

PULMONARY TUBERCULOSIS; AGE RELATED RADIOLOGICAL FINDINGS

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ABSTRACT... Objective: To study the age related radiological finding in pulmonary tuberculosis. **Study design:** A cross sectional study. **Place and duration of study:** From January 2009 to December 2009 pulmonary department of Bahawal Victoria Hospital Bahawal Pur. **Patients and method:** The cases diagnosed as pulmonary tuberculosis of either gender above age of 12 years were included in the study. Patients suffering from extra pulmonary tuberculosis, treatment failure, relapse, drug resistant tuberculosis and HIV sero-positive patients were excluded from the study. Patients were divided into groups according to the age. Group 1 consist of patients having age ≥ 50 years while group 2 consist of patients having < 50 years. Data was recorded on the Proforma and was analyzed statistically on SPSS 11. **Results:** this study consists of 106 patients and divided into two groups. It has been found that apical zone of lung involvement was more common in patients younger than 50 years while involvement of lower zone was more common in patients with age ≥ 50 years. No significant difference was found regarding the involvement of middle zone, multiple zones and the type of lesions as the p-value was > 0.05 . **Conclusions:** the elderly patients with pulmonary tuberculosis have predominant involvement of lower zones. So, lower zone involvement of radiological lesions should be evaluated for pulmonary tuberculosis to start the treatment earlier and to minimize the risk of missing the diagnosis.

Key words: Pulmonary tuberculosis, Radiology, Old age

INTRODUCTION

Tuberculosis has been declared as a global public health emergency by World Health Organization (WHO). Tuberculosis is public health problem in Pakistan for a long period of time. It is becoming a common problem not only in younger population but also in elderly population. Radiology remains one of the important diagnostic modalities of TB infection¹. It provides essential information for the management and follow-up of these patients as well as tools for monitoring complications². Reactivation pulmonary tuberculosis has been classically considered as a disease causing fibro nodular infiltrates, often with cavitation, in one or both upper lung fields, except in older people in whom "atypical" images of lower lung lesions and fewer cavities are common^{3,4}. Atypical presentation is supported by studies comparing "young" and "old" tuberculosis patients⁵. Nevertheless, there is little information about when and how these "atypical" changes occur.

Pulmonary TB in elderly patients is more likely to present

with non-specific symptoms and atypical radiographic findings. The impact of age on the radiological presentation of pulmonary tuberculosis is important because misinterpretation of the images might delay appropriate diagnostic tests and the start of treatment, thus risking the dissemination of Mycobacterium tuberculosis to others.

In order to identify possible age-related changes occurring in pulmonary tuberculosis, the chest radiographs from tuberculosis patients were reviewed.

MATERIAL AND METHODS

The study was carried out on patients attending the pulmonary department of Bahawal Victoria Hospital Bahawal Pur from January 2009 to December 2009. Patients diagnosed as case of pulmonary tuberculosis of either gender above age of 12 years were included in the study. Patients suffering from extra pulmonary tuberculosis, treatment failure, relapse, drug resistant tuberculosis and HIV seropositive patients were

excluded from the study. All the subject suffering from symptoms and sign suggestive of pulmonary tuberculosis were subjected for X-ray chest PA view and other related investigations for the diagnosis of tuberculosis. Radiological findings were discussed with radiologist, the tubercular lesions were classified according to the site of lesion (unilateral, bilateral), involved zones (upper zone, middle zone, lower zone and multiple zones if two or more than two zones are involved) and type of lesion (homogenous or non homogenous opacities and cavities).

Patients were divided into groups according to the age. Group 1 consist of patients having age ≥ 50 years while group 2 consist of patients having age < 50 years. It was analytical (cross-sectional) study. Chi square test was applied to compare the variables between two groups and differences were regarded significant when p-value was equal to or < 0.05 . Data was recorded on the proforma and was analyzed statistically on SPSS 11.

RESULTS

This study consisted of 106 patients with mean age of 49.2. Females were 36 and male were 70. Table no II showed that unilateral involvement of lung was more common among patients younger than 50years [group1 (50.9%) & group 2 (73.6)] while bilateral involvement was common among patients of age ≥ 50 years [group1 (49.1%) & group2 (26.4%)] and these differences were statistically significant as p-value was < 0.05 . Apical involvement of lungs was more among patients younger than 50 years (77.4%) as compare to patients of age ≥ 50 years (43.4%) that was statistically significant as p-

value was < 0.05 , while the involvement of lower zone of lungs was more common among the patients of age ≥ 50 years (20.8%) as compare to patients younger than 50years (5.7%) that was statistically significant as p-value was < 0.05 . There were differences regarding the involvement of middle zone and the multiple zones but the differences were not statistically significant as p-value was > 0.05 .

Table-I. Demographic features of patients	
Mean age	49.2
Male	70 (66.03%)
Female	36 (33.96%)
Total	106 (100%)

Table III showed the type of lesion. We found that the non homogenous type of lesion (88.7%) were more frequent as compare to homogenous lesions (11.3%) while non cavitatory lesions(74.5%) were more frequent as compare to cavitatory lesions (25.5%). There were 17.0% of the patients among younger than 50 years and 5.7% of the patients among elderly patient who were having non homogenous opacity, with no statistically significant difference. Similarly 83.0% of the patients in younger group and 94.3% of the patients in elderly group were having homogenous opacity with no statistically significant difference. Frequency of cavitatory lesions was 30.2% and 20.8% in the younger group & elderly group of patients respectively while frequency of non cavitatory lesions was 69.8% and 79.2% in the younger group & elderly group of patients respectively with no statistically significant difference.

Table-II. Radiological features of pulmonary tuberculosis			
	Age		P-value
	≥ 50 (n=53)	< 50 (n=53)	
Unilateral	27 (50.9%)	39 (73.6%)	.027
Bilateral	26 (49.1%)	14 (26.4%)	
Apical	23 (43.4%)	41 (77.4%)	.001
Middle	3 (5.7%)	1 (1.9%)	.618
Lower	11 (20.8%)	3 (5.7%)	.042
Multiple	16 (30.2%)	7 (13.2%)	.058

Table-III. Type of radiological lesions in pulmonary tuberculosis

Type of lesion	Age		Total	P-value
	≥50(n=53)	<50 (n=53)		
Homogenous Opacity	9 (17.0%)	3 (5.7%)	12 (11.3%)	0.12
Non homogenous opacity	44 (83.0%)	50 (94.3%)	94 (88.7%)	
Cavitatory	16 (30.2%)	11 (20.8%)	27 (25.5%)	0.37
Non cavitatory	37 (69.8%)	42 (79.2%)	79 (74.5%)	

DISCUSSION

Tuberculosis epidemic is prevailing in the developing countries despite extreme efforts of WHO and local health department Tuberculosis affects individuals of all age groups but it is increasingly becoming more common in elderly population. There are several factors that may contribute to the development of the pulmonary tuberculosis, but immuno-compromised states, steroid and anticancer drugs intake, and reactivation of dormant tuberculosis are more common in elderly people. Studies have reported higher tuberculosis related mortalities among elderly patients as compare to the younger patients^{6,11} and delay in diagnosis due to atypical clinical and radiological findings may be the important factor.

In this study, we found that male were predominant than the female. Similar male predominance has been reported by the studies done abroad^{7,8,9}.

In relation to radiological findings of pulmonary tuberculosis, we found that unilateral involvement of lung was more common in the younger patients while the bilateral involvement was more common in elderly patients.

It also had been found that the young patients were mostly suffering from the pulmonary tuberculosis involving the apical zone while the elderly patients were mostly having lower zone involvement. Many studies had been done concerning the atypical radiological findings of pulmonary tuberculosis in elderly. Some studies reported no major difference while others reported higher involvement of the middle and lower lung zone in the elderly patients. Our findings are consistent with study

done by R. Jagdish et al in this respect¹⁰. Similarly according to the study done by Lee JH and his colleagues, apical zone involvement was more in younger patients while the lower zone involvement was more in the elderly patients¹¹.

Regarding the type of the opacities and cavitations, we found no statistical significance among the both age groups. Perez-zguzman C and his colleague did a study on progressive age related changes in pulmonary tuberculosis images and the effect of the diabetes on pulmonary tuberculosis and found that in non diabetic patients frequency of cavitations remained same in all age groups while in diabetic the frequency of cavitations increases with the age¹².

CONCLUSIONS

Elderly patients suffering from pulmonary tuberculosis were having predominant involvement of the lower lung zones as compare to the younger patients. Thus, such radiological manifestations of pulmonary tuberculosis in elderly people can result in delay in diagnosis and initiation of treatment that may result in higher rate of pulmonary tuberculosis related morbidity and mortality.

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**However beautiful the
strategy, you should occasionally
look at the results.**

Sir Winston Churchill