

Prevalence of Tuberculosis among Human Immunodeficiency Virus-Positive Patients – A Cross-sectional Study

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Abstract

Introduction: Tuberculosis (TB) and human immunodeficiency virus (HIV) are significant public health issue worldwide. TB is the important reason of morbidity and mortality among people living with the HIV and is the manifestation of acquired immunodeficiency syndrome (AIDS). Hence, the present study was conducted to find out the prevalence of TB among HIV-positive patients. **Materials and Methods:** A descriptive cross-sectional study was carried out to find out the prevalence of TB among 150 HIV-positive patients in Ghaziabad City. The data were entered into Excel and evaluated using the SPSS v20.0 software package. Frequency distribution of demographic data and prevalence of TB among various clinical stages of HIV patients were analyzed. **Results:** Out of 150 study participants, 22.67% was at age group ≤ 30 years, 59.33% were between 31–50 years, and the rest 18% were at age group above 50 years. About 29.33% of HIV-positive patients were having 1st clinical stage in which 4.5% had TB, while among 42% of HIV patients in the 2nd clinical stage 11.11% had TB. About 8.82% of participants with the 3rd clinical stage of HIV were noticed to have TB while 44.4% of participants with the 4th clinical stage of HIV had TB. **Conclusion:** According to the current study results, the prevalence of TB among HIV patients is 10.6%. Thus, screening of TB among HIV-positive patients, public awareness, and community mobilization should be encouraged.

Keywords: Acquired immunodeficiency syndrome, Prevalence, Tuberculosis

INTRODUCTION

Tuberculosis (TB) and human immunodeficiency virus (HIV) are significant public health problem worldwide.^[1,2] HIV/AIDS causes considerably high morbidity and mortality particularly in resource-limited countries. It has so far caused more than 35 million deaths since its discovery, and as of 2015, there were about 37 million people who were alive with HIV/AIDS.^[3] It is known that in HIV patients, active TB is occurred by the reactivation of endogenous latent disease as well as reinfection with a new strain.^[4]

TB is an airborne disease caused by a bacterium *Mycobacterium tuberculosis*, which is a non-motile rod-shaped and an obligate aerobe.^[5] The World Health Organization (WHO), in 1993, declared TB a global emergency.^[6] According to 2004 WHO report, TB which originates from a single infectious agent ranked the 7th leading cause of death worldwide.^[7-9] Active TB can present as pulmonary TB (PTB) or extra-PTB (EPTB), with cardinal features of fever, productive cough, hemoptysis, and weight loss, though the presentation among HIV-infected persons is often atypical. Several factors have been associated with an increased risk of TB incidence, such

as poverty, malnutrition, and overcrowding.^[10] India has the largest number of TB cases in the world.^[11] Approximately 5% of the incident TB cases in India have comorbidity with HIV.^[12] TB is the leading cause of morbidity and mortality among people living with the HIV and is the manifestation of acquired immune deficiency syndrome (AIDS) worldwide.^[5] An estimated 87,000 HIV-associated TB cases were reported in India in 2016 and 12,000 patients died among them.^[12] The present study was conducted to find out the prevalence of TB among HIV patients.

MATERIALS AND METHODS

A descriptive cross-sectional study was carried out to find out the prevalence of TB among 150 HIV-positive patients. The ethical clearance was obtained from the Institutional Review

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Board. The written informed consent was also obtained from the study subjects after explaining the purpose and methodology of the study.

Statistical Analysis

The data were entered into Excel and analyzed using the SPSS v20.0 software package. Frequency distribution of demographic data and prevalence of TB among various clinical stages of HIV patients were analyzed.

RESULTS

The present study included 150 HIV-positive patients. Out of 150 study participants, 22.67% was at age group ≤ 30 years, 59.33% were between 31 and 50 years, and the rest 18% were at age group above 50 years. About 84% of the study participants were male and 16% were female. Table 1 illustrates the demographic data of the participants.

In this study, 10.6% prevalence of TB was found among HIV patients. About 29.33% of HIV-positive patients were having 1st clinical stage in which 4.5% had TB, while, among 42% of HIV patients in the 2nd clinical stage 11.11% had TB. About 8.82% of participants with the 3rd clinical stage of HIV were noticed to have TB while 44.4% of participants with the 4th clinical stage of HIV had TB [Table 2].

Table 1: Demographic data of the study participants (n=150)

Demographic data	Number (%)
Age	
≤30 years	34 (22.67)
31–50 years	89 (59.33)
>50 years	27 (18)
Gender	
Male	126 (84)
Female	24 (16)
Educational status	
Illiterate	81 (54)
Literate	69 (46)
Residence	
Rural area	98 (65.33)
Urban area	52 (34.67)

Table 2: Prevalence of TB among various HIV clinical stage

HIV clinical stage	Tuberculosis (%)		
	Present	Absent	Total
1 st stage	2 (4.5)	42 (95.5)	44 (29.33)
2 nd stage	7 (11.11)	56 (88.89)	63 (42)
3 rd stage	3 (8.82)	31 (91.18)	34 (22.67)
4 th stage	4 (44.4)	5 (55.6)	9 (6)
Total	16 (10.67)	134 (89.33)	150 (100)

TB: Tuberculosis, HIV: Human immunodeficiency virus

DISCUSSION

In India, TB and HIV are some of the leading cause of morbidity and mortality.^[7,8] The present study was conducted to find out the prevalence of TB among various clinical stages of HIV patients.

Out of 150 study participants, 22.67% was at age group ≤ 30 years, 59.33% were between 31 and 50 years, and the rest 18% were at age group above 50 years. In a study by Lawn *et al.*, there were 162 participants below the age of 33 and the rest 184 were ≥ 33 years.^[9] About 84% of the study participants were male and 16% were female. In a study by Lawn *et al.*,^[9] there were 190 males and 156 females, but in a study by Gunda *et al.*,^[3] only 96 participants were male and rest 295 were female.

In this study, 10.6% prevalence of TB was found among HIV patients and this was in agreement with the study by Gunda *et al.*^[3] in which 11.0% developed TB while receiving ART. In a study by Majigo *et al.*, the overall prevalence was 2.2%, with a peak of 2.5% in the year 2013.^[1] About 29.33% of HIV-positive patients in the present study were having 1st clinical stage in which 4.5% had TB, while, among 42% of HIV patients in the 2nd clinical stage 11.11% had TB. In a study by Gunda *et al.*,^[3] 12 HIV-positive participants with clinical Stage 1 or 2 had TB. About 8.82% of participants of this study with the 3rd clinical stage of HIV were noticed to have TB while 44.4% of participants with the 4th clinical stage of HIV had TB. In a study by Gunda *et al.*,^[3] 31 HIV-positive participants with clinical Stage 3 or 4 had TB. The present study included only a smaller sample size so generalization of the results will be impossible and it may be one of the major limitations.

CONCLUSION

According to the present study findings, the prevalence of TB among HIV patients is 10.6%. Thus, screening of TB among HIV-positive patients, public awareness, and community mobilization should be encouraged.

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