

# A Study to Evaluate the Spectrum of Tuberculosis in Newly Diagnosed People Living with HIV AIDS Attending Tertiary ART Centre at M.Y. Hospital Indore

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## Abstract

**Background:** Tuberculosis is the most common opportunistic infection among HIV-infected patients worldwide, who remain at the high risk for tuberculosis (TB) throughout the course of their disease. The HIV virus damages the body's natural defenses - the immune system and accelerates the speed at which TB progresses from a harmless infection to life-threatening condition. To mitigate the effect of dual burden of HIV and TB, Revised National Tuberculosis Control Programme and National AIDS Control Programme have developed a collaborative framework wherein intensified case-finding is done through screening all anti-retroviral therapy (ART) center attendees for TB.

**Aims and Objectives:** The present study was conducted with the aim to study spectrum of TB in newly diagnosed people living with HIV AIDS (PLHA) attending Tertiary ART Centre.

**Material and Methods:** The present study was conducted at Tertiary ART Centre and Department of Medicine, M.Y. Hospital, Indore, during the period January 2019–July 2020. We had screened 1610 patients with PLHA in the age group of 18–70 years for TB.

**Results:** Of these 1610, 200 patients were diagnosed with TB. Out of 200 TB-HIV patients, 63.0% patients were in the age group of 21–40 years, followed by 41–60 years. There was male predominance (74%). Out of 200 TB-HIV patients, 75 (37.5%) had pulmonary TB and 125 (62.5%) had extrapulmonary involvement. Out of 125 cases of extrapulmonary TB in 57 (45.6%) patients there was Koch's abdomen, in 48 (38.4%) patients there was lymph node TB, in 10 (8%) patients there was pleural effusion, and in 10 (8%) patients tubercular meningitis was seen.

**Conclusion:** TB is the major opportunistic infection in newly diagnosed PLHA. The prevalence of pulmonary TB is comparatively lower than the extrapulmonary TB in these patients and among the extrapulmonary TB patients, prevalence of Koch's abdomen is highest.

**Key words:** Opportunistic infection, People living with HIV AIDS, Tubercular meningitis, Tuberculosis

## INTRODUCTION

Tuberculosis (TB) is the most common opportunistic infection among HIV-infected patients.<sup>[1]</sup> It is the most important cause of morbidity and mortality in people living with HIV.<sup>[2]</sup> India is the third-highest HIV burden

country in the world, with an adult prevalence of 0.22%.<sup>[3]</sup> PLHIV are 20–21 times at the higher risk of developing TB. TB-HIV coinfection results in the higher mortality rates and nearly 25% of all deaths among people living with HIV AIDS (PLHA) are due to TB. In India, about 110,000 people are estimated to be HIV-TB coinfecting annually, with the national average for HIV prevalence among incident TB cases at 5%. The mortality in this group is very high and 9700 people die every year among TB/HIV coinfecting patients.<sup>[4-6]</sup>

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progresses from a harmless infection to life-threatening condition.

To overcome the effect of dual burden of HIV and TB, Revised National Tuberculosis Control Program and National AIDS Control Program have developed a collaborative framework. In which a single window for delivery of TB and HIV services is successfully developed for all people living with HIV in the anti-retroviral therapy (ART) centers. This window also provides intensified case-finding through screening all ART center attendees for TB, through offering rapid molecular testing to symptomatic patients and also provides anti-TB treatment.<sup>[4,5]</sup>

The aim of this study is to study the spectrum of TB in newly diagnosed PLHA attending Tertiary ART center.

## MATERIALS AND METHODS

This is a prospective observation study was done among 18–70 years old patients with in a period of 17 months from February 2019 to July 2020 at Tertiary ART Centre and Department of Medicine, M.Y. Hospital, Indore, M.P. We had screened 1610 patients with PLHA. Out of which, 200 patients were diagnosed with TB. Patients with history of COPD, diabetes mellitus, chronic liver disease, who have already taken ART or ATT, prisoner, patient with unknown identity, pregnant women, and lactating mothers were excluded from the study.

First, a verbal approval for participation in the study, a voluntary written informed consent was obtained from patients for participation in the study.

A detailed medical and surgical history were obtained, followed by a detailed general and systemic examination. Following which blood samples were collected for routine laboratory investigations. Electrocardiogram was performed to assess the cardiac function. Radiological assessment included X-ray chest and ultrasound abdomen. CBNAAT of various body fluids and tissues was performed for confirmation of TB, adenosine deaminase and routine microscopy of various body fluids were also performed. A customized proforma was designed of the purpose of the study and all relevant information was captured in this pro forma.

### Statistical Analysis

The data were initially entered into the Microsoft Excel for analysis. Online statistical software such as GraphPad and Epi Info was used for calculating the p values. Comparison of means between the groups was done using unpaired “*t*”

**Table 1: Distribution of patient**

Category	No. of patients	Prevalence (%)
Total PLHIV patients at Tertiary ART Centre and M.Y. Hospital, during the study period	1610	
Tuberculosis patients	200	12.4
Pulmonary tuberculosis patients	75	4.6
Extrapulmonary tuberculosis patients	125	7.8

**Table 2: Distribution of patients according to the age**

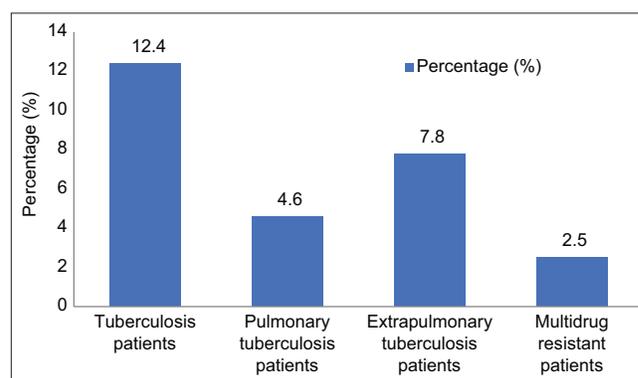
Age	Number	Percentage
18–20 years	6	3.0
21–40 years	126	63.0
41–60 years	62	31.0
>60 years	6	3.0
Total	200	100.0

**Table 3: Distribution of patients according to the gender**

Sex	Number	Percentage
Female	52	26.0
Male	148	74.0
Total	200	100.0

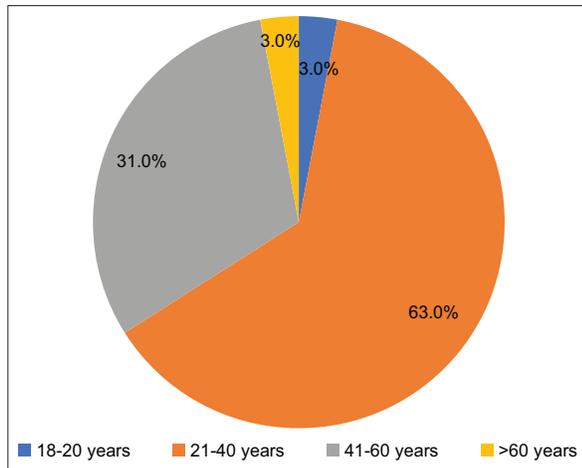
**Table 4: Distribution of patients according to the tuberculosis type**

Tuberculosis type	Number	Percentage
Koch's abdomen	57	28.5
Lymph node	48	24.0
Pleural effusion	10	5.0
Pulmonary tuberculosis	75	37.5
Tubercular meningitis	10	5.0
Total	200	100.0

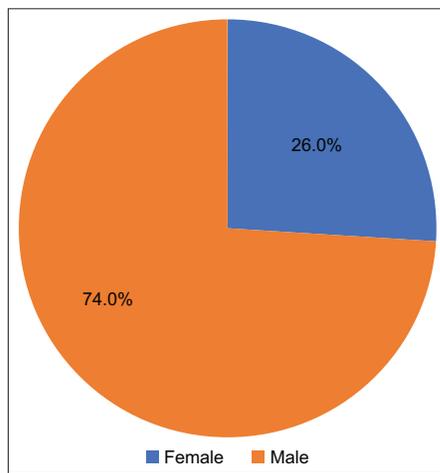


**Graph 1: Bar diagram showing distribution of patients**

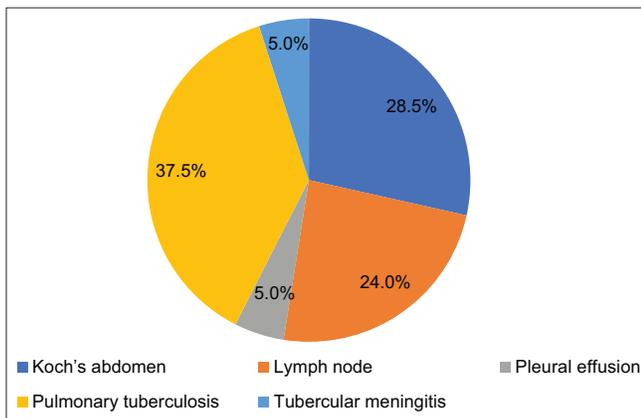
test and within the group was done using paired “*t*” test. Association between two non-parametric variables was done using Pearson Chi-square test.  $P < 0.05$  was taken as statistically significant. The final data were presented in the form of Tables 1-4 and Graphs 1-4.



Graph 2: Pie diagram showing distribution according to the age



Graph 3: Pie diagram showing distribution according to the sex



Graph 4: Pie diagram showing distribution according to the type of tuberculosis

## RESULTS

A total of 1610 newly diagnosed PLHA were enrolled. Of these 1610 patients, 200 (12.4%) patients had TB. About 75 (4.6%) patients had pulmonary TB and 125 (7.8%) patients

had extrapulmonary TB. Out of 200 TB-HIV patients, 63.0% patients were in the age group of 21–40 years, followed by 41–60 years. There was male predominance (74%). Out of 200 TB-HIV patients, 75 (37.5%) had pulmonary TB and 125 (62.5%) had extrapulmonary involvement. Multidrug resistance was seen in 5 (2.50%) patients, out of 200 patients with TB-HIV. Out of 125 cases of extrapulmonary TB in 57 (45.6%) patients, there was Koch's abdomen, in 48 (38.4%) patients there was lymph node TB, in 10 (8%) patients there was pleural effusion, and in 10 (8%) patients tubercular meningitis was seen.

## DISCUSSION

Studies have reported that TB is the most common opportunistic infection seen in patients with HIV infection and TB may develop at any stage of the HIV disease.

In this study, there were 1610 patients who came to the Tertiary ART Centre, of these there were 200 (12.4%) patients had TB. In this study, the prevalence of pulmonary TB was 4.6% and extrapulmonary TB was seen in 7.8%. According to the National TB Elimination Program Annual Report, 2020,<sup>[4]</sup> the prevalence of TB in PLHA patients was approximately 5%, which is less in comparison to our study findings. In this study, 75 (37.5%) patients had pulmonary TB while 62.5% were developed extrapulmonary TB. According to the WHO index-TB guidelines for extrapulmonary TB in India, 2016,<sup>[8]</sup> the prevalence of pulmonary and extrapulmonary TB was 50–60% and 40–50%, respectively. Pulmonary TB among patients with newly diagnosed TB is comparatively lower in this study population.

There were 126 (63.0%) patients in the age group of 21–40 years and 6 (3.0%) patients in the age group 18–20 years. Jaryal *et al.*<sup>[8]</sup> in their study had included 87 HIV-infected patients. They found that the most commonly affected age group in their study was 31–40 years. Leeds *et al.*<sup>[9]</sup> conducted a study with an aim to determine the risk factors associated with particular type of extrapulmonary TB. In their study, the mean age of the patients was 40 years with a range from 18 to 89 years.

Our results corroborate with the study done by Jaryal *et al.* and Leeds *et al.*, who also reported that the HIV/AIDS is more commonly seen in productive age group patients.

There were 52 (26.0%) females and 148 (74.0%) males in our study, showing a male preponderance, comparable with the study done by Leeds *et al.*<sup>[9]</sup>

Who also showed male predominance (67%) in their study.

In this study, 75 (37.5%) patients were having pulmonary TB, while the rest 125 (62.5%) patients were having

extrapulmonary TB. In 57 (28.5%) patients, there was Koch's abdomen, in 48 (24.0%) patients there was lymph node TB, in 10 (5.0%) patients there was pleural effusion, and in 10 (5.0%) patients tubercular meningitis was seen. The prevalence of Koch's abdomen is the highest in our study, followed by lymph node TB. Dharmshale *et al.*<sup>[10]</sup> conducted a study on patients with HIV and non-HIV patients. They found 47.5% of HIV patients had extrapulmonary TB and it was 35.86% in patients without HIV. In our study, we found a higher prevalence of extrapulmonary TB in comparison to the study done by Dharmshale *et al.*<sup>[10]</sup> Pulmonary TB incidence is very high in the study done by Dias *et al.*,<sup>[7]</sup> that is, 86.6%, while in our study we found its prevalence to be 37.5%. Study done by Leeds *et al.*<sup>[9]</sup> showed a prevalence of lymphatic TB to be 28%, which is quite comparable to our results, where in we found a prevalence of 24% in the present study, while study done by Dias *et al.*<sup>[7]</sup> showed lymphatic involvement in 31.3% patients, which is higher than that reported by our study.

### Limitations

The most important limitation of this study is smaller sample size. Other than that, there should be longer follow-up of the newly diagnosed PLHA so that there would be estimation of the time period after which patients develop TB as an opportunistic infection.

### CONCLUSION

This study concluded that TB is the major opportunistic infection in newly diagnosed PLHA and these patients

should be definitely screened for TB at the time of diagnosis for early diagnosis and treatment. The prevalence of pulmonary TB is comparatively lower than the extrapulmonary TB in these patients and among the extrapulmonary TB patients, prevalence of Koch's abdomen is the highest.

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