ORIGINAL RESEARCH PAPER

Radiology

KEY WORDS:

# PATTERNS OF PRESENTATIONS (CLINICO – RADIOLOGICAL) IN HIV-TB CO-INFECTION

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## INTRODUCTION:

The HIV infection and AIDS pandemic is one of the most devastating disease, that mankind has ever faced. The HIV pandemic fuels the TB epidemic. TB is the most common opportunistic infection in HIV infection patients. In the developing countries, TB accounts for about 1/3rd of all AIDS deaths and the deadly synergy between HIV and TB is the leading cause of mortality among infectious diseases(S K Sharma et al,2005)[1]. HIV infected persons are at markedly increased risk of progressive disease following primary TB infection, reactivation of latent TB infection(LTBI), and exogenous re-infection. The risk of development of TB in HIV infection patients in India is 10% per year as compared to 10% lifetime risk of developing TB in HIV negative persons. The cumulative lifetime risk of reactivation of TB in HIV positive patients is 30-50% compared to 5-10% in HIV negative patients. The interaction between HIV and TB in persons co-infection with them is bi-directional and synergistic. The impact of HIV on TB control programme may lead to over-diagnosis of sputum smear negative pulmonary TB(PTB) (due to difficulties in diagnosis), under-diagnosis of sputum smear positive PTB(due to excessive laboratory workload), low cure rates, high morbidity and mortality during treatment, high default rates(due to adverse drug reactions), high rates of recurrence, and increased transmission of drug resistant strains among HIV infected patients in congregate settings(WHO) [2]. On the other hand, the impact of TB on HIV/AIDS control programme leads to shorten the survival of patients, accelerates the progression of HIV, precipitates MDR-TB(due to increased chance of default, drug –drug interactions and drug related toxicities, increased frequency of visit to hospital with exposure to MDR-TB patients).

In the developing country like India, the potential extra burden of new TB cases attributable to HIV is staggering and could overwhelm the already stretching tuberculosis budget and support services.

## MATERIALS AND METHODS:

65 in-patients of the TB ward in the department of Pulmonary Medicine, SCB Medical College, Cuttack were included in this study during the period from June'2007 to June'2009 with strong clinical suspicion of HIV infection/AIDS. After recording detailed clinical history and complete general and systemic examination and besides routine blood examination and sputm examination for AFB, pyogenic infection, relevant samples were obtained for mycobacterial and histo-pathological examination in cases of EPTB.

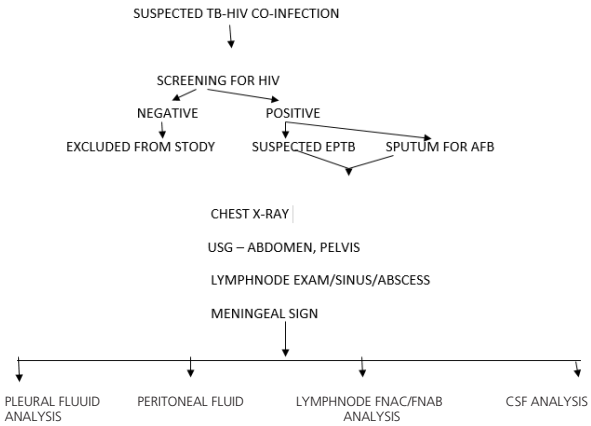
## RAPID TESTS FOR SCREENING OF ANTI-HIV ANTIBODY:

A) Immuno concentration (flow through)(dot-blot assay)
B) Immuno- chromatography (lateral flow assay)
C) Particle agglutination (latex, gelatine, RBCs etc)
D) Immuno-comb (mostly ELISA based)

## SAMPLES COLLECTED FOR MYCOBACTERIA AND HP STUDY:

1) FNAC/BIOPSY of lymphnode for cytopathological and microbiological evidence of tuberculosis
2) Thoracocentesis and pleural fluid obtained for biochemical, microbiological and cytological characteristics in pleural effusion cases
3) Paracentesis and ascitic fluid obtained for biochemical, microbiological and cytological characteristics in ascites cases
4) CSF analysis, in suspected cases of TB Meningitis

## FLOW CHART:




TABLES:

**TABLE 1 : DISTRIBUTION OF CLINICAL SYMPTOMS IN HIV-TB CO-INFECTION**

| SYMPTOMS | No.OF PATIENTS | PERCENTAGE |
|---|---|---|
| FEVER | 55 | 84% |
| NIGHT SWEATS | 51 | 78% |
| COUGH WITH EXPECTORATION | 45 | 69% |
| MALAISE | 44 | 67% |
| ODYNOPHAGIA | 43 | 66% |
| SIGNIFICANT WEIGHT LOSS | 38 | 58% |
| ANOREXIA | 30 | 46% |
| NECK SWELLING | 24 | 37% |
| DIARRHOEA | 21 | 32% |
| DYSPNOEA | 18 | 27% |
| CHEST PAIN | 11 | 17% |
| ABDOMINAL PAIN | 11 | 17% |
| DISORIENTATION | 10 | 15% |
| HEADACHE | 10 | 15% |
| VOMITING | 6 | 9% |
| HEMOPTYSIS | 4 | 6% |

| CLINICAL SIGN | No. Of PATIENT | PERCENTAGE |
|---|---|---|
| PALLOR | 53 | |
| LYMPHADENOPATHY | 46 | |

| | | |
|---|---|---|
| ORAL THRUS | 43 | |
| PEDAL ODEMA | 10 | |
| JAUNDICE | 9 | |
| CLUBBING | 5 | |
| CYANOSIS | 2 | |
| RESPIRATORY SIGNS<br>-BBS<br>-CREPITATIONS<br>-RONCHI | <br>5<br>26<br>7 | |
| ABDOMINAL SIGNS<br>-HEPATOMEGALY<br>-SPLENOMEGALY<br>-SHIFTING DULLNESS<br>-OTH PALPABLE MASS | <br>9<br>4<br>9<br>1 | |
| CNS SIGNS<br>-NECK STIFFNESS | <br>7 | |

**RESULTS:**

This study was carried out on 65 tuberculosis patients with strong clinical suspicion of HIV infection and tested positive by ELISA/rapid test for anti-HIV antibodies. Most of the HIV-TB co-infected patients (68%) were in the age group of 25-44 years, while 25% patients were above 45 years and 6% cases were in 15-24 years age group. Hence, HIV-TB co-infection was most common in the sexually active and economically productive age group. This could be attributed to the fact that this population group includes mostly the people working or studying alone outside home and thus, being exposed to the vices of the outside world. Of all the patients in our study, 61(94%) were males and the rest 4(6%) were females. Similar results were reported by other studies in India, e.g *Jain SK et al, 2000*[3]*; Kumar P et al,2002*[4]*; Swaminathan S et al,2002*[5]*; S Bhagyabati Devi et al,2006*[6]*, Rajasekaran et al,2008*[7] . 80% of the patients of our study were married and 20% were unmarried, matched with the study by *Swaminathan S et al,2002*[5], who reported higher incidence of HIV-TB co-infection among married persons as compared to unmarried. The occupational profile of the patients revealed that 26% were labourers, 23% were truck-drivers followed by painters(10%), textile mill workers(7%) and plumbers(7%). Similar occupational profile have been reported by *Kumar P et al,2002*[4]*, Purohit et al*[8]*, Thanasekaran et al*[9].

Heterosexual promiscuity and casual sex was found to be the major risk factors in most Indian studies. In our study also, sexual route (heterosexual 78%, homosexual 1.5%) was found to be the major risk factor. All the females got the infection from their husbands. Except these, 3% of our patients were IV drug users, 3% had history of blood transfusion, 3% had history of surgery and 1.5% gave history of tattooing. *Suadaram et al, 1986*[10] observed that majority of their cases to be IV drug users(68%); while *Chaisson et al,1987*[11] showed tha 80% of their subjects were homosexual.

Fever(84%), night sweats(78%), cough with expectoration(69%), malaise(67%), odynophagia(66%), significant weight loss(58%) and anorexia(46%) were the common symptoms in our study. *Kumar P et al,2002*[4] *and Swaminathan S et al,2002*[5] reported cough with expectoration was the commonest symptom followed by fever and night sweats. Our study was in accordance with the study of Purohit et al[8] and Mohanty et al[12]. But Dey et al observed rapid weight loss as the most common presentation in sero-positive patients co-infected with TB. Our study also in accordance with the study by Deivanayagam et al[13], who reported Odynophagia in 60.44% of patients.

Superficial lymphadenopathy and oral thrush were found in 70% and 66% of patients respectively. *Kumar P et al,2002*[4] reported lymphadenopathy in only 11.9% and oral thrush in 28.6% cases. Pallor and lymphadenopathy were the two most common noticeable signs; probably because of a large number of cases were in advanced stages of disease.

Among all these, 57% patients were diagnosed as Pulmonary tuberculosis. Apart from this, 70% patients had extra-thoracic lymphadenopathy and 15% had hilar/mediastinal adenopathy. 30% presented with features of pleural effusion, 3% with pericardial effusion, 15% with ascites, 15% with TB meningitis and 3% with tuberculosis of brain. Our study matched with the study by Afework Kassu et al[14]; where PTB and EPTB were found to be 52% and 47% respectively and also with CK Ong et al[15]; who observed PTB, EPTB and combination of both in 47.6%, 18.4% and 34% of cases respectively in HIV infected persons.

In mild immunosuppression, the radiological appearance is often classical as in HIV negative patients; while in severe immunosppression, atypical appearances have been observed. In this study, the typical radiological findings of post-primary TB i.e upper zone infiltration, fibrosis and cavities were found in 21.6%, 5.4% and 5.4% respectively; while atypical features like mid- and lower zone infiltrates, consolidation and intrathoracic lymphadenopathy were found in 35.1%, 2.7% and 15% respectively. Infiltrates over all zones was found in 24.3%; while miliary shadows was present in 13.5% of patients. 23% of patients had pleural effusion and 6% had hydropneumothorax. 14% had normal looking chest radiograph. Our study more or less corroborate with the study by Swaminathan S et al,2002[5] ; who reported miliary TB in 17% and normal chest radiograph in 7.3% cases. Hence the predominance of atypical radiological findings in our study reflects advanced immunosuppression.

The overall sputum smear positivity for AFB was 29% in our study. But 51% of patients having clinic-radiological features suggestive of pulmonary tuberculosis had their sputum smear positive. About 10% of all EPTB patients also had their sputum smear positive. Thus sputum smear microscopy be a sensitive diagnostic tool even in presence of HIV infection. *S Bhagyabati Devi et al,2006*[6] reported that sputum for AFB was positive in 29% of seropositive patients.

In our study; ultrasonography of abdomen revealed retroperitoneal lymphadenopathy, ascites, hepatosplenomegaly and matted bowel loops in 43%, 23%, 23%, and 4.5% of patients respectively and hence matched with Edford Sinkala et al[16] study, who found ascites followed by retroperitoneal lymphnodes to be the commonest ultrasonography findings.

Unfortunately, all the patients in this study could not get their $CD_4$ T-Lymphocyte count done due to various constraints. $CD_4$ count could be done only on 55 patients and of which, only 6(11%) had their counts > 200cells/µl and rest 49(89%) had < 200cells/µl with 69% having count even < 100cells/µl, indicating advanced HIV disease. On comparision with $CD_4$ count and tuberculosis, we found EPTB in 84.2% cases with $CD_4$ count between 0-100cells/µl, 54.5% cases with count between 101-200cell/µl and 33% cases with count > 200cells/µl. This study coincides with the study of Jones et al.

**TABLE -3 : PATTERNS OF CLINICAL PRESENTATIONS IN HIV-TB CO-INFECTION**

| CLINICAL MANIFESTATION | No. OF PATIENTS | PERCENTAGE |
|---|---|---|
| EXTRATHORACIC LYMPHADENOPATHY | 46 | 70% |
| PULMONARY TB | 37 | 57% |
| PLEURAL EFFUSION | 20 | 30% |
| HILAR/MEDISTINAL LN | 10 | 15% |
| ASCITES | 10 | 15% |
| TB MENINGITIS | 10 | 15% |
| HYDROPNEUMOTHORAX | 4 | 6% |
| EMPYEMA | 2 | 3% |
| TUBERCULOMA OF BRAIN | 2 | 3% |
| PERICARDIAL EFFUSION | 2 | 3% |
| BONE & JOINT TB | 1 | 1.5% |

TABLE 4: DIAGNOSTIC PARAMETERS OF TUBERCULOSIS IN PATIENTS WITH HIV-TB CO-INFECTION

| DIAGNOSTIC PARAMETER | No. OF PATIENTS | PERCENTAGE |
|---|---|---|
| SPUTUM FOR AFB | 19 | 29% |
| FNAC OF LN | 44 | 68% |
| PLEURAL FLUID | 24 | 37% |
| ASCITIC FLUID | 10 | 15% |
| PERICARDIAL FLUID | 1 | 1.5% |
| USG GUIDED FNAC OF INTRA ABDOMINAL MASS | 1 | 1.5% |

## References:


1) S K Sharma, Alladi Mohan, Tamilarasu Kadhiravan. HIV-TB Co-infection: Epidemiology, Diagnosis & Management; Indian J Med Res 121, APR 2005, pp 550-567.
2) TB/HIV – A CLINICAL MANUAL; 2nd edn 2004; Stop TB department, Department of HIV/AIDS; Department of Child and Adolescent Health and Development. WHO, Geneva. Pages 37-38.
3) Jain SK, Agrawal JK, Rajpal S, Baveja U. Prevalence of HIV infection among tuberculosis patients in Delhi. A sentinel surveillance study. Indian J Tuberclosis 2000; 47:21.
4) Kumar P et al, Sharma N, Sharma NC, Patnaik S. Clinical profile of tuberculosis in patients with HIV infection/ AIDS. Indian J Chest Dis Allied Sci.2002; 44: 159-163.
5) Swaminathan S, Sangeetha M, Arun Kumar N, et al. Pulmonary tuberculosis in HIV positive individuals: preliminary report on clinical features and response to treatment. Indian J Tuberclosis,2002; 49:189.
6) S Bhagyabati Devi, Santa Naorem, et al. HIV and TB Co-infection : A study from RIMS Hospital Manipur; Indian Academy of Clinical Medicine_vol.6 and no_3 July-Sept,2006.
7) S Rajasekaran, L Jeyaseelan, et al. Effectiveness of management of HIV-TB patients under programme conditions in India; JK SCIENCE; Vol. 10 No. 2, April-June,2008.
8) Purohit SD, Gupta RC, Bhatura VK. Pulmonary tuberculosis and HIV infection in Ajmer. Lung India; 1996; 14; 113-120.
9) Thanasekaran V, Krishnarajasekhar OR, Madhavi et al. Pulmonary disease in HIV infected patients: An Analysis of 16 cases. Lung India,1994;12;123-28.
10) Suadaram G, Mc Donald RJ, Maniatis T,et al. Tuberculosis as a manifestation of AIDS. JAMA, 1986;256:362-366.
11) Chaisson RE, Scecter GF, Theuer CP,et al. Tuberculosis in patients with AIDS, Clinical features, response to therapy and survival. American Rev Respir Dis,1987;136:570-574.
12) Mohanty KC, Basheer DMM. Changing trend of HIV infection and tuberculosis in Bombay area since 1988. Indian J tuberculosis,1995;42:117.
13) Deivanayagam CN, S Rajasekaran et al. Clinic – radiological spectrum of tuberculosis among HIV seropositives – A Tamaram Study. Ind J tuberculosis, 2001:48,124.
14) Afework Kassu , G mengistu et al. Co-infection and clinical manifestations of TB in HIV infected and uninfected adults at a teaching hospital, North West Ethiopia; J Microbiol Immuno Infect;2007,40:116-122.
15) CK Ong, WC Tan, et al. Tuberculosis – HIV Co-infection: the relationship between manifestation of TB and the degree of immunosuppression(CD4 COUNTS). LeJSME 2008:2(2):17-22.
16) Edford Sinkala, Sylvia Gray, et al. Clinical and ultrasonographic features of abdominal tuberculosis in HIV positive adults in Zambia, @2009 Biomed Central Ltd.