

Prevalence of Pulmonary and Extrapulmonary Tuberculosis Infections among HIV Patients.

Balaji Naik Bhanoth¹, Saranya Dasari², Chakravarti Narukurthi²

¹Assistant Professor, Department of DVL, Rajiv Gandhi Institute of Medical sciences, Ongole, Andhra Pradesh.

²Senior Resident, Department of DVL, Rajiv Gandhi Institute of Medical sciences, Ongole, Andhra Pradesh.

Received: January 2018

Accepted: January 2018

Copyright: © the author(s), publisher. It is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Background: Tuberculosis is estimated to be shown higher incidence among HIV population when compared to population without HIV infection. This study proposes to describe the prevalence of coinfection of HIV TB among patients attending hospital at Ongole and also aimed at assessing pulmonary and extrapulmonary TB. **Methods:** With strict aseptic precautions, 3ml of venous blood sample will be collected by venepuncture using EDTA vacutainer and processed for HIV detection and CD4 estimation. Patients were also advised to go for Tuberculosis diagnostic tests. **Results:** Out of 33 confirmed HIV - TB coinfection patients, Pulmonary tuberculosis was observed in 21 patients, 42% and extra pulmonary tuberculosis was diagnosed in 12 (24%) patients. Out of 33 HIV-TB coinfections, 15.1% TB pleural effusion, 6.06% TB pericardial effusion, 3.03% each of TB meningitis, TB abdomen, TB pericardial effusion, TB granuloma of brain, TB skin. **Conclusion:** Awareness has to be create among health care personnel in order to improve their decisions related to treatment and approaching towards diagnosis of HIV/TB coinfections.

Keywords: Tuberculosis, HIV.

INTRODUCTION

AIDS is an emerging pandemic viral infectious disease caused by Human Immunodeficiency Virus, which has posed the greatest challenge to public health in modern world.^[1,2]

The patients of HIV / AIDS exhibit different manifestations due to its ability to cause dysregulation of immune system. Especially when dual Epidemic i.e., HIV and Tuberculosis synergistically affects the mankind, fatality and morbidity is enhanced devastatingly.

In India, tuberculosis is the most common opportunistic infection than pneumocystis Carinii pneumonia which is commoner in western countries like USA.^[3] Tuberculosis is estimated to be shown higher incidence among HIV population when compared to population without HIV infection. WHO estimates that TB incidence is 16-27 times greater incidence among HIV population than people without HIV infection.^[4] Globally it was estimated that in 2015, 10.4 million cases of tuberculosis disease including 1.2 million [11%] among people living with HIV.^[4]

The high incidence of commonly Tuberculosis with low CD4 counts in Indian HIV infected individuals is increasing, there is for early screening .

This study included all age group patients including both sexes. This study proposes to describe the prevalence of coinfection of HIV TB among patients attending hospital at Ongole and also aimed at assessing pulmonary and extrapulmonary TB.

MATERIALS AND METHODS

This is a prospective study involving proven cases of HIV/AIDS with signs and symptoms of tuberculosis attending the Out Patient departments of Rajiv Gandhi Institute of Medical sciences. A minimum of 50 clinically, radiologically and diagnostically proved HIV and suspected TB cases encountered during 6 months period , from March to August 2016 will form the study group.

With strict aseptic precautions, 3ml of venous blood sample will be collected by venepuncture using EDTA vacutainer and processed for HIV detection and CD4 estimation. Patients were also advised to go for Tuberculosis diagnostic tests including chest X ray, Sputum for AFB, investigations related to diagnose extrapulmonary tuberculosis such as radiological imaging, TB culture which is gold standard and recommended.

Patients diagnosed with HIV and suspected with Tuberculosis (pulmonary and extra pulmonary)

Name & Address of Corresponding Author

Dr. Balaji Naik Bhanoth,
Assistant Professor,
Department of DVL,
Rajiv Gandhi Institute of Medical sciences,
Ongole, Andhra Pradesh.

included in this study. Informed consent was taken from all the patients before doing this study. All the patients were admitted in the ward, examined and investigated thoroughly.

All clinical, radiological and laboratory data available will be documented. Baseline investigations done in all HIV seropositive individuals, screening and confirmation for HIV infections [Strategy III WHO] will be recorded. Relevant microbiological investigations on case by case basis will be carried out if required and documented in standardised proforma for later analysis.

RESULTS

A total of 50 confirmed cases of HIV and suspected TB infection were included in this study. Majority of them were males. 38 (76%) were males and remaining 12 (24%) were females. According modified kuppuswamy socioeconomic status classification, most of the patients were grouped under Lower middle class.

Table 1: Occupation distribution of HIV patients

S. No.	Occupation	Male	%	Female	%	Total	%
1	Cooley	11	28.9	1	8.3	12	24
2	Business	8	21	2	16.6	10	20
3	Drivers	11	28.9	-	-	8	16
4	Housewives	-	-	6	50.0	6	12
5	CSW	1	2.6	3	25.0	4	8
6	Employers	3	7.8	-	-	3	6
7	Hotel Workers	1	2.6	-	-	1	2
8	Hawkers	1	2.6	-	-	1	2
	Total	38	76	12	24	50	100

Table 2: Pulmonary and Extrapulmonary Tuberculosis infection incidence.

S. No.	Diagnosis	Male	Female	Total	%
A.	Pulmonary tuberculosis	16	5	21	42
B.	Extra pulmonary T.B	9	3	12	24
	Total	25	8	33	66

Out of 50 HIV patients with terminal illness, 33 were diagnosed with tuberculosis. Out of 33 confirmed HIV - TB coinfection patients, Pulmonary tuberculosis was observed in 21 patients, 42% and extra pulmonary tuberculosis was diagnosed in 12 (24%) patients [Table 2]. Among HIV-TB coinfection 25 (75.7%) were males and 8 (24.2%) were females.

Extrapulmonary TB were presented clinically in various forms including TB pleural effusion (5), TB

lymphadenitis (2), each one of TB meningitis, TB abdomen, TB pericardial effusion, TB granuloma of brain, TB skin.

Out of 33 HIV-TB coinfections, 15.1% TB pleural effusion, 6.06% TB pericardial effusion, 3.03% each of TB meningitis, TB abdomen, TB pericardial effusion, TB granuloma of brain, TB skin [Figure 1].

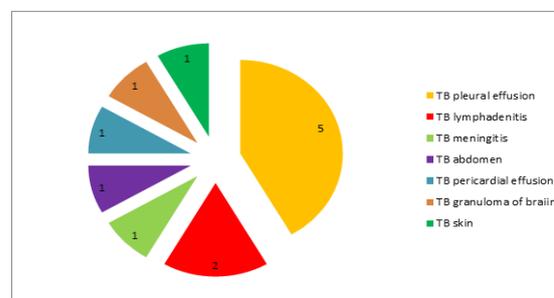


Figure 1: Incidence of Extrapulmonary Tuberculosis infections.

Most of the HIV-TB coinfections were noted among patients with CD4 count less than 500 cells/ μ l. Out of 33 HIV-TB patients, 8 (24%) were relapse cases, 5(15.1%) were defaulter patients. No failure cases were observed in this study. 5 (15.1%) patients expired out of 33 HIV-TB coinfections, among them 4 were males.

DISCUSSION

Human immune deficiency virus infection in children is becoming a common occurrence [5]. The linkage of HIV and TB was being explained from the past 3 decades. In India, Tuberculosis is the most commonly reported opportunistic infection with CD4 cells >200 cells/cu.mm.^[2,6]

Patients with latent Mycobacterium tuberculosis infection are at higher risk for progression if they are coinfecting with HIV. Patients with HIV infection have a similar bacteriologic response to tuberculosis treatment as those who are not infected but have higher risks of recurrence and death. The influence of tuberculosis coinfection on the progression of HIV disease is controversial.^[7]

Out of 50 HIV patients with terminal illness, 33 (66%) were diagnosed with tuberculosis. 5 (15.1%) patients expired out of 33 HIV-TB coinfections, among them 4 were males in this study. In line with this study, Haileyuss Getahun et al stated that one third of total HIV persons (33.2 million) had coinfection with TB.^[8] Mortality rate accounted for TB-HIV was 26%. Studie from Thailand have reported a lower proportion of pulmonary TB (60%) while a report from Kenya stated 87% co-infected patients had pulmonary TB.^[9,10]

In the present study, Majority of them were males. 38 (76%) were males and remaining 12 (24%) were females. Most of the patients were grouped under Lower middle class. Suresh Shastri et al observed 6480 adult TB coinfections and a third of them

occurred in females.^[11] Purushottam A giri et al reported that 17% of HIV positive patients had pulmonary tuberculosis,^[12] among them 50.58% (87) were males and 48.42% (85) were females, also observed statistical significant association between ($P < 0.0001$) HIV/TB co-infection with Low CD4 count < 50 cells/ μ l.

Jain SK et al stated that among HIV-TB co-infection patients,^[13] illiterates and those educated up to primary level were significantly more compared to those with middle and higher education. The other risk factors for HIV and tuberculosis co-infection were (i) heterosexual relations with multiple partners, (ii) intravenous drug abuse and (iii) concomitantly present sexually transmitted disease

The implication of HIV infection is that it activates dormant tuberculosis to rapid disease progression of tuberculosis and death.^[14] In fact, tuberculosis is now the most common opportunistic infection in patients from developing countries who die from AIDS.^[15] According to an estimate of World Health Organization, TB has become one of the leading causes of death among HIV-infected persons.^[16]

In the present study, Most of the HIV-TB co-infections were noted among patients with CD4 count less than 500 cells/ μ l. Usually cryptococcal meningitis or toxoplasmosis occur in HIV patients with very low CD 4 count about < 300 cells/ μ l. But TB is unique in that as it can occur over a wide range of CD 4 counts.

In the present study 24% of extrapulmonary tuberculosis were observed in HIV patients. Out of 33 HIV-TB coinfections, 15.1% TB pleural effusion, 6.06% TB pericardial effusion, 3.03% each of TB meningitis, TB abdomen, TB pericardial effusion, TB granuloma of brain, TB skin. Namme LH et al,^[17] reported 33.6% of HIV patients with EPTB. The most affected sites of disease were bones and joints (29.6%), lymph nodes (17.8%), the pleura (15%), peritoneum (14.3%), and the central nervous system and meninges (9%). Neuromeningeal TB however, less common was most strongly associated with HIV infection, odd ratio (OR) 2.3 (95% CI 1.1-5.0, $p < 0.05$). Leeds IL et al [18] observed the most common sites of EPTB were lymphatic (28%), disseminated (23%), and CNS/meningeal (22%) disease. One hundred fifty-four (48.1%) were HIV-infected, 40% had concomitant pulmonary tuberculosis, and 14.7% died within 12 months of EPTB diagnosis.

Although TB is acquired by inhalation of contaminated droplets, it can produce disease in any organ system other than the lungs, which is usually the initial site of infection. With this increase awareness on the burden of TB, there has been an increase in the number of reported cases of extrapulmonary tuberculosis (EPTB), and depending on the region, ethnic group, and HIV coinfection rates, the prevalence of EPTB is between 15 and 50%.^[19]

Suresh Shastri et al documented that third of women were found to be affected by HIV/TB co-infections in the study population;^[11] 78% of patients were initiated on ART. Treatment success among co-infected patients not on ART (54%) were significantly lower compared to those already on ART (80%); death and default rates were higher in the non-ART group.

CONCLUSION

TB is the most common opportunistic infection among HIV patients. TB has ability to infect many organs, there is a need to diagnose and treat as early as possible, to save their lives. Many large clinical trials are on-going to prevent and treatment of HIV/TB infection. Awareness has to be create among health care personnel in order to improve their decisions related to treatment and approaching towards diagnosis of HIV/TB coinfections.

REFERENCES

1. Sterling TR, Chaisson RE. General clinical manifestation of HIV infections (including retroviral syndrome and oral, cutaneous, renal, ocular, metabolic and cardiac disease). In : Mandell GL, Bennett JE, Dolin R. Principles and practice of infectious diseases. 7th ed, United States: Churchill Livingstone; 2010 .p.1705-1726.
2. Fauci AS, Chiffordlane H. Human immunodeficiency virus disease, AIDS and related disorders. In : Lango DL, Kasper DL, Jameson JL, Fauci AS, Hauser SL, Loscalzo J, editors, Harrison's principles of internal medicine, 17th ed, Vol. I, New York : McGraw Hill; 2008 .p.1137-1203.
3. Robert Miller. HIV associated respiratory diseases. Lancet. 1996;348:307-312.
4. World Health Organization. Tuberculosis and HIV. <http://www.who.int/hiv/topics/tb/en/>.
5. Wananukul S, Deekajorndech T, Panchareon C, Thisyakorn U. Mucocutaneous findings in pediatric AIDS related to degree of immunosuppression. *Pediatr Dermatol* 2003; 20: 289 – 94.
6. Ghate M, Deshpande S, Tripathy S, Nene M, Gedam P, Godbole S et al. Incidence of common opportunistic infections in HIV-infected individuals in Pune, India: analysis by stages of immunosuppression represented by CD4 counts. *Int J Infect Dis* 2009;13:e1-e8.
7. Reid A, Scano F, Getahun H, et al. Towards universal access to HIV prevention, treatment, care, and support: the role of tuberculosis/HIV collaboration. *Lancet Infect Dis* 2006;6:483-495.
8. Haileyesus Getahun, Christian Gunneberg, Reuben Granich, Paul Nunn. HIV Infection—Associated Tuberculosis: The Epidemiology and the Response. *Clinical Infectious Diseases*. 15 May 2010;50(3): S201–S207.
9. Kingkaew N, Sangtong B, Amnuaiophon W, Jongpaibulpatana J, Mankatittham W et al. HIV-associated extrapulmonary tuberculosis in Thailand: epidemiology and risk factors for death. *Int J Infect Dis*. 2009;13: 722-729.
10. Tayler-Smith K, Zachariah R, Manzi M, Kizito W, Vandenbulcke A et al. Antiretroviral treatment uptake and attrition among HIV-positive patients with tuberculosis in Kibera, Kenya. *Trop Med Int Health*. 2011.
11. Suresh Shastri, Balaji Naik, Anita Shet, Bharat Rewari and Ayesha De Costa. TB treatment outcomes among TB-HIV co-infections in Karnataka, India: how do these compare with

- non-HIV tuberculosis outcomes in the province? BMC Public Health 2013;13:838.
12. Purushottam A Giri, Jayant D Deshpande, and Deepak B Phalke. Prevalence of Pulmonary Tuberculosis Among HIV Positive Patients Attending Antiretroviral Therapy Clinic. N Am J Med Sci. 2013 Jun; 5(6): 367–370.
 13. Jain SK, Aggarwal JK, Rajpal S and Baveja U. Prevalence of HIV Infection among Tuberculosis patients in Delhi - A Sentinel Surveillance Study. Ind. J. Tub., 2000;47:21.
 14. Escott S, Nsuteby E, Walley J, Khan A. Management of TB in countries with high HIV prevalence. Afr Health. 2001;23:12–5.
 15. DeCock KM, Sero B, Coulibaly IM, Lucas SB. Tuberculosis and HIV infection in Sub-Saharan Africa. JAMA. 1992;278:1581–7.
 16. World Health Organization. Tuberculosis facts. 2007. [Accessed January 10, 2012]. <http://www.cdc.gov/hiv/resources/factsheets/hivtb.htm>.
 17. Namme LH, Marie-Solange D, Hugo Bertrand MN, Elvis T, Achu JH, Christopher K. Extrapulmonary tuberculosis and HIV coinfection in patients treated for tuberculosis at the Douala General Hospital in Cameroon. Ann Trop Med Public Health. 2013; 6:100-4.
 18. Leeds IL, Magee MJ, Kurbatova EV, del Rio C, Blumberg HM, Leonard MK, et al. Site of extrapulmonary tuberculosis is associated with HIV infection. Clin Infect Dis. 2012;55:75-81.
 19. Gonzalez OY, Adams G, Teeter LD, Bui TT, Musser JM, Graviss EA. Extra-pulmonary manifestations in a large metropolitan area with a low incidence of tuberculosis. Int J Tuberc Lung Dis. 2003;7:1178-85.

How to cite this article: Bhanoth BN, Dasari S, Narukurthi C. Prevalence of Pulmonary and Extrapulmonary Tuberculosis Infections among HIV Patients. Ann. Int. Med. Den. Res. 2018; 4(2):DT01-DT04.

Source of Support: Nil, **Conflict of Interest:** None declared