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ORIGINAL ARTICLE

Retrospective evaluation of radiographic findings in patients with pulmonary tuberculosis: An observational study

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ABSTRACT:

Background: Tuberculosis (TB) remains a worldwide problem despite well documented, well publicised methods of prevention and cure. Chest X-ray is the primary radiologic evaluation of suspected or proven pulmonary TB. Hence; the present study was undertaken for analysing the data of the pulmonary tuberculosis patients for assessing the spectrum of radiographic findings.

Materials & methods: Data records of a total of 200 patients, diagnosed with pulmonary tuberculosis, were analysed. All the radiographs were analysed by skilled and experienced radiologists. All the results were recorded in Microsoft excel sheet and were analysed by SPSS software.

Results: Unilateral nodular infiltration was found to be present in 45 patients. Bilateral nodular infiltration was present in 6 patients. Patchy consolidation was present in 40 patients. Calcified nodule was present in 15 patients. Fibrotic scar was found to be present in 20 patients. Cavitation was found to be present in 24 patients. Hilar lymph node involvement was found to be present in 85 patients.

Conclusion: Radiographic imaging is an excellent tool for estimating the extent of severity in TB patients.

Key words: Pulmonary, Tuberculosis, Radiological

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INTRODUCTION

Tuberculosis remains a worldwide problem despite well documented, well publicised methods of prevention and cure. Poverty and HIV infection are major reasons for its persistence.Most tuberculosis programmes use direct smear examination of sputum but, if resources permit, culture is desirable. Reliable susceptibility testing is a luxury few developing countries can afford, although it is especially desirable for purposes of re-treatment. Rapid methods of culture and susceptibility testing are widely available in the wealthier nations.[1] Molecular techniques have provided quick, sensitive, and specific tests for Mycobacterium tuberculosis—such as polymerase chain reaction, DNA and RNA probes, and γ interferon tests—but these are expensive and technically demanding.[2, 3]

Anyone with a cough that lasts for two weeks or more or with unexplained chronic fever and/or weight loss should be evaluated for TB. Chest X-ray is the primary radiologic evaluation of suspected or proven pulmonary TB. Radiological presentation of TB may be variable but in many cases is quite characteristic. Radiology also provides essential information for management and follow-up of these patients and is extremely valuable for monitoring complications.[4- 6]

Hence; under the light of above mentioned data, the present study was undertaken for analysing the data of the pulmonary tuberculosis patients for assessing the spectrum of radiographic findings.

MATERIALS & METHODS

The present study was commenced in the department of radio-diagnosis of the medical institute and it included assessment of data of the pulmonary tuberculosis patients for assessing the spectrum of radiographic findings.Ethical approval was obtained from institutional ethical committee and written consent was obtained after explaining in detail the entire research protocol. Data records of a total of 200 patients, diagnosed with pulmonary tuberculosis, were analysed. Inclusion criteria for the present study included:

- Patients with more than 20 years of age,
- Patients with complete data records,
- Patients with negative history of any other systemic illness

Complete demographic data, clinical profile and past medical history of all the patient was obtained from their data records. Only those patients were included in the present study in which pulmonary TB was found to be present both by clinical and bacteriological examination. All the radiographs were analysed by skilled and experienced radiologists. All the results were recorded in Microsoft excel sheet and were analysed by SPSS software. Chi- square test was used for assessment of level of significance. P- value of less than 0.05 was taken as significant.

RESULTS

Table 1 shows the age-wise distribution of patients. In the present study, the data records of a total of 150 patients diagnosed with pulmonary TB were analysed.

Mean age of the patients of the present study was 45.8 years. 43.3 percent of the patients of the present study belonged to the age group of 35 to 50 years. 28.7 percent of the patients belonged to the age group of more than 50 years. 57.3 percent of the patients were males while the remaining 42.7 percent of the patients were females.

Table 2 and **Graph 2** show the radiographic manifestations in pulmonary TB patients. Unilateral nodular infiltration was found to be present in 45 patients. Bilateral nodular infiltration was present in 6 patients. Patchy consolidation was present in 40 patients. Calcified nodule was present in 15 patients. Fibrotic scar was found to be present in 20 patients. Cavitation was found to be present in 24 patients. Hilar lymph node involvement was found to be present in 85 patients.

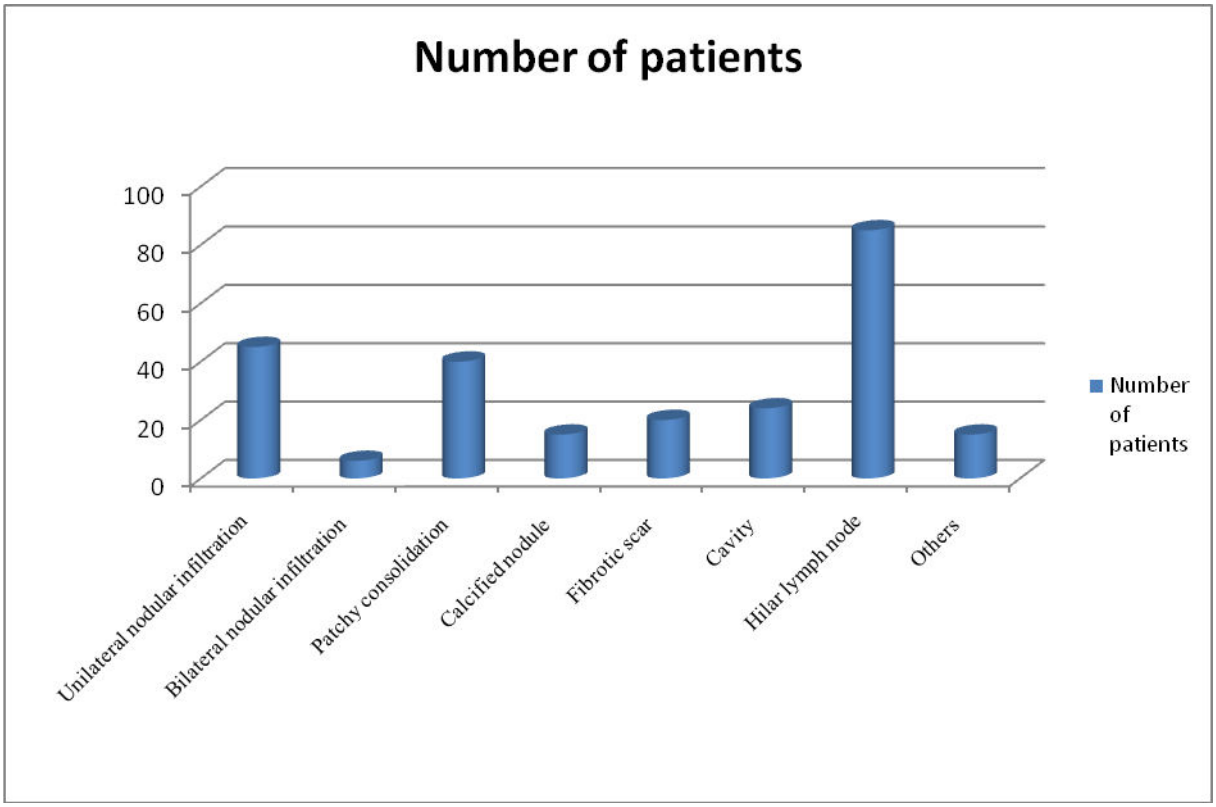
Table 1: Age-wise distribution of patients

Parameter		**Number of patients**	**Percentage of patients**
Age group (years)	Less than 35	42	28
	35 to 50	65	43.3
	More than 50	43	28.7
Gender	Males	86	57.3
	females	64	42.7
Mean BMI (Kg/m^2)		25.8	

Table 2: Radiographic manifestation

Radiographic manifestation	**Number of patients**
Unilateral nodular infiltration	45
Bilateral nodular infiltration	6
Patchy consolidation	40
Calcified nodule	15
Fibrotic scar	20
Cavity	24
Hilar lymph node	85
Others	15

Graph 1: Radiographic manifestation



DISCUSSION

Chest radiography is a more expensive test than examination of sputum by direct smear, but when available and reliable it is an important investigation, especially when clinical suspicion of tuberculosis exists but the sputum is negative. Fluffy upper zone shadowing, frequently bilateral and often associated with cavitation, is classic, as is miliary shadowing.[7- 9] New, soft shadowing among old, fibrotic changes often indicates relapse of previous disease. Paratracheal, mediastinal, and hilar lymphadenopathy are not unusual in African and Indian patients with tuberculosis. In patients infected with HIV, the radiological appearances are often less specific, just as symptoms and signs may not be classical and sputum may be negative on direct smear.[10]

In the present study, the data records of a total of 150 patients diagnosed with pulmonary TB were analysed. Mean age of the patients of the present study was 45.8 years. 43.3 percent of the patients of the present study belonged to the age group of 35 to 50 years. 28.7 percent of the patients belonged to the age group of more than 50 years. 57.3 percent of the patients were males while the remaining 42.7 percent of the patients were females. Kisembo HNet al described chest radiograph (CXR) findings in a population with a high prevalence of human immunodeficiency virus (HIV) and tuberculosis (TB). Consecutive adult patients admitted to a national referral hospital with a cough of duration of 2 weeks or longer underwent diagnostic evaluation for TB and other pneumonias, including sputum examination and mycobacterial culture, bronchoscopy and CXR. Two radiologists blindly reviewed CXRs using a standardised interpretation form. Smear or culture-positive TB was diagnosed in 214 of 403 (53%) patients. Median CD4+ T-cell count was 50 cells mm–3. Although different CXR patterns can be seen in TB and non-TB pneumonias there is considerable overlap in features, especially among HIV-seropositive and severely immunosuppressed patients.[11]

In the present study, unilateral nodular infiltration was found to be present in 45 patients. Bilateral nodular infiltration was present in 6 patients. Patchy consolidation was present in 40 patients. Calcified nodule was present in 15 patients. Fibrotic scar was found to be present in 20 patients. Cavitation was found to be present in 24 patients. Hilar lymph node involvement was found to be present in 85 patients. Due to high TB prevalence and radiological similarities, a large number of lung cancer patients initially get wrongly treated for tuberculosis based on radiological picture alone. At chest skiagram, tuberculosis may manifests as 5 main entities: Parenchymal disease, lymphadenopathy, miliary disease (evenly distributed diffuse small 2-3-mm nodules, with slight lower lobe predominance), pleural effusion, and cavitation. Parenchymal lesions are characterized by dense, homogeneous, or non-homogenous parenchymal consolidation in any lobe (mostly upper lobe predilection) and fibrotic changes. Mass with or without collapse is the commonest radiological finding in lung cancer.[9, 10]Koh WJet al described the radiographic findings of primary pulmonary tuberculosis (TB) in previously healthy adolescent patients. TB outbreaks occurred in 15 senior high schools and chest radiographs from 58 students with identical strains of TB were analyzed by restriction fragment length polymorphism analysis by two independent observers. Of 58 patients, three (5%) had normal chest radiographs. Cavitary lesions were present in 25 (45%) of 55 students. The most common radiographic findings in primary pulmonary TB by recent infection in previously healthy adolescents are upper lung lesions, which were thought to be radiographic findings of reactivation pulmonary TB by remote infection.[12]

CONCLUSION

Under the light of above obtained results, the authors conclude that radiographic imaging is an excellent tool for estimating the extent of severity in TB patients. However; further studies are recommended in future for better exploration results.

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