

Study of Radiological Features of Pleuropulmonary Tuberculosis with Comorbidities in Tertiary Care Hospital of North India

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ABSTRACT

Introduction: Pulmonary tuberculosis (PTB), the commonest form of TB is characterized by the involvement of lung parenchyma resulting in nodule formation in the lungs. PTB leads to cavity formation is one of the highly contagious pulmonary tuberculosis. In PTB chest x ray findings of patient with comorbidities varies as compare to without comorbidities. Current research aimed to study radiological features of pleuropulmonary tuberculosis with comorbidities.

Material and method: This study was conducted in 100 patients of pleuropulmonary tuberculosis with comorbidities (dm, htn, cld, ckd, malignancy and hiv) confirmed by sputum AFB, CBNAAT and pleural fluid analysis. Radiological manifestations were recorded and all clinical examination findings were recovered. Baseline investigations including plain X-ray chest P.A., sputum AFB and CBNAAT, pleural fluid routine microscopy, AFB and CBNAAT was done.

Results: Xray chest of Majority of patients with all comorbidities have upper zone involvement, right side more common. Consolidation as commonest pattern followed by Infiltration, Effusion {DM, HTN, CLD} Cavity Were present in DM (2,3.4%) and MALIGNANCY (2,66%) Fibrosis were only present in malignancy. only studied patient with Millitary pattern were observed in DM.

Conclusion: Right upper lobe is more common associated than the left side and consolidation is the most common lesion present on radiological findings in Pulmonary Tuberculosis.

Keywords: Radiological Features, Pleuropulmonary Tuberculosis

INTRODUCTION

Tuberculosis is an infectious disease caused by Mycobacterium tuberculosis; it is transmitted from person to person via droplets from individuals with active respiratory disease.¹ TB usually affects the lungs, causing the condition called pulmonary tuberculosis. However TB can also affect other parts of the body including the brain, abdomen, lymph nodes, kidneys, bones, pleura and joints. TB affecting any other body part except lung, such a form of TB is known as extra pulmonary tuberculosis (EPTB). If not treated properly, tuberculosis can be a fatal disease. Tuberculosis (TB) a disease which is caused by Mycobacterium tuberculosis complex remains the cause of highest mortality in individuals, leading to three million deaths annually, about five deaths every minute. Pulmonary tuberculosis (PTB), the commonest form of TB is characterized by the involvement of lung parenchyma resulting in nodule formation in the lungs. India on an average accounts for nearly 25% of the global burden

of tuberculosis and 29% of mortality due to tuberculosis.² Many risk factors such as age, sex, malnutrition, diabetes, human immunodeficiency virus (HIV) infection (biological factors), tobacco smoking, alcoholism (personal habits), poverty, overcrowding and poor housing (socio-economic factors) are known to be associated with the development of pulmonary TB. Some of these risk factors strongly contribute to risk of infection rather than to progression to disease, while others are mostly responsible for progression from infection to disease.³ TB can present with symptoms and atypical radiologic findings that are indistinguishable from those of community-acquired pneumonia.⁴ Diabetes mellitus (DM) is an increasingly recognized co-morbidity that can both accelerate tuberculosis (TB) disease and complicate TB treatment.⁵

Study aimed see the radiological features of pleuropulmonary tuberculosis with comorbidities.

MATERIALS AND METHODS

This prospective, observational study was performed in Department of Respiratory Medicine for duration of 01st November 2017 to April 2019 of pleuro-pulmonary tuberculosis patients with all age who were attending medicine OPD those were confirmed consent and fit to the inclusion criteria were recruited for this study.

Inclusion Criteria –

1. Patients with common comorbidities namely Chronic Kidney Disease, Chronic Liver Disease, HIV, Diabetes Mellitus and others (hypertension, malignancy).
2. All cases both new and retreatment of pulmonary tuberculosis and pleural tuberculosis.
3. All patients microbiologically and clinically diagnosed pulmonary tuberculosis and pleural tuberculosis

Data were collected, cleaned and analysed by using Stata version 15. Continuous variables were represented as mean (SD) and categorical variables were represented as frequency (%). Inferential statistics was performed using independent

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t-test for continuous outcomes and Chi-squared test or Fishers exact test for categorical outcomes, considering p value <0.05 for statistical significance.

RESULTS

There were 100 cases of pleuropulmonary tuberculosis, recruited from the respiratory medicine wards from duration of 01st November 2017 to April 2019 of pleuro-pulmonary tuberculosis patients with all age who were attending medicine OPD those were confirmed consent and fit to the inclusion criteria were recruited for this study. Out of 100 studied patients majority were DIABETES (58,58%) HTN (21,21%) CLD(10,10%) CKD (5,5%)HIV (3,3%) Malignancy (3,3%).table 1 shows radiological (chest X-ray) findings of studied patients with comorbidity. Majority of

patients in all comorbidities have upper zone involvement in both right and left lung, right side more common. Majority of patients with comorbidities chest x-ray depicts Consolidation as commonest pattern followed by Infiltration, Effusion {DM, HTN, CLD} Cavity Were present in DM (2,3.4%) and Malignancy (2,66%) Fibrosis were only present in malignancy. only studied patient with Millitary pattern were observed in DM. upper zone predominance were more common in all comorbidities in right lung. majority of patients were diabetics (41,70.7%) followed by HTN (11,52.4%), CLD, CKD, HIV AND least were Malignancy. In right lung lower lung field involvement was present in 3 patients only in DM and in 1 patient of malignancy. In left lung also upper zone involvement is more common. majority of patients were diabetics (23,39.7%) followed by htn(13,61.9%),

Radiology			Present Comorbidity						
			DM	HTN	CLD	CKD	HIV	Malignancy	
RIGHT	Zone	Upper	41 (70.7%)	11 (52.4%)	8 (80.0%)	3 (60.0%)	3 (100.0%)	2 (66.7%)	
		Middle	1 (1.7%)	1 (4.8%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	
		Lower	3 (5.2%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (33.3%)	
	Lesion	Consolidation	30 (51.7%)	7 (33.3%)	7 (70.0%)	2 (40.0%)	3 (100.0%)	0 (0.0%)	
		Infiltration	12 (20.7%)	5 (23.8%)	1 (10.0%)	1 (20.0%)	0 (0.0%)	0 (0.0%)	
		Effusion	4 (6.9%)	0 (0.0%)	3 (30.0%)	2 (40.0%)	1 (33.3%)	0 (0.0%)	
		Cavity	2 (3.4%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	2 (66.7%)	
		Fibrosis	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (33.3%)	
		Millitary	1 (1.7%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	
		Hydropneumo	1 (1.7%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	
	LEFT	Zone	Upper	23 (39.7%)	13 (61.9%)	4 (40.0%)	1 (20.0%)	3 (100.0%)	0 (0.0%)
			Middle	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
			Lower	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Lesion		Consolidation	16 (27.6%)	5 (23.8%)	3 (30.0%)	1 (20.0%)	3 (100.0%)	0 (0.0%)	
		Infiltration	6 (10.3%)	6 (28.6%)	1 (10.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	
		Effusion	2 (3.4%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	
		Cavity	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	
		Fibrosis	1 (1.7%)	1 (4.8%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	
		Hydropneumo	1 (1.7%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	
		Millitary	1 (1.7%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	

*N=100

Table-1:

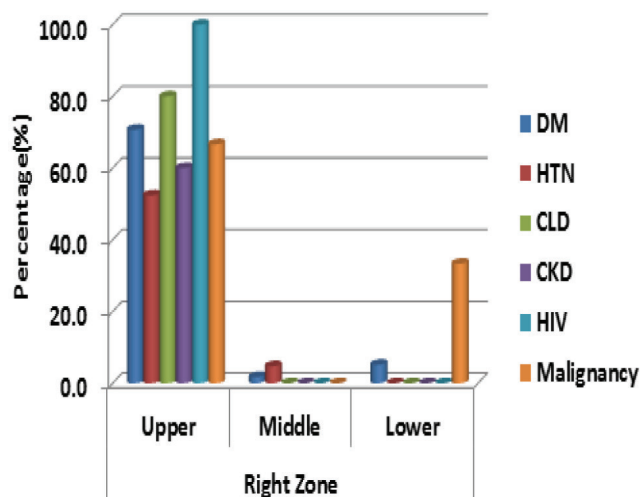


Figure-1A: Radiological profile of right lung

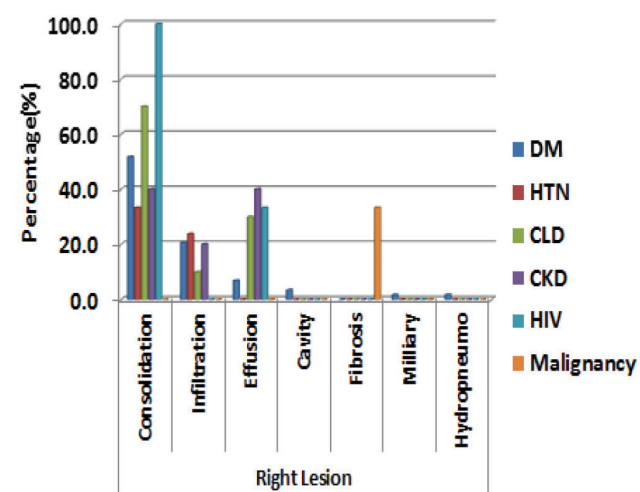


Figure-1B: Radiological lesion seen in rt lung

CLD, CKD, HIV, no lower zone involvement seen in left lung with comorbidities. Figure 1A and 1B radiological profile of pleuropulmonary tuberculosis patients with comorbidities in right lung. In right lung in DM most common pattern observed was consolidation followed by infiltration, effusion, cavity and milliary. Among all comorbidities in rt lung fibrosis were observed only in malignancy.

Fig 2A and 2b radiological profile of pleuropulmonary tuberculosis patients with comorbidities in left lung. In DM most common pattern observed was consolidation followed by infiltration, cavity and milliary. In patients with HTN infiltration were observed over consolidation. Among all comorbidities in left lung fibrosis were observed only in malignancy.

DISCUSSION

In present study radiological findings of patients in all comorbidities have upper zone involvement, right side more common. Majority of patients with comorbidities chest X ray depicts Consolidation as commonest pattern followed by Infiltration, Effusion and Cavity were present in DM (3.4%); among studied patient Milliary pattern were observed in DM only in one study patient. Ruslami

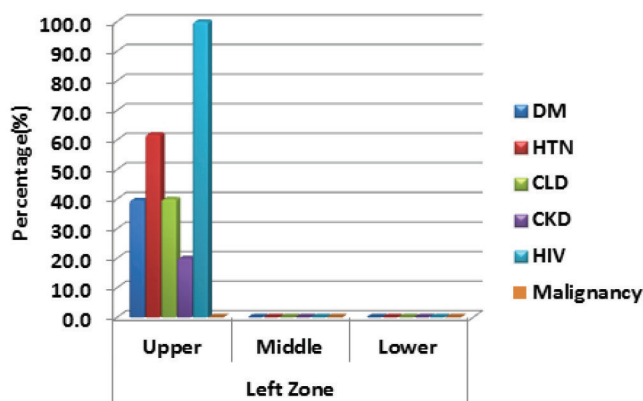


Figure-2A: Radiological profile of left lung

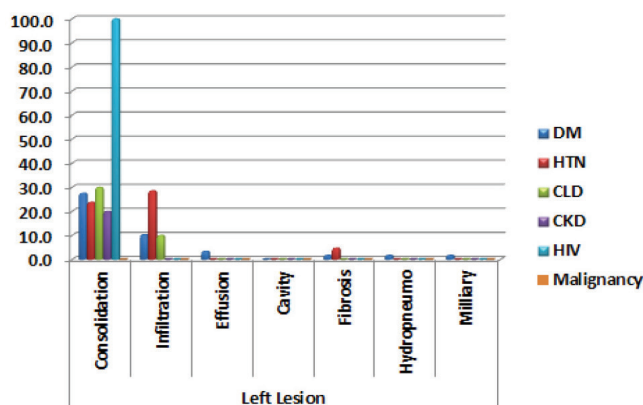


Figure-2B: Radiological lesion seen in left lung

R et al⁶ have been conflicting findings regarding the effect of DM on the radiologic characteristics of pulmonary tuberculosis. Alisjahbana B et al⁷ concerning the distribution of pulmonary involvement, some studies did not find any difference between DM and non DM cases. However, Ruslami R et al⁶ studies that showed a higher incidence of lower lobe involvement among DM TB cases. Ocal S et al⁸ also reported there was no significant difference in the frequency of pleural effusions or isolated pleural TB between patients with and without DM. Results of ParvanehBaghaei et al⁹ study of pulmonary TB CT findings showed a high prevalence of non-segmental distribution (30%) and multiple small cavities among diabetic patients. However, unusual localization such as lower lobe lesions, involvement of the anterior segment of the upper lobes or right middle lobe, was similar between DM and non DM cases. HIV co-infection can alter the pathogenesis of MTB and lead to negative sputum smear results, atypical radiographic manifestations and extrapulmonary manifestations, which poses difficulty in diagnosing MTB disease.¹⁰ The tuberculosis pleural effusion right side pleural effusion was present in 60% cases, left side pleural effusion was present in 40% cases. In uremic pleural effusion bilateral pleural effusion was present in 80% cases, in parapneumonic effusion left side pleural effusion was present in 50% cases and right side pleural effusion was present in 50% cases.¹¹ Most common radiographic findings for primary pulmonary TB included parenchymal disease, lymphadenopathy, pleural effusions

& miliary disease. Homogenous parenchymal consolidation of the middle & lower lung lobes is suggestive of disease, although differential diagnoses would include a host of other bacterial infections¹² Pleural association has been reported in up to 38.0% of cases of primary pulmonary TB.¹³

CONCLUSION

Diabetes Mellitus is the common associated comorbidity in patients with Pleuro Pulmonary Tuberculosis Right upper lobe is more common associated than the left side and consolidation is the most common lesion present on radiological findings in Pulmonary Tuberculosis.

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