Comparative Study of Radiological Appearances in Patients of Pulmonary Tuberculosis in HIV Positive and Negative Patients

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Abstract
The Human immunodeficiency virus (HIV) is a lentivirus that causes the Acquired Immuno Deficiency Syndrome (AIDS). Pulmonary complications have been one of the most common causes of morbidity and mortality since the advent of AIDS. The spectrum of pulmonary illnesses in HIV infected patients includes both opportunistic infections and neoplasms. The opportunistic infections are caused by mycobacterial, bacterial, viral, fungal and parasitic pathogens with a characteristic clinical and radiographic presentation. Knowledge about the spectrum of pulmonary disease in HIV infected individuals is essential as more than 80% of patients with AIDS have pulmonary disorders and 90% of these being infectious in nature. Radiological presentation of tuberculosis differ in HIV seropositive individuals compared to seronegative individuals. Knowledge of these varied clinical and radiological patterns helps for early diagnosis and effective management. Early diagnosis of tuberculosis and prompt treatment definitely contributes to increased life expectancy among infected patients thereby delaying progression to AIDS. Hence the present study was undertaken with the aim of evaluating the clinico-radiological profile of tuberculosis in HIV seropositive and negative patients.

Keywords
AIDS; HIV; Tuberculosis;

Introduction
HIV (Human Immunodeficiency Virus) has a major effect on tuberculosis [1]. It is the most common risk factor to activate latent tuberculosis, usually associated with rapid progress of infection towards disease [2]. Tuberculosis (TB) and human immunodeficiency virus (HIV) disease are the 2 leading causes of infectious disease–associated mortality worldwide. TB and HIV disease have been inextricably bound together from the early years of the HIV/AIDS epidemic. Their dangerous synergy affects all aspects of each disease, from pathogenesis and the epidemiologic profile; to clinical presentation, treatment, and prevention; to larger issues of social, economic, and political consequence.

Radiographic findings of pulmonary tuberculosis (PTB) are diverse in both HIV+ and HIV- patients [3]. Clinical presentation of TB in HIV-infected individuals depend on the level of immune suppression [4]. Radiological findings of pulmonary tuberculosis on chest x-ray differ according to a fact if it is a first contact with bacilli or it is reactivation or secondary infection and according to status of immune response of the patient.

The risk of developing tuberculosis (TB) is estimated to be between 16-27 times greater in people living with HIV than among those without HIV infection. In 2015, there were an estimated 10.4 million cases of tuberculosis disease globally, including 1.2 million (11%) among people living with HIV.

In immunosuppressed patients, as happens in HIV infection, the findings vary depending on the degree of suppression. Patients with normal CD4 count have findings similar to those for immunocompetent individuals.

Aims/Objectives
To assess the various radiological findings of pulmonary tuberculosis in HIV seropositive patients and compare it with HIV negative patients.

Materials and Methods
A total of 50 patients of sputum positive Pulmonary Tuberculosis as per RNTCP guidelines were selected. All patients selected were more than 12 years of age and out of these, 25 were also diagnosed as HIV positive as per NACO guidelines, presented at
Government Medical College Amritsar. Chest x-ray PA view or any other view as per requirement was taken. Radiological findings were noted, especially the number of zones involved with infiltration, consolidation, cavitation, pleural effusion, milliary disease, hilar and mediastinal lymphadenopathy and the findings were compared with the radiological findings of HIV seronegative patients.

Results

Out of all participants, 76% were male (Graph 1). The pulmonary involvement with infiltration (20% vs 16%) is more common in PTB/HIV Co infection group than PTB without HIV infection. Similarly, consolidation (16% vs 8%), hyperinflation (8% vs 0%), Pleural effusion (4% vs 0%), LUNG abscess (4% vs 0%) were common in HIV positive pulmonary tuberculosis patients. However, HIV positive pulmonary tuberculosis patients have less common cavitary lesion (8% vs 40%), hydropneumothorax (0% vs 4%). The presence of military pattern and hilar/mediastinal lymphadenopathy is similar in both groups (Graph 2).

Discussion

The present study was carried out to understand the influence of HIV on radiological manifestations of sputum positive pulmonary tuberculosis patients. Patients having HIV have an increased risk of tuberculosis. The radiological pattern of pulmonary tuberculosis in HIV positive patients differs from those in HIV negative patients.

In our study the pulmonary involvement with infiltration (20% vs 16%) was more common in PTB/HIV Co infection group than PTB without HIV infection. But the difference was comparable. In our study consolidation was present in 16% patients of immunocompromised group and in 4% patients of immunocompetent group. This forms a major radiological difference in HIV positive pulmonary patients compared to HIV negative pulmonary TB patients. Similarly pleural effusion (20% vs 8%), hyperinflation (8% vs 0%), Pneumothorax (4% vs 0%), Lung abscess (4% vs 0%) were common in HIV positive pulmonary tuberculosis patients. A study conducted by Padyana M, et al. showed Infiltration (39%) followed by consolidation (30%), cavity (11%), and lymphadenopathy (9%) seen with CD4 less than 200 in HIV positive pulmonary TB patients [5]. However, HIV positive pulmonary TB patients have less common cavitary lesion (8% vs 40%) and hydropneumothorax (0% vs 4%). Our study is in concordance with the study done by Haramati LB et al., where they showed that HIV negative patients had cavitation significantly more frequent than HIV positive patients (52% vs 18%) [6]. Leung AN et al., also observed cavitation in 19% HIV-seropositive patients and in 55% HIV-seronegative patients [7].

Conclusion

Despite the development of effective therapies, pulmonary tuberculosis remains an important cause of morbidity and mortality in HIV positive patients. Imaging plays a vital role in early diagnosis of pulmonary tuberculosis associated with HIV. Tuberculosis has a varied clinical presentation in patients with HIV infection. The spectrum of radiographic features ranges from infiltration to military pattern. Radiological differences in HIV positive and negative patients as outlined above.

References
