

## Original Research Article

# Tuberculosis in North-East India: patient profile and treatment outcome of patient attending RNTCP

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## ABSTRACT

**Background:** Tuberculosis is a disease of global concern. India with its high burden of Tuberculosis, HIV and HIV-TB co-infection, this disease continue to have tremendous impact on its denizens especially the north-eastern states of the country because of its problem of HIV. It is imperative to understand every aspects of the disease for effective prevention and control.

**Methods:** A retrospective record study of tuberculosis units was conducted.

**Results:** The proportion of males was more as compared to females, with more cases seen with increasing age. Pulmonary TB was seen more among males, whereas extra-pulmonary TB was seen more among females. Favorable treatment outcome was seen in 84.7% of the population. HIV-TB Co-infection was seen 6.5% of the patients, with 46.3% having extra-pulmonary TB. Favorable treatment outcome was seen among them too.

**Conclusions:** More common in males, showing increasing number of patients in older age group with favourable outcomes on treatment in all categories including HIV-TB co-infection patients.

**Keywords:** TB, North-East, Treatment outcomes, HIV-TB

## INTRODUCTION

Tuberculosis (TB) is still a disease of global concern with United Nations targeting its elimination from the world by 2030, and WHO with End TB Strategy targeting reduction in number of new cases to 80% i.e. <20/100,000 population by 2030.<sup>1,2</sup> In 2015, there were 10.4 new million cases in the world according to WHO, and the epidemic was found to be more profound than previously estimated with newer data coming in from India.<sup>2</sup> India alone is responsible for one fourth of all TB burden in the world, and India along with five other countries are responsible for 60% of all global TB cases.<sup>2</sup> India, China and the Russian Federation are also responsible for 45% of all multi drug resistant TB (MDR-TB) cases, making the country with highest burden of both TB and MDR-TB. TB in India has gained further

momentum due to co-infection with HIV and now has high number of HIV-TB cases making it one of the countries with triple high burden of TB, MDR TB and HIV-TB Co-infection and taken tremendous toll on its denizens.<sup>2</sup>

In the country in 2016, there were 27.9 lac TB incident cases, with 1.47 lac incident cases of MDR TB and 0.87 lac incident cases of HIV-TB. With the world, struggling to attain set targets for achieving TB elimination, increasing drug resistant cases, and increasing HIV-TB, the need to study and research every aspect of TB has become pertinent for its control and elimination. Manipur is a state in the north eastern region of India, where the incidence of HIV is high and has been selected as one of the 100 priority districts under revised national tuberculosis control program (RNTCP) for intensifying

diagnosis of TB.<sup>4</sup> Thus the study was undertaken to understand the patient profile and TB treatment outcome of patients in the state under RNTCP.

**METHODS**

A retrospective record study was conducted in Imphal district of Manipur, which has high literacy rate and having slightly more urban population. The district was selected randomly through simple random sampling. From the selected district, all the tuberculosis units (TU) were included in the study. The study was conducted in months of November and March 2017. Information from treatment card for all patients took treatment under RNTCP from May 2012 to February 2016 were extracted using a questionnaire. The secondary data collected were then entered into MS excel spreadsheet and analyzed using SPSS v20 are importing the data. Mean and percentages were used for descriptive statistics and tests such as chi-square and fisher’s exact test were used to find out associations and p value less than 0.05 were taken as significant. Permission to conduct the study was taken from the concern district tuberculosis officer.

Permission for the conduct of the study was taken from the institutional ethics committee and from the concerned administration.

**RESULTS**

There were 630 tuberculosis patients registered at the TUs under RNTCP in the district. There were 61.7%

males, giving male to female patient ratio of 1.6:1, who underwent treatment. The minimum and maximum age of the study participants were 1 and 87 years respectively, with the mean age being 46.3 years (Standard Deviation-17.89). The common occupations of the patients were homemakers, government employees, farmers, self-employed individuals and students. The DOT providers in the district were mostly ASHAs, community volunteers (CV), and nurses.

**Table 1: Distribution of types of patients.**

Sl. no	Type of patient	Frequency (%)
1	New cases (Category I)	524 (83.1)
2	Retreatment cases (Category II)	106 (16.9)
	Total	630 (100)

In the study, 83.1% of them were new cases and 6.6% cases as failure, relapse and treatment after default as shown in Table 1. Pulmonary TB cases constitute 66.9% of the total patients, with 36.5% sputum positivity. The common extra-pulmonary tuberculosis were pleural TB which was responsible for 40% of all extra-pulmonary TB, followed by TB lymphadenitis accounting for 37.5%. The other extra-pulmonary TB seen were Koch’s abdomen, Pott’s spine, Skin TB etc.

The distribution of patients according in different treatment categories is given in Table 2 and 3. In category II patients, most of the patients were pulmonary cases.

**Table 2: Distribution of patients belonging to category I.**

Sl. no	Type of patient	Frequency (%)	Pulmonary	Extra-pulmonary
1	Pulmonary sputum positive	190 (36.5)	183	7
2	Pulmonary sputum negative	169 (32.4)	143	26
3	Extra-pulmonary	164 (30.9)		
4	New others	01 (0.2)	01	00
	Total	524 (100)	327	197

**Table 3: Distribution of patients belonging to category II.**

Sl. No	Type of patient	Frequency (%)	Pulmonary	Extra-pulmonary
1	Relapse	25 (23.6)	25	0
2	Failure	08 (7.5)	08	0
3	Default	09 (8.5)	09	0
4	Others	64 (60.4)	53	11
	Total	106 (100)	95	11

Patients who were undergoing treatment under RNTCP had more male patients in both types of category of treatment, and the number of older patients who underwent treatment was more as compared to lower age groups as shown in Table 4.

Pulmonary tuberculosis was more common in males and in the age group of 55 years and above, and extra-pulmonary TB was more common in females, and the difference was found to be significant as can be seen in Table 5. In the study, it was found that more TB cases were consistently reported among males in all age group except in children below 15 years of age, where females

were found to be more. Pulmonary TB was more frequent across all age groups, except in children of 14 years and the proportion of extra-pulmonary TB cases decreased

with increasing age which was found to be significant, and the same pattern followed in both male and females.

**Table 4: Distribution according to category of TB treatment.**

Variables	Category		P value	
	I	II		
<b>Gender</b>	Male	304	85	0.0001
	Female	220	21	
<b>Age groups (in years)</b>	0-14	13	0	0.1*
	15-34	150	23	
	35-54	167	42	
	55 and above	194	41	

\*Fischer's Exact Test.

**Table 5: Distribution of type of TB disease according to gender and age groups.**

Variables	Type of TB disease		P value	
	Pulmonary	Extra-pulmonary		
<b>Gender</b>	Male	293	96	<0.001
	Female	129	112	
<b>Age groups (in years)</b>	0-14	07	06	<0.001*
	15-34	96	77 (44.5% ExTB)	
	35-54	128	81 (38.75%)	
	55 & above	191	44 (18.7%)	

**Table 6: Treatment outcome of the patients attending RNTCP**

Treatment outcome N (%)	Cured	Treatment Completed	Default	Died	Failure
	153 (24.8)	371 (59.9)	59 (9.5)	23 (3.7)	13 (2.1)

**Table 7: Association of various variables with treatment outcome.**

Variables	Favorable	Unfavorable (%)	P value	
<b>Treatment</b>	Category I	449	68	0.001
	Category II	75	27	
<b>Gender</b>	Male	322	57	0.7
	Female	202	38	
<b>Type of TB disease</b>	Pulmonary	347	68	0.3
	Extra-Pulmonary	177	7	
<b>Age groups</b>	0-14 Years	12	01	0.5*
	15-34 Years	146	23 (13.6)	
	35-54 Years	176	29 (14.1)	
	55 Years & above	190	42 (18.1)	

\*Fisher's exact test.

**Table 8: Treatment outcome among HIV positive patient of tuberculosis (n=41).**

Cured	Treatment completed	Died	Default	Failure	Switch to Cat IV
10	28	2	1	0	0

**Patient treatment outcome**

The proportion of the patients with favorable outcome such as cured and treatment completed was seen 84.7% of the study population, and reported case fatality of 3.7% as seen in Table 6. Six percent of the patients were found to have missed doses during the treatment period.

Favorable outcome was seen in patients who were in category I as compared to category II was found to be significant. Although the proportion of unfavorable outcome was seen increasing with increasing age, no statistical significant association was found as shown in Table 7.

In the study, HIV was found to be positive in 6.5% (41) of the patients, although HIV status was known only among 81.1% of the patients (Table 8). Among the TB-HIV co-infected patients, 46.3% of the cases were Extra-Pulmonary TB. Good treatment outcome was seen in patients who had HIV-TB co-infection. Among the positive patients, 51.2% (21) were started on ART.

## DISCUSSION

In the present study, TB was consistently found to be higher in males as compared to females and this pattern concurs to what is seen in rest of India and the world.<sup>5,6</sup> This trend observed in this study may not be related to gender inequality, because women have considerably better decision power about their own health in NE India, and also female patients were found to be more in age group below 15 years of age.<sup>7</sup> The proportion of older age groups suffering from TB was found to be high, and showed an increasing trend with increasing age group. Although TB burden is considered highest to be in the age group of 15-54 years, which is the productive age group, and increasing trend of the disease is seen with increasing age in this study. This concurs with studies from different parts now, which can be a result of the demographic transition.<sup>6,8,9</sup>

In the study, the percentage of extra-pulmonary TB cases was 33.1%, which was higher than the country average of 18%.<sup>3</sup> The case of higher extra-pulmonary cases could be because of higher prevalence of HIV in the state, and extra-pulmonary TB are more commonly seen in people living with HIV.<sup>10</sup> The ratio of pulmonary to extra pulmonary was observed to have decreased with increasing age, and the pattern remain the same in both male and females. Similar results were seen in other studies.<sup>11</sup> Most common extra pulmonary TB seen was pleural TB. Similar findings were seen in studies conducted in south India, but there were studies from Southern and Northern part of India which reported lymph node TB as the commonest extra-pulmonary TB.<sup>12-14</sup>

Sputum positive pulmonary TB– 36.5% (Smear positivity trend) was also found to be lower than the national average of 50%.<sup>4</sup> The decrease seen could be a result of the implementation of the proper implementation of DOTS as similar findings are reported in other studies after implementation of DOTS.<sup>15-18</sup>

Pulmonary tuberculosis more in males and extra-pulmonary more in females which was found to be significant as seen in other studies too.<sup>19</sup>

### *Treatment outcome*

Almost 85% favorable outcome with a case fatality of 3.7%. Favorable outcome was seen more in category I as compared to category II. This association was found to be significant and was expected. No significant favorable

outcome association were seen with gender, age or type of TB, sputum positivity although some studies have shown better outcomes in females and sputum positive patients, while adverse outcome were seen in elderly.<sup>20</sup>

The percentage of defaulters, failures, and deaths were 15% which is lower than the national average.<sup>3</sup>

## CONCLUSION

Study conducted only in public sector with no representation from the private sector.

The study concur with many of the known facts about tuberculosis as seen in the rest of the country, a shift observed in the age of occurrence of tuberculosis will require further research which can have an impact on the prevention and control measures. The higher prevalence of extra-pulmonary tuberculosis seen in the region which is almost double of the national average also requires further research to help understand the epidemiology of the disease in the region.

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