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RESEARCH ARTICLE

A STUDY ON HIV-TUBERCULOSIS CO-INFECTION AND CORRELATION WITH CD4+ T LYMPHOCYTE LE-VELS AT AGARTALA GOVERNMENT MEDICAL COLLEGE

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ABSTRACT

Background: Human Immunodeficiency Virus (HIV) and Tuberculosis (TB) co-infection is a lamentable medical phenomenon and CD4 count among them is a surrogate marker of their immune status.**Objectives**: 1. To study the epidemiological profile of HIV –TB co-infected subjects. 2. To study the CD4 count status among HIV, TB and HIV-TB co-infected patients both at diagnosis (pre treatment) and after initiation of treatment. **Methodology**: This was a hospital based comparative cross-sectional study conducted at Agartala Government Medical College between May & June 2013, among 60 patients in each group of HIV, TB and HIV-TB co-infected patients. **Results**: The study revealed that the HIV-TB co infection and HIV infection was more prevalent among males and in the age group of . Majority of the HIV-TB co-infected patients had CD4 count less than 200 cells/µl at the time of diagnosis and there has been a significant rise in CD4 count level with the initiation of treatment in all the three groups of HIV +ve patients, HIV-TB co-infected patients, and TB patients (P value <0.00). **Conclusion**: Sustained efforts are needed to detect and treat tuberculosis among HIV infected patients to curb the dual menace of HIV-TB epidemic.

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INTRODUCTION

Concomitant Human Immunodeficiency Virus (HIV) infection and Tuberculosis (TB) is a lamentable medical phenomenon with dreadful social and economic impact across the globe, and has become a major public health challenge worldwide. According to WHO, at least one third of 35.3 million people living with HIV worldwide are infected with latent TB. Globally about 14.8% of patients with TB are co infected with HIV. TB is the leading cause of death among people living with HIV, accounting for one in five HIV-related deaths (http://www.who.int/tb/challenges/hiv. Accessed 26 June 2014.). In India, it is estimated that 60-70% of HIV-positive persons will develop tuberculosis in their lifetime (Swaminathan *et al*., 2000). Approximately, 50% of adult Indian population is infected with *Mycobacterium tuberculosis*, and the spread of HIV infection could lead to a potentially explosive increase in the number of cases of tuberculosis (Swaminathan *et al*., 2000).

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CD4 count is considered as the surrogate marker of immune status of an individual. CD4 counts are critical in the control of infection with Mycobacterium tuberculosis, as quantitative and qualitative deficiency of these effecter cells in HIVinfected individuals increases the rate of both primary and reactivation of disease (Niraula *et al*., 2013). Estimation of CD4 count may mark the level of immuno competence, commonly used for staging of disease, determine the risk of opportunistic infections, assess prognosis, and guide decisions regarding antiretroviral therapy (ART) in HIV infected persons. But there is paucity of informationregarding the CD4 count status among HIV, TB and HIV-TB co-infected patients. Hence the present study was conducted with the objective to study the epidemiological profile of HIV –TB co-infected subjects and to study the CD4 count status among HIV, TB and HIV-TB co-infected patients both at diagnosis (pre treatment) and after initiation treatment.

MATERIALS AND METHODS

This was a hospital based comparative cross-sectional study conducted at Agartala Government Medical College between May and June, 2013.

The study included confirmed cases of HIV-TB co- infection, confirmed HIV infection, and diagnosed cases of tuberculosis (both pulmonary and extra pulmonary cases of tuberculosis were taken into consideration). However Subjects tested positive for HIV infection but having an evidence of opportunistic infection other than tuberculosis or those who did not give consent to participate in the study were excluded. The sample size was calculated based on the observation that 64% subjects[4] had CD4 T lymphocyte counts less than 200 cells/µl and the sample size was calculated to be 60 for each group considering a relative precision of 20%. Hence, 180 patients were included in the study. The study subjects were selected from ICTC (Integrated Counselling and Testing Centre) and SRL (State referral laboratory) of AGMC and GBP hospital and Designated Microscopy Centre of AGMC. An equal number patients with HIV seropositivity without tuberculosis and the diagnosed subjects of only tuberculosis without HIV infection were also included in the study. After taking the written consent from all the study subjects, their demographic profile and clinical presentation were recorded and CD4 count was estimated. After taking consent, 3 ml blood was collected from each study subject by sterile disposable syringe in Potassium-EDTA [BD vacutainer tubes] to estimate the CD4 count. The CD4 count of the study subjects were estimated following BD FACS Count System using the BD FACS Count CD4/CD3 Reagent Kit. The CD4 estimation was again repeated after 1 month of start of treatment to get the CD4 status following initiation of treatment.

The study was approved by the institutional ethical committee of Agartala Govt. Medical College. Statistical analysis was done by using SPSS. The study was conducted under STS project of ICMR and was funded by ICMR.

RESULTS

The present study included 180 respondents, with 60 respondents belonging to each group of confirmed cases of HIV-TB co- infection, confirmed HIV infection, and diagnosed cases of tuberculosis. Table1 shows that that 93.30% of HIV-TB co-infected patients were male whereas 71.70% of the HIV +ve patients were male. Majority of the HIV-TB co-infected patients belonged to the age group of 31 to 45 years (56.70%) followed by 16-30 years (31.70%). Similarly majority of the HIV infected patients belonged to the age group of 31 to 45 years (48.30%) followed by 16-30 years (31.70%). However majority of the patients who were suffering from tuberculosis belonged to the age group of 46 to 60 years (48.30%). HIV- TB co-infection was found to be more prevalent among Govt. employees (20%) and vehicle drivers (16.70%).

Likewise HIV infection was found to be more prevalent among Govt. employees (21.70%) followed by housewives (18.30%). Table 2 shows that 40% HIV TB co infected patients and 48.33% HIV positive patients had CD4 levels in the range of 100-200 cells/mm^3.

Table 1. Epidemiological profile of the study participants

		HIV-TB coinfected	HIV seropositive only	Diagnosed with only TB
Sex	Male	56 (93.30%)	43 (71.70%)	49 (81.70%)
	Female	4 (6.70%)	17 (28.30%)	11 (18.30%)
Age group	0-15 yrs	0 (0%)	5 (8.3%)	0 (0%)
	16-30 yrs	19 (31.70%)	19 (31.70%)	7 (11.70%)
	31-45 yrs	34 (56.70%)	29 (48.30%)	21 (35.0%)
	46-60 yrs	6 (10.00%)	7 (11.70%)	29 (48.30%)
	>60 yrs	1 (1.70%)	0 (0%)	3 (5.00%)
Occupation	Unemployed	0 (0%)	3 (5.00%)	0 (0%)
	Housewife	3 (5.00%)	11 (18.30%)	9 (15.00%)
	Teacher	7 (11.70%)	3 (5.00%)	5 (8.30%)
	Govt. employee	12 (20.00%)	13 (21.70%)	8 (13.30%)
	Vehicle driver	10 (16.70%)	8 (13.30%)	9 (15.00%)
	Farmer	8 (13.3%)	6 (10.0%)	6 (10.0%)
	Labourer	9 (15.00%)	4 (6.70%)	7 (11.70%)
	Businessman	3 (5.00%)	5 (8.30%)	6 (10.00%)
	Retired	1 (1.70%)	1 (1.70%)	7 (11.70%)
	School going	1 (1.70%)	5 (8.30%)	1 (3.30%)
	Army	6 (10.00%)	1 (1.70%)	2 (3.30%)

Table 2. Pre treatment CD4 count status among the HIV-TB co-infected patients, HIV +ve patients, and TB patients

Initial CD4 count (cells/µl)	HIV-TB co-infected	HIV +ve	TB
0-100	13 (21.67%)	6 (10.00%)	0
100-200	24 (40.00%)	29 (48.33%)	0
200-300	19 (31.67%)	22 (36.67%)	1 (1.67%)
300-400	1 (1.67%)	3 (5.00%)	9 (15.00%)
400-500	2 (3.33%)	0	10 (16.67%)
>500	1 (1.67%)	0	40 (66.67%)

Table 3: Pre treatment and under treatment CD4 count status among the HIV +ve patients, HIV-TB co-infected patients, and TB patients

	Pretreatment CD4 count		Under treatment CD4 count (After 1 month of initiation of treatment)		P value using paired t-test
	Mean	SD	Mean	SD	
HIV +ve patients	181.93	71.20	341.07	162.46	0.000
HIV-TB co-infected patients	176.25	100.05	288.68	169.25	0.000
TB patients	574.83	151.57	594.13	143.49	0.002

Majority of the HIV-TB co-infected patients, and HIV +ve patients had a CD4 level of ≤300, whereas 66.67% of the Tuberculosis patients had a CD4 level of >500 cells/µl. Table 3 shows that with the initiation of treatment there has been a significant rise in CD4 count level in all the three groups of HIV +ve patients, HIV-TB co-infected patients, and TB patients.

DISCUSSION

The present study was conducted among 60 HIV +ve patients, 60 HIV-TB co-infected patients, and 60 TB patients. The present study showed that 93.30% of HIV-TB co-infected patients were male whereas 71.70% of the HIV +ve patients were male. Similar finding was obtained from a study conducted in Bundelkhand, Uttar Pradesh by Jaiswal *et al.* (2012) which showed that the HIV-TB co-infection was more common among males. Again, a study conducted by Bhaskaran *et al*. (2015) showed that 69.30% of the co-infected patients were males. Hence, the study findings were consistent with studies conducted in various parts of India. In this aspect, more research is necessary to understand the mechanism as to why males with HIV sero positivity are more prone to get affected by TB than females. The present study showed that Majority of the HIV-TB co-infected patients and HIV infected patients belonged to the age group of 31 to 45 years followed by 16-30 years. However majority of the patients who were suffering from tuberculosis belonged to the age group of 46 to 60 years. Similar finding was obtained from the study conducted by a study conducted by Bhaskaran *et al*. (2015) where 56.80% co-infected patients were less than 40 years of age. Again, the study conducted by Jaiswal RK *et al*. (2012) showed that majority of the HIV-TB co-infected patients belonged to the age group of 26 to 45 years. Therefore, the present study is consistent with the results obtained from other studies and showed that the economically productive age group are worst affected with the co-infection.

The present study showed that majority of the HIV-TB co infected patients and HIV positive patients had CD4 levels in the range of 100-200 cells/µl at the time of diagnosis. Similar finding was obtained from the study conducted by Kavya S *et al*[7] which showed that the mean CD4 counts at the time of diagnosis in HIV-TB co infected was <200 cells/µl. Again, in a study conducted by Ketki at al. (2015) in a tertiary care hospital in Delhi, the mean CD4 counts in patients with PTB was 241 cells/ µl and EPTB 224 cells/ µl before initiation of Anti tubercular treatment and there was statistically significant increase in CD4 count after ATT in PTB and EPTB. Similar finding was obtained in the present study where with the initiation of treatment there has been a significant rise in CD4 count level in both the HIV +ve patients and the HIV-TB co-infected patients.

Again, in the study conducted by Kavya *et al*. (2014) it was found that there was a significant difference in CD4 count before and after ATT with an increase in CD4 count.

Conclusion

The present study revealed that the HIV-TB co infection and HIV infection was more prevalent among males and in the economically productive age group. Majority of the HIV-TB co-infected patients had CD4 count less than 200 cells/µl at the time of diagnosis and there has been a significant rise in CD4 count level with the initiation of treatment in all the three groups of HIV +ve patients, HIV-TB co-infected patients, and TB patients. Sustained efforts are needed to detect and treat tuberculosis among HIV infected patients to curb the dual menace of HIV-TB epidemic.

REFERENCES

Bhaskaran U, Holla R, Darshan B B, Arjun B Y, Thapar R, Mithra P, Kumar N, Kulkarni V, Kumar, A. 2015. Clinico epidemiological profile of HIV-TB co-infected patients in Coastal South India. Manipal Journal of Nursing and Health Sciences. January; 1(1): 9-13.

Jaiswal RK., Srivastav S, Mahajan H. 2012. Socio demographic profile of TB-HIV coinfected patients in Bundelkhand Region, Uttar-Pradesh. National Journal Of Medical Research. Apr – June 2 (2): 149-151

Kavya S, Anuradha K, Venkatesha D. 2014. CD4 count evaluation in HIV-TB co infection before and after anti-tubercular treatment. *Int J Res Med Sci.,* Aug;2(3):1031-1034.

Ketki J, Malhotra S, Sharma S, Hans C. 2015. CD4 cell counts recovery in HIV/TB co-infected patients in a tertiary care Hospital. *Sch. Acad. J. Biosci.,* 3(6):518-521.

Marchie TT, Akhiobe OT. Comparing the level of CD4 T lymphocytes, to pulmonary features of tuberculosis in HIV patients in a local hospital.

Niraula SR, Barnawal SP, Agrahari AK, Bista N, Yadav DK, Jha N, *et al*. 2013. Prevalence and CD4 cell count pattern of TB co-infection among HIV infected individuals in Nepal. SAARC J Tuber Lung Dis HIV/AIDS. X(1):27-36.

Swaminathan S, Ramachandran R, Bhaskar R, Ramanathan U, Prabhakar R, Datta M, *et al*. 2000. Development of tuberculosis in HIV infected individuals in India. *Int J Tuberc Lung Dis.,* 4:839–44.

World Health Organization. 2014. Fact sheet: TB/HIV, 2013. Available at: http://www.who.int/tb/challenges/hiv. Accessed 26 June.

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