



# A Study on Socio-demographic Profile and Outcome of Tuberculosis in HIV-TB Co-infected Cases in Surat City, Western India

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## ABSTRACT

**Background:** As tuberculosis is one of the most common causes of morbidity and mortality in HIV-infected individuals. The present study was planned with an objective to find out the socio-demographic profile of HIV-Tb co-infected cases.

**Methodology:** This was a descriptive longitudinal study of HIV TB co-infected patients registered in Revised National Tuberculosis Control Programme (RNTCP) and Anti-retroviral Therapy (ART) centre.

**Results:** Diagnosis of both HIV and tuberculosis at the same time was positive in 104 (51.0%) of the patients. Majority (77.0%) of the cases were having extra-pulmonary tuberculosis which includes abdominal, lymph node, inguinal nodes, etc. Sputum positivity was seen in 22 (34.4%) of the cases. Radiological findings were significant in 24.5% of the cases HIV Tb co-infected cases. It was found 146 (75.6%) of the cases had favourable outcome i.e., cure and treatment completed.

**Conclusion:** It was observed that 75.6% of the cases of the HIV-TB co-infected cases had a favourable outcome (cured and treatment completed). Active case finding of Tuberculosis should be done in HIV cases as we observed 51% cases having TB and HIV diagnosed simultaneously.

**Keywords:** HIV-TB co-infection, socio-demographic profile, outcome, Surat

## INTRODUCTION

In India, over half of the adult population is infected with *Mycobacterium tuberculosis*, and the spread of HIV infection could lead to a potentially explosive increase in the number of cases of tuberculosis.<sup>1</sup> As tuberculosis is one of the most common causes of morbidity and mortality in HIV-infected individuals, its prevention, diagnosis, and treatment has become an integral component of HIV care policy. Intensified case-finding and treating tuberculosis in HIV infected individual interrupts ongoing transmission by infectious cases<sup>2</sup>, reduces mortality<sup>3</sup>, and decreases the risk of noso-

comial transmission<sup>4</sup>. Intensified case finding is feasible, time efficient, and can be mainstreamed into pre-existing health services with little additional cost.

The diagnosis of tuberculosis disease in HIV-infected individuals requires a high index of clinical suspicion and sound knowledge of the spectrum of potential clinical manifestations.<sup>5</sup> As the immune system deteriorates smear negative and extra-pulmonary tuberculosis become more common and disseminated tuberculosis occurs at highest rates at very low CD4 cell counts.<sup>6</sup> When CD4 cell counts reach very low levels the risk of tuber-

culosis disease can rise to 20 times the risk in HIV-negative people.<sup>7</sup> This phenomenon poses major diagnostic challenges, especially in low-income settings where burden is greatest but resources available for investigation are most limited. The present study was planned with an objective to find out the socio-demographic profile of HIV-Tb co-infected cases.

### MATERIALS AND METHODS

The present study was a descriptive longitudinal study of HIV TB co-infected patients who had been registered in Revised National Tuberculosis Control Programme (RNTCP) and Anti-retroviral Therapy (ART) centre between 1<sup>st</sup> January 2011 and 30<sup>th</sup> June 2011 in Surat city. The cases who were diagnosed as HIV positive and who during the study period also diagnosed positive for tuberculosis were considered as HIV TB co-infected patients. These patients were enrolled in the study after taking informed consent and persuading patients with possible benefits of study.

The study was conducted by pretested semi-structured questionnaire. Information regarding socio-demographic profile like age, gender, education, occupation and income of the patients were gathered from the patients by taking interview. Medical records of all the enrolled patients were reviewed from the treatment card and laboratory investigation reports. Information about adherence to ART was gathered at 1 month after starting AKT, at 3 month of AKT therapy and at the 5<sup>th</sup> month of tuberculosis treatment. Interview was conducted either at ART centre or DOT centre according to feasibility.

The outcome of pulmonary tuberculosis was noted at the end of 6 months of AKT while in case of extrapulmonary tuberculosis outcome was noted at the end of 9 months of AKT. Outcome was designated as tuberculosis cured; treatment completed, on AKT, death, default, loss to follow-up, failure and transfer. Data management and analysis was done using Microsoft excel and Epi-info software.

### RESULTS

The mean age of HIV-Tuberculosis co-infected cases were 34.76 ± 10.07 years. The mean age of male patients were 35.23 ± 10.20 years while mean age of female was 33.80 ± 10.08 years. Male patients formed the 2/3<sup>rd</sup> proportion of the total cases. Major portion of patients had primary 72 (36.0) and secondary 75 (37.5%) education. It was found that 22% of the HIV-TB co-infected patients were illiterate. Around 38% of the participants were labourer which includes working as labourer in diamond work, textile work, looms work and

embroidery work, working in farms, lari gallas, sweepers, house work. According to the Modified B.G.Prasad classification, 71% of the cases were in class IV & V.

**Table 1: Socio-demographic profile if HIV-TB cases (n=204)**

Profile	Cases (%)
<b>Age group (in years)</b>	
≥ 10	7 (3.4)
11-20	4 (2.0)
21-30	51 (25.1)
31-40	97 (47.5)
41-50	36 (17.6)
51-60	8 (3.9)
61-70	1 (0.5)
<b>Gender</b>	
Male	137 (67.2%)
Female	63 (30.9%)
Transgender	4 (2.0%)
<b>Education level@</b>	
Illiterate	44 (22.0)
Primary (1-7 Std)	72 (36.0)
Secondary (8-12 Std)	75 (37.5)
College	9 (4.5)
<b>Occupation</b>	
Labour	78 (38.2)
Business/ Self employed	17 (8.3)
Service	48 (23.6)
Unemployed	10 (4.9)
Housewife	45 (22.1)
Student	6 (2.9)
<b>Income group (Rupees)#</b>	
I (≥ 4290)	4 (2.0)
II (2150 - 4289)	17 (8.6)
III (1290 - 2149)	36 (18.3)
IV (640 - 1289)	102 (51.8)
V (≤ 639)	38 (19.3)

@4 patients were children less than 5 years of age

#Income data of 7 cases was not available

Diagnosis of both HIV and tuberculosis was positive at the same time in 104 (51.0%) of the patients. Among the cases, majority 77.0% of the cases were having extra-pulmonary tuberculosis which includes abdominal, lymph node, inguinal nodes, etc. It was found that 161 (78.9%) of the participants were falling in category 1 of tuberculosis. According to the tuberculosis, abdomen was maximally involved in 118 (57.8%) of the cases followed by lungs 56 (27.5) cases.

According to the symptomatology, sputum smear examination was done in 64 (31.4%) of the participants. Among the cases in whom sputum smear examination was done, sputum positivity was seen in 22 (34.4%) of the cases. Two-third of the patients did not show *M.tuberculosis* in their sputum smears. Radiological findings were significant in 24.5% of the cases HIV Tb co-infected cases.

**Table 2: Tuberculosis profile of cases (n=204)**

Variable	Cases (%)
<b>Time of Diagnosis of HIV and TB</b>	
Diagnosis done at the same time	104 (51.0)
Diagnosis of HIV and TB done separately	100 (49.0)
<b>Type of Tuberculosis</b>	
Pulmonary tuberculosis	47 (23.0)
Extra-pulmonary tuberculosis	157 (77.0)
<b>Category of Tuberculosis</b>	
Category 1	161 (78.9)
Category 2	43 (21.1)
<b>History of tuberculosis</b>	
Present	43 (21.1)
Absent	161 (78.9)
<b>Site</b>	
Lungs	56 (27.5)
Abdomen	118 (57.8)
Inguinal	16 (7.8)
Cervical	12 (5.9)
Axilla	2 (1.0)
<b>Sputum smear result</b>	
Positive for AFB	22 (10.8)
Negative for AFB	42 (20.6)
Sputum examination not done	140 (68.6)
<b>Categorization (n=22)</b>	
Scanty bacilli (1-9 AFB per 100 oil immersion fields)	0
1+ (10-99 AFB per 100 oil immersion fields)	10 (45.5)
2+ (1-10 AFB per oil immersion field)	8 (36.3)
3+ (> 10 AFB per oil immersion field)	4 (18.2)
<b>Functional Status of patients</b>	
Working	181 (88.7)
Ambulatory	20 (9.8)
Bed ridden	3 (1.5)

**Table 3: X ray chest finding of HIV-TB co-infected cases (n=204)**

Radiological Findings	Cases (%)
Abnormal/mixed changes	12 (5.9)
Apical/upper lobe disease	13 (6.4)
Atypical infiltrate for TB	7 (3.4)
Miliary infiltrate	2 (1.0)
Pleural effusion	13 (6.4)
Pleural effusion & pericardial effusion	2 (1.0)
Consolidation in lung	1 (0.5)
No abnormality detected	154 (75.5)

**Table 4: Outcome of tuberculosis treatment in HIV-TB co-infected cases**

Outcome	Cases (n=193) (%)
Cure	14 (7.3)
Completed	132 (68.3)
Death	11 (5.7)
Default	7 (3.7)
Failure	2 (1.0)
Loss to follow-up	9 (4.6)
On AKT	18 (9.4)

\*11 patients get transferred.

# 18 patients were having more than the usual course of AKT.

On further categorization of sputum smear result according to the number of bacilli in smear, 10

(45.5%) of the cases were categorized in 1+ grade while 8 (36.3%) and 4 (18.2) were put in 2+ and 3+ grade respectively. It was observed that no sputum smear slide showed scanty bacilli.

It is evident from above table that 146 (75.6%) of the cases had favourable outcome i.e., cure and treatment completed. Among the unfavourable outcome, death during tuberculosis treatment was reported in 11 (5.7%) of the cases. Tuberculosis treatment was prolonged than the usual course of 6 months in pulmonary and 9 months in extrapulmonary in 18 (9.3%) cases. Among these 18 cases, 7 were having pulmonary tuberculosis and 11 having extra-pulmonary tuberculosis.

The adherence reduces during the 3<sup>rd</sup> month of AKT. The reason for this was extra pills to be taken of both ART and AKT together and lack of motivation to the patients. DOTS therapy was well monitored by DOTS worker as it is given on weekly basis while ART is given on monthly basis. So the adherence to ART drops down during the middle of the AKT therapy. But again due to counseling of the patients by HIV counselors and Medical Officer the adherence increases to good level during the end of the AKT therapy.

## DISCUSSION

In the present study, majority 77.0% of the cases were having extra-pulmonary tuberculosis which includes abdominal, lymph node, inguinal nodes, etc. while 23.0% had pulmonary tuberculosis. In another study done by Sophia Vijay et al, fifty percent of 281 patients had pulmonary and the rest had Extrapulmonary TB.<sup>8</sup> Of those with pulmonary TB, 55% were smear positive.<sup>8</sup> The commonest form of Extra Pulmonary TB was lymph node involvement (34%) followed by pleural effusion (28%)<sup>8</sup>, which was similar to our study.

In the present study, among all cases, majority 77.0% of the cases were having extra-pulmonary tuberculosis which includes abdominal, lymph node, inguinal nodes, etc. while 23.0% had pulmonary tuberculosis. In another study done by Sophia Vijay et al, fifty percent of 281 patients had pulmonary and the rest had Extrapulmonary TB.<sup>8</sup> Of those with pulmonary TB, 55% were smear positive.<sup>8</sup> The commonest form of Extra Pulmonary TB was lymph node involvement (34%) followed by pleural effusion (28%)<sup>8</sup>, which was similar to our study. In line with this, study done by Ragini Ghiya et al found majority of their study subjects manifested (68.3%) extrapulmonary TB.<sup>9</sup> In contrast, pulmonary TB, a common presentation in HIV-negative cases, was present in only 54.8% of HIV-TB co-infected cases.<sup>9</sup>

**Table 5: Adherence to ART throughout tuberculosis treatment**

Adherence Status	Duration of Tuberculosis Treatment (n=204)		
	1 month Cases (%)	3 months Cases (%)	5 months Cases (%)
A (> 95%)	174 (85.2)	112 (54.9)	143 (70.1)
B (80% - 95%)	2 (1.0)	56 (27.5)	26 (12.7)
C (< 80%)	3 (1.5)	8 (3.9)	0 (0)
Death	4 (2.0)	7 (3.4)	10 (4.9)
Loss to Follow-up	12 (5.9)	12 (5.9)	12 (5.9)
Transfer	9 (4.4)	9 (4.4)	13 (6.4)

Among the unfavourable outcome, death during tuberculosis treatment was reported in 11 (5.7%) of the cases. Tuberculosis treatment was prolonged than the usual course of 6 months in pulmonary and 9 months in extrapulmonary in 18 (9.3%) cases. Among these 18 cases, 7 were having pulmonary tuberculosis and 11 having extra-pulmonary tuberculosis.

Jiang Xueyan et al found that low CD4 T-cell count were associated with an increase in mortality, implying that the extent to which immune function is suppressed is of the utmost importance in the prediction of the survival rate of patients with HIV/TB co-infection.<sup>10</sup> The results of our study confirm that multidrug combination regimens used for TB chemotherapy are highly effective for patients with HIV/TB co-infection. In the present study, only two patients (1.0%) experienced treatment failure. A low rate of treatment failure (0.4%) was also found in the Malawi study,<sup>11</sup> (Harries AD, 1998) as well as in the Campinas study<sup>12</sup> (Oliveira HB et al, 2005).

## CONCLUSION

Extrapulmonary TB was the most common tuberculosis found in Tb-HIV cases. It was observed that 75.6% of the cases of the HIV-TB co-infected cases had a favourable outcome (cured and treatment completed). Active case finding of Tuberculosis should be done in HIV cases as we observed 51% cases having TB and HIV diagnosed simultaneously.

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