

Original article

Radiological manifestations of HIV Pulmonary Tuberculosis co - infection

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Abstract:

Human immune deficiency Virus (HIV) infection is a most common risk factor to activate latent tuberculosis and is associated with increased rate of progression of infection to disease. The radiographic manifestations of pulmonary tuberculosis in HIV infected patients are not typical as seen in immunocompetent individuals. In this study we have investigated the radiological manifestations of HIV and Tuberculosis (TB) co-infected patients of UP Rural Institute of Medical Sciences and Research, Saifai.

Key words: HIV, Tuberculosis, Radiography,

Introduction

Tuberculosis has been declared a global public health emergency by the World Health Organization (WHO).^[1] TB incidence has been rising all over the world. HIV is one of the most important factor contributing to the increased incidence of TB worldwide.^[2] HIV infection is a most common risk factor to activate latent tuberculosis and usually associated with rapid progress of infection towards disease.^[3] In India, tuberculosis is the most common

opportunistic infection among HIV seropositive patients.^[4] Sputum negativity does not exclude Pulmonary Tuberculosis especially when clinical symptoms and radiographic features are in support of the diagnosis. Usually pulmonary tuberculosis is found predominantly in the upper lobes. 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.^[5,6] There is insufficient data on the radiographic presentation of tuberculosis in HIV infected patients from India. About 5% of HIV+ patients have normal radiography in spite of positive sputum culture.^[7] Findings like lymphadenopathy and pleural effusion are more common in HIV+ patients than others, but apical involvements and cavitations are less common.^[8] Among factors contributing to the increased incidence of tuberculosis, epidemic human immune deficiency virus (HIV) infection and the acquired immunodeficiency syndrome (AIDS) are of major importance.^[9] Since control of tuberculosis in an individual depends on an intact cellular immunity, it is not surprising that HIV infection is a risk factor for tuberculosis progressing from dormant infection to clinical disease.^[10]

The radiographic pattern frequently seen includes hilar or mediastinal adenopathy, noncavitary infiltrates located in upper or lower lung zones, and pleural effusions, miliary patterns occur, and cavitary lesions are rare. The chest radiograph may be normal despite a positive sputum smear for acid-fast bacilli.

Aims and Objective

To investigate the radiological manifestations of HIV and Tuberculosis (TB) co-infected patients of UP Rural Institute of Medical Sciences and Research.

Material and Methods

170 HIV infected [confirmed by standard serology tests, (two positive ELISA and one Western-Blot

test] patients presented to pulmonary medicine clinic for cough with or without expectoration for two weeks or more, fever of any duration and breathlessness on exertion of any duration were investigated for pulmonary tuberculosis and diagnosis of pulmonary tuberculosis established with the help of clinical features and sputum examination for acid fast bacilli done by Ziehl-Neelsen method at RNTCP accredited DMC (Designated Microscopy Centre) and Sputum culture in Lowenstein-Jensen medium was performed at reference laboratory. Chest X-rays were done. Out of 170 HIV infected patients who presented with respiratory symptoms 135 patients diagnosed Pulmonary Tuberculosis. Chest X-rays of 135 HIV/TB coinfecting patients were evaluated in order to determine the presence of opacity in the parenchyma of the lung, mediastinal and hilar adenopathy, pleural effusion, cavity, interstitial nodules, bronchiectasis, and pleural thickening. According to radiographic manifestations the patients were divided into 2 categories. 1) Typical manifestations: reactivation or post-primary lesions including opacities in upper lobes of the lung in the form of Nodular infiltration or fibrocavitary changes (posterior or apical segments). 2) Atypical manifestations: included opacities in middle and inferior lobes, opacity in anterior segment of superior lobe, mediastinal or hilar adenopathy, pleural effusion, diffused opacity, interstitial nodules, and normal radiography of the lung. All radiographies were examined at the beginning of admission and before starting the treatment.

Table.1. Radiological pattern of pulmonary Tuberculosis in Seropositive Tuberculous Patients

SITE OF LESION	TYPE OF LESION	NUMBER OF PATIENTS	PERCENTAGE (%)
UPPER ZONE (34)	Nodular Infiltration	14	41.11
	Fibrosis	12	35.29
	Cavities	08	23.52
MID AND LOWER ZONE (52)	Nodular Infiltration	36	69.23
	Fibrosis	10	19.23
	Cavities	06	11.53
ALL ZONES	Miliary	09	6.6

Table.2. Incidence of Mediastinal Lymphadenopathy and Pleural Effusion

Mediastinal Lymphadenopathy	Pleural Effusion	Mediastinal Lymphadenopathy with Pleural Effusion
18 (13.33%)	10 (7.4%)	14 (10.37%)

Results

There was a higher involvement of lower lung field 52 (38.51%) as compare to upper lung field 34 (25.185%). Out of 52 patients those had lower lung field involvement, 36 (69.23%) patients had nodular lesion, 10 patients (19.23%) had fibrosis and in 6 (11.53%) patients cavities were found on chest x-ray. Those 34 patients had upper lung field involvement, 14 (41.11%) patients had nodular lesions, 12 (35.29%) patients had fibrosis and in 8 (23.52%) patients cavities were found in x-ray. Miliary pattern found in 09 (6.6%) cases. Mediastinal lymphadenopathy found in 18 (13.33%) patients and pleural effusion in 10 (7.4%) cases both mediastinal lymphadenopathy and pleural effusion found in 14 (10.37%) cases.

Discussion

There is increasing prevalence of HIV in India. HIV infection is a most common risk factor to activate latent tuberculosis and is associated with increased rate of progression of infection to disease. 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. Radiological manifestations of Pulmonary Tuberculosis in HIV infected 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 patients with a relatively intact immune system, radiographic findings are similar to those

found in non-HIV patients with predominantly upper lobe lung lesions, cavitation and fibrosis.^[11] Atypical manifestations like lower lung field infiltrations, noncavitary^[11] or pleural effusion, finding suggestive of primary tuberculosis^[12] and intrathoracic lymphadenopathy are found when immune system get compromised as in HIV patients. Sometimes there was no radiological abnormality in chest x-ray despite of active Tuberculosis.^[13] The commonest radiographic presentations in our study were lower lung field lesion. In this study cavitary form was less frequent, found in 14 (10.37%) which was almost similar to the other studies.^[5,6] In the present study millitary pattern was found in 09 (6.6%) of patients which was similar to study by Deivanayagam et al (5%).^[5] Pleural effusion was present in 10 (7.4%) of patients which was similar to reported by

Nwonwu et al (5.09%).^[14] Mediastinal lymphadenopathy was present in 18 (13.33%) of patients which was similar with the finding by Debnath et al (20%).^[6]

Conclusion

Our study shows pulmonary tuberculosis patients in HIV positive patients are more likely to present with atypical radiological manifestations which can lead to delay in diagnosis and management of pulmonary tuberculosis in HIV patients, consequently there are higher rates of morbidity and mortality from this treatable infection. So, we must consider Pulmonary Tuberculosis in all atypical radiological presentation in HIV positive for early diagnosis and management. This study indicates that the majority of Tuberculosis manifestations in HIV patients are atypical.

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