

Original Article:**A prospective study of pulmonary tuberculosis in rural geriatric population of South India**

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ABSTRACT

Background: Sparse data are available documenting similarities and differences in the clinical, bacteriological and radiographic features of pulmonary tuberculosis (TB) in persons aged over 60 years and those aged under 60 years.

Materials and Methods: We prospectively studied 100 adult patients with pulmonary TB aged 18-59 years (n=50) and 60 years and above (n=50; elderly subjects) who presented to the medicine out-patient service and were admitted in the medical wards at our medical college teaching hospital at Kuppam, Andhra Pradesh.

Results: In both the groups, males were in the majority (72% in geriatric and 60% in adult group).

Hemoptysis (26% in geriatric and 42% in adult) and night sweats (12% in geriatric and 58% in adult) were frequent in adults than geriatric patients. Chronic obstructive pulmonary disease(COPD),Hypertension and diabetes mellitus were more frequent in geriatric patients than 18-59 year old adults. Cavitations were more common in adults, whereas lower lobe involvement was more frequent in the geriatric group. In the geriatric patients 72% were completely cured compared to 92% in adult patients.

Treatment failure was 20% in geriatric group compared to 6% in adults. Mortality was 8% in geriatric and 2% in adults. Adverse reactions were frequent in geriatric group (n=20) than 18-59 year old individuals.

Conclusion: The present study documents important differences in clinical and radiological presentation of pulmonary TB in geriatric patients compared with adults aged 18-59 years. Geriatric patients also experienced more frequent occurrence of adverse reactions, failure of treatment and mortality.

Key words: *Pulmonary tuberculosis, elderly*

Shaik KU, Sunil Dattu M, Krishnamurthy S, Suresh R, Revanasiddappa HG, Reddy YJV. A prospective study of pulmonary tuberculosis in rural geriatric population of South India. J Clin Sci Res 2016;5:28-32. DOI: <http://dx.doi.org/10.15380/2277-5706.JCSR.15.043>.

INTRODUCTION

Tuberculosis (TB) is among the most widespread and serious of all human infectious diseases and is still a major infectious disease worldwide. Despite the implementation of strong TB initiatives, this highly infectious disease continues to affect all vulnerable populations, including the elderly population. Atypical clinical manifestations of TB in older persons can result in delay in diagnosis and initiation of treatment; higher rates of morbidity

and mortality from this treatable infection can occur. Underlying illnesses, age-related diminution in immune function, the increased frequency of adverse drug reactions, and institutionalization can complicate the overall outcome in elderly patients with TB. A high index of suspicion for TB in this vulnerable population is, thus, undoubtedly justifiable.¹ Acute or chronic diseases, malnutrition, and the biological changes associated with aging can disrupt protective barriers, impair microbial

Received: July 11, 2015; Revised manuscript received: December 19, 2015; Accepted: December 21, 2015.

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**Online access**

http://svimstpt.ap.nic.in/jcsr/jan-mar16_files/3oa16.pdf
DOI: <http://dx.doi.org/10.15380/2277-5706.JCSR.15.043>

clearance mechanisms, and contribute to the expected age-related diminution in cellular immune responses to *Mycobacterium tuberculosis*.² The diagnosis of TB can be difficult, and this treatable infection is sometimes documented only on post-mortem examination. In addition, therapy for TB in elderly individuals is challenging because of the increased incidence of adverse drug reactions. Furthermore, institutionalized elderly persons are at high risk for reactivation of latent TB and are susceptible to new TB infection². As sparse published data are available on this topic from Andhra Pradesh, the present study was planned.

MATERIAL AND METHODS

During the period December 2012 to November 2013, 50 patients in the age group of 18-59 years and 50 patients aged 60 years or above (geriatric subjects) who were diagnosed to have and treated for pulmonary TB in medical outpatient service and medical wards at PES Hospital, Kuppam, Andhra Pradesh were prospectively studied. The study was cleared by the Institutional Ethics committee. In all of them a detailed history was obtained and physical examination was done. The clinical, bacteriological, radiographic presentation of pulmonary TB, and treatment outcome was compared in both the groups.

All of them underwent the following laboratory testing: sputum smear examination for acid-fast bacilli (AFB), blood urea and serum creatinine, fasting and post-prandial blood sugar, liver function tests, urinalysis, chest radiograph (postero-anterior view), 12 lead electrocardiogram (ECG), Mantoux test (5 Tuberculin units) and serological testing for test for human immunodeficiency virus (HIV). All patients received trice-weekly intermittent DOTS treatment as per Revised National Tuberculosis Control Programme (RNTCP) guidelines. Treatment outcomes were recorded as per RNTCP guidelines.

Statistical analysis

Continuous variables are summarized as mean \pm standard deviation. Categorical variables are summarized as percentages.

RESULTS

We observed that the gender distribution was similar in adults aged 18-59 years (male:female = 30:20) and geriatric (male: female = 36:14) patients. In the geriatric group 32 (64%) patients were in age group 60-65 years, 13 (26%) were in the age group 65-70 years and the remaining 5 (10 %) were aged over 70 years. In the 18-59 year old adults 12 (24%) patients were aged 18-30 years, 23 (46%) were in the age group 31-45 years and the remaining 15 (30%) were aged 45-59 years. Salient presenting symptoms are shown in Table 1. In comparison to adults aged 18-59 years, cough ($p=0.007$), dyspnea ($p<0.001$), chest pain ($p=0.012$), night sweats ($p<0.001$), and non-

Table 1: Presenting symptoms

Symptoms	≥ 60 years (n=50)	18-59 years (n=50)	p-value
Cough			
Yes	30	43	
No	20	7	0.007
Dyspnoea			
Yes	27	9	
No	23	41	<0.001
Haemoptysis			
Yes	13	21	
No	37	29	0.139
Chest pain			
Yes	19	7	
No	31	43	0.012
Fever			
Yes	29	35	
No	21	15	0.298
Night sweats			
Yes	6	29	
No	44	21	<0.001
Non-specific symptoms			
Yes	27	11	
No	23	39	0.002

specific symptoms ($p=0.002$) were more frequently seen in geriatric patients. In geriatric patients, malnutrition 64%, followed by anaemia (30%), hypertension (24%), chronic obstructive pulmonary disease (COPD) (18%), diabetes mellitus (14%), and renal dysfunction (6%) were the comorbid conditions. In the 18-59 year old adult patients malnutrition was seen in 60% patients, followed by anaemia (42%), diabetes mellitus (8%), COPD (6%), hypertension (6%). There was no statistically significant difference in sputum smear positivity and grading between geriatric patients and adults aged 18-59 years (Table 2). On radiological examination, geriatric patients had a statistically significant higher occurrence of lower lobe infiltrates ($p=0.005$) compared with adults aged 18-59 years, all other radiological findings were comparable (Table 3). Among geriatric patients a significantly less proportion

Table 2: Radiological findings

Type of lung lesion	≥60 Years (n=50)	18-59 (n=50)	p-value
Upper lobe			
Yes	18	24	0.311
No	32	26	
Lower lobe			
Yes	13	2	0.005
No	37	48	
Middle lobe			
Yes	3	5	0.712
No	47	45	
Unilateral Infiltrates			
Yes	6	8	0.773
No	44	42	
Bilateral Infiltrates			
Yes	3	5	0.712
No	47	45	
Cavities			
Yes	3	8	0.201
No	47	42	
Miliary Pattern			
Yes	1	2	>0.99
No	49	48	

Table 3: Sputum Smear Examination

Sputum grading	≥60 years (n=50)	18-59 years (n=50)	p-value
Positive			
Yes	29	31	0.838
No	21	19	
3+			
Yes	13	10	0.635
No	32	40	
2+			
Yes	7	10	0.594
No	43	40	
1+			
Yes	7	8	>0.99
No	43	42	
Scanty			
Yes	2	3	>0.99
No	48	47	

of patients were cured compared to adults aged 18-59 years (36/50 Vs 46/50; $p=0.019$); treatment failure and death were comparable between the groups (Table 4). Side-effects of anti TB treatment in the geriatric patients included nausea, vomiting (14%), renal dysfunction (8%), liver dysfunction (6%), skin rash (4%). In the 18-59 year old patients gastrointestinal symptoms 4% and liver dysfunction were seen in 2 patients each; renal dysfunction was evident in 1 (2%) patient (Table 5).

Table 4: Treatment outcome

Outcome	≥60 years (n=50)	18-59 years (n=50)	p-value
Cured			
Yes	36	46	0.019
No	14	4	
Failure			
Yes	10	3	0.074
No	40	47	
Died			
Yes	4	1	0.074
No	46	49	

None of the patients had defaulted

Table 5: Adverse drug reactions

Adverse effects	≥60 years (n=50)		18-59 years (n=50)	
	No.	%	No.	%
GIT symptoms	7	14	2	4
Liver dysfunction	3	6	2	4
Renal dysfunction	4	8	1	2
Skin rash	1	2	0	0
Ocular symptoms	2	4	0	0
Arthritis	1	2	0	0
Neurological symptoms	1	2	0	0
Psychiatric	1	2	0	0
Others	0	0	0	0

GIT = gastrointestinal tract

DISCUSSION

In the present study male patients predominated in both the geriatric (72%) and 18-59 year old (60%) adults. Similar findings were reported in other studies,³⁻⁵ where the proportion of male patients ranged from 61% - 67.6%.

In the present study, in comparison to 18-59 years old adult patients, geriatric patients had a significantly higher occurrence of cough ($p=0.007$), dyspnea ($p<0.001$), chest pain ($p<0.001$) non-specific symptoms ($p=0.002$) and night sweats ($p<0.001$). In other studies cough, fever, chest pain, night sweats were more frequently described in adults aged 18-59 years compared to geriatric patients.⁵⁻⁷ The regional, ethnic variations responsible for this merits further study.

In our study, upper lobe involvement dominated in geriatric patients (36%) and lower lobe involvement was more often seen in geriatric patients compared with adults aged 18-59 years ($p=0.005$). Atypical presentation observed in the geriatric patients in our study is consistent with the results reported in other studies.^{6,8-12} Such atypical presentation may delay the diagnosis of pulmonary TB in geriatric patients. Similar observations were reported in other published studies.^{1,8-10,13-19}

Sputum smear examination in the present study showed no significant difference in the geriatric

and 18-59 year old adult patients. This observation is similar to that documented in other studies.^{6,11,12} Thus, our observations suggest that sputum smear examination is a simple useful tool for the diagnosis of pulmonary TB in geriatric population.

In the present study co-morbidities like HT, COPD, DM were more often reported in the geriatric patients compared with adults aged 18-59 years. These findings are in concurrence with the reports from other studies.^{4,6,11,20,21}

Outcome of treatment in the present study was poor in the geriatric patients compared to adult patients in our study. These findings are in comparison with observation documented in another study.²²

The adverse drug reactions observed in the study were mild and transient. The most common adverse event in the study was gastrointestinal discomfort which was higher in the geriatric age group (14%) compared to the adult group (4%). In other studies^{11,12} also, gastrointestinal discomfort was the most common adverse event. Skin rash, ocular symptoms, arthritis, liver and renal function abnormalities were higher in the geriatric patients compared to adult patients. These findings are in accordance with observations in other studies.^{11,12}

Adherence to tuberculosis treatment can be particularly challenging: the duration of

treatment in long, combination therapy is required, and side effects may be unpleasant. Furthermore, patients often experience rapid improvement in symptoms, which may obfuscate the importance of continuing prolonged treatment with drugs that may be perceived as unnecessary.^{23,24} Family support, including financial assistance, collecting medication, and emotional support, appeared to be a strong influence on patient adherence to treatment. Further there is a possibility of MDR-TB as a result of re-infection with a drug-resistant strain of TB.

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