32.12
Intermediate	14	8.48
Graduate	06	3.63
Postgraduate	03	1.81
Total	165	100

Educational status of mother is given in Table 2 which shows that 26.66% of the mothers of the patients were illiterate, 15.15% were middle school, 12.12% were primary school, 32.12% were high school, 8.48% were intermediate, 3.63% were graduate and the highest level of education was Post graduate (1.81%). Thus more than half of the mothers of paediatric patients are either illiterate or having low educational status.

Table 3: Distribution of patients according to educational status of father.

Educational status	Frequency	%
Illiterate	40	24.24
Primary school	22	13.33
Middle school	23	13.93
High school	53	32.12
Intermediate	17	10.30
Graduate	07	4.24
Postgraduate	03	1.81
Total	165	100

Table 4: Distribution of patients according to occupation of head of family.

Occupation	Frequency	%
Professional	04	2.42
Semi-professional	04	2.42
Skilled	75	45.45
Semi-skilled	16	9.69
Unskilled	66	40
Unemployed	00	00
Total	165	100

Table 5: Distribution of patients according to socio-economic status according to Kuppuswamy's classification.

Socioeconomic status	Frequency	%
Upper class	00	00
Upper middle	03	1.81
Lower middle	09	5.45
Upper lower	131	79.39
Lower class	22	13.33
Total	165	100

Similarly, educational status of father is given in Table 3 shows that 24.24% of the father of paediatric patients were illiterate, 13.93% were middle school,13.33% were primary school, 32.12% were high school, 10.30% were intermediate, 4.24% were graduate and the highest level of education was Post graduate (1.81%). Greater percentage of TB cases was noted among children with father of low educational background.

As far as occupation and socio-economic status is concerned, Table 4 and 5 show that 45.45% of the head of the families were employed in skilled occupation and 40% were employed in unskilled occupation followed by semi-skilled (9.69%), semi-professional (2.42%) and Professional (2.42%). In our study 92.72 % of patients belonged to low socio economic status and 7.26% belongs to middle class. Thus re-emphasizing that TB is usually seen in people's belonging to low socioeconomic status.

Table 6 shows that 33.93% of the patients lived in pucca houses, 58.18% in semi pucca and 7.87 % in kaccha houses. Majority i.e. 69.09% of the patients lived in overcrowded households. Thus this study revealed that TB transmission is more in people residing in poor living conditions and overcrowded houses.

Table 6: Distribution of patients according to type of house and overcrowding.

Variable		Frequency	%
Type of house	Pucca	56	33.93
	Semi-pucca	96	58.18
	Kachha	13	7.87
Over crowding	Present	114	69.09
	Absent	51	30.90
	Total	165	100

Table 7: Distribution of patients as per their nutritional status according to IAP classification.

Nutritional status		Frequency	%
Protein energy malnutrition	Absent	51	30.90
	Present	114	69.09
Grade of PEM	i	31	27.19
	ii	47	41.22
	iii	21	18.42
	iv	15	13.15

Nutritional status of paediatric patients is shown in Table 7 which reveals that 69.09% of children were malnourished. This shows that TB and malnutrition forms a vicious cycle. Out of 114 children with malnutrition 27.19% suffered grade I, 41.22% grade II, 18.42% grade III and 13.15% grade IV malnutrition.

DISCUSSION

In the present study maximum numbers of patients (66.06%) were in the age group of 1-10 years, followed by the age group of 11-14 years (28.48%). Only 5.45% of paediatric patients were below one year. In our observation youngest patient was 4 months old and oldest were 14 years of age. This is in contrast with the study of Sushmabai and co-workers in which maximum numbers of cases were in the 1 to 5 years age group (49.5%), 27.4% were in 5 to 10 years age group, 17.9% were under 1 year and 5.3% were in the age group 10 to 12 years.[6] Garg et al in their study on 2424 children who attended paediatric out-patient department in a hospital in Agra reported that proportion for paediatric tuberculosis was 3.5%, maximum numbers of children were seen in age group of 3-5 years (48.8%) followed by 21.4% in the 5-7 years age group.[7] In a study of Newton et al**,** the risk of disease was highest among infants and in late teens, with the lowest risk between 5 and 10 years.[8] Sharada et al study revealed that the maximum number were in the 1-6 year age group.[9]

In the present study, there were more female patients (58.78%) then males which are similar to the observation of Ruchi et al in which out of 1016 registered childhood TB cases, majority (62%) were females.[10] In a record based study conducted by Puwar et al in Ahmedabad city, out of total 382 paediatric patients, 193 (50.5%) were girls and 189 (49.5%) were boys.[11] Similar findings were observed in the study of Nelliyanil et al in which there were more females (62.68%) than males (37.32%).[12]

Our observation is in contrast with the observation of Ramesh et al study in which out of 155 paediatric patients, 84 (55.6%) were males and 67 (44.4%) were females.[13] Also in retrospective record based study of cases registered between January 2008 and December 2011, at the Amdanga TB unit (TU), West Bengal, conducted by Mukherjee et al in which males constituted 62.7% of the childhood cases.[14]

In the present study, among all the cases maximum proportion of the patients belongs to Hindu religion (53.93%) followed by Muslims (45.45%) and Christians (0.60%). Similar findings were observed in the study of Nelliyanil et al in which majority of the patients were Hindus (58.4%) followed by Muslims (36.4%).[12]

In the present study, majority (63.63%) of the patients lived in nuclear families followed by three generation family (24.24%) and joint family (12.1%). Similar findings were observed in the study of Nelliyanil et al in which majority i.e. 73.2% of the paediatric patients lived in nuclear families followed by joint (21.5%) and three generation families (4.8%).[12]

Majority of the mothers and fathers of paediatric tuberculosis patients were educated up to high school (32.12%) followed by illiterate mothers and fathers i.e. 26.66% and 24.24% respectively. Highest education i.e. post-graduation is seen in only 1.81% of mothers and head of families. This is in contrast with the findings of Nelliyanil et al in which Majority of the mothers of the paediatric patients were illiterate (54.08%) followed by primary school education (26%).[12] In a study of Thakor majority (34%) of heads of family of children were illiterate, followed by those who had completed primary education (19%).[15] 25% had secondary education and 19% had higher secondary education. Only 3% of heads of family were graduates.

In the present study, 92.72% of patients belonged to low socio economic status and 7.26% belongs to middle class. Similar findings were observed in study of Nelliyanil et al in which Majority of the patients i.e. 95.2% belonged to low socioeconomic status and 4.8% belonged to middle class.[12] While in a study by Sushmabai et al in Kottayam district of Kerala slightly more than half (55.8%) belonged to low, 38.9% to middle and 5.3% to high socio-economic groups.[6]

In the present study, 69.09% of the patients lived in overcrowded households. Similar findings were observed in study of Sharada et al in which about 89.5% lived in overcrowded houses.[9]

In the present study, 69.09% of children were malnourished. Out of 114 malnourished children 27.19% suffered grade I, 41.22% grade II, 18.42% grade III and 12.28% grade IV malnutrition. Similar findings were observed in Nelliyanil et al study in which 57.4% of paediatric patients were undernourished.[12] Our observation is in contrast with the study of Sushmabai et al et al in which 42% had under nutrition and also in a study of Thakor N in which out of 100 children 76% were normal.[6,15] 15% children had grade-1 malnutrition, 5% children had grade-2 malnutrition and 3% children had grade-3 malnutrition. Only 1% male child had grade-4 malnutrition.

CONCLUSION

The study concluded that tuberculosis in children affects mainly the age group of 1-10 years. Tuberculosis incidence is more common in females then male. Majority of the patients were Hindus followed by Muslims. Majority of the patients lived in nuclear families. More than half of the mothers and fathers of paediatric patients are either illiterate or having low educational status. Children affected by this disease were mostly belongs to low socio economic status as per Kuppuswamy's classification thus reemphasizing that TB is more common in low socioeconomic status. Poor housing conditions contribute to tuberculosis incidence as majority of the paediatric patients lives in semi Pucca and Kaccha house and gave a history of dwelling in overcrowded houses. Majority of children were malnourished. This shows that TB and malnutrition forms a vicious cycle.

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