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

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Date of Submission: 20-04-2018
Date of acceptance: 07-05-2018

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 20-40yrs. A slight male preponderance (54%) as against 46% in females was noted. Majority were married (70%) and (58.3%) educated up to school level. Incidence was highest among manual labourers, drivers and unemployed. Low CD4 counts <200 cells/microlitre were found. 91 (60.7%) had CD4 <200. Pulmonary tuberculosis constituted 54% and Extra-pulmonary tuberculosis constituted 45.9%. Conclusion: This study found a prevalence of 16% HIV-TB co-infection in patients attending Antiretroviral 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 infection. 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 1.8 million AIDS related deaths per year. 2, 3

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 infection. HIV and TB co-infections pose particular diagnostic and therapeutic challenges and exert immense pressure on healthcare 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 countries.

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 in these two cities is thought to be due to the differing epidemiological patterns of HIV and TB. The co-infection rate in these two cities is thought to be due to the differing epidemiological patterns of HIV and TB.

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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 a 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 to October 2017 in a tertiary care hospital, Coimbatore. Samples 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 sputum culture 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 years 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 a mean age of 40.8% 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 of education, 6 (25%) studied up to primary school and 6 (25%) were illiterate. Occupation of the study population on TBC 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 the most commonly seen in 5 (45.5%), followed by pleural effusion seen in 4 (36.5%), TB spine in 1 (9%) and TB brain in 1 (9%).

Regarding CD4 count in HIV-TB infected 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

<table>
<thead>
<tr>
<th>Total No of HIV positive patients (n=150)</th>
<th>Total No of HIV-TB Co-infected patients (n=24)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>150</td>
<td>24</td>
<td>16%</td>
</tr>
</tbody>
</table>

Table 2: Prevalence of HIV-TB Co-infected patients with respect to age and gender

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Male (n=13)</th>
<th>Percentage</th>
<th>Female (n=11)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 20 years</td>
<td>0</td>
<td>0%</td>
<td>1</td>
<td>4%</td>
</tr>
<tr>
<td>21-30 years</td>
<td>2</td>
<td>8.2%</td>
<td>4</td>
<td>16.7%</td>
</tr>
<tr>
<td>31-40 years</td>
<td>6</td>
<td>25%</td>
<td>3</td>
<td>12.5%</td>
</tr>
<tr>
<td>41-50 years</td>
<td>5</td>
<td>20.8%</td>
<td>3</td>
<td>12.5%</td>
</tr>
<tr>
<td>Overall</td>
<td>13</td>
<td>54%</td>
<td>11</td>
<td>46%</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Type of Tuberculosis</th>
<th>No of patients (n=24)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pulmonary TB</td>
<td>13</td>
<td>54.1%</td>
</tr>
<tr>
<td>Extra pulmonary TB</td>
<td>11</td>
<td>45.9%</td>
</tr>
</tbody>
</table>

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. Therates 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 16% (Table 1). The mean age of the patients was 34.5 years. There were 13 (54%) males and 11 (46%) females (Table 2).

Educational level of the study population indicated that 14 (58.3%) had high school level of education, 6 (25%) studied up to primary school and 6 (25%) were illiterate. Occupation of the study population on TBC showed that 50% were labourers, followed by 25% who were drivers and 25% were unemployed.

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Regarding CD4 count in HIV-TB infected patients, majority of them 15 (62.5%) showed CD4 count of < 200 cells/μL and 9 (37.5%) showed > 200 cells/μL.
This study shows that the prevalence of HIV-TB co-infection was 16% among HIV positive patients who attended the ART centre in the hospital in Coimbatore. This prevalence of HIV-TB co-infection is similar to that of a study done by Purushottam A Giri et al. in 2013. Study done by Ramachandra Kamath et al showed prevalence of 18.9% in their study which is similar to that of our study.

On the contrary, a study by SBhagyabati Devital et al showed prevalence of TB was found in 55% of HIV infected patients which is very much high compared to our study.

This study showed that, the sexual transmission of HIV-TB 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 an urban setting and belonging to a 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 the highest among the manual labourers who were married, working as drivers and thus this finding is consistent with the finding of our study.

The study showed that the prevalence of HIV-TB co-infection among HIV positives. The 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. As a step forward to achieve the goals of the Govt. of India & WHO, at district levels the approach 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.

Acknowledgement

The authors acknowledge the valuable support of Dr. N. Bharathi Santhose, Dr. Sivaram and the ART centre staffs of Coimbatore Medical College Hospital.

References


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