



## TUBERCULOSIS INFECTION AMONG SEROPOSITIVE HIV PATIENTS AVAILING SERVICES FROM A TERTIARY CARE CENTRE IN KERALA, SOUTH INDIA

### Medical Science

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### ABSTRACT

**Introduction :** Tuberculosis (TB) and HIV have been closely linked since the emergence of AIDS. Worldwide, TB is the most common opportunistic infection affecting HIV-seropositive individuals. HIV infection has contributed to a significant increase in the worldwide incidence of TB. Manifestations of Tuberculosis differ in patients who are HIV seropositive.

**Objective :** To study the Epidemiology of Tuberculosis among HIV positive individuals seeking treatment from a Tertiary Care Centre.

**Methodology :** A descriptive cross sectional study was done among 396 HIV/AIDS patients who were under treatment in the infectious disease department of a Tertiary care centre. All these patients were screened for Tuberculosis as soon as the diagnosis of HIV was made. Data was analysed.

**Results :** A total of 396 HIV positive patients were treated at the centre during the study period. 150 (37.87 %) of them were diagnosed with Tuberculosis during the study period. Majority of the study subjects 351 (88.66%) were between the age group of 25-49 years. Odds of occurrence of TB in HIV positive males was found to be 4.55 (95% CI = 2.71-7.61) times than that of females. Out of 150 Tuberculosis cases 76 (50.66 %) had Extra pulmonary Tuberculosis. TB lymphadenitis was found to be the most common extra pulmonary TB.

**Conclusion :** High proportion of extra pulmonary Tuberculosis among the seropositive HIV cases underscores the urgent need for strategies that lead to rapid identification and treatment of this co infection.

### KEYWORDS

HIV, Tuberculosis (TB), Extra Pulmonary Tuberculosis

#### Introduction

Tuberculosis ( TB ) is a major health problem globally especially in low and middle income countries like India. India bears second highest number of estimated HIV associated TB in the world. In 2015, 1.1 lakh cases were reported of which an estimated 31,000 died.<sup>1</sup> TB is often atypical in presentation causing extra pulmonary involvement in most HIV/AIDS infected patients. These factors coupled with low sputum positivity often results in delayed diagnosis. People with HIV/AIDS are up to fifty times more likely to develop active TB in a given year than HIV negative people.<sup>2</sup> This study describes the manifestations of Tuberculosis in HIV/AIDS patients receiving treatment from a Tertiary Care Centre.

#### Objectives

To study the Epidemiology of Tuberculosis among HIV positive individuals seeking treatment from a Tertiary Care Centre.

#### Materials and Methods

A descriptive cross sectional study was done among 396 HIV/AIDS patients who were under treatment in the infectious disease department of a Tertiary care centre. As per the Revised National Tuberculosis Control Programme /National AIDS Control Programme guidelines all these patients were screened for Tuberculosis as soon as the diagnosis of HIV was made. Those patients who presented with signs and symptoms suggestive of Tuberculosis were also reviewed and tested for Tuberculosis during their follow-up visits. A semi structured pre-tested questionnaire was used to collect data from the study subjects after taking informed consent from them. Data was analysed using Epi Info software.

#### Ethical Consideration

Ethical committee clearance was obtained before the commencement of the study. Confidentiality of the study subjects were maintained through out the course of the study.

#### Results

A total of 396 HIV positive patients were treated at the centre during the study period. 150 (37.87%) of them were diagnosed with Tuberculosis during the study period. Majority of the study subjects, 351 (88.66%) were between the age group of 25-49 years. No statistically significant association [Chi square = 3.65, df=2, P value=0.16] was found between the occurrence of Tuberculosis and age group in the HIV positive cases. There were 266 (67.17 %) males among the study subjects. A statistically significant association was found between gender and occurrence of Tuberculosis among the

study subjects. Odds of occurrence of TB in HIV positive males was found to be 4.55 (95% CI = 2.71-7.61) times that of females (Table 1) 87 (58%) of the Tuberculosis positive cases resided in Urban area. In cases with CD4 count > 500 cells/mm<sup>3</sup> only 10 (18.86%) were found to be Tuberculosis positive where as 43 (81.13%) tested negative for Tuberculosis [Chi-square = 11.39, df=3, P value=0.10] this was found to be statistically significant. Out of 150 Tuberculosis positive case 74 (49.33 %) had pulmonary TB and 76 (50.66 %) Extra pulmonary Tuberculosis. There were 44 (59.45 %) sputum positive pulmonary cases among the 74 cases of Pulmonary TB. TB Lymphadenitis 37 (24.66%) was the most common type of Extra pulmonary TB (Table 2).

**Table 1. Gender and Occurrence Of Tuberculosis in HIV positive Subjects**

Gender	Tuberculosis Positive	Tuberculosis Negative	Total
Male	128 (48.12%)	138 (51.87%)	266
Female	22 (16.92 %)	103 (83.07%)	130
<b>Total</b>	<b>150 (37.87%)</b>	<b>246 (62.12%)</b>	<b>396</b>

Chi square = 36.11 (df=1) P Value=0.0001 [Odds ratio = 4.55 ( 95% CI = 2.71-7.61 ) ]

**Table 2. Organs/Systems affected by Tuberculosis in HIV/AIDS Cases.**

Organ/System	Number	Percent
<b>Pulmonary TB</b>	74	49.33
<b>TB Lymphadenitis</b>	37	24.66
<b>Pleural Effusion</b>	13	08.66
<b>Miliary Tuberculosis</b>	13	08.66
<b>TB Meningitis</b>	07	04.60
<b>Abdominal TB</b>	06	04.00
<b>Total</b>	<b>150</b>	<b>100</b>

#### Discussion

The proportion of Tuberculosis in HIV positive patients in this study was found to be 37.87%. Various studies show that HIV TB co infection rate ranges between 35-50%.<sup>3,4</sup> TB is the most common opportunistic infection affecting HIV-seropositive individuals, and it remains the most common cause of death in patients with AIDS. Tuberculosis positive cases were found to be more among the productive age group. A cross-sectional study at the ART clinic of Pravara Rural Hospital, Loni also revealed a similar picture, around 60% of the HIV TB co infected patients in the study were between 30-50 years.<sup>5</sup> A statistically significant association could not be established between

age group and occurrence of TB in this study. As per this study, male HIV positive patients were found to have higher risk of developing TB (Odds ratio=4.55). In a study among HIV patients in Nigeria 22% of males and 30% of females were found to be co infected with TB.<sup>6</sup> There were 87 (50.58%) males and 85 (48.42%) females among the HIV positive cases who were co infected with Tuberculosis in the study by Purushottam et al.<sup>5</sup> In a Study by Liberato I.R et al in Brazil Tuberculosis was more prevalent among male HIV patients.<sup>7</sup> Male preponderance in Tuberculosis is not only true for seropositive cases but also in case of seronegative individuals.<sup>7</sup> A statistically significant association was there between the occurrence of TB and CD4 count of the study subjects. Studies done in various other settings also reveal similar findings. In a study among HIV patients in a teaching hospital, baseline CD4 count of the patients were found to be an important predictor for Tuberculosis. 37.4 % of the study subjects who were diagnosed with Tuberculosis had CD4 count less than 200/mm<sup>3</sup>.<sup>8</sup> In a study by Brenda E Jones to establish the relation between CD4 count and manifestation of Tuberculosis, it was highlighted that low CD4 count is a risk factor for development of Tuberculosis in HIV seropositive individuals, in addition this study also sheds light on the fact that acid-fast smears and tuberculin skin tests were more often positive in patients with low CD4 cell counts.<sup>9</sup> Extrapulmonary cases were more among the study subjects, this finding is in line with many other studies done elsewhere. Although pulmonary TB is the commonest manifestation, those who are HIV positive are more likely to have extra pulmonary TB. Extra pulmonary TB is seen in 40-80% of HIV positive individuals as compared to 10-20% in others.<sup>1,10</sup> Investigation of pulmonary tuberculosis in HIV patients is challenging as most of them may not show AFB in their sputum but in this study majority of around (60%) pulmonary cases were sputum positive.<sup>2</sup> There are a few studies which contrasts the present study like a study in Zambia only 35 % of HIV-positive cases were sputum-positive.<sup>11</sup> Among the extra pulmonary TB, TB lymphadenitis was found to be the most common one followed by pleural effusion and Miliary TB. Most of the studies among HIV positive extra pulmonary TB patients reveal a preponderance of TB lymphadenitis similar to this study. The common types of EPTB were lymphatic (28%), disseminated (23%), and CNS/meningeal (22%) disease as per a study conducted in USA.<sup>12</sup>

## Conclusion

In this study more than one-third of the HIV positive patients were found to be coinfecting with Tuberculosis. Male preponderance was evident in the occurrence of Tuberculosis. Extra pulmonary involvement was found to be higher than that of Pulmonary. High proportion of extra pulmonary Tuberculosis among the seropositive HIV cases underscores the urgent need for strategies that lead to rapid identification and treatment of this condition.

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