VOLUME - 9, ISSUE - 12, DECEMBER - 2020 • PRINT ISSN No. 2277 - 8160 • DOI : 10.36106/gjra

Original Research Paper

Microbiology

RETROSPECTIVE STUDY OF HIV-TB COINFECTION AMONG PATIENTS ATTENDING ICTC IN NAGPUR, CENTRAL INDIA

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ABSTRACT

BACKGROUND: Human immunodeficiency virus (HIV) associated tuberculosis (TB) remains a major global public health challenge .The risk of developing TB is estimated to be 26 to 31 times greater in people living with HIV than among those without HIV infection. It can be seen that the factors associated with the transmission and prognosis of both these infections are mainly the social and economic factors. **AIMS AND OBJECTIVE:** The present study is therefore undertaken to determine the prevalence of TB cases among HIV/AIDS patients attending ICTC, to study the sociodemographic determinants in HIV-TB coinfected patients and to determine the relationship between tuberculosis and the degree of immunosuppression as determined by CD4 count. **MATERIAL AND METHODS:** This was a retrospective study done at ICTC (Integrated Counselling and Testing Centre) in which the data over a period of 5 years from January 2013 to December 2017 was analyzed. **RESULTS:** Total 2033 patients were (2.8%) HIV positive and 224 (11%) patients were coinfected with TB, of which (48%) were of pulmonary TB and (52%) extra pulmonary TB. 69% of patients were male and 31% were females. 85.6% of the patients were in age group 35- 44 years, 86% were married, heterosexual route was the most common route of infection, most (89.3%) resided in urban areas. 40% of HIVTB coinfected patients had CD4 count below 200. **CONCLUSION:** The prevalence of tuberculosis in HIV positive patients in our region is 11%. Coinfection was seen to be associated with reduced CD4 counts, which could hasten the progression to AIDS. So grass root level awareness coupled with aggressive case finding may be key in preventing and early detection of the dual infections.

KEYWORDS : HIV, TB, HIV-TB Coinfection, CD4 Count

INTRODUCTION

Human immunodeficiency virus (HIV) associated tuberculosis (TB) remains a major global public health challenge. TB may occur at any stage of HIV disease and is frequently the first recognized presentation of underlying HIV infection [1]. The risk of developing TB is estimated to be 26 to 31 times greater in people living with HIV than among those without HIV infection [2].

In 2015, there were an estimated 10.4 million cases of tuberculosis disease globally, including 1.2 million (11%) among people living with HIV. Almost 60% of tuberculosis cases among people living with HIV were not diagnosed or treated, resulting in 3, 90, 000 tuberculosis-related deaths among people living with HIV in 2015 [3]. Tuberculosis can occur at any stage of HIV disease, and its manifestations depend largely on the level of immunosuppression [4].

HIV coinfection is the most powerful known risk factor for progression of M. tuberculosis infection to active disease, increasing the risk of latent TB reactivation 20-fold. Likewise, TB has been reported to exacerbate HIV infection[5]. It can be seen that the factors associated with the transmission and prognosis of both these infections are mainly the social and economic factors and the diseases share some common demographic factors too.[6]

The present study is therefore undertaken to determine the prevalence of TB cases among HIV/AIDS patients attending ICTC and to determine the relationship between tuberculosis and the degree of immunosuppression as determined by CD4 count in our region representing Central India.

AIMS AND OBJECTIVES

1. To determine the prevalence of tuberculosis in HIV positive patients.
2. To study the sociodemographic determinants in HIV-TB coinfected patients.
3. To study the correlation of CD4 count in HIV-TB coinfected patients

MATERIAL AND METHODS

This was a retrospective study, where review of patient's standardized record was done at ICTC (Integrated Counselling and Testing Centre) in a tertiary care hospital at Nagpur, Central India. Data over a period of 5 years from January 2013 to December 2017 was analyzed. Ethical clearance was duly obtained from the Institute Ethical Committee for conducting the study

RESULTS

Table 1: HIV-TB coinfection data from March 2013 to April 2018

Year	Total Test	HIV +VE	HIV -VE	HIV+ve TB+ve	HIV-ve TB+ve	HIV+ve TB-ve	HIV-ve TB-ve
2013	10336	447 (4.32%)	9889	68 (15.2%)	32	379	9857
2014	12019	447 (3.71%)	11572	43 (9.6%)	88	404	11157
2015	13380	409 (3%)	12971	44 (10.75%)	115	365	12856
2016	16497	381 (2.30%)	16116	42 (11%)	140	339	15976
2017	19409	349 (1.79%)	19060	27 (7.73%)	187	322	18873
Total	**71641**	**2033 (2.8%)**	**69428 (97%)**	**224 (11%)**	**562 (0.8%)**	**1809 (89%)**	**68717 (99%)**

Table No. 2: Age and Sex distribution of HIV-TB coinfected patients (n=224)

Age group in years	Male	Female	Total
15-24	10	4	14 (6%)
25-34	35	12	47 (21%)
35-44	64	27	91 (41%)
45-54	34	20	54 (24%)
>55	11	7	18 (8%)
Total	**154 (69%)**	**70 (31%)**	**224 (100%)**

Table No. 3: Marital status of HIV TB coinfected patients (n=224)

Marital Status	Numbers	Percentage (%)
Married	192	86
Unmarried	32	14

Table No. 4: Area wise distribution of HIV TB coinfected patients (n=224)

Area	No of Patients	Percentage (%)
Urban	182	81
Rural	42	19
Total	224	100

Table No. 5: Mode of transmission of HIV TB coinfected patients (n=224)

Modes of transmission	No of Patients	Percentage (%)
Heterosexual	201	90
Homosexual	1	0.4
Blood transfusion	2	0.8
IV Drug Abuse	0	0
Needle Stick	0	0
Route unknown	20	9
Total	224	100

Table No. 6: Occupation of HIV TB coinfected patients (n=224)

Occupation	No of Patients	Percentage (%)
Labourers	105	46
Drivers	34	15
Housewives	32	14
Farmers	9	4
Job	30	13
Miscellaneous*	14	7
Total	224	100

*Salesman, Painter, Electrician, Welder Carpenter, Police Shopkeeper, Barber, Students, Hawkers etc.

Table No. 7: Type of TB in HIV TB coinfected patients (n=224)

Type of Tuberculosis		No. of Patients	Percentage (%)
Pulmonary TB	Sputum Positive	78	58
	Sputum Negative	56	42
	Total	134	60
Extrapulmonary TB		90	40
Total		224	100

Table No. 8: CD4 counts in HIV TB coinfected and non coinfected HIV patients (n=2033)

CD4 Count	HIV TB coinfected patients	HIV positive TB negative patients
<200	**148(66%)**	**546(30%)**
201-500	54(24%)	872(48%)
>500	22(10%)	391(22%)
Total (2033)	**224 (100 %)**	**1809 (100%)**

DISCUSSION

This study aimed to determine the prevalence of tuberculosis in HIV positive patients. Total 71641 patients were tested in the ART center from January 2013 to December 2017. Of them, 2033 (2.8%) were HIV positive and 224 (11%) were HIV-TB coinfected. So the prevalence of HIV-TB coinfection was 11%. Study done by Mohan et al[6] Mohanty et al[7], Manjareka et al[8], reported prevalence of HIV TB coinfection from 10.15% to 12.3% which is in accordance with our findings. But other studies done by Chauhan T et al [9] (17.7%), Kamath R et al [10](18.86%), Mishra S et al (23.48%) [11], Rajeev shah (30%) [12], Chavan VR et al [13] (33.5%).

Our study shows higher prevalence of HIV-TB coinfection among males (69%), in the sexually active age group (35 to 44 years), being married (86%), working as laborers (46%), living in the urban setting (81%). These socio-demographic findings are comparable to other studies conducted in India by Patel et al[14] (),Agrawal et al[15] (),Gupta et al[16] (), and Ghiya et al[17].Interestingly, married (86%) individuals were seen to have a higher rate of coinfection and the heterosexual route of transmission was the most common indicating the need for intervention targeted at behavior modification Seifu et al [18]Indian National Statistics (NACO)[19] also reported that HIV-TB co-infected comprised 74% males and 89% in the age group of 15-44 years.

The occupation profile of our study population mainly comprised unskilled labourers (46%) followed by drivers (15%), and more than a tenth were unemployed, mostly due to the disease. Mohanty et al[7] and Ahmad Z et al [20] found similar occupation profile with unskilled labourer comprising the majority, and a large number of unemployed patients. Pulmonary TB cases were 64 % in which 58 %were sputum positive and 42% were sputum negative. Extrapulmonary TB cases were 36 %. These findings coincides with studies done by Kamath R. et al[10] (PTB 62% & EPTB 38%), Kumar P et al[21] (PTB 55% and EPTB 45%) whereas study done by Patel AK [14] reported 60% EPTB cases.

Present study shows that the patients with CD4 count less than 200 are at higher risk HIVTB coinfection which could translate into increased morbidity and progression of HIV to AIDS. Similar correlation was reported by other studies like Mohan et al,[6] Kavya et al,[22] and Vajpayee et al[23].

CONCLUSION

The prevalence of tuberculosis in HIV positive patients in our region is 11%. Coinfection was seen to be associated with reduced CD4 counts, which could hasten the progression to AIDS. It is imperative that physicians treating HIV-infected patients should aggressively identify those with M. tuberculosis in order to reduce the associated comorbidity resulting from the pairing of the infections, notwithstanding the imminent threat of multidrug-resistant and extremely drug-resistant TB on the rise. Creating grass root level awareness coupled with aggressive case finding in suspected high-risk population may be key in preventing and early detection of the dual infections.

REFERENCES

1. Padmapriyadarshini C.,Narendran G. and Swaminathan S.Dignosis and treatment of tuberculosis in HIV co-infected patients. Indian J Med Res134, December 2011, pp 850-865
2. Katay P, Ravi S., and Anke G. HIV-TB Dual infection among Patients Attending ART Centre in Vijaywada:A 3 Year Hospital Based Study. Sch.Acad.J.Biosci. 2016; 4(3A):207-2010
3. World Health Organization. Global TB report, 2016. Geneva, Switzerland: WHO; 2016
4. Swaminathan S., Padmapriyadarshini., Narendran G. and.HIV –Associated tuberculosis: Clinical Update. Clinical Infectious Diseases 2010; 50(10):1377-1386.
5. Powlowski A.,Jansson M.,Skold M. Tuberculosis and HIV Co-infection.PLoS Pathog 8(2);e1002464
6. Mohan A. M.V.,Tejaswi H.J. and Ragnath T.S.Socio-demographic profile of TB-HIV co-infected adults and its association with tuberculosis treatment outcome, in a South Indian city . Int J Community Med Public Health. 2016 Dec; 3(12):3498-3503
7. Mohanty K, Sundrani R, Nair S. HIVinfection in patients with respiratory disease. Indian J Tuberc. 1993; 405-12.
8. Manjareeka M, Nanda S. Prevalence of HIV infection among tuberculosis patients in Eastern India. ELSEVIER J of infect and pub.health (2013)6,358-362
9. Chauhan T., Bhardwaj A., Parashar A. A study of an association between tuberculosis and HIV among ICTC attendees at a tertiary care hospital of Shimla,Himachal Pradesh,India. IJHAS Jul-Sep 2012; 1(3):142-146
10. Kamath R, SharmaV, Pattanshetty S,Hegde M B, Chandrasekaran V. HIV-TB coinfection: Clinico-epidemiological determinants at an antiretroviral therapy center in Southern India. Lung India: official organ of Indian Chest

Society 2013; 30:302-306.
11. Mishra S., Rukadikar A. Prevalence of pulmonary tuberculosis in HIV positive individuals.Its sensitivity and association with CD4 count.Int.J.Curr. Microbiol.App.Sci2015;4(6):292-304
12. Shah R. Microbiological study of TB/HIV Co-infection in relation to CD4 Count. Int.J.Biol Med Res.2015; 6(1):4670-4676
13. Chavan VR.,Chaudhary V., Ahir P. Current scenario of Opportunististic and co-infection in HIV –infected individuals at a tertiary care hospital in Mumbai,India.IJMM(2015)339(1):78-83
14. Patel AK, Thakrar SJ, Ghanchi FD. Clinical and laboratory profile of patients with TB/HIV coinfection: A case series of 50 patients. Lung India. 2011; 28:93–96.
15. Agarwal U, Kumar A, Behera D. Profile of HIV associated tuberculosis at a tertiary institute in setting of free anti-retroviral therapy. J Assoc Physicians India. 2009; 57:685–90.
16. Gupta P, Rawat J, Sindhwani G, Prasad R, Talekar M. HIV sero-prevalence and tuberculosis in Uttarakhand. Indian J Tuberc. 2006; 53:96–100.
17. Ghiya R, Naik E, Beata C, Izurieta R, Marfatia Y. Clinico-epidemiological profile of HIV/TB coinfected patients in Vadodara, Gujarat. Indian J Sex Transm Dis. 2009; 30:10–15.
18. Seifu L. Socio-demographic and clinical profile of AIDS patients in Jimma referral Hospital, Southwest Ethiopia. Ethiop J Health Dev. 2004; 18:203–7.
19. Global Tuberculosis Control 2015" [Internet].Available from: http://www.who.int/tb/publications/global_report.
20. Ahmad Z, Bhargava R, Pandey D, Sharma K. HIVinfection seroprevalence in tuberculosis patients. Ind J Tub. 2003; 50151.
21. Kumar P,Sharma N.,Sharma N C. and Patnaik S.Indian J Chest Dis Allied Sci.Jul-Sep 2002;44(3):159-63.
22. Kavya S, Anuradha K, Venkatesha D, et al., CD4 count evaluation in HIV-TB co-infection before and after antitubercular treatment. Int J of Res in Med Sciences, 2017; 2(3): 1031-4.
23. Vajpayee M, Kanswal S, Seth P, Wig N, Pandey RM. Tuberculosis infections in HIV-infected Indian Patients. AIDS Patient Care STDS. 2004; 18:209–13.