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INCIDENCE OF TUBERCULOSIS CO INFECTION IN HIV/AIDS PATIENTS - OBSERVATIONAL STUDY FROM ART CENTRE, SVRR GG HOSPITAL, TIRUPATHI.

General Medicine

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ABSTRACT

Back ground: TB (tuberculosis) and HIV (Human Immuno Deficiency Virus) act in deadly synergy. HIV infection increases the risk of TB infection on exposure, progressing from latent infection to active TB, increasing the risk of death if not timely treated and increasing the risk of recurrence even if successfully treated.

Objective: The present study was a retrospective observational hospital based study conducted to study the relative frequency of Tuberculosis among HIV Seropositive patients attending ART centre, SVRR GG Hospital, Tirupathi.

Materials and Methods:

INCLUSION CRITERIA: Patients above the age of 12 years, both male and female patients, positive for HIV attending ART centre, SVRRGG Hospital, Tirupathi and patients in Medical wards and TBCD wards were included in the study. All the patients were subjected to routine and specific investigations and thorough clinical examination. Data collected was analyzed. Results: Out of 168 patients, 74 (44%) were determined to be infected with TB. 49(66.2%) were males, and 25 (33.8%) cases were females, with male to female ratio 2:1. Most of patients (52.7%) fell in the age group of 31-40. The mean age for males was 36.2 and 35.2 for females. Among all the patients Sputum AFB (Acid Fast Bacillus) positive pulmonary TB was seen in19 (25.7%), Sputum AFB negative pulmonary TB in 21 (28.4%). In present study the mean CD4 count was 237.27 to 167.81 cells/ micro L.

Conclusions: Present study concludes that male sex and patients of age group 30-40 years were the commonly affected population. All forms of tuberculosis were common with CD4 counts ranging from 237.27 to 167.81 cells/mm3.

KEYWORDS

HIV, Tuberculosis, Co infection, CD4 count.

Introduction:

Co-infection with HIV and TB accelerates the course of both infections. HIV viremia is higher in persons with active tuberculosis than those with similar CD4 counts as is HIV related mortality. Whereas the lifetime risk of reactivation of latent tuberculosis infection (LTBI) is 5 to 10 percent in HIV-negative persons, it jumps to 7 to 10 percent annually in HIV-positive persons. Tuberculosis is seen at any stage of HIV infection. The frequency and clinical presentation of tuberculosis in HIV-infected patients depends on the degree of immunosuppression. In patients with relatively preserved higher CD4 cell counts (greater than 350 cells/mm3), co-infection with TB tends to look like that seen in those without HIV (upper lobe predominance, cavitary disease and a low risk of extrapulmonary presentations. (1).

Worldwide, approximately one-third of all AIDS-related deaths are associated with TB, and TB is the primary cause of death for 10-15% of patients with HIV infection. Approximately 60-80% of HIV-infected patients with TB have pulmonary disease, and 30-40% has extra pulmonary disease.(2).As per the WHO Global TB report 2011, there were an estimated 8.8 million incident cases of TB (range 8.5 million – 9.2 million) globally in 2010, 1.1 million deaths (range, 0.9 million – 1.2 million) among HIV – Negative cases of TB and an additional 0.35 million (350,000) deaths (range, 0.32 million – 0.39 million) among people who are HIV – Positive.There were 34 million people living with HIV with 2.6 million becoming newly infected with HIV of the 1.8 million HIV related deaths in 2010, 350,000 were due to TB. Global estimation of burden of HIV positive incident TB cases is 10,00,000 (11,00,000-12,00,000) while the estimates of HIV positive incident TB cases in India is 75,000 (1,10,000-1,60,000). As per WHO's global TB report of 2011, HIV prevalence amongst incident TB cases is estimated to be 3.3% (5%- 7.1%). (3)

Surveillance data and clinical observations suggest that TB is the most common life-threatening opportunistic infection in patients with HIV infection and AIDS. It has been reported that 25 to 65 percent patients with HIV infection and AIDS had tuberculosis of any organ (4, 5).

HIV fuels the spread of MDR TB – HIV infection lead to high default rates because of adverse drug reactions. People with HIV who have been cured of TB may be more at risk of developing TB again may be re infection or relapse. HIV associated TB poses difficult clinical challenges. Patients are relatively more like to be sputum negative. More over the pathogenesis of both tuberculosis infection and the disease relates directly to cell mediated immunity especially CD4+T lymphocytes. As HIV infection progresses CD4+lymphocytes decline in number and function. The immune system is, therefore less able to prevent the growth and local spread of M.tuberculosis. As a result, disseminated and extra pulmonary disease is more commonly seen. (6,7,8,9,10,11)

Materials and Methods:

The present study was a retrospective observational hospital based study, Patients above the age of 12 years, both male and female patients, positive for HIV antibodies by ELISA methods attending ART centre, SVRRGG Hospital, Tirupathi and patients in Medical wards and TBCD wards were included in the study. All the patients were subjected to routine and specific investigations like Hemoglobin (Hb), Total Leucocytes count, Differential leucocyte count, Erythrocyte sedimentation rate (ESR).Chest X – ray PA or AP view, Sputum for - Ziehl-Neelson method of staining. Lesional cytology and / or Biopsy of Tissues. Fine needle aspiration (FNAC) cytology of enlarged and clinically palpable lymph nodes was executed and specimens were processed with hemotoxyllin and eosin (H and E), Giemsa and Zehil – Neelson staining.CT scan brain when Intra cranial pathology is suspected. Data collected on all HIV – TB co infected patients was analyzed. Patients were treated based on RNTCP and NACO guidelines. Anti-tuberculosis therapy (ATT) was administered according to the directly observed treatment-short course (DOTS) regimen. Institution of highly active anti-retroviral therapy (HAART) was done 10-14 days after institution of ATT in patients with CD4 counts less than 200 cells/mm3. In patients with CD4 counts over 200 cells/mm3 HAART was commenced 2-8 weeks after the institution of ATT.

Results:

Out of 168 patients, 74 (44%) were determined to be infected with TB. 49(66.2%) were males, and 25 (33.8%) cases were females, with male to female ratio 2:1. Most of patients (52.7%) fell in the age group of 31-40, as shown in table 1. representing the economically productive segment of the population. The most common mode of transmission was hetero sexual in nature (89%), while 11% were due to various reasons like (Needle stick injury, blood transfusion, IV drug abuse etc).

TABLE 1
AGE AND SEX DISTRIBUTION

Age Group (Years)	Male		Female		Total	
	No. of cases	%	No. of cases	%	No. of cases	%
21-30	12	24.4	8	32%	20	27.0
31-40	27	55.1	12	48%	39	52.7
41-50	08	16.3	03	12%	11	14.9
51-60	01	2.0	02	8%	03	4.1
> 61	01	2.0	00	0%	01	1.4
Total	**49**	**100**	**25**	**100%**	**74**	**100.00**

Among the studied patients Sputum AFB positive pulmonary TB was seen in19(25.7%),Sputum AFB negative pulmonary TB in 21 (28.4%),TB lymphadenitisin9(12.2%), TB pleural effusion in 18(24.3%),TB meningitis in 03 (4.1%),Koch's abdomen in 3(4.1%),Pott"s spine in 1(1.4%),as shown in fig 1.

Figure:1 Clinical Manifestations of Tuberculosis

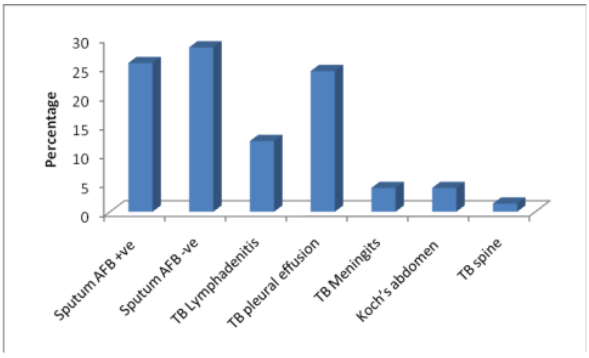

Table: 2 CD4 COUNTS AND NUMBER OF PATIENTS

CD4 Counts	No. of Patients	Percentage
< 50	4	5.4
51-100	4	5.4
101-150	16	21.6
151-200	12	16.2
201-250	17	23.0
251-300	5	6.8
301-350	5	6.8
> 350	11	14.9
TOTAL	74	100.0

In this study CD4 counts <50 cells was seen in 4 (5.4%) patients and 51-100 cells in 4 (5.4%) patients, 101-150 cells in 16(21.6%) patients, 151-200 cells in 12(16.2%) patients, 201-250 cells in 17 (23%) patients , 251-300 cells in 5(6.8%) patients ,300- 350 cells in 5 (6.8%) patients and >350 cells in 11 (14.9%) patients, as shown in table 2.

Discussion:

TB is one of the most common diseases among HIV-infected persons worldwide and a major cause of death. A person with a positive TST who acquires HIV infection has a 3–13% annual risk of developing active TB. A new TB infection acquired by an HIV-infected individual may evolve to active disease in a matter of weeks rather than months or years. TB can appear at any stage of HIV infection, and its presentation varies with the stage. When CMI is only partially compromised, pulmonary TB presents in a typical manner with upper-lobe infiltrates and cavitation and without significant lymphadenopathy or pleural effusion. In late stages of HIV infection, a primary TB–like pattern, with diffuse interstitial or miliary infiltrates, little or no cavitation,and intrathoracic lymphadenopathy, is more common. However, these forms are becoming less common because of the expanded use of antiretroviral treatment (ART), Extrapulmonary TB is common among HIV-infected patients. In various series, extrapulmonary TB—alone or in association with pulmonary disease—has been documented in 40–60% of all cases in HIV-co-infected individuals. The most common forms are lymphatic, disseminated, pleural, and pericardial. Mycobacteremia and meningitis are also frequent, particularly in advanced HIV disease. The diagnosis of TB in HIVinfected patients may be difficult not only because of the increased frequency of sputum-smear negativity (up to 40% in culture-proven pulmonary cases) but also because of atypical radiographic findings, a lack of classic granuloma formation in the late stages, and a negative TST. Delays in treatment may prove fatal. (12)

According to an estimate of World Health Organisation (WHO), TB has become one of the leading causes of death among HIV infected persons. (13)

TB is the most common treatable HIV-related disease and a leading killer of people living with HIV/AIDS (PLWHA). In India, there were an estimated 5.134 million PLWHA at the end of 2004. (14)

Tuberculosis can occur at any CD4 cell count. Pulmonary tuberculosis is more common at CD4 counts between 200-500/microL. Miliary and extra pulmonary tuberculosis at less than 200 cells/microL. MAC at less than 50 cells/microL (15)

Three important considerations are relevant to TB treatment in HIV-infected patients: an increased frequency of paradoxical reactions, drug interactions between ART and rifamycins, and development of rifampin monoresistance with widely spaced intermittent treatment .The optimal timing for its initiation is as soon as possible and within the first 8 weeks of anti-TB therapy. Rifampin, a potent inducer of enzymes of the cytochrome P450 system, lowers serum levels of many HIV protease inhibitors and some nonnucleoside reverse transcriptase inhibitors—essential drugs used in ART. In such cases, rifabutin, which has much less enzymeinducing activity, has been recommended in place of rifampin.However, dosage adjustment for rifabutin and/or the antiretroviral drugs may be necessary .Several clinical trials have found that patients with HIV-associated TB whose immunosup pression is advanced (CD4+ T cell counts of <100/μL) are prone to treatment failure and relapse with rifampin-resistant organisms when treated with "highly intermittent" (i.e., once- or twice-weekly) rifamycin- containing regimens. Consequently, it is recommended that these patients receive daily therapy for at least the initial phase.(12)

In present study, out of 74 people studied 62.2%(49) of patients were males and 33.8%(25)females compared to study done by Siddeswari R et al. *where* male were the commonly affected population 132 (73.3%) male and 48 (26.7%) female patients.(16) Most of the people were in the age group 21-40 age group. With mean age of males being 36.2 and the females 35.2 compared to study by Siddeswari R et al. *where* males ≥40 (51.51%) years age group and females 30-39 (56.25%) years age group was the most commonly affected (16). This age reflects the sexually active age group which is commonly affected by the disease. In present study sputum positivity was 25.7% and found to be low compared to study by *Siddeswari R et al. where* Out of 180 cases 60 were sputum positive, 60 were sputum negative pulmonary tuberculosis and 60 had extra pulmonary disease. (16) The mean CD4 count in present study was 237.27± 167.81 cells/ micro L. compared to study done by *Siddeswari R et al.* where among sputum positive cases mean CD4 count was 183 cells/mm3, in sputum negative cases mean CD4 count was 176 cells/ mm3 and in extra pulmonary tuberculosis the mean CD4 count was 168 cells/mm3.(16)

Conclusion:

In present study, out of 74 people studied 62.2%(49) of patients were males and 33.8%(25)females. Most of the people were in the age group 21-40 age group. This age reflects the sexually active age group which is commonly affected by the disease. Most common constitutional symptom was fever (88%) and most common respiratory symptom was cough (96%). In this study sputum positivity was 25.7%. Among the extra pulmonary manifestations of pleural effusion was seen 18 (24.3%) followed by lymphadenopathy 9 (12.2%), meningitis 3 (4.1%) and ascities 3 (4.1%), spine 1(1.4%). The mean CD4 count in present study was 237.27 ±167.81 cells/ micro L. Tuberculosis is the most common opportunistic infection in HIV/AIDS and is the most common cause of death in HIV/AIDS patients. Early diagnosis and treatment can decrease the mortality and morbidity.

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