*International Journal of Basic and Applied Medical Sciences ISSN: 2277-2103 (Online)*
*An Open Access, Online International Journal Available at http://www.cibtech.org/jms.htm*
*2014 Vol. 4 (2) May-August, pp. 230-233/Ekta and Aroma*
***Research Article***

# HIV – TUBERCULOSIS COINFECTION: A RETROSPECTIVE STUDY IN A TERTIARY CARE HOSPITAL

***Ekta Mala and Aroma Oberoi**
*Department of Microbiology, Christian Medical College & Hospital, Ludhiana*
**Author for Correspondence*

## ABSTRACT
HIV seropositive patients have decreased immunity which predisposes them to infections .Since tuberculosis is an endemic in our country, it is the most common coinfection found in such patients. Therefore early diagnosis and therapy of such patients is required in order to decrease mortality. As the disease progresses in HIV, the immunity of the patient diminishes leading to more susceptibility to a coinfection. In India where tuberculosis is an endemic disease its prevalence is more in an immunocompromised state. Therefore it can be might be misdiagnosed as some other respiratory illness leading to delay in treatment in HIV positive patients. In this retrospective study done it was observed that 16 out of 227 HIV positive patients were coinfected with tuberculosis. Therefore, there is need of 100% referral of all HIV seropositive patients to the nearest DOTS centre or tertiary care hospital. The aim was to study the prevalence of tuberculosis in HIV seropositive patients. Study design includes four year, retrospective study in a tertiary care hospital. A fresh early morning sputum sample is collected at the DOTS centre. Approximately 3-5 ml of the sample is preferred. The concentrated smear is then stained by the Ziehl – Neelsen method, using 25 % sulphuric acid. The smear is reported by visualizing the acid fast bacilli and the smear is grade. All universal precautions are taken during processing of the samples. The patients were tested for HIV status at the ICTC centre of the hospital using rapid immunochromatography test. In the four year retrospective study, a total of 227 patients were diagnosed of HIV infection out of which 16 patients were positive for acid fast bacilli. In total 7.04 % of HIV patients were coinfected with tuberculosis. The study concludes the total positivity rate of 7.04% of tuberculosis in HIV seropositive patients in a four year period. The early diagnosis and prompt treatment of tuberculosis in HIV status is necessary to decrease the mortality in an already immunocompromised patient. Therefore, there is need of complete referral of all HIV seropositive patients to the nearest DOTS centre or tertiary care hospital.

***Keywords:*** *HIV, Tuberculosis, Co- infection*

## INTRODUCTION
Human immunodeficiency virus (HIV) is a retrovirus, belonging to the lentivirus subgroup. It is the etiological agent of AIDS, which is a global pandemic. The virus is highly mutagenic in nature and the antigenic variations present, makes it survive in the human body. The mode of contact of the virus is through blood and blood stained body fluids. On entering the bloodstream it acts primarily on the CD4 (helper /inducer) T lymphphocyte. The binding of the virus to the receptor is by the envelope glycoprotein gp 120. The co- receptor molecule, is the CXCR 4 for T cell- tropic HIV strains and CCR 5 for the macrophage – tropic strains (Paniker, 2005). HIV seropositive patients are in an immunocompromised state making them more vulnerable to infections. Various opportunistic infections including bacterial, viral, fungal and protozoal infections can be present in these patients. In India, since tuberculosis is an endemic disease which is communicable, there are chances of co- infection in HIV patients. Tuberculosis, caused by Mycobacterium tuberculosis, presents as pulmonary and extrapulmonary form. The bacteria are primarily phagocytosed by the macrophages in the lungs (Prescott, 2010). The disease can prove, to be fatal for the patient. In patients with an already decreased immunity, the bacilli will multiply rapidly since there are less defensive cells in the body. In HIV patients there are high chances of this co infection. Co-infection with HIV leads to challenges in both diagnosis and treatment of tuberculosis. The global burden of tuberculosis in the year 2009 was estimated to be 0.38 million deaths in HIV positive patients (Padmapriyadarsini *et al.*, 2011). The HIV epidemic has the potential to worsen the situation of

tuberculosis. HIV acts as a risk factor for the progression of tuberculosis to an active form. Research shows that of the opportunistic infections affecting HIV-infected patients, TB is found to be the most common with high risk for mortality and the risk of coinfection with TB is about 20-37 times higher among those infected with HIV according to WHO (Corbett *et al.*, 2003). Since the severity of the disease is marked in HIV positive patients, therefore early diagnosis is beneficial to the patient. The evaluation of HIV positive patients should be complete with referral to DOTS centers. These centers aim at prompt finding of the infection and treatment therapy. In India, since tuberculosis is endemic cure of the disease is mandatory to prevent failures and relapses and multidrug resistant forms. The 2009 report of UNAIDS estimated that 33.4 million people are living with HIV/AIDS with a third of them showing coinfection with tuberculosis (Lawn and Churhyard, 2009). Therefore there is a need diagnose and treat tuberculosis co infections in HIV seropositive patients. There should be 100% referral of patients to nearest DOTS centre. This retrospective study was done to see the prevalence of HIV and tuberculosis co-infection in patients attending DOTS and Integrated Centre of Testing and Counciling of a tertiary care center.

## MATERIALS AND METHODS

This retrospective study was done over a period of four years from 1st December 2009 to 31st December, 2013 in DOTS and ICTC under the Department of Microbiology, Christian Medical College and Hospital, Ludhiana, a tertiary care hospital. A fresh early morning sputum sample was collected at the DOTS centre. Approximately 3-5 ml of the sample was preferred. The sample was processed for microscopy. The sample was homogenized and decontaminated by the Petroff's method. The concentrated smear was then stained by the Ziehl – Neelsen method, using 25 % sulphuric acid (Paniker, 2005). The smear was reported by visualizing the acid fast bacilli and the smear was graded. All universal precautions were taken during processing of the samples. The patients were tested for HIV status at the ICTC centre of the hospital using rapid immunochromatography test.

## RESULTS AND DISCUSSION

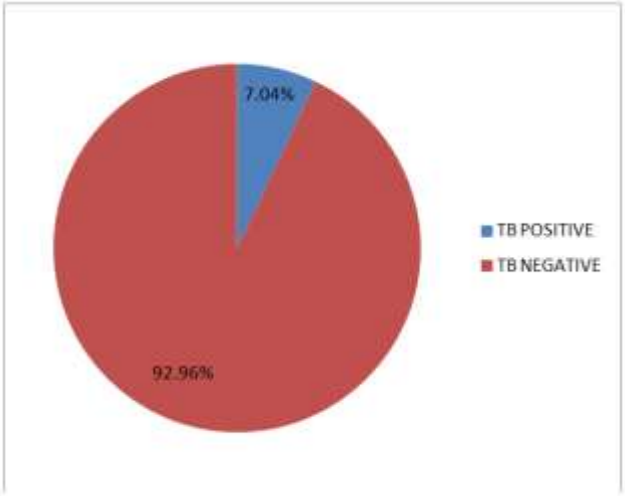


**Figure 1**

### *Results*

In the four year retrospective study, a total of 227 patients were diagnosed of HIV infection out of which 16 patients were positive for acid fast bacilli. In total 7.04 % of HIV patients were coinfected with tuberculosis, see Figure 1.

### *Discussion*

In our study the total positivity rate of 7.04% of tuberculosis in HIV seropositive patients in a four year period. Studies have shown that there is a 5% incidence of tuberculosis found in HIV infected patients (Khedkar *et al.*, 2014). The RNTCP data reveals, 9% of tuberculosis suspects with positive HIV status

(RNTCP, 2014). The World Health Organization (WHO) reports 9.2 million new cases of TB in 2006 of whom 7.7% were HIV-infected (WHO, 2012). Studies in India, give an estimation that nearly 5% of all TB patients are infected with HIV. The 2007 survey represents HIV epidemiology among TB patients in India. The survey demonstrated that the prevalence of HIV among TB patients varied substantially across the geographic regions between 1% and 13.8% across the 15 surveyed districts (Seth, 2011). The number of people living with HIV who were screened for TB went from 600,000 in 2007 to 2.3 million in 2010, but still accounts for less than 7% of the 34 million people living with HIV globally (Action Global Health Advocacy, 2012). In a study in Manipur, TB was found in 55 % of the HIV positive patients and in 25% of the HIV negative patients which had significant value (Devi *et al.,* 2005). Whereas in Kolkata, 27% positive tuberculosis cases in HIV patients were found (Dey *et al.*, 2003). Studies showing HIV and TB coinfection are correspondingly as India (5.0%), Pakistan (0.3%) and Bangladesh (0.2%) (Singhal and Jaiswal, 2011). A study conducted in Coimbatore concluded that 8.6% of the HIV seropositive patients were coinfected with tuberculosis (Rajam and Muhammad, 2013). Surveillance data from India and Nepal shows that 83% and 56 % respectively of AIDS patients had tuberculosis (Kant, 2002). A study conducted in Western Maharashtra showed a 17% prevalence of tuberculosis in HIV positive patients (Giri *et al.*, 2013). India is accounting for one -fifth of world new tuberculosis cases and an estimated prevalence of HIV in adult population is 0.36% (Bhushan, 2013).

***Conclusion***

The study concludes the total positivity rate of 7.04% of tuberculosis in HIV seropositive patients in the four year period. The early diagnosis and prompt treatment of tuberculosis in HIV status is necessary to decrease the mortality in an already immunocompromised patient. The presence of co- infection in an HIV patient increases the mortality chances of the patient. Therefore, there should be complete referral of all HIV seropositive patients to the nearest DOTS centre or tertiary care hospital.

**REFERENCES**

**Action Global Health Advocacy Partnership (2012).** TB HIV Coinfection.

**Bhushan B *et al.*, (2013).** Tuberculosis in HIV coinfected patients – A study at tertiary care centre, Amritsar. *The Indian Journal of Tuberculosis* (60) 202- 207.

**Corbett EL, Watt CJ, Walker N, Maher D, Williams BG and Raviglione MC *et al.*, (2003).** The growing burden of tuberculosis: Global trends and interactions with HIV epicemic. *Archives of Internal Medicine* **163** 1009-1021.

**Devi S Bhagyawati *et al.*, (2005).** HIV and TB Coinfection. *Journal Indian Academy of Clinical Medicine* **6**(3) 220-223.

**Dey SK, Pal NK and Chakrabarty MS (2003).** Cases of Immunodeficiency virus infection and Tuberculosis – Early experiences of different aspects. *Journal of Indian Medical Association* **101** 291-298.

**Giri AP, Deshpande DJ and Phalke BD (2013).** Prevalence of Pulmonary Tuberculosis among HIV positive patients attending Antiretroviral therapy clinic. *North American Journal of Medical Sciences* **5**(6) 367-370.

**Global Tuberculosis Report (2012).** World Health Organization.

**Kant L (2002).** Tackling HIV/TB: more questions than answers. *The Indian Journal of Tuberculosis* 49.

**Khedkar *et al.*, (2014).** RNTCP –Evolution, Achievements and Challenges. *Medical Journal of Dr. D Y Patil University* **7**(1) 5-12.

**Lawn S and Churhyard G (2009).** Epidemiology of HIV associated tuberculosis. *Current Opinion HIV AIDS* (4) 325-333.

**Padmapriyadarsini C, Narendran G and Soumya S (2011).** Diagnosis & treatment of tuberculosis in HIV co-infected patients. *Indian Journal of Medical Research* **134**(6) 850-865.

**Paniker CKJ (2005).** Human Immunodeficiency Virus: AIDS. *Text book of Microbiology*, 7th edition (Orient Longman Private Ltd) Chennai 582-598.

**Paniker CKJ (2005).** *Mycobacterium Text book of Microbiology*, 7th edition (Orient Longman Private Ltd) Chennai 337.
**Prescott, Harley and Klein's Microbiology (2010).** *Human Diseases caused by Bacteria,* 7th edition, (Mc Graw- Hill Ltd) New York 954.
**Rajam RC Mano and Muhammad GM (2013).** A study of HIV coinfection among pulmonary tuberculosis at a private medical college and hospital. *Asian Student Medical Journal* **13**(2).
**Seth P (2011).** The situation of HIV / M tuberculosis co –infection in India. *The Open Infectious disease Journal* **M5**(5) 55-59.
**Singhal S and Jiaswal P (2011).** Presentation of Tuberculosis in TB – HIV coinfection patients and treatment outcome directly observed short course therapy. *Asian Pacific Journal of Tropical Biomedicine* **1**(2) S266-S267.
**TB India (2013).** RNTCP_ Annual Status Report.