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TUBERCULOSIS AND HIV COINFECTION AT ANANTA INSTITUTE OF MEDICAL SCIENCES AND RESEARCH CENTER

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Conflicts of Interest: Nil

ABSTRACT:

INTRODUCTION: About 60 per cent of TB cases and deaths occur among males, but the disease burden is also high among women also. In 2015 nearly 500,000 women died from TB, and among them, 28 per cent had human immunodeficiency virus (HIV) co-infection. Tuberculosis (TB) is a bacterial disease caused by *Mycobacterium tuberculosis (M. tuberculosis*), which mostly manifests as pulmonary TB but it can affect other organs called as extra-pulmonary Tuberculosis (ETB). TB is expanding public health issue amongst the developing countries, due to HIV pandemic, poverty, movement of displaced people and emergence of multidrug-resistant strains and it is evidenced that, in most of the developing countries, HIV pandemics, diabetes, malnutrition, alcoholism, smoking cigarette, active TB contact, extreme poverty, and homelessness are common identified risk factors pertaining to tuberculosis. **MATERIAL AND METHODS**: Patients who presented with cough lasting for 2 weeks, evening rise of temperature, weight loss or more were clinically suspected of having TB. Laboratory and radiological investigations were carried out. Laboratory investigation for TB was by sputum smear for acid-fast bacilli (AFB) and who had at least one smear positive for AFB were categorized as smear-positive pulmonary TB (PTB). Chest X-ray was done to detect radiological changes of PTB. Extra-pulmonary tuberculosis included tuberculosis of organs other than the lungs, such as the abdomen, genitourinary tract, lymph nodes, skin, bones, joints, and meninges. A diagnosis of extra pulmonary tuberculosis (EPTB) was made based on clinical findings suggestive of TB, radiology, cytology, and tissue histology. **RESULTS**: A total of 100 TB patients were included in the study. Age range was 15 to 59 years with mean age 37 ±15.9 years. HIV coinfection was found in 15 patients age range was 24 to 49 years with mean age 35 ±12.9 years. More than a half (*n*=10; 54.3%) of participants had CD4 count ranged between 200-500/µl and 21.6% (*n*=63) of respondents had CD4 count <200/µl. In addition, the study also showed that 29.2% (*n*=85) and 3.7% (*n*=11) . Of the 15 HIV positive diagnosed cases 5 were relapse case (33.33%) of which 2 were female and 3 were male . 10 cases (66.67%) were new cases of which 3 were female and 7 were male.MDR TB (multidrug resistant TB) was seen in 10 cases of HIV co infected patients as compared to HIV negative it was 15 cases. **CONCLUSION**: Drug-resistant TB is becoming a significant challenge to the control of the infection in the world especially in HIV-positive patients. Treatment should be targeted at treating the immune suppression associated with HIV which promotes development of active TB. Previous history of TB, CD4 count less than 200/µl were the possible risk factors.

KEYWORDS: TB, HIV, CD4 and ETB.

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Introduction

Tuberculosis (TB) is a bacterial disease caused by *Mycobacterium tuberculosis (M. tuberculosis*), which mostly manifests as pulmonary TB but it can affect other organs called as extra-pulmonary Tuberculosis (ETB)[i]. Tuberculosis is a major health problem globally which affects millions of people every year. It has been ranked as the second leading cause of death from an infectious disease worldwide. The World Health Organization (WHO) estimated that there are over 9 million new active cases of tuberculosis resulting in 1.5 million TB deaths per year[ii]. Some epidemiological studies evinced that, co-infection with HIV can elevate the risk of latent TB reactivation by 20-fold and is the most potent risk factor known for the advancement of *M. tuberculosis* infection to active disease[iii]. TB is expanding public health issue amongst the developing countries, due to HIV pandemic, poverty, movement of displaced people and emergence of multidrug-resistant strains and it is evidenced that, in most of the developing countries, HIV pandemics, diabetes, malnutrition, alcoholism, smoking cigarette, active TB contact, extreme poverty, and homelessness are common identified risk factors pertaining to tuberculosis[iv] . The depressed immune system associated with HIV increases the risk of reactivation of latent tuberculosis and rapid progression to active infection. Therefore, areas with high HIV prevalence also have high TB incidence rate[v]. Generally pulmonary tuberculosis is the commonest TB manifestation and those who are HIV positive are more likely to have extra pulmonary TB. Extra pulmonary TB is seen in 40–80% of TB–HIV infection but in only 10–20% of patients without coinfection [vi],[vii]. Therefore HIV-related TB impacts negatively on the efforts to control tuberculosis. This study was carried out to determine the prevalence of TB–HIV coinfection among those being treated for TB, to compare the pattern of TB in HIV-infected and non-HIV-infected individuals.

MATERIAL AND METHODS

The present study was carried out in the Dept. of Pulmonary Medicine at Ananta Institute of Medical Sciences and Research centre, Rajsamand.

Patients who presented with cough lasting for 2 weeks, evening rise of temperature, weight loss or more were clinically suspected of having TB. Laboratory and radiological investigations were carried out. Laboratory investigation for TB was by sputum smear for acid-fast bacilli (AFB) and who had at least one smear positive for AFB were categorized as smear-positive pulmonary TB (PTB). Chest X-ray was done to detect radiological changes of PTB. Extra-pulmonary tuberculosis included tuberculosis of organs other than the lungs, such as the abdomen, genitourinary tract, lymph nodes, skin, bones, joints, and meanings. A diagnosis of extra pulmonary tuberculosis (EPTB) was made based on clinical findings suggestive of TB, radiology, cytology, and tissue histology. Patients with EPTB were treated using the directly observed treatment short course (DOTS) regimen of at least 6 months of anti-TB drugs which consists of 2 months of rifampicin, isoniazid, pyrazinamide, and ethambutol followed by 4 months of rifampicin and isoniazid.

After proper counselling and permission all patients were tested for HIV by an initial rapid test screening and confirmed by ELISA. Demographic and clinical information were retrieved from patients' records using a standardized questionnaire.

Data analysis was performed using the SPSS software. The Chi-squared test was used to test for association between categorical tables. The level of significance was set at $p \leq 0.05$.All data was entered on the EXCVEL sheet of Windows 2013.

Written informed consent was obtained from all the patients.

OBSERVATIONS AND RESULTS

A total of 100 TB patients were included in the study. Age range was 15 to 59 years with mean age 37 ±15.9 years. HIV coinfection was found in 15 patients age range was 24 to 49 years with mean age 35 ±12.9 years

Table 1: HIV and TB coinfection

	HIV positive	HIV negative	Total
Total	15	85	100
Male	10	42	52
Female	5	43	48

In the present study, more than a half (*n*=10; 54.3%) of participants had CD4 count ranged between 200-500/µl and 21.6% (*n*=63) of respondents had CD4 count <200/µl. In addition, the study also showed that 29.2% (*n*=85) and 3.7% (*n*=11)

Of the 15 HIV positive diagnosed cases 5 were relapse case (33.33%) of which 2 were female and 3 were male . 10 cases (66.67%) were new cases of which 3 were female and 7 were male.

MDR TB (multidrug resistant TB) was seen in 10 cases of HIV co infected patients as compared to HIV negative it was 15 cases

Table 2: New and relapse cases

Sex	Male	Female
New cases	7	3
Relapse or old case	3	2
Total	10	5

Out of 15 diagnosed cases of HIV 3 were on ART while 12 were not taking any drugs. 1 case (male) was having CD4 count less than 200 while 5 cases were having count 200 to 500

DISCUSSION AND CONCLUSION

WHO Tuberculosis report shows that prevalence of tuberculosis has been declining globally; we are far away from achieving TB free world even in 2050[viii]. Also people living with HIV are most prone to contracting active TB because of the deficiency of immune response. It is envisaged that TB can affect young people in a disproportionate manner[ix].

In our study the age distribution showed the mean age of TB–HIV infection to be of 35 ±12.9 years. This is in accordance to findings of several other studies where the peak age of coinfection ranged from 31–40 to 41–50[x,xi]. In Thanh et al. study in Vietnam[xii] lower age group was reported,

The WHO global report shows that more TB cases and deaths occur among men compared to women. [xiii]in our study same results were found in which 5 female (33.33%) were having co infection as compared to men having 10 (66.67%). Atypical presentations like extra pulmonary TB and sputum smear-negative TB and atypical radiologic manifestations have been said to hamper the diagnosis of TB, thus, affecting the prompt treatment and control of the infection. Suchindran S reported high multidrug resistant TB in HIV patients [xiv].MDR TB (multidrug resistant TB) was seen in 10 cases of HIV co infected patients as compared to HIV negative it was 15 cases. One study reports a similar contrasting picture in which, even though the prevalence of extra pulmonary TB was 11–38%, it was higher in areas with the lowest HIV prevalence [xv].

Drug-resistant TB is becoming a significant challenge to the control of the infection in the world especially in HIV-positive patients[xvi].Treatment should be targeted at treating the immune suppression associated with HIV which promotes development of active TB. Previous history of TB, CD4 count less than 200/µl were the possible risk factors. Large-scale studies on the trends in TB/HIV co-infection and associated factors should also be implemented across the country.

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