

ORIGINAL ARTICLE

RADIOLOGICAL MANIFESTATIONS IN PATIENTS OF PULMONARY TUBERCULOSIS WITH HIV

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ABSTRACT

Background: Tuberculosis infection is the most common co-infection among Human Immunodeficiency Virus (HIV) sero-positives in high tuberculosis prevalence countries. Radiological presentation of pulmonary tuberculosis (PTB) is variable in both HIV negative and positive patients. But this variability is more in HIV positive patients.

Objective: To study radiological manifestations in patients of pulmonary tuberculosis with HIV.

Materials and Methods: In this prospective observational study we studied radiological findings of pulmonary tuberculosis cases having HIV infection in Shree M. P. Shah Medical College & Guru Gobind Sing Hospital, Jamnagar, Gujarat from November 2003 to July 2006.

Results: There was a higher involvement of lower lung field (41.86%) as compare to upper lung field (23.26%) while 34.88% had extensive disease. Cavitory lesions were more frequently observed in extensive diseases (60%). Incidence of mediastinal lymphadenopathy and pleural effusion was equal in upper lung field while in lower lung field; incidence of mediastinal lymphadenopathy was higher as compare to pleural effusion.

Conclusion: In HIV positive patients, pulmonary tuberculosis is more likely to present with atypical radiological images. So, in HIV positive patients, we must consider PTB in all atypical radiological presentation for prompt diagnosis and management.

Key message: HIV positive patients presenting with lower lung field lesions even without cavitory lesion, possibility of TB should always be considered.

Key words: pulmonary tuberculosis, HIV, radiological manifestation, Chest- x ray

INTRODUCTION

Tuberculosis has been declared a global public health emergency by the World Health Organization (WHO).¹ Pulmonary tuberculosis is the most common clinical presentation of TB. HIV (Human Immunodeficiency Virus) has a major effect on tuberculosis.^{2, 3} TB incidence has been rising all over the world, but is worse in developing countries. Among factors contributing to the increased incidence of TB worldwide, HIV is one of the most important.⁴ HIV infection is a most common risk factor to activate latent tuberculosis and usually associated with rapid progress of infection towards disease.⁵

In India, tuberculosis is the most common opportunistic infection among HIV seropositive patients.⁶ Sputum negativity does not exclude PTB especially when clinical symptoms and radiographic features are in support of the diagnosis.

Usually pulmonary tuberculosis is found predominantly in the upper lobes. Lower lung field tuberculosis occurs but is often misdiagnosed as pneumonia, carcinoma, or lung abscesses. Patients with HIV co-infection may not have typical radiographic features of pulmonary tuberculosis. A few studies have been conducted in India comparing the radiographic features of pulmonary tuberculosis between HIV seropositive and negative individuals which has showed the diversity in radiographic features of PTB in HIV positive patients.^{7, 8} There is insufficient data on the radiographic presentation of tuberculosis in HIV infected patients from India. In this study we have investigated the radiographic manifestations of TB/HIV patients of Guru Gobindsing Hospital, Jamnagar, Gujarat.

MATERIALS AND METHODS

This prospective study was carried out on patients coming to department of respiratory medicine, Shree

M. P. Shah Medical College & Guru Gobind Sing Hospital, Jamnagar from November 2003 to July 2006. In the present study 43 adult pulmonary TB patients having confirmed HIV sero-positivity were selected in randomized manner. We included only pulmonary tuberculosis patients and pulmonary tuberculosis associated with extra pulmonary tuberculosis. All other forms of extra pulmonary tuberculosis, and patients with long term steroid therapy, diabetes, and other causes of immunosuppression were excluded from the study to allow better data comparison. Patients with symptoms suggestive of pulmonary tuberculosis were investigated further. Three sputum specimens were collected for smear microscopy for acid-fast bacilli (AFB). Human immunodeficiency virus testing was done after pretest counseling and written informed consent. Diagnosis of HIV was confirmed by Immunocomb Bispot (Organic Ltd., Israel) and GENEDIA HIV ELISA (Green cross life science, Korea). Apart from clinical manifestations and history of contact with TB patient, the diagnosis of TB was based on (i) sputum smear AFB examination (ii) chest radiography, (iii) Mantoux test, (iv) fluid analysis and studies, and (v) response to antituberculosis treatment (ATT). All postero-anterior chest skiagrams were reviewed by one of the participants of this study. Radiographs were evaluated in order to determine the presence of opacity in the parenchyma of the lung, mediastinal and hilar adenopathy, pleural effusion and cavity. The tubercular lesions were classified according to the site of lesion (unilateral, bilateral), cavitary or non-cavitary disease. Upper lung field tuberculosis was defined as tuberculosis involving upper zone. Lower lung field tuberculosis was defined as tuberculosis involving the middle zone and or lower zone. Extensive involvement was defined if there is lesion in both the zone whether unilateral or bilateral. Cavitation was considered to be present only when its diameter was more than 2 cms.

RESULTS

A total of 43 patients were enrolled in the study during this period. There were 35 male (81.4%) and 8 (18.6) female patients. In 25 (58.14%) of the cases, pulmonary involvement was bilateral.

Table 1: Incidence of cavitary lesion

| | Cavitary | Infiltrative |
|-------------------|----------|--------------|
| Upper Zone (n=10) | 1 (10.0) | 9 (90.0) |
| Lower Zone (n=18) | 1 (6.6) | 17 (94.4) |
| Extensive (n=15) | 3 (20.0) | 12 (80.0) |
| Total (n=43) | 5 (11.6) | 38 (88.4) |

There was a higher involvement of lower lung field (41.86%) as compare to upper lung field (23.26%) while 34.88% had extensive disease (Table 1). Bilateral involvement was present in 25 (58.14%) patients. Five (11.63%) patients had cavitary disease. Cavitary lesions

were more frequently observed in extensive diseases (60%).

Table 2: Incidence of mediastinal lymphadenopathy and pleural effusion

| | Mediastinal Lymphadenopathy | Pleural effusion | Mediastinal Lymphadenopathy with pleural effusion |
|-------------------|-----------------------------|------------------|---|
| Upper Zone (n=10) | 3 | 3 | 0 |
| Lower Zone (n=18) | 8 | 0 | 2 |
| Extensive (n=15) | 1 | 2 | 1 |
| Total (n=43) | 12 | 5 | 3 |

Mediastinal lymphadenopathy was present in 15 (34.88%) patients while pleural effusion was present in 8 (18.61%) patients out of whom 3 patients had both mediastinal lymphadenopathy and pleural effusion (Table 2). Incidence of mediastinal lymphadenopathy and pleural effusion was equal in upper lung field while in lower lung field; incidence of mediastinal lymphadenopathy was higher as compare to pleural effusion.

Pericardial effusion and pneumothorax was present in 2 (4.65%) and 1 (2.33%) patients respectively. Milliar pattern was found in 1 (2.33%) patient.

DISCUSSION

There is increasing prevalence of HIV in India. Infection with HIV has now emerged as the strongest risk factor for the development of active tuberculosis.⁶ Because TB is curable and contagious, prompt diagnosis and treatment is necessary so that clinicians need to be aware of the different radiological manifestations of tuberculosis in HIV positive patients. In HIV infection, radiological manifestations of PTB patients may be diverse. Therefore delay in diagnosis because of unusual clinical and radiographic manifestations will be a great threat to public health.

In tuberculosis, there are mainly 2 groups of radiologic manifestations: one is the typical form including opacity in upper zone with or without cavity and fibrosis.^{9, 10} The second form is the unusual adult tuberculosis which is similar to primary tuberculosis seen in children. This type consists of mediastinal or hilar adenopathy, pleural effusion, miliary form, opacities in lower zone.^{9, 10}

The commonest radiographic presentations in our study were lower lung field or extensive infiltrative lesion associated with mediastinal lymphadenopathy and pleural effusion.

In this study cavitary form was less frequent (11.63%) which was almost similar to the other studies.^{7, 8} while Nwonwu et al¹¹ had found cavitary form in 66.1% of patients with PTB and HIV. In the present study miliary pattern was found in 2.33% of patients which was similar to study by Deivanayagam⁷ et al (5%) while

it was less as compare to study by Debnath⁸ et al (20%).

Pleural effusion was present in 18.61% of patients which was similar to reported by Debnath⁸ et al (20%) while higher than reported by Nwonwu¹¹ et al (5.09%). Mediastinal lymphadenopathy was present in 34.88% of patients which was almost similar with the finding by Debnath⁸ et al (20%) while much higher than reported by Nwonwu¹¹ et al (3.39%). Pneumothorax was present in 4.65% which was similar to reported by Nwonwu¹¹ et al (1.9%).

In conclusion, our study shows pulmonary tuberculosis patients with HIV are more likely to present with atypical radiological manifestations which can result in delay in diagnosis and initiation of treatment. This can lead to unfortunately higher rates of morbidity and mortality from this treatable infection. So, we must consider PTB in all atypical radiological presentation in HIV positive for prompt diagnosis and management.

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