

Prevalence of Tuberculosis among HIV/AIDS Patients in Modinagar, Ghaziabad- A Descriptive, Cross-Sectional Study

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ABSTRACT

Introduction: Tuberculosis (TB) and Human immunodeficiency virus (HIV) are significant public health issues worldwide. TB is the important reason for morbidity and mortality among people living with 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 Modinagar, Ghaziabad. 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 the 150 study participants, 22.67% were in the age group ≤30 years, 59.33% were between 31–50 years, and the rest 18.0% were in the 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, Anti-Retroviral Therapy.

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Introduction

Tuberculosis (TB) and human immunodeficiency virus (HIV) are significant public health problems 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 has been known that in HIV patients, active TB is occurred by the reactivation of endogenous latent disease as well as re-infection with a new strain.⁴

Tuberculosis is an airborne disease caused by the bacterium *Mycobacterium tuberculosis*, which is a non-motile rod-shaped and obligate aerobe.⁵ The World Health Organization (WHO), in 1993, declared TB a global emergency.⁶ According to the 2004 WHO report, TB which originates from a single infectious agent ranked the 7th leading cause of death worldwide.^{7,8,9} Active TB can present as pulmonary TB (PTB) or extra-pulmonary TB (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 incidences, 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 Thus, the aim of the present study was to assess and establish the prevalence of TB among HIV patients in Modinagar, Ghaziabad.

Materials & Methods

A Descriptive, Cross-sectional study was carried out in the Community Health Center (CHC), Modinagar to establish the prevalence of TB among 150 HIV-positive patients. The study participants were selected based on convenience sampling. The subjects who visited the CHC for receiving their

Antiretroviral therapy (ART) at the AROGYAM CENTER were included in the study. The patients who were present on the day of the examination and who were willing to participate in the study were included in the study, while the subjects who were TB positive before ART initiation and subjects who were not willing to participate in the study were excluded. The study was conducted over a period of 3 months: from March 15 to June 15, 2019.

The ethical clearance was obtained from the Institutional Review Board of D.J. Dental College of Dental Sciences & Research, Modinagar (Ref no: DJD/IEC/2019/A162). For the collection of data, permission was also taken from the Chief Medical Officer of the CHC, Modinagar. Complete details and information regarding the study being conducted, the methods, and the purpose of the study were explained to him. This was also explained to all the study participants and informed consent was taken from them. The TB diagnosis for the study subjects was performed using clinical examination, sputum acid-fast bacillus (AFB) smear, and chest radiography. The study subjects who were, thus, diagnosed with TB were referred for treatment to the DOTS center of the CHC as well.

Statistical Analysis

The findings obtained were coded and entered into Microsoft Excel (2010). The data were entered into Excel and analyzed using the SPSS v 20.0 software package. Frequency distribution of demographic data and prevalence of TB among various clinical stages of HIV patients were analyzed. $P \leq 0.05$ was considered statistically significant.

Results

The present study included 150 HIV-positive patients. Out of 150 study participants, 22.67% was at the age group ≤ 30 years, 59.33% were between 31 and 50 years, and the rest 18.0% were at age group above 50 years. About 84.0%

of the study participants were male and 16.0% were female. For the current study, the educational status for 54.0% of the study subjects was found to be illiterate while the

rest 46.0% were literate. 65.33% of the study subjects resided in rural areas, while 34.67% were located in urban areas. **(Table 1)**

DEMOGRAPHIC DATA	VARIABLE	N (%)
1. Age	≤ 30 years	34 (22.67%)
	31 - 50 years	89 (59.33%)
	> 50 years	27 (18.0%)
2. Gender	Male	126 (84.0%)
	Female	24 (16.0%)
3. Educational status	Illiterate	81 (54.0%)
	Literate	69 (46.0%)
4. Location of Residence	Rural	98 (65.33)
	Urban	52 (34.67)

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

In the present study prevalence of TB was found to be 10.6% among HIV patients. About 29.33% of HIV-positive patients presented with 1st clinical stage of the disease of which 4.5% had TB, while, among 42% of HIV patients presented with 2nd clinical-stage and 11.11% of

them had TB. About 8.82% of participants with the 3rd clinical stage of HIV were found to have TB while 44.4% of participants with the 4th clinical stage of HIV presented with TB. **(Table 2)**

CLINICAL STAGES OF HIV	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 (42.0%)
3 rd STAGE	3 (8.82%)	31 (91.18%)	34 (22.67%)
4 th STAGE	4 (44.4%)	5 (55.6%)	9 (6.0%)
Total	16 (10.67%)	134 (89.33%)	150 (100%)

HIV: Human immunodeficiency virus

Table 2: Prevalence of Tuberculosis in various clinical stages of HIV infection

Discussion

In India, Tuberculosis and HIV are some of the leading causes of morbidity and mortality.^{7,8} The present study was conducted to assess and establish the prevalence of TB among various

clinical stages of HIV patients in Modinagar, Ghaziabad.

Out of the 150 study participants, 22.67% were in the age group ≤ 30 years, 59.33% were between 31 and 50 years, and the rest 18% were in the 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 84.0% of the study participants were male and 16.0% were female which is similar to the study by Lawn et al which was found to have 54.9 % (190) males and 45.1% (156) females.⁹ However, in a study by Gunda et al³ only 24.6% (96) participants were found to be male, and the rest 75.4% (295) were female.

In the present study, the prevalence of Tuberculosis was found to be 10.6% among HIV patients which were in agreement with the study by Gunda et al.³ in which 11.0% of the HIV patients 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 presented with 1st clinical-stage in which 4.5% had developed TB, while, among 42% of HIV patients in the 2nd clinical-stage 11.11% had TB. In the study conducted by Gunda et al 3.0% (12) of the HIV-positive participants who presented with clinical Stage 1 or 2 had developed TB.³

About 8.82% of the study participants who presented with the 3rd clinical stage of HIV were found to have TB while 44.4% of participants with the 4th clinical stage of HIV had TB. In the study by Gunda et al, 7.9% (31) HIV-positive participants with clinical Stage 3 or 4 had TB.³ The present study included only a smaller sample size so generalization of the results would be impossible and it may be one of the major limitations of the study.

Conclusion

According to the present study findings, the study concluded that the prevalence of Tuberculosis among HIV patients in Modinagar, Ghaziabad was found to be around 10.6%. Thus, screening of TB among HIV- positive

patients, public awareness, and community mobilization should be encouraged. All the TB patients should be assessed for HIV risk factors and counseled to undergo HIV testing. Conversely, all HIV-positive cases should be screened for TB. Public health programmes should be carried out for creating awareness about the widespread prevalence of Tuberculosis among HIV-AIDS patients.

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