THE RATE OF TUBERCULOSIS INFECTION IN HIV POSITIVE PATIENTS IN RELATION TO CD4 COUNT

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ABSTRACT: INTRODUCTION: Tuberculosis is the most common HIV-related opportunistic infection in India, and caring for patients with both diseases is a major public health challenge, which places an immense burden on health care systems and poses particular diagnostic and therapeutic challenges, increasing the risk of treatment failure, relapse and death. Estimates by the World Health Organization (WHO) indicate that there are more than 9 million new active cases of TB and close to 2 million deaths per year. **MATERIALS AND METHOD:** The present retrospective study was conducted for a period of one year. HIV status was confirmed for patients attending voluntary counselling and testing centre (VCTC). HIV positive patients were referred to designated microscopic centre (DMC) for sputum examination for AFB and ART centre for estimation of CD4 count and necessary relevant investigations were carried out for extrapulmonary tuberculosis (EPTB). **RESULTS:** Out of 682 HIV positive patients, 93(13.6%) cases were diagnosed with pulmonary tuberculosis. Extrapulmonary tuberculosis was detected in 16 (2.3%) patients. The commonest form of EPTB was cervical adenitis detected in 13 (1.9%) of cases and pleural effusion in 3 (0.4%) of cases respectively. The mean CD4 count was 208 cells/ μ l in patients with pulmonary tuberculosis (PTB) and 192 cells/ μ l, 162 cells/ μ l in patients with cervical adenitis and pleural effusion. **CONCLUSIONS:** Further reduction of CD4 count occurs in dually infected patients. Early diagnosis and prompt institution of ART and ATT reduces mortality and morbidity significantly.

INTRODUCTION: Tuberculosis (TB) and human immunodeficiency virus (HIV) constitute the main burden of infectious disease in resource-limited Countries¹. Persons infected with HIV are particularly susceptible to tuberculosis, both from the reactivation of latent infection and from new infection with rapid progression to active disease². An individual who is HIV-positive has 10 times increased risk of developing TB compared to an HIV-negative person the life time risk is 50% for an HIV-positive person and 5–10% for an HIV-negative person³. Estimates by the World Health Organization (WHO) indicate that there are more than 9 million new active cases of TB and close to 2 million deaths per year and that 2.6 million new cases of HIV infection and 1.8 million AIDS-related deaths occur per year¹. In India alone about 2.5 million people are currently infected with

HIV of whom 40% are also coinfecting with TB⁴. TB infection contributes to further reduction in CD4 cell count accelerating the progression of HIV infection to Acquired Immunodeficiency syndrome (AIDS) increasing the mortality and morbidity⁵. Despite the existence of effective drugs, TB continues to be a major health problem and kills more than a million a year⁶. 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 controversial². The present study was carried out to estimate the rate of TB in HIV patients and its relation to CD4 count.

MATERIALS AND METHODS: The present retrospective study was carried out over a period of one year from (1st January 2010 to December 2010) in the community care centre (CCC), Charlapalli, affiliated to Kamineni Institute of Medical Sciences, Sreepuram, Narketpally, Nalgonda Dist. Andhra Pradesh. Screening and confirmation of HIV status were carried out in patients visiting Integrated counseling and testing centers centre (ICTC) after pre-test counseling and written informed consent. HIV antibodies were tested by three ELISA/Rapid/Simple tests as per guide lines laid by NACO (Testing strategy III). Post test counseling was done for patients found to be positive for HIV. CD4 estimation was done by flow cytometry. Diagnosis of pulmonary tuberculosis was made by positive sputum AFB smear examination by Ziehl Neelsen technique as per RNTCP guidelines. Diagnosis of extra-pulmonary tuberculosis was made by relevant investigations like tissue biopsy, FNAC, and pleural fluid analysis.

RESULTS: Of the 682 HIV positive cases, 380 (55.7 %) were males and 302 (45.1%) were females. There were more patients in the 21-40 years (70.6%) of age group and least in the > 60 years (1.3%) age group (Table.1). Pulmonary tuberculosis was diagnosed in 93(13.6%) patients and extrapulmonary tuberculosis (EPTB) was diagnosed in 16 (2.3%) patients of HIV positive group. The commonest extrapulmonary lesion was cervical lymphadenopathy reported in 13(1.9%) patients followed by pleural effusion in 3 (0.4%) patients respectively.

CD4 count < 200/ μ l was found in 48 (7.03%) of patients with pulmonary tuberculosis and 9 (1.3%) of with EPTB. The mean CD4 count was 208 cells/ μ l in patients with PTB while the mean CD4 count of 192cells / μ l and 162 cells / μ l was found in patients with cervical adenitis and pleural effusion.

DISCUSSION: Tuberculosis is the most common opportunistic infection in HIV positive persons in India⁷. Maximum patients were in the age group of 21-40 years (70.6%) and majorities were males. This is consistent with the findings of other studies⁴. Unprotected heterosexual transmission was the commonest mode of transmission as was reported in other studies⁸. The commonest type of TB found among HIV patients was pulmonary TB accounting for 13.6% of cases. Studies conducted by Christopher C. Affusim⁹ et al and Peters et al¹⁰ demonstrated pulmonary tuberculosis was the commonest type of TB in HIV positive patients. The World Health Organization (WHO) reported that among the 9.27 million incident cases of tuberculosis in 2007, an estimated 1.37 million (14.8%) occurred in HIV-positive patients¹¹. In a study conducted between January and September 2006, in the six Indian states with the highest HIV prevalence (Andhra Pradesh, Karnataka, Maharashtra, Manipur, Nagaland, and Tamil Nadu); tuberculosis was diagnosed in 22.3% and

23.9% of patients in these groups, respectively¹². EPTB was diagnosed in 2.3% of the HIV positive patients, the commonest being cervical adenitis (1.9%) of the cases followed by pleural effusion (0.4%) of the cases. This was consistent with other studies^{9,13}. The mean CD4 count of HIV patients with EPTB was < 200 cells / μ l when compared to HIV patients with pulmonary tuberculosis. Our study also demonstrates that significant decline in CD4 lymphocyte count results in progressive immunosuppression resulting in growth and local spread of *M.tuberculosis*. Hence extra pulmonary disease is more common.

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Table. 1: Age wise distribution of HIV infected cases

Age (years)	HIV Positive patients	%	Coinfected patients	%
1-20	39	5.7	11	10
21-40	482	70.6	63	57.7
41-60	152	22.2	32	29.3
>60	9	1.3	3	2.7

Table. 2: Distribution of pulmonary and extra pulmonary tuberculosis

CD4/ μ l	Pulmonary TB sputum (+)	cervical lymphadenopathy	Pleural effusion
<200	48	06	03
>200	45	07	-
Mean CD4/ μ l	208	192	162