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HIV and Tuberculosis: the impact goes beyond those infected with HIV/AIDS

(Original Article)

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Abstract

Background & objectives: *Tuberculosis is said to be one of the commonest opportunistic infection in patients with HIV/ AIDS. In this study the clinical profile of tuberculosis in patient with HIV infection /AIDS and to study the pulmonary and extra pulmonary tuberculosis involvement and clinical profile in HIV infection/AIDS subjects.*

Methods: *HIV sero-positive patients with symptoms suggestive of pulmonary and extra pulmonary tuberculosis, attending the Outpatient Departments and indoor at Department of Medicine, Govt. Medical College, Kota.*

Results: *fever (97.1%), weight loss (85.7%) cough (80%), pallor (68.5%) mouth ulcer (41.4%) and lymphadenopathy (33%). Incidence of both Pulmonary and extra pulmonary tuberculosis were almost same (45.71%).Among extra pulmonary tuberculosis, abdominal TB was (18.57%). Infiltrative lesions were (54.28%) on chest x-ray. Sputum positivity was seen only in 31.25% of patients. Mean CD4 counts was 133.95+141.89 cells/ µl. Most of the patients (78.57%) had CD4 counts <200 cells /µl. 77% of sputum negative TB, 88.32% of extra pulmonary TB had CD4 cell count <200 cells/ µl. and 100% of disseminated TB had CD4 cell count <50 cells/ µl.90% Sputum positive cases were seen with CD4 cell count >50 cells/µl.*

Conclusion- *most common manifestation of TB in HIV infected patients were sputum negative pulmonary TB. A high proportion of cases with extra pulmonary TB were also found. There is an urgent need to strengthen the information, education and expand the ART services to meet the requirement of early testing and treatment initiation in patients co-infected with HIV-TB.*

Keywards- *HIV/TB, AIDS, Tuberculosis, Extrapulmonary TB.*

Introduction

Co-infection of Human Immunodeficiency Virus (HIV) and tuberculosis (TB) is considered to be one of the emerging medical conditions responsible for huge social and economic burden globally. Tuberculosis is a leading cause of

mortality among people living with HIV/AIDS. Tuberculosis infection with HIV weakens the immune system and activates latent tuberculosis infection[1].

In countries with high prevalence of TB as well as HIV, tuberculosis is a very common presentation of AIDS and, in most cases, it is the earliest manifestation. Clinical and surveillance data show that in Asia, TB is the most important life-threatening opportunistic disease associated with HIV, For example, in Thailand, 60% of AIDS patients seen in a Bangkok hospital between 1985 and 1991 had pulmonary tuberculosis 25 and TB is the most common reported cause of hospitalization and death among AIDS patients in Thailand. Surveillance data from India and Nepal show that 83% and 56% of AIDS patients had tuberculosis.[2]

The World Health Organization (WHO) estimated 8.8 million incident cases of TB globally in 2010; with 12-14 per cent of cases among people with HIV [3]. India accounted for maximum number of incident cases of TB (2-2.5 million) worldwide, with an estimated 5.0 per cent (3.3-7.1%) having HIV co-infection[3]. Despite the high burden of disease, there is a paucity of data from India on response to anti-tuberculosis treatment (ATT) in patients with HIV-TB co-infection[4-6]. Information on the pattern of TB, the outcome of ATT and the associated factors will help in planning interventions to improve outcomes in this patients.[15]

In India, human immunodeficiency virus (HIV) testing is performed as a voluntary test or as a diagnostic procedure in symptomatic individuals[7]. HIV testing is a part of screening procedure in antenatal clinics as a mode of prevention of parent to child transmission (PPTCT). It is also done in all tuberculosis (TB) patients due to the strong association between HIV and TB[8]. In spite of these various HIV testing opportunities, earlier a majority of infected individuals became aware of their status only after they developed opportunistic infections in the late stages[9, 10].

In present study was carried out to assess the clinical symptoms and signs of TB (Pulmonary Tuberculosis and Extra-pulmonary Tuberculosis) are differ from non-HIV infected patients. There are few studies of clinical profile of Tuberculosis in HIV infected patients. Present work was designed to study the clinical profile (signs, symptoms, laboratory investigations), comparison of various studies of HIV infected and make a proper clinical diagnosis.

Material & Methods

HIV sero-positive patients with symptoms suggestive of pulmonary and extra pulmonary tuberculosis attending the Outpatient Departments and indoor at Department of Medicine, Govt. Medical College, Kota from may 2012 to April 2014. Total seventy patients were selected randomly in this study. This is a type of prospective study.

A written informed consent was taken from each patients included in the study after thorough counseling. All cases were selected, taking into consideration the inclusion & exclusion criteria. Inclusion criteria were Subject having HIV serology positive by ELISA test. Patients having pulmonary involvement with sputum positive acid fast bacilli and/ or supported by MT test. Patients were having extra pulmonary involvement with positive acid fast bacilli other than sputum viz. lymph node, CSF, Pleural fluid, ascitic fluid. Extra pulmonary involvement with negative acid fast bacilli but other tubercular marker positive (ADA, TB PCR) and/ or supported by MT test. Exclusion criteria were any antecedent history of hypertension, diabetes mellitus, heart disease, chronic renal disease and Ischemic heart disease.

If they were fulfilled the inclusion criteria. The patients had to be more than 15 year old male and female. A detailed history including previous anti-tuberculosis therapy, addictions & high-risk sexual behavior was elicited. A general clinical examination was performed. Baseline investigations such as chest X-ray, two sputum specimens for AFB smear, culture and drug

sensitivity and blood examination were performed as detailed below. All the positive cultures were subjected to drug susceptibility tests using standard methods. HIV screening was performed using the Tridot Rapid Test; all positive results were confirmed using Comb Aids Rapid test and also by ELISA. Hemoglobin, total and differential leukocyte cell counts, blood sugar, blood urea, serum creatinine, serum uric acid and liver function tests were performed and ultrasound abdomen. The CD4, CD8 cell counts and CD4/CD8 ratio were determined using flow cytometry (Simultest-lMK Lymphocyte kit).Tuberculin skin (Mantoux) test,Lymph nodes, FNAC and biopsy, Pleural and ascitic fluid analysis and TB PCR.CECT chest & abdomen was done in needy patients. All infected TB/HIV patients were send to DOTS center for anti tubercular treatment in respected category.

Statistical analysis was performed with the statistical package for the social science system version SPSS 17. Continuous variables are presented as mean ± SD, and categorical variables are presented as absolute numbers and percentage.

Results

In this study, seventy HIV positive patients with Tuberculosis were studied, of this 54 were males and 16 were females. In this study maximum number of patients were in 30-39 years age group in which 25 were Male and 8 were females (Table 1) The mean age was 36.44±9.70 (37.2± 9.75 for males and 33.87±9.42 for females).Common occupation among the study group was drivers (28.5%), followed by Laborers & housewives (20%), farmers (11.5%), Shopkeepers/ businessmen's (10%), govt. servant (7.15%), others (2.85%) (Table 2).

In this study, common constitutional symptoms reported were fever (97.1%), weight loss(85.7%).Common respiratory symptoms reported were cough(80%), breathlessness (65.7%) and chest discomfort (45.7%).Common gastrointestinal symptoms reported were anorexia (32%), abdominal distention (18.5%) and altered sensorium 8.57 %. Physical examination revealed that pallor in 68.5%, icterus in 12.8%, lymphadenopathy in 10% and mouth ulcer in 41.4% (Table 3)

In 70 HIV patients 32(45.71%) had only pulmonary TB and only extra pulmonary TB in 32(45.7%) in which abdominal TB was seen in 13(18.57%), tubercular pleural effusion in 10(14.28%), tubercular lymphadenopathy in 6(8.57%) & TB meningitis in 3(4.28%) and disseminated TB in 6(8.57%) (Table 4)

Out of 35 patients with abnormal X-rays infiltrative lesions were seen in 19(54.28%), fibrocavitory lesions seen in 11(34.11%) and miliary mottling 5(14.28%) (Table 5).In this study CD4 >200 cells was seen in 15(21.5%), 50-200 cells in 32(45.7%) and <50 in 23(32.8%) of patients. The mean CD4 count in this study was133.95± 141.89 ,mean CD4 among males was 121.57± 126.60 and females was 175.75± 183.22 (table 6)

In this study sputum negative PTB was seen in 27.27% of <50 CD4 counts patients, 50% of 50-200 cells CD4 counts patients and 22.72% of >200 cells CD4 counts patients. Sputum positive PTB was seen in 10% of <50 CD4 counts patients, 40% of 50-200 CD4 counts patients and 50% of >200 CD4 counts patients. Disseminated TB was seen in 100 %(all) of <50 CD4 counts patients. EPTB was present in 31.21% of <50 CD4 counts patients, 53.12% of 50-200 CD4 counts patients and 15.6% of >200 CD4 counts patients. Thus 77% of sputum negative pulmonary TB and 88.32% of extra pulmonary TB was seen in CD4 <200 cells counts patients (Table 7)

Table 1: Demographic characteristics of the study participants

Age Group (Years)	Male		Female		Total	
	No	%	No	%	No	%
<21	3	5.5	1	6.2	4	5.7
21-29	8	14.8	2	12.5	10	14.3
30-39	25	46.3	8	50	33	47.1
40-49	10	18.5	4	25	14	20
50-59	6	11.1	1	6.2	7	10
60+	2	3.8	0	0	2	2.9
Total	54	100	16	100	70	100

Table 2: Distribution of study population by occupation

Occupation	No. of patients	Percentage
Farmer	8	11.5%
Driver	20	28.5%
Labour	14	20%
Shopkeeper/ Business man	7	10%
House wife	14	20%
Government Servant	5	7.15%
Others	2	2.85%
Total	70	100%

Table 3: Distribution of symptoms & signs in study population

Symptoms	No. of patients	Percentage
Fever	68	97.1%
Weight Loss	60	85.7%
Cough	56	80%
Shortness of Breathing	46	65.7%
Chest discomfort	32	45.7%
Altered Sensorium	6	8.57%
Abdominal Distension	13	18.5%
Anorexia	23	32%
Signs		
Mouth Ulcer	29	41.1%
Pallor	48	68.5%
Icterus	9	12.8%
Lymphadenopathy	7	10%

Table 4: Distribution by Clinical Manifestation of Tuberculosis

	No. of Patients	Percentage
Pulmonary Tuberculosis	32	45.71%
Extrapulmonary tuberculosis	32	45.71%
- Tubercular Lymphadenopathy	6	8.57%
- Tubercular Meningitis	3	4.28%
- Abdominal tuberculosis	13	18.57%
-Tubercular Pleural Effusion	10	14.28%
Disseminated tuberculosis	6	8.57%
Total	70	100%

Table 5: Distribution according to Chest X-ray Findings

Chest X-ray Findings	No. of patients	Percentage
Infiltrative	19	54.28%
Fibro cavitatory	11	31.4%
Miliary mottling	5	14.28%

Table 6: Distribution of study population according to CD4 Counts

CD4 Counts (cells)	No. of patients	Percentage
> 200	15	21.5%
50-200	32	45.7%
< 50	23	32.8%

Table 7: Relation between CD4 Range and Clinical manifestations of TB

CD4 Count	Sputum Negative PTB	Sputum Positive PTB	Disseminated TB	EPTB	Total
< 50	6 (27.27%)	1 (10 %)	6 (100%)	10 (31.21%)	23 (32.85%)
50-200	11 (50%)	4 (40%)	0 (0%)	17 (53.12%)	32 (45.7%)
> 200	5 (22.72%)	5 (50%)	0 (0%)	5 (15.6%)	15 (21.5%)
Total	22 (100%)	10 (100%)	6 (100%)	32 (100%)	70 (100%)

Discussion

Present study carried out in 70 patients at Government Medical College and Associated Group of Hospitals, Kota.

In our study, out of 70 patients, 77% of patients were males and 22.9% females. Other study done by Deivanayagam CN et al [11] in which 79.25% were males and rest 20.75% were females. NACO[7] National Statistics also show s similar distribution of subjects of which 74% were males and 26% females. This observation is similar to study by Zuber Ahmad et al[12] where 84.6% were males and 15.4% were females.

In our study most of the people (47.1%) were in the 30-39 age groups, with mean age of males being 37.2 years and mean age of females 33.85 years. This is comparable to the study done by Deivanayagam CN et al[11] in which 74.94% of patients belonged to 21-40 years; Praveen Kumar et al[13] observed 69% of patients belonged to 21-40 years. National Statistics reported to NACO[7] shows 89% of cases were in the age group of 15-44 years. This age reflects the sexually active age group which is commonly affected by the disease

In our study group most common occupation were unskilled drivers (28.5%), laborers (20%), and farmers (11.5%), which indicate the co-infection affected people of low socio-economic status. Praveen Kumar et al[13] found a similar occupation profile with 38% manual laborers, 21.4% driver, 11.9% drivers and 19% other while in study done by Anand K.Patel et al[14]30% were farmer 16% driver and 22% were manual laborers by occupation. so we can conclude that economical status of study groups were similar. We can conclude that tuberculosis is generally occurring in low socioeconomic population because of poor hygiene and diet and over crowed living condition.

In our study commonest presenting symptoms were fever 97.1% followed by weight loss 85.9%, cough 80% , breathlessness 65.7% and anorexia 32% .in study conducted by Anand K Patel et al[14] most common symptoms was fever 86% respectively, while in study by Deivanayagam et al[11] and Zuber Ahmed et al[12] cough was the commonest symptoms 85.43% and 97% respectively because in these studies pulmonary TB was more than extra pulmonary TB. Weight loss was the second most common presenting symptoms in our study (85.7%). Zuber Ahmed et al[12]and Anand K Patel et al[14] also observed weight loss in 97% and 78% patients respectively where as Deivanayagam et al[11] observed weight loss in 49.69% .

In our study Sputum positive for AFB in HIV patients with pulmonary TB and disseminated TB was present in 28.57%. Zuber Ahmed et al[12] observed 36.54% of Sputum positive cases. It is probably because in our study number of fibrocavitory lesions were 31.4% and in Zuber Ahmed et al[12] fibrocavitory lesions were 42.69%. In other studies Praveen kumar et al[13] and Anand K. Patel et al[14] observed 21.4% and 25.58% of patients with in Sputum positivity respectively.

In our study in X-rays chest, infitrative lesions were seen in 19(54.28%), fibrocavitory lesions seen in 11(34.11%) and miliary mottling 5(14.28%). X-rays chest findings was observed in study conducted by Zuber Ahmed et al[12] observed infiltrative lesions in 65 (62.5%), fibrocavitory lesions in 34(32.69%) and miliary mottling in 5 (4.81%).

In our study patients with pulmonary tuberculosis and extra pulmonary tuberculosis were almost equal 32 (45.71%), which is same as in studies of Anand K patel et al[14] observed pulmonary tuberculosis in 61.54% patients. It is probably because; these studies have larger number of patients. We also observed disseminated TB in 8.57% of patients which is same as Anand K patel et al[14].

In our study among Extra pulmonary TB, Abdominal TB was seen in 18.57%, Tubercular Pleural effusion in 14.2%, Tubercular lymphadenopathy in 8.57%, and Tuberculosis meningitis in 4.28%. Similar Extra pulmonary TB was observed in study conducted by Praveen kumar et al[13] observed Abdominal TB 14.8%, Tubercular Pleural effusion 9.5%, Tubercular

lymphadenopathy 11.9%, and Tuberculosis meningitis 7.2%. Anand K patel et al[14] observed Abdominal TB 12%, Tubercular Pleural effusion 6%, Tubercular lymphadenopathy 20%, and Tuberculosis meningitis in 8% of cases.

Conclusion

In this study, most common manifestation of TB in HIV infected patients were sputum negative pulmonary TB. A high proportion of cases with extra pulmonary TB were also found. There is an urgent need to strengthen the information, education and expand the ART services to meet the requirement of early testing and treatment initiation in patients co-infected with HIV-TB.

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