Demographic Profile of Childhood TB cases under Revised National Tuberculosis Control Program in Himachal

S. R. Mazta[1], Dr Anmol Kumar[2], Praveen Kumar[3]

Abstract

Background: Childhood tuberculosis has been described as neglected disease despite being public health problem and may constitute 5 to 20% of total TB case load in many high incidence countries. In India it is estimated that 6 to 8 % of all new TB cases are in pediatric age group. Although all the cases of tuberculosis diagnosed and treated under RNTCP are registered, the records are rarely analyzed and fail to provide accurate information on the tuberculosis profile especially on childhood TB cases.

Objectives: This study attempts to find out the demographic profile and case characteristics of childhood TB cases treated under RNTCP.

Methodology: A descriptive analysis was performed using secondary data obtained from tuberculosis registers and treatment cards from all the four tuberculosis units of Shimla district. Data was collected from 1st July 2000 when RNTCP was launched in Shimla district to 31st December 2010.

Results: Out of the total 541 cases of childhood TB registered for DOTS during study period there were 349 (64.5%) females and 192 (35.5%) males. Among female children pulmonary smear positive TB in 128(36.6%) and smear negative TB in 85(24.3%). Mean age was 12 years. Youngest child was 1 year old. Maximum number of 212 (39.19%) children were 14 years old. Most common type of childhood TB was pulmonary in 297 (54.8%) of total 541 cases. Among the extra pulmonary TB cases most common site was lymph node in 81 (33.1%).

Conclusions: Majority of childhood TB cases were female children and most common type of TB was pulmonary TB. Most of childhood TB cases registered and treated under RNTCP were of 13 to 14 years of age. Proportion of children with tuberculosis less than 5 years was very low, indicating need to diagnose and treat children in this age group under the program.

Key words: Childhood tuberculosis, Revised National Tuberculosis Control Program,

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Introduction

Childhood tuberculosis has been described as neglected disease despite being public health problem as this may constitute 5 to 20% of total TB case load in many high incidence countries.[1] In India it is estimated that 6 to 8 % of all new TB cases are in pediatric age group.[2] Childhood TB is neglected because in children it usually either extra pulmonary or pulmonary smear negative which is difficult to suspect and diagnose in children.[1]

In view of wide range of clinical spectrum of childhood TB, diagnosis is often difficult and high index of suspicion is required. To address this problem Revised National Tuberculosis Control Program (RNTCP) in consultation with Indian Association of Pediatrics issued guidelines for diagnosis of childhood TB and introduced patient wise boxes for pediatric TB patients.[3]

Though reported through monthly and quarterly reports no details are available about the demographic and disease profile of patients. This study attempts to find out the demographic profile in terms of age and sex distribution of childhood TB cases, site of disease and its sex distribution. This will contribute to current knowledge of childhood TB epidemiology in Shimla district and better program management as far as childhood TB is concerned.

Material and methods

This was a retrospective record based study. Study area was Shimla district of Himachal Pradesh. There are 4 tuberculosis units in Shimla district. The study was conducted by reviewing the tuberculosis registers and treatment cards maintained at each of the TB units in Shimla districts. Prior permission was obtained from the concerned authority to access the records. Children included in study were 0 to 14 years of age at the time of diagnosis and registration for DOTS under RNTCP. Data was collected with effect from July 2000 when RNTCP was launched in Shimla district to December 2010. Data collected about age, sex and disease was entered in Microsoft excel and analyzed using Epi info version 7.1.0.6.

RESULTS

Types of childhood TB

Most common type of childhood TB was pulmonary in 297 (54.8%) of total cases. (Fig. 1) Among the pulmonary TB cases 169 (56.9%) were smear positive and 128 (43.09%) were smear negative. Among the extra pulmonary TB cases most common site was lymph node in 81 (33.1%). Pleural effusion in 56 (22.9%) and abdominal TB in 16(6.5%) were the next common site among extra pulmonary TB. Other sites including bone and joint, meninges, skin, intestinal, and cold abscess were in 10 (4.09%) of cases. Site of extra pulmonary TB in 77(31.5%) cases could not be known as the site was not recorded in the TB register or the treatment cards were not available. (Fig: 2)

Figure 1

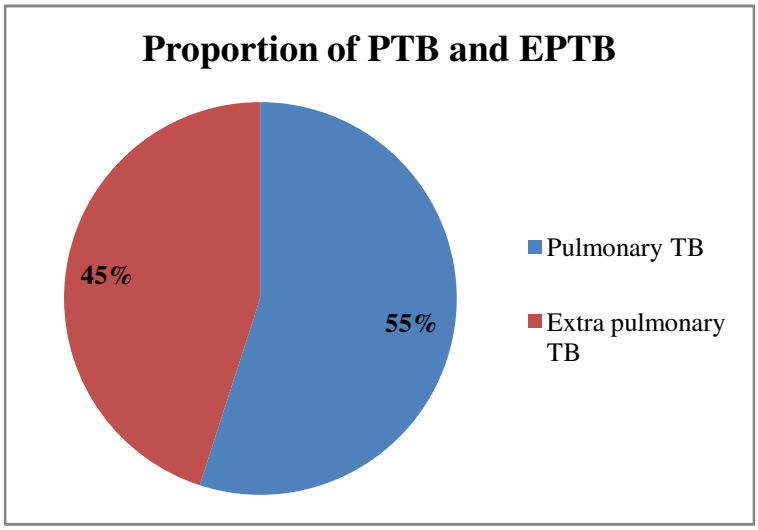
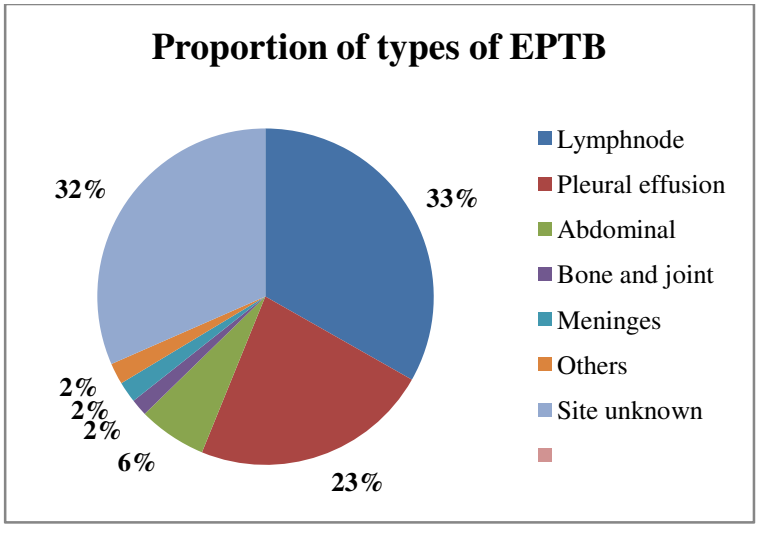


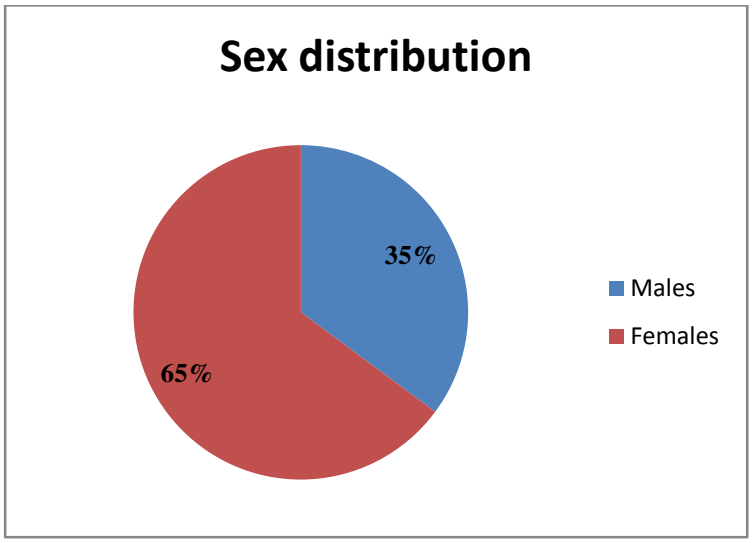
Figure 2



Sex Distribution of cases.

Total of 541 cases were diagnosed and registered for DOTS during the period July 2000 to December 2010. Out of the total 541 cases there were 349 (64.5%) females and 192 (35.5%) males. (Fig: 3)

Figure 3



Among female children pulmonary smear positive TB in 128(36.6%) and smear negative TB in 85(24.3%), bone and joint TB in 4(1.1%), was more common than males. Proportion of lymphadenitis among males and females was equal with 27 males and 54 females (15.4%). Pleural effusion in 22(11.4%), abdominal TB in 8 (4.1%), meningitis in 3 (1.5%), skin in 1(0.5%), intestinal in 1 (0.5%) was more common among male children. Site of extra pulmonary TB in 44 (22.9%) of males and 33(9.4%) of females could not known as this was not recorded in TB register. (Table: I)

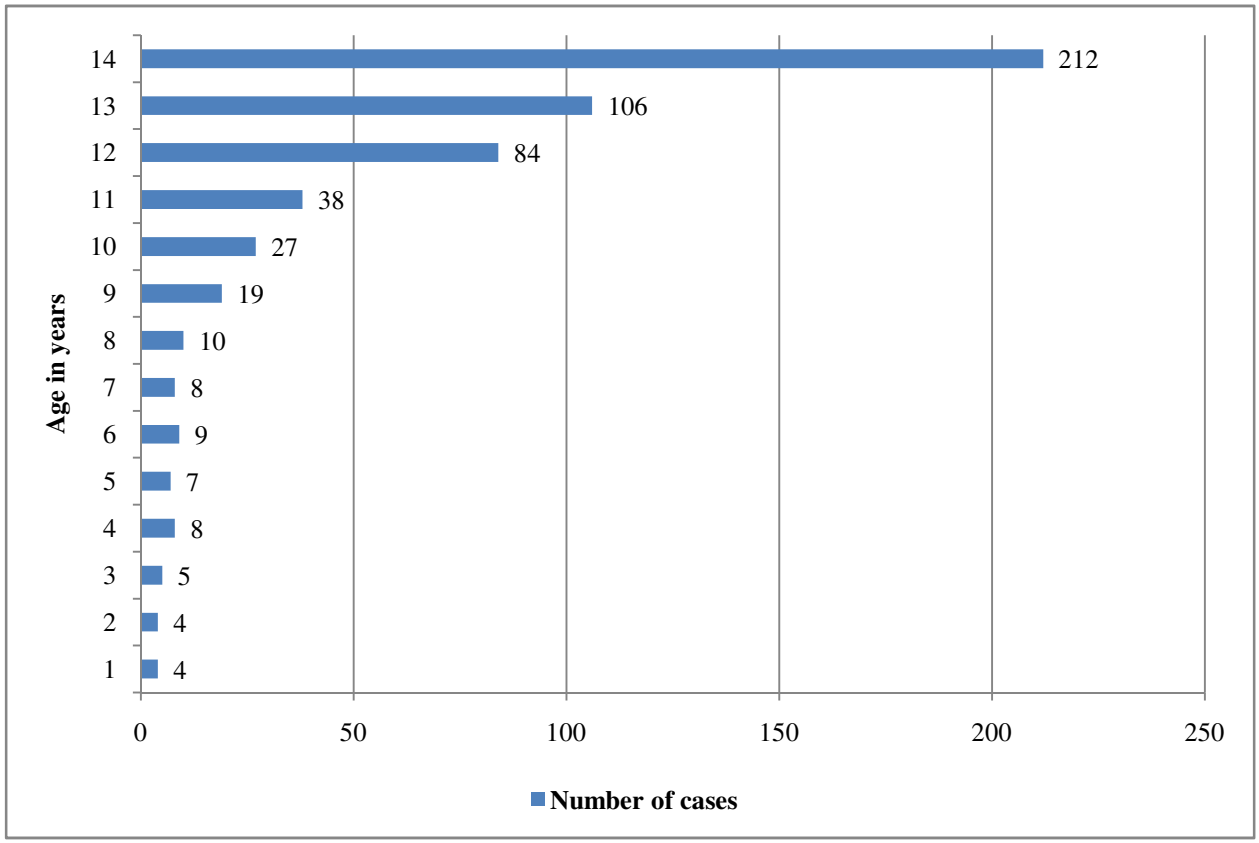
Table: I Sex distribution of type of tuberculosis.
n=541

Type of Tuberculosis	Male (%)	Female (%)	Total (%)
Pulmonary Smear Positive	41 (21.3%)	128 (36.6%)	169 (31.2%)
Pulmonary Smear Negative	43 (22.4%)	85 (24.3%)	128(23.6%)
Lymphadenitis	27 (15.4%)	54 (15.4%)	81 (14.9%)
Pleural Effusion	22 (11.4%)	34 (9.7%)	56 (10.3%)
Bone and Joint	0 (0)	4 (1.1%)	4 (0.7%)
Abdominal	8 (4.1%)	8 (2.2%)	16 (2.9%)
Meningitis	3 (1.5%)	2 (0.5%)	5 (0.9%)
Skin	1 (0.5%)	1 (0.2%)	2 (0.3)
Intestinal	1 (0.5%)	0 (0)	1 (0.1%)
Cold Abscess	2 (1.0%)	0 (0)	2 (0.2%)
EPTB site unknown	44 (22.9)	33 (9.4)	77 (14.2)
	192 (100)	349 (100)	541 (100%)

Age distribution of childhood TB:

Mean age was 12 years with standard deviation of 2.75. Youngest child was 1 year old. Maximum number of 212 (39.19%) children were 14 years old, followed by 106 (19.59%) children of 13 years. There were only 4 (0.74%) children aged 1. (Fig: 2)

Figure: 2 Age distribution of childhood TB cases
n=541



Age and sex distribution

Age was stratified into 3 age groups, 0 -4 years, 5 – 9 years and 10 – 14 years. There were more males in the age group of 0 to 4 years with male to female ratio of 1.6:1. In the age groups of 5 to 9 and 10 to 14 there were more females than males. In the age group 10 to 14 years male to female ratio was 1:2. (Table: II)

Table: II Age and sex distribution
n=541

Age Group	Total Number (%)	Male (%)	Female (%)	PTB Negative (%)	PTB Positive (%)	EPTB (%)
0 – 4	21 (3.88)	13 (6.77)	8 (2.29)	15 (2.77)	0 (0)	6 (1.10)
5 – 9	53 (9.79)	26 (13.54)	27 (7.73)	16 (2.95)	7 (1.29)	30 (5.54)
10 – 14	467 (86.32)	153 (79.68)	314 (89.97)	97 (17.92)	162 (29.94)	208 (38.4)

Discussion

Study found that most common type of tuberculosis was pulmonary which was present in 54.8% of total childhood TB cases which is consistent with many other studies carried out in hospital or program settings. [4-10] In contrast one study in randomly selected TUs of New Delhi found extra pulmonary form of TB to be more common (63.3%).[11] In the present study, among pulmonary TB cases 56.9 % were smear positive and 43.09% were smear negative cases. Higher percentage of pulmonary smear positive TB in this study is in contrast to other studies carried out in different settings where pulmonary smear negative TB was more common.[4-7, 12, 13, 14] One possible reason for higher percentage of pulmonary smear positive cases in present study, could be higher percentage of girls (79.36%) in the age group of 12 to 14 years in this study. This age group is more likely to have adult type pulmonary tuberculosis. Among the extra pulmonary TB, lymphadenitis was most common with 33.1% of children with extra pulmonary TB having lymphadenitis. With TB lymphadenitis is indeed most common form of extra pulmonary TB among children. This is consistent with number of studies.[6, 8, 15, 16,12]

Sex distribution

There were more female (64.5%) than males (35.5%) in this study. Out of 14 studies reviewed for sex distribution there were 4 studies where proportion of females was more than 60%.[10,11,15,17] A study by Sharma et al in LRS institute of Tuberculosis and Respiratory Diseases in New Delhi found 61.7% of pulmonary TB cases to be females.[17] This study included children suffering from pulmonary tuberculosis only. In rest of studies either male female ratio was equal or there were more males than females. Reasons for this sex distribution in this study can only be speculated. One possible reason could be neglect of girl child leading to poor nutritional status and consequently poor immunity. Neglect of girl child may also affect treatment seeking behavior of parents and may delay diagnosis and treatment. It was found in this study that majority (79.36%) of female children were in the age group of 12 to 14 years. Female children of this age group are more likely to be confined inside doing household chores. This may expose them to smear positive PTB case if there is any such case within the household. Pulmonary smear positive TB was also more common among females (36.6%) as compared to males

(24.3%). This could be because the risk of developing adult-type pulmonary TB in females is 2-6 times greater than males and that its occurrence is often associated with menarche.[18]

Age distribution

Mean age in this study was 12 years was higher than the study by Sharda MP et al in Bangalore where mean age was 7.5 years.[10] Majority of children in this study were in the age group of 10 to 14 years, constituting 86.32% of total childhood TB cases. Higher percentage of children in this age group in present study indicates that children under the age of 10 years were either missed or not being diagnosed and treated under the RNTCP. It was also found in this study that children under the age of 5 years constituted only 3.88% of total childhood TB cases despite the fact that childhood TB is most common in this age group.[19] Proportion of childhood TB cases below 5 years ranged from 39% to 79% in countries elsewhere [6, 16, 20, 21] and from 11% to 45.9% in India and neighboring countries. [4, 18-10, 11, 14, 15] These studies were conducted in different settings varying from tertiary care hospitals to community level under TB control programs. First reason for such low proportion of TB cases in 0 to 5 years age group could be that incidence of TB in this age group was actually low which is unlikely considering the fact that as per NFHS3 for Himachal Pradesh, 31% of children under 3 years were underweight and 19.9 % of children in same age group were wasted. Second reason could be that children in this age group were not treated under the program. If they were not treated under the program, possible reason could be non referral to DOTS by treating physician/pediatrician because of potentially serious nature of this disease in this age group which pediatrician like to treat under their own direct supervision. Difficulty in administering drugs in tablet/capsule in this age group could also be a reason behind such low proportion of patients in this age group.

Further studies are required to find out if the difference between male and female childhood TB in terms of disease burden and clinical presentation is real. Low proportion of children below the age of 5 years diagnosed and treated under RNTCP is also a cause of concern. Reasons for this needs to be found out and corrected.

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