

Prevalence of HIV-TB Co-Infection in Patients Attending Antiretroviral Therapy Centre in a Tertiary Care Hospital, Coimbatore.

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Abstract: Active/latent Tuberculosis in HIV infected individuals is termed co-infection. Worldwide around 1 million cases of HIV have been affected with Tuberculosis and about 0.4 million deaths have occurred; more so in developing countries like Africa, India, etc. This study has identified various risk factors and assessed the prevalence of this co-infection in a tertiary care hospital. **Materials and Methods:** This hospital based retrospective study was done among 150 randomly selected HIV positive patients using their unique ART identification number. All HIV patients on ART irrespective of age, occupation, gender and treatment category were included in the study. Screening and diagnosis of Tuberculosis carried out by Acid fast Ziehl-Neelsen's technique, Radiological findings and Mantoux test. Based on this they were categorised into Pulmonary and Extra-pulmonary tuberculosis. Correlation with CD4 counts by Partek was also done. **Results:** Among these 150 patients, 24 (16%) had HIV-TB co-infection and were in the sexually active age group 20-40 yrs. A slight male preponderance (54%) as against 46% in females was noted. Majority were married (70%) and (58.3%) educated upto school level. Incidence was highest among manual labourers, drivers and unemployed. Low CD4 counts < 200 cells/microlitre were found in 62.5%. Pulmonary tuberculosis constituted 54% and Extra pulmonary 45.9%. **Conclusion:** This study found a prevalence of 16% HIV-TB co-infection in patients attending Anti-retroviral Therapy centre. Heterosexual mode of transmission and drastic cultural changes indicate targeted behavioural modification could prevent further transmission. Effective implementation of awareness and control programs as envisaged by the Govt. of India and the State health authorities along with NGOs and private sector could help in formulating further interventional measures to reduce the prevalence of HIV-TB co-infection and thereby reduce the disease burden.

Key words- HIV-TB co-infection, ART, CD4.

I. Introduction

HIV and TB co-infection is when people have both HIV infection and also either latent or active TB disease. Infection with HIV is the most powerful known risk factor predisposing for Mycobacterium tuberculosis infection and progression to active disease. The risk of developing tuberculosis (TB) is estimated to be between 26 and 31 times greater in people living with HIV (PLHIV) than among those without HIV infection⁵. Likewise TB has been reported to exacerbate HIV infection. Estimates by the World Health Organization (WHO) indicate that there are more than 9 million new active cases of TB and close to 2 million deaths per year, and 2.6 million new cases of HIV infection and 1.8 million AIDS related deaths occur per year¹.

India has a very high burden of TB according to WHO, and infection with M. tuberculosis ranks foremost among opportunistic infections causing co-morbidity with HIV infection². HIV and TB co-infections pose particular diagnostic and therapeutic challenges and exert immense pressure on health care systems particularly in developing countries with large populations of co-infected individuals.

TB is the largest single cause of death in AIDS, accounting for about 26% of AIDS related deaths, 99% of which occur in developing countries¹.

There is a wide variation in HIV seropositivity among TB patients in India, ranging from 9.4% in New Delhi and 30% in Mumbai. The implication of HIV infection is that it activates dormant tuberculosis or rapid disease progression of tuberculosis and death.

In fact, tuberculosis is now the most common opportunistic infection in patients from developing countries who die from AIDS. Report show that active tuberculosis increases the morbidity and mortality of HIV-infected person and about one-third die of tuberculosis². There is evidence that immuneresponses in tuberculosis and in other infection induce cytokines that enhance the replication of HIV and this drives the patient into full picture of AIDS.

However, with addition of prophylactic therapy for opportunistic infections, this problem can be brought down drastically. Hence, this study was conducted in order to assess the socio-demographic profile and the prevalence of pulmonary tuberculosis among HIV positive patients who attended the ART clinic at tertiary care teaching hospital in Coimbatore.

II. Materials and Methods

It is a Hospital based retrospective study conducted among HIV positive patients attending ART centre between August 2017–October 2017 in a tertiary care hospital, Coimbatore. Sample size was 150, patients were selected randomly using their ART unique identification number. The study considered all HIV infected patients on ART, in all age groups regardless of their treatment category during the study period.

All patients were diagnosed with tuberculosis on the basis of one or more of the following criteria: Sputum or tissue sample positivity for Acid-fast bacilli, radiological features suggestive of tuberculosis and positive skin tuberculin testing based on which they were categorised as Pulmonary and Extra-pulmonary tuberculosis. CD4 counts were also analysed for all the patients with TB before the initiation of treatment (DOTS).

III. Results

From this study it was observed that, among 150 HIV positive patients 24 (16%) had HIV/TB co-infection (table:1), 9 (37.6%) were in the age group of 31-40 years, followed by 8 (33.3%) in the age group of 41-50 years, 6 (25%) in the age group of 20-30 yrs and 1 (4.1%) <20 years (table:2). The mean age of the patients was 34.5 years. There were 13 (54%) males and 11 (46%) females (table:2)

With more than half (70.8%) of the study population being married, (29.2%) were either single, divorced/widowed, or separated from family.

Educational level of the study population indicated that 14 (58.3%) had high school level education, 6 (25%) studied up to primary school level and 6 (25%) were illiterates. Occupation of the study population of HIV/TB co-infections showed that 50% were labourers, followed by 25% who were drivers and 25% were unemployed.

Out of 24 HIV/TB co-infected patients overall, the commonest form of tuberculosis was parenchymal pulmonary tuberculosis (PTB) seen in 13 (54.1%) followed by extra pulmonary tuberculosis (EPTB) in 11 (45.9%) (table:3).

Among the EPTB, tubercular lymphadenitis was most commonly seen in 5 (45.5%), followed by pleural effusion seen in 4 (36.5%), TB spine in 1 (9%) and TB brain (tuberculoma of brain) in 1 (9%).

Regarding CD4 count in HIV/TB co-infection patients, majority of them 15 (62.5%) showed CD4 count of <200 cells/μl and 9 (37.5%) showed >200 cells/μl.

Table:1. Prevalence of HIV-TB Co-infection

Total No of HIV positive patients (n=150)	Total No of HIV-TB Co-infected patients (n=24)	Percentage%
150	24	16%

Table:2. Prevalence of HIV-TB Co-infected patients: with respect to Age and Gender

Age group	Male (n=13)	Percentage%	Female (n=11)	Percentage%
<20 years	0	0	1	4.3%
21-30 years	2	8.2%	4	16.7%
31-40 years	6	25%	3	12.5%
41-50 years	5	20.8%	3	12.5%
Overall	13	54%	11	46%

Table:3. Distribution of Pulmonary (PTB) and Extrapulmonary tuberculosis (EPTB) in HIV-TB Co-infected patients

Type of Tuberculosis	No of patients (n=24)	Percentage%
Pulmonary TB	13	54.1%
Extra pulmonary TB	11	45.9%

IV. Discussion

Present study investigated the prevalence and drawing out the profile of individuals with dual infection of HIV-TB. In this study out of total 150 HIV positive patients, who attended the ART clinic and received treatment, 24 (16%) had HIV-TB Co-infection. The rates of HIV-TB Co-infection have been reported to vary in different regions of India from as low as 0.4% to as

high as 20.1%². This study shows that the prevalence of HIV-TB co-infection was 16% among HIV positive patients who attended the ART centre in a tertiary care hospital, Coimbatore. This prevalence of HIV-TB co-infection is similar to that of study done by Purushottam A Giri et al, 2013. Study done by Ramachandra Kamath et al, showed prevalence of 18.9% in his study which is similar to that of our study.

On contrary, a study by S Bhagyabati Devi et al, showed prevalence of TB was found in 55% of HIV infected patients which is very much higher as compared to our study.

From this study, the profile emerged was of higher prevalence of co-infection among males in the sexually active age group (20-40 years), majority of them with high school level education, being married, working as labourers/drivers, living in urban setting and belonging to lower socioeconomic status. A study by S. Bhagyabati Devi et al showed that the sexually active age group, 20-40 years was the most commonly affected age group and it was highest among the manual labourers, followed by Drivers³ and this is inconsistent with the findings of our study.

In this study, married (70.8%) individuals were seen to have a higher rate of infection when compared with single, divorced, or widowed individuals. This could be seen in light of the cultural drift toward the universality of marriage in the Indian context and also unmarried (single) persons are younger than married persons and have a different life style, especially males, who often migrate to towns in search for a job where they live alone or with friends. This study shows that the number of HIV-TB co-infection cases were higher in urban than in rural areas, possibly this might be due to higher prevalence of HIV infection and this is similar to that of a study by Ahmed Esmael et al 2013⁴.

The low CD4 count in HIV infected persons indicates severely depressed immunity that makes them susceptible to fresh TB infection or reactivation of latent infection. Unlike Cryptococcal meningitis or toxoplasmosis, which occur at very low CD4 counts, TB is unique in that it can occur over a wide range of CD4 counts. In our study 15 (62.5%) patients showed CD4 count of <200 cells/ μ l and 9 (37.5%) patients had CD4 count of >200 cells/ μ l.

V. Conclusion

This study identified factors such as age, gender, personal history, marital status, educational level, occupation, baseline CD4 count which were associated with HIV/TB co-infection among HIV positives. The relatively low prevalence of HIV-TB co-infection in our study reflects on the effective implementation of the HIV & TB control programme implemented by the Govt. of India and executed by the regional programme officers of the State of Tamil Nadu. A sustained effort by the people & Govt. including N.G.O's can bring down the rates further down to achieve the goals of the Govt. of India & WHO.

At district levels the development of programs with an integrated approach to inducing behavioural change and promoting use of condoms may reduce the infectivity of HIV transmission and susceptibility of individuals to co-infection.

The most important aspect of this control program is public awareness and health education on transmission of HIV/TB co-infection. Moreover accountability of private practitioners will go a long way in helping the Govt. to frame interventional measures at all levels in reducing the prevalence of this disease.

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