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Comparison of Clinico-Radiological Profile Of New Smear Positive Pulmonarytuberculosis Cases Among Adults and Elderly People

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Abstract: ***Introduction: Elderly age group is one of the risk factor for tuberculosis. The presentation of tuberculosis in elderly may vary at times from young adults. Such atypical presentation may delay the diagnosis in elderly patients. Aim of the study is to compare the clinico-radiological pattern of smear positive pulmonary tuberculosis in the adults (18-50 years) and elderly (> 50 years). Methods: This prospective observational study was carried out on all new smear-positive pulmonary tuberculosis patients in the Department of pulmonary medicine, Chettinad Hospital and Research Institute, Chennai. Results: Malesare predominantly affected in both the groups.Loss of appetite, loss of weight, breathlessness and chest pain, weremore frequently reported in the elderly group (age > 50 years) whereas hemoptysis was found significantly higher in younger patients group. Bacillary load was higher in elderly. Radiologically bilateral involvement,lower zone predominance and far advanced disease were noted in elderly. Conclusion: Elderly patients with tuberculosis have more atypical clinico radiological presentation.A high degree of suspicion need be maintained by the physician to aid early diagnosis of tuberculosis in the elderly.***

Keywords: Pulmonary tuberculosis,Elderly, Adults, Atypical Presentation

1. Introduction

Tuberculosis is an endemic disease in India that progresses from a focal infection to systemic infection caused by Mycobacterium tuberculosis. Most commonly, tuberculosis spreads from person to person by airborne transmission of droplet nuclei. Despite a relatively low transmission rate compared with other contagious diseases and the existence of effective control programmes, still tuberculosis remains a growing public health problem. Approximately one-third of the world's population is infected with tuberculosis. Although occurrence of atypical clinical presentation and chest radiographic findings in the geriatric population is known, a large number of studies conducted overseas report similarity in clinical, microbiological and radiological presentation amongst both adults and elderly. [1] Review of literature reveals a serious deficiency of Indian medical literature describing the problems of diagnosis and management of pulmonary tuberculosis in the elderly population.

India is considered as "an ageing nation" with 7.7% of its population being more than 60 years old. Pulmonary tuberculosis presents varyingly amongst adults and the elderly [2]and need to be evaluated differently. Probably the higher morbidity and mortality reported in the elderly population is due to non-recognition of these subtle differences in presentation thereby, delaying establishment of the diagnosis and early institution of treatment.[3]Tuberculosis constitutes a major disease burden amongst the elderly and is expected to increase continually in the geriatric community,[4] therefore, this study was undertaken to study the clinic-radiological variability of smear positive pulmonary tuberculosis in elderly as compared to young patients.

2. Aims and Objectives

To compare the clinico-radiological presentation in adults(18-50 years) and elderly(> 50 years) patients with smear positive pulmonary tuberculosis.

3. Methodology

The study was conducted at the Department ofRespiratory Medicine, Chettinad Hospital and Research Institute, Chennai in outpatient and inpatients of Tuberculosis. It is a prospective observational studyapproved by research and ethical committee. 150 smear positive pulmonary tuberculosis patients were included in the study.

Inclusion criteria

1. Subjects diagnosed as new smear positive pulmonary Tuberculosis.
2. Subjects in age group 18 - 70 years

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Exclusion criteria

1. Extra pulmonary tuberculosis
2. Seropositive (HIV/AIDS)
3. Chronic liver/renal failure
4. Chronic steroid/immunosuppressive therapy
5. Diagnosed Connective tissue disorders
6. Malignancy
7. Pregnancy

Informed written consent was obtained from all subjects before enrollment.

The Diagnosis of Tuberculosis was based on detailed history, clinical examination, sputum microscopy for acid fast bacilli and chest radiography. The included subjects were divided into two groups-adults (age 18-50yrs) and elderly (age>50yrs).

All chest x-rays were reviewed for presenceor absence of cavities, zones involved and extentof disease. Extent of lesions was classified into 3 categories namely "(i) minimal lesion: disease with a combined area lessthan that of the right upper lobe, (ii) moderate: diseasewith a combined area less than that of the right lungbut more than that of the right upper lobe and (iii) advanced: disease with a combined area more thanthat of the right lung."[5]
At the end of the study, the data collected was subject to statistical analysis.

4. Results

A total of 150 (63 elderly and 87 adult) patients of new smear positive pulmonary tuberculosiswere included in the study. The data thus collected was subject to appropriate statistical analysis, and results are presented below.

Table 1: Gender Distribution

Gender	Smear positive TB (n=150)	
	Adults (n=87)	Elderly (n=63)
Male	57 (65.5%)	48 (76.2%)
Female	30 (34.5%)	15 (23.8%)

Tab1e 1 compares the gender distribution in both the groups. Male predominance was seen in both the groups.

Table 1: Symptom Characteristics

Parameter	Smear positive TB (n=150)		p Value
	Adults (n=87)	Elderly (n=63)	
Cough	79(90.8%)	59(93.7%)	0.526
Expectoration	85(97.7%)	62(98.4%)	0.759
Breathlessness	43(49.4%)	55(87.3%)	0.000
Chest pain	15(17.2%)	20(31.7%)	0.038
Hemoptysis	30(34.5%)	10(15.9%)	0.011
Fever	69(79.3%)	52(82.5%)	0.621
Loss of appetite	66(75.9%)	57(90.5%)	0.021
Loss of weight	62(71.3%)	57(90.5%)	0.004

Table 2 compares the symptom characteristics amongstelderly and adults. Breathlessness, chest pain, loss of appetite and loss of weight were found significantly higherin elderlycompared to adults, while hemoptysis was found significantly higher in adults ($p < 0.01$). However cough and /or expectoration, andfever did not significantly differ between the groups

Table 2: Bacillary load

AFB	Smear positive TB (n=150)		p Value
	Adults (n=87)	Elderly (n=63)	
Scanty	9(10.3%)	5(7.9%)	0.030
1+	32(36.8%)	17(27.0%)	
2+	26(29.9%)	12(19.0%)	
3+	20(23.0%)	20(46.0%)	

Table 3 shows the comparison of bacillary load between the two groups. It is observed that the high bacillary load (3+) was found to be more in elderly than adults($p<0.03$). Within the elderly group 46% reported 3+ smear positivity.

5. Comparison of Radiology Characteristics

Table 4.1: Comparison of side preference

Side	Smear positive TB (n=150)		p Value
	Adults (n=87)	Elderly (n=63)	
Right	30(34.5%)	24(38.1%)	0.21
Left	29(33.3%)	13(20.6%)	
Bilateral	28(32.2%)	26(41.3%)	

Table 4.2: Comparison of lesions

Lesions	**Smear positive TB (n=150)**		**p Value**
	Adults (n=87)	**Elderly (n=63)**	
Fibrosis	14(16.1%)	16(25.4%)	0.160
Cavity	41(47.1%)	26(41.3%)	0.476
Alveolar opacity	67(77.0%)	45(71.4%)	0.438
Consolidation	33(37.9%)	23(36.5%)	0.859

Table 4.3: Comparison of extent of lesions

Extent of lesion by chest x ray	Smear positive TB (n=150)		**p Value**
	Adults (n=87)	Elderly (n=63)	
Minimal	40(46.0%)	10(15.9%)	0.000
Moderately advanced	33(37.9%)	28(44.4%)	
Far advanced	14(16.1%)	25(39.7%)	

Table 4.1-4.4compares the radiological characteristicsof both the groups. Bilateral involvement was found more in elderly group compared to adults ($p = 0.21$).Cavity, alveolar opacity and consolidation were seen predominantly in adults whereas fibrosis was more common in the elderly group**.** Lower zone involvement and far advanced disease were significantly higher ($p<0.001$) in elderly as compared to adults.

Table 4.4: Comparison of zone preference

Lung Zone		*Smear positive TB (n=150)*		*p Value*
		Adults (n=87)	*Elderly (n=63)*	
UZ	Present	61(70.1%)	37(58.7%)	0.148
	Absent	26(29.9%)	26(41.3%)	
MZ	Present	62 (71.3%)	47(74.6%)	0.651
	Absent	25(28.7%)	16(25.4%)	
LZ	Present	15(17.2%)	27(42.9%)	0.001
	Absent	72(82.8%)	36(57.1%)	

6. Discussion

1. Sex distribution

In our study, in both groups males were predominantly affected similar to the observations of Morris et al [6]. Tripathy and Kar [7]in their study reported 78% of their patients to be males.Meta-analysis of 12 studies done by

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Carlos Perez-Guzma [8] showed male preponderance.Similar observations were reported by Tan KK et al [9].

2. Comparison of symptomatology

In our study, breathlessness, loss of appetite, loss of weight and chest pain was found significantly higher in elderly and haemoptysis was significantly higher in adults. The most common presenting complaint in both the groups was cough with (or) without expectoration. Jagdish Rawat et al [10] compared the clinico-radiological pattern of pulmonary tuberculosis in adults and elderly patients and observed that "hemoptysis (29.5% vs. 6%), fever (95.4% vs. 76%) and night sweats (54.5% vs. 18.0%) were significantly higher in the adults". Anand Patel et al [11] from Gujarat also reported that elderly had less incidence of fever, chest pain, haemoptysis and higher incidence of dyspnea as compared to adults. Umeki [12] and VandenBrande et al [13] found that hemoptysis occurred equally in both groups.

3. Comparison of Bacteriology

High bacillary load was reported in 46% elderly as compared to 23% adults possibly making them more infectious that warrants early diagnosis and management. Tan et al [9] also reported that the elderly had significantly more severe disease and high bacteriological burden compared with age group 15-45 years.

4. Comparison of Radiology

Bilateral involvement, lower zone predominance and far advanced disease were more prevalent in elderly compared to adults. Similar observations were reported in tuberculous diabetics by Hariprasad et al [14]also observed that lower lung field is involved more commonly in older age group than adults. Jagdish Rawatet al[10] also reported "a higher involvement of lower zone (24.0% vs. 7.9%) and far advanced lesions (32.0%vs. 14.7%) in the elderly". In our study, minimal lesions were predominantly found among young patients as compared to elderly.

7. Conclusion

Atypical presentation with advanced disease and high bacterial load at time of diagnosis is commonly seen in the elderly. Hence high index of suspicion is crucial to early diagnosis and management, thereby reducing morbidity and mortality amongst the patients and curtailing the spread of tuberculosis in the community.

Conflict of Interest: None

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