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Original Research Article.

Study of Efficiency of DOTS in Extra Pulmonary TB in HIV Seropositive Cases

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ABSTRACT

Objectives: To study in relation to CD4+ T lymphocyte count and efficacy of DOTS in extra -pulmonary TB, among HIV seropositive cases.

Method: The study comprised a total 40 patients having co-infection with TB-HIV referred to the OPD clinic and also admitted in the department of medicine, MBGH hospital Udaipur. History of treatment in past and information about various risk factors associated with HIV infection such as blood transfusion, contact with commercial sex workers, needle prick and IV drug abusers. All subject was clinically examined and undergone laboratory and radiological investigation required as diagnosed having extra-pulmonary TB. CD4+ T lymphocyte count, and HIV seropositive by western blot analysis.

Results: Among 40 cases of extra-pulmonary TB with HIV co-infection, having 75% cases had CD4+ <200 cell/ mm3, and 25% cases having CD4+ >200 cell/mm3. Commonest risk factor for HIV transmission was sexual exposure in 72.5%, mostly by heterosexual route (60%). All cases given DOTS therapy under RNTCP guidelines with ART. 37 patients were put on CAT-1 and 03 patients put on CAT-II RNTCP regimen. Disseminated TB caused maximum (50%) deaths followed by tubercular meningitis and abdominal TB. Treatment success (completed and cured) was achieved in 75% cases (30 cases), 5% cases (02 cases) defaulted and 20% cases (08 cases) were died during the study.

Key words: Extra- Pulmonary Tuberculosis, HIV Seropositive, CD4+ T Cell, DOTS (Directly Observed Treatment Short-Course).

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INTRODUCTION

Tuberculosis is a common and often deadly infections disease caused by strains of Mycobacterium, usually Mycobacterium tuberculosis in humans. Mycobacterium Tuberculosis usually attacks the lungs but can also affect other parts of the body called Extra pulmonary tuberculosis (EPTB).[1] It most commonly spread through the air when patient of pulmonary TB cough, sneeze, or spit. Most infections in humans result in an asymptomatic, latent infection and about one in ten latent infections eventually progresses to active disease which, if left untreated, kills more than 50% of its victims. More than a hundred years after the description of etiological agent and even after introduction of effective chemotherapy, Tuberculosis (TB) still remain one of the world's most important health crisis. The emergence & pandemic spread of Acquired Immunodeficiency Syndrome (AIDS) & Human Immunodeficiency Virus (HIV) have posed the greatest challenge to public health in modern times since 1980's.HIV is more powerful risk factor for reactivation of latent TB infection to active disease.

In 2015 1.1 million deaths due to HIV infection and 36.7 million peoples were living with HIV/AIDS (PLWHA).[2] Tuberculosis remains a major public health problem worldwide since centuries and has been declared a "Global emergency" by world health organization in 1994.[3] Approximately one third of the world's population have latent tuberculosis infection (LTBI). 8.7 million new cases of TB and 1.4 million people died from the disease were reported to WHO in 2011.[4] Tuberculosis is one of the commonest opportunistic infection in cases of HIV infection and may precede the development of AIDS. The effect of HIV – TB coinfection is bidirectional. TB affects the natural history of HIV infection and HIV infection affects the presentation and outcome of TB. There is an increased risk of progression of TB infection to disease in presence of HIV infection due to depressed cell mediated immunity and this risk increases by 100 times in endemic areas in patients with old infected foci. Rates of recurrences are both due to endogenous reactivation and exogenous re-infection are increased.[5]

Tuberculosis is a major cause of death in HIV infected persons particularly in developing nations, most prominent in Sub-Saharan Africa, the Pacific Nations and Indo-Asia. It is estimated that out of 1.4 million deaths from TB cases in 2011, 0.4 million were HIV-TB co infected.

One third of increase in TB cases over the last 5 years can be attributed to HIV epidemic. HIV induced immune-suppression dramatically increases the number of TB cases, changes the clinical course of the disease, changes clinical presentation, rendering the disease more difficult to diagnose, more complicated to treat and more chances of emergence of multi-drug resistant TB. Before that advent of HIV approximately 80% of all new cases of TB were only pulmonary TB but now two-third of HIV- TB co-infected patients are having either pulmonary TB with Extra pulmonary TB or Extra pulmonary TB alone.

Thus HIV/AIDS and TB need to be addressed together and harmonization of a package of care between TB-HIV should be established. In India about 56% of the HIV infected patients are co-infected with TB.

This burden of TB and HIV/AIDS pose unprecedented challenges on the public health system in India and cause substantial economic and social burden on the nation.

In the present study we have concentrated on the clinical and laboratory presentation of Extra pulmonary TB in seropositive HIV patients and observe the outcome of tuberculosis treatment under Directly Observed Treatment Strategy (DOTS) and study the efficacy of DOTS in such patients.

OBJECTIVES

1. To study the relation between HIV infection and Extra Pulmonary Tuberculosis.
2. To assess the clinical and laboratory features of extra pulmonary Tuberculosis in HIV seropositive patients.
3. To study the presentation of extra pulmonary Tuberculosis in relation to CD4+ T lymphocyte count, among HIV seropositive cases.
4. To know outcome and efficacy of treatment in HIV – TB co-infected patients put under DOTS.

MATERIALS AND METHODS

This present study was carried out on 40 adult patients having co-infection with TB-HIV referred to the OPD clinic and also those admitted in the department of Medicine and TB & Chest of RNT Medical college Udaipur (RAJ.). Detailed history was elicited in all cases especially emphasizing on age, sex, marital life, occupation and residential area. History of treatment taken for TB in the past as well as any documented evidence of past history of TB. Information about various risk factors associated with HIV infection were taken.

Apart from routine laboratory investigation, specific investigations for HIV-TB co-infected patients like CD4+/ CD8+ T cell counts, tuberculin test, chest radiographs, pleural fluid examination, 2D echo, CT scan of thorax, USG, MRI (Brain), CSF examination, lymph node FNAC & biopsy were done when required according to clinical profile of the patient.

Test for HIV by ELISA and confirmed by standard western blot analysis were carried out in all the cases. In extra pulmonary TB respective site is investigated according to clinical presentation which was stated ahead.

Criteria for Patient Selection

1. All subjects were clinically examined and undergone laboratory and radiological investigations as required and diagnosed as having extra pulmonary tuberculosis.
2. All subjects were documented HIV seropositive by standard western blot analysis.
3. In every subject, CD4+ T lymphocytes counts were obtained at presentation.

Subjects with concomitant opportunistic pulmonary infection or malignancy or those currently receiving anti tuberculous therapy were not included in the study.

Table 1: Age Wise Distribution of Patients

Age in Years	Total
20-45	30 (75%)
>45	10 (25%)
Total	40 (100%)

Table 2: Sex Wise Distribution of Patients

Category	No. of Patients
Male	32 (80%)
Female	08 (20%)
Total (n=40)	40 (100%)

Table 3: Distribution of Different Extra Pulmonary TB in HIV Positive Patient (n=40)

Category	Male	Female	Total
TB Meningoencephalitis	18 (45%)	02 (5%)	20(50%)
Genitourinary/Abdominal	07(17.5%)	01(2.5%)	8 (20%)
Lymph node TB	03(7.5%)	03(7.5%)	06(15%)
Disseminated TB	03(7.5%)	1(2.5%)	4(10%)
Pericardial Effusion	1(2.5%)	1(2.5%)	2 (5%)
Total	32 (80%)	08(20%)	40(100%)

Table 4: Distribution of an Extra Pulmonary TB in Relation to CD4+ Count (n=40)

Category	No. of Patients
<200	30 (75%)
>200	10 (25%)
Total (n=40)	40 (100%)

Table 5: Distribution of Different Extra Pulmonary TB in Relation to CD4+ Count (n=40)

Category	<200	>200	Total
TB Meningoencephalitis	14 (35%)	6 (15%)	20(50%)
Genitourinary/Abdominal	06(15%)	02(5%)	8 (20%)
Lymph node TB	05(12.5%)	01(2.5%)	06(15%)
Disseminated TB	4(10%)	00(00%)	4(10%)
Pericardial Effusion	1(2.5%)	1(2.5%)	2 (5%)
Total	30 (75%)	10(25%)	40(100%)

Table 6: Cause of Death in Relation to HIV-EPTB (n=40)

Category	Dead	Live
TBME (n=20)	03 (15%)	17 (85%)
Abdominal (n=8)	03 (37.5%)	05 (62.5%)
Disseminated (n=4)	02(50%)	02 (50%)
Lymph node (n=6)	0 (0%)	05 (100%)
Pericardial effusion	0(0%)	02(100%)
Total (n=40)	08 (20%)	32 (80%)

OBSERVATIONS AND DISCUSSION

As defined and discussed in material and methodology, 40 patients of extra pulmonary TB with HIV infection were selected. In all of them, their case history was reviewed and analyzed, all clinical findings and laboratory reports were co-related, and then all outcomes and statistical details had been concluded as follows.

In the present study, 30 cases (75%) were in age group 20-45 years while 10 cases (25%) were above 45 years. The age of the Youngest patient was 22 years and that the oldest was 74 years. (Table 1)

Similar to the finding reported by Chandwani et al.[6] (54.72%), Aturaka et al.[7] (47.6%), Said et al. (43%) and Kavya et al.[8] (54%). Dahiya et al.[9] reported 25-34 age group to be maximally (60.60%) affected by HIV-TB co-infection. The mean age of the present study population was found to be 32 years, which is comparable to the findings made by Dahiya et al. (31.18 years) and Chandra et al. (36.67 years).[6-9]

In the present study 32 cases (80%) were males while 08 cases (20% cases) were females. (Table 2) It showed that risk of HIV-EPTB co infection is very much common in males. Similar finding reported by Giri Om Prakash et al.[10]

In present study Tubercular meningitis was detected in 20 cases (50%), followed by Abdominal Tuberculosis in 08 cases (20%), followed by lymph node TB in 06 cases (15%) and 04 cases (10%) were suffered with disseminated TB. (Table 3)

In the present study 30 cases (75%) of extra pulmonary TB was having CD4 count <200; while 10 cases (25%) was having CD4+ count >200. It is very much suggestive that extra pulmonary TB is more prevalent in immune compromised patients. (Table 4)

In HIV positive patients, TB is the commonest opportunistic infection in India. Unlike other opportunistic infections which occur at CD4+ counts below 200/mm, TB can crop up at any stage of the disease. The risk of developing clinical TB rises sharply after HIV infection, well before the total CD4 count drops to levels below 500 cells/mm[11]. Although many studies have been done in western countries and African region to know the clinical profile of TB in HIV positive persons; however, there is still a scarcity of such studies from India.

Our study similar to other recent observations. In a study by Lee et al. most patients were in the advanced stage of HIV infection; 93% had CD4 cell count less than 200/mm[12]. HIV is notoriously known to cause depletion and dysfunction of CD4 cells while TB may accelerate this process and a combination of both the infections could explain the reason, why the majority of patients in this study had low CD4 cell count. Another reason may be due to relatively delayed presentation of patients leading to severely immune-compromised state with some sort of opportunistic infection e.g. TB in our cases.

In the present study 14 cases (35%) of TB meningoencephalitis was having CD4 count <200 while 06 cases (15%) of TB meningoencephalitis was having CD count >200. In patients with genitourinary or abdominal tuberculosis, 06 cases (15%) had CD4 count <200 and 02 cases (5%) had CD4 count > 200. All other forms also showed greater incidence when CD4 count <200 as shown in table 5. This suggests that extra pulmonary TB incidence is greater in immunocompromised state.

The present study showed that in patients of disseminated TB 02 cases died out of 04 cases i.e. 50% mortality while in patients with tubercular meningitis 03 cases died out of 20 (15%); in patients with abdominal TB 03 cases died out of 05 (62.5%) while there was no death in patients of lymph node TB and tubercular pericardial effusion. (Table 6) This may be due to more immune compromised status in disseminated EPTB with HIV and disseminated nature of disease.

SUMMARY

40 Cases of extra pulmonary TB with HIV were studied over two years. During this period various aspects of clinical features, physical examinations, and various investigations were evaluated in totality. Study results summarized as below.

1. Commonest age group was 20-25 years which includes 75% cases. The youngest is 22 years and oldest is 74 years.
2. Males (80%) are more commonly affected than females (20%) in HIV with extra pulmonary tuberculosis.
3. In various forms of extra pulmonary TB, CNS tuberculosis (50%) is most common followed by abdominal TB (20%), lymph node TB (15%), disseminated TB (10%) and pericardial tubercular effusion (5%).
4. Among 40 cases of extra pulmonary TB with HIV co infection, 75% cases had CD4+ count <200 cells/cmm3, and 25% cases having CD4+ > 200 cells cmm. This indicates that extra pulmonary TB occurs more when immunity decreases.
5. Disseminated tuberculosis caused maximum (50%) deaths followed by tuberculous meningitis and abdominal tuberculosis. This is due to disseminated nature of disease and severe immune compromised state of a patient with HIV and disseminated TB.

CONCLUSION

Tuberculosis is one of the most common diseases in Indian Subcontinent. With the entry of HIV, co infection of HIV-TB has been aggravated the existing problem. The present study was an effort to find out the various relationships between HIV-TB, particularly the effect of anti-tubercular treatment under RNTCP guidelines in patients co-infected with extra pulmonary tuberculosis and HIV.

This present study included 40 patients co-infected with EPTB and HIV out of which37 cases were put on cat I regimen and 03 patients were put on cat II according to RNTCP guidelines all patients were given treatment with DOT strategy along with ART according to NACO guidelines and on follow up treatment success rate was found in 75% cases.

Every patient having HIV-TB needs special attention as they have atypical features, atypical radiological findings, disseminated TB, and opportunistic infections. HIV-TB co-infection may aggravate both conditions as both are intracellular organism and TB co-infection increase replication of HIV virus. However, all patients with co-infection must be treated as per RNTCP guidelines with DOT strategy.

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