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Original Research

Evaluation of Chest Radiographic Findings in Primary Pulmonary Tuberculosis: An observational study

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ABSTRACT:
Background: The current guidelines for diagnosis of adult chest tuberculosis (TB) are based primarily on the demonstration of acid-fast bacilli (AFB) on sputum microscopy. Hence; the present study was conducted for evaluating Chest Radiographic Findings in Primary Pulmonary Tuberculosis. **Materials & methods:** A total of fifty children in whom culture-proved TB was present were enrolled. Complete demographic and clinical details of all the patients was obtained. Chest radiographic examinations was done in all the patients. The initial chest radiographs of the students with newly diagnosed TB were reviewed in and assessed for the presence of lung parenchymal abnormalities. The distributions (upper or lower zone) and the laterality (unilateral or bilateral) of lung lesions were also analyzed. **Results:** Small nodules were seen in 90 percent of the subjects while large nodules were present in 70 percent of the subjects. Cavitation was seen in 42 percent of the subjects while consolidation was seen 28 percent of the subjects. Upper lung zone involvement was seen in 52 percent of the patients while lower lung involvement was seen in 18 percent of the patients. Bilateral involvement was seen in 30 percent of the patients. **Conclusion:** Typical CT findings of pulmonary TB include centrilobular small nodules, opacities, and cavitation.
Key words: Pulmonary tuberculosis, Chest, Radiographic

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INTRODUCTION

The current guidelines for diagnosis of adult chest tuberculosis (TB) are based primarily on the demonstration of acid-fast bacilli (AFB) on sputum microscopy. Chest radiograph (CXR) finds its place in sputum-negative patients not responding to a course of antibiotics. Though computed tomography (CT) is frequently employed in the diagnosis and follow-up of TB, it does not find a place in the national and international guidelines. Literature is lacking and no consensus exists on use of ultrasound (USG), CT, and magnetic resonance imaging (MRI) in such patients. With India having a large burden of TB, it is important to have established imaging criteria and recommendations.[1-3]

The role of imaging in tuberculosis (TB) has shown exponential growth, as in all spheres of medicine. The possibility of a tubercular etiology is often first suggested on an imaging study, particularly in relatively inaccessible sites. In a known case of TB, imaging is often requested to assess the extent of disease, evaluate response to therapy, or detect residual infection after completion of therapy. Imaging also plays a vital role in guiding aspiration and biopsies and provides guidance for therapeutic drainage of pathological fluid collections.[4-7]Hence; the present study was conducted for evaluating Chest Radiographic Findings in Primary Pulmonary Tuberculosis.

MATERIALS & METHODS

The present study was conducted for evaluating Chest Radiographic Findings in Primary Pulmonary Tuberculosis. A total of fifty children in whom culture-proved TB was present were enrolled. Complete demographic and clinical details of all the patients was obtained. Chest radiographic examinations was done in all the patients. The initial

chest radiographs of the students with newly diagnosed TB were reviewed in and assessed for the presence of lung parenchymal abnormalities. The distributions (upper or lower zone) and the laterality (unilateral or bilateral) of lung lesions were also analyzed. All the results were recorded in Microsoft excel sheet and were subjected to statistical analysis using SPSS software.

RESULTS

Mean age of the subjects was 15.9 years. Out of 50 subjects, 66 percent were boys while the remaining 34 percent were girls. Small nodules were seen in 90 percent of the subjects while large nodules were present in 70 percent of the subjects. Cavitation was seen in 42 percent of the subjects while consolidation was seen 28 percent of the subjects. Upper lung zone involvement was seen in 52 percent of the patients while lower lung involvement was seen in 18 percent of the patients. Bilateral involvement was seen in 30 percent of the patients.

Table 1: Abnormal radiographic findings

Variable	Number	Percentage
Small nodules	45	90
Large nodules	35	70
Cavity	21	42
Consolidation	14	28

Table 2: Pulmonary zone involvement

Zone involvement	Number	Percentage
Upper lung zone	26	52
Lower lung zone	18	36
Both upper and lower lung zone	6	12
Total	50	100

Table 3: Number of lungs involved

Lung involved	Number	Percentage
Unilateral	35	70
Bilateral	15	30
Total	50	100

DISCUSSION

Pulmonary Tuberculosis (TB) is a specific infectious disease caused by Mycobacterium tuberculosis. TB is one of the major public health problems in the developing countries like India.Radiology remains one of the most important diagnostic modalities of tuberculosis infection. Radiological manifestations of pulmonary tuberculosis are dependent on several host factors, including underlying immune status.[10-12]Hence; the present study was conducted for evaluating Chest Radiographic Findings in Primary Pulmonary Tuberculosis.

Mean age of the subjects was 15.9 years. Out of 50 subjects, 66 percent were boys while the remaining 34 percent were girls. Small nodules were seen in 90 percent of the subjects while large nodules were present in 70 percent of the subjects. Cavitation was seen in 42 percent of the subjects while consolidation was seen 28 percent of the subjects.In a study conducted compared the computed tomography chest features of pulmonary tuberculosis in between immunocompromised patients and immunocompetent patients. They conducted their study on newly diagnosed 60 pulmonary tuberculosis patients of which 30 patients had no underlying disease (Immunocompetent Group) and 30 patients had diabetes mellitus or were human immunodeficiency virus seropositive (Immunocompromised Group). CT scan of chest were evaluated for each patient.In immunocompetent patients, 36.7% had radiologically atypical presentation,90% had nodular opacities, 73.3% had consolidation, 23.3% had lymphadenopathy, 60% had cavitation and cavitatory lesion were single in 94.4% patients. Isolated upper lung field were involved in 60% patients. In immunocompromised patients 76.7% had radiologically atypical presentation, 66.7% had nodular opacities, 46.7% had consolidation, 63.3% had lymphadenopathy, 20% had cavitation and cavitatory lesions were multiple in 60% patients. Isolated lower lung field were involved in 23.3% patients. They concluded that immunocompromised patients have more atypical involvement of lung fields, higher prevalence of lymphadenopathy as compared to immunocompetent patients.[13]

Upper lung zone involvement was seen in 52 percent of the patients while lower lung involvement was seen in 18 percent of the patients. Bilateral involvement was seen in 30 percent of the patients. Lachi, T et al described the radiological findings of pulmonary tuberculosis in indigenous patients according to age and sex.Chest radiographic images of 81 patients with pulmonary tuberculosis. The findings in abnormal radiographs were classified according to the changes observed and they were correlated to age and sex. The data were submitted to statistical analysis.The individuals' ages ranged from 1 to 97 years. Heterogeneous consolidations, nodules, pleural involvement and cavities were the most frequent imaging findings. Most patients were male, and upper lung and right lung were the most affected regions. Fibrosis, heterogeneous consolidations and involvement of the left lung apex were significantly more frequent in males. Presence of a single type of finding at radiography was most frequent in children.[14]

CONCLUSION

Typical CT findings of pulmonary TB include centrilobular small nodules, opacities, and cavitation.

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