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Original Research Article

Tuberculosis in elderly: The Indian perspective

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ABSTRACT

Background: Tuberculosis, the leading infectious cause of morbidity, mortality worldwide. Elderly Tuberculosis accounts for a major proportion of these cases and are often neglected due to associated comorbidities and overlapping clinical features. This study aimed to estimate the prevalence of tuberculosis among elderly and medication adherence.
Methods: A cross-sectional, retrospective study in patients with Tuberculosis ≥50 years registered under RNTCP, at a tertiary care hospital, South India, from January 2017 to December 2017. Clinical data collected, and medication adherence was assessed.
Results: Out of the total 187 study population, 35 subjects were found to be ≥50 years with a prevalence of 18.7%. Pulmonary Tuberculosis was more common (82.8%). Majority of the subjects were sputum positive (77.14%). Comorbidities highest in patients >70years. Diabetes was the most significant comorbidity in all the age groups (48.57%) and patients with pulmonary Tuberculosis (p=0.04). Pulmonary Tuberculosis observed highest among smokers whereas extra pulmonary Tuberculosis found higher among alcoholics (33.3%). Treatment outcome was better in patients with hypertension compared to other comorbidities (p=0.014). Loss to follow-up was highest among smokers and in patients with bronchial asthma (40%). Present study showed moderate to low adherence to medication in elderly.
Conclusions: There is high prevalence of Tuberculosis among elderly. Diabetes was the commonest comorbidity. Pulmonary Tuberculosis was significantly associated with smokers. Low adherence and loss to follow-up was high among elderly. We recommend comprehensive screening, treatment and follow-up especially in elderly with comorbidities for early diagnosis and better treatment outcome.

Keywords: Adherence, Elderly, Prevalence, Tuberculosis

INTRODUCTION

Tuberculosis(TB) is the leading infectious cause of morbidity and mortality worldwide. Even though the global incidence is falling at about 2% per year, it is still rampant. According to the World Health Organization (WHO) 2017, there were 10.4 million new cases of tuberculosis worldwide which claimed 1.7 million lives. India alone accounted for 2.79 million cases of Tuberculosis with an incidence rate of 211 per 1 lakh population and deaths approximating 423,000 per year.[1]

Older adults account for a major percentage of Tuberculosis cases, morbidity and mortality globally.

Developed countries may have driven Tuberculosis to the enclave but their geriatric population represents the largest reservoir of Tuberculosis infections.[2] Approximately 80% of Tuberculosis infected persons in Europe are above 50 years.[3] Similar increase in incidence of Tuberculosis with age have been demonstrated in South East Asia.[3]

Even amidst all these staggering statistics, the elderly group remains the most neglected of the population. There is a 23% lower detection rate of Tuberculosis in elderly.[4] Majority of them are misdiagnosed.[5] Prevalence of comorbid conditions including diabetes mellitus, hypertension, chronic obstructive pulmonary diseases are higher in older tuberculosis patients.[6,7] The mortality rate of tuberculosis in elderly is 6 times higher than the rest of the population and is 30% higher in above 70 years age groups.[3,8]

There is a scarcity of data of Tuberculosis among elderly in India. This study was aimed at estimating the prevalence of tuberculosis in elderly, the factors affecting the outcome and adherence to anti tubercular medication.

METHODS

It was a cross sectional, retrospective study in patients ≥50years of age, diagnosed with pulmonary and extra-pulmonary tuberculosis registered for DOTS (Directly Observed Treatment, Short course) treatment under RNTCP (Revised National Tuberculosis Control Program), at a tertiary care hospital in South India, from January 2017 to December 2017. Subjects less than 50years of age were excluded from the study group. Relevant clinical data with associated comorbidities were collected and analysed.

The treatment outcome was assessed in the study subjects according to the RNTCP Technical Guidelines, 2016, in the following manner 1) Cured (Patient who is successfully treated) 2) Treatment completed (Patient who has completed Intensive and Continuous phase under DOTS) 3) Loss to follow up (A Tuberculosis patient previously treated for 1 month or more, declared loss to follow up and was subsequently found microbiologically confirmed Tuberculosis case).

Adherence to anti-tubercular medication was assessed using the Morisky's 8-item Medication Adherence Questionnaire (MMAS-8):

1. Do you sometimes forget to take your medicine?
2. People sometimes miss taking their medicines for reasons other than forgetting. Thinking over the past 2 weeks, were there any days when you did not take your medicine?
3. Have you ever cut back or stopped taking your medicine without telling your doctor because you felt worse when you took it?
4. When you travel or leave home, do you sometimes forget to bring along your medicine?
5. Did you take all your medicines yesterday?
6. When you feel like your symptoms are under control, do you sometimes stop taking your medicine?
7. Taking medicine every day is a real inconvenience for some people. Do you ever feel hassled about sticking to your treatment plan?
8. How often do you have difficulty remembering to take all your medicine?

{A=0, B-E=1}

a. Never/rarely
b. Once in a while
c. Sometimes
d. Usually
e. All the time

Each question was given a score of 1(yes) OR 0(no). A total score of 'zero' inferred high adherence, 1-2 suggested moderate while a score of >2 gave us a low adherence.

Statistical analysis

Data was entered in MS Excel. Descriptive statistics was used in measures of number and frequencies. 'p' value <0.05 was considered statistically significant.

RESULTS

Out of the total 187 cases registered, 35 subjects were ≥50 years of age. The prevalence of Tuberculosis in the elderly was found to be 18.7%. Present study group had predominantly males (71.42%, n=25) and females were 28.5% (n=10). 82.8% of the cases were pulmonary Tuberculosis whereas the remaining 17.14% were extra-pulmonary. 77.14% were sputum positive cases.

Association of TB with comorbidities

As the age progressed, the association with comorbidities increased. There was increased comorbidity association in >70 years age group (Table 1).

Diabetes mellitus (48.57%) was the commonest comorbidity observed among the elderly followed by bronchial asthma (14.28%) but was not statistically significant. Diabetes mellitus was also the major comorbidity associated pulmonary tuberculosis (51.72%) (Table 2).

Association of habits

Pulmonary Tuberculosis was highest amongst smokers whereas, extra pulmonary Tuberculosis was more predominantly observed with chronic alcoholics (33.33%) (Figure 1).

Table 1: Age and comorbidity.

Age group in years	Total	Comorbidities									
		DM (N)	%	HTN (N)	%	BA (N)	%	COPD (N)	%	Absent (N)	%
50-60	22	12	54.54	1	4.54	3	13.63	1	4.54	8	36.36
61-70	8	2	25	0	0	1	12.5	0	0	5	62.5
>70	5	3	60	1	20	1	20	3	60	0	0

Table 2: Tuberculosis and comorbidity.

TB	Total (%)	Comorbidities										
		DM (N)	%	HTN (N)	%	BA (N)	%	COPD (N)	%	Absent (N)	%	
Pulmonary	29 (82.8%)	15	51.72	2	6.89	4	13.8	4	13.8	10	34.48	P=0.04
Extra-pulmonary	6 (17.14%)	2	33.33	0	0	1	16.66	0	0	3	50	

Table 3: Age and outcome.

Age group (in years)	Total	Outcome			
		Cured		LTFU[#]	
		Number	Percentage	Number	Percentage
50-60	22	15	68.18	7	31.81
61-70	08	08	100	0	0
>70	05	04	18.18	1	4.54

#Loss to follow up

Table 4: Comorbidity and outcome.

Comorbidities	Total	Outcome			
		Cured		#LTFU	
		Number	Percentage	Number	Percentage
Diabetes	17	11	64.7	06	35.29
Hypertension	2	2	100	0	0
BA	5	3	60	2	40
COPD	4	3	75	1	25
Absent	13	12	92.30	1	7.69
	P=0.014				

#Loss to follow up

Treatment outcome

Out of the thirty-five subjects, 8 of them showed loss to follow up (22.85%).

- Loss to follow up was highest among 50-60years age group (31.81%) followed by more than 70years age group (4.54%) (Table 3).
- Smokers have shown an increased loss to follow up (25%) (Figure 2).
- Treatment outcome was better in study subjects with hypertension than with other comorbidities (p=0.014). Loss to follow up was highest among patients with bronchial asthma (40%) closely followed by diabetes (35.29%) (Table 4).

Table 5: Morisky's 8- item medication adherence scores.

MMAS- 8 item scores	Number	Percentage
>2	02	5.71%
1 OR 2	22	62.86%
0	11	31.42%

>2: Low; 1-2: Moderate; 0: High adherence

Adherence to medication

A majority of elderly subjects, 22 (62.86%) had moderate adherence to medication, while 11 (31.42%) of them

showed good adherence. Low adherence was seen in 2 (5.71%) elderly subjects (Table 5), who have also shown high association with more than one comorbidities

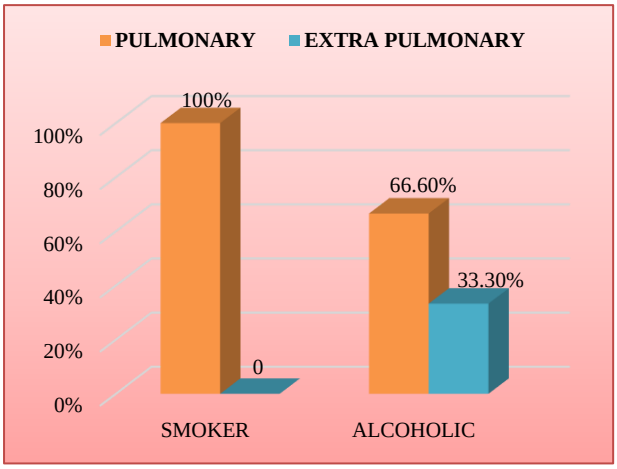

Figure 1: Tuberculosis and habits.

Prevalence of tuberculosis is highest amongst smokers. Whereas extra pulmonary tuberculosis is observed more with chronic alcoholics.

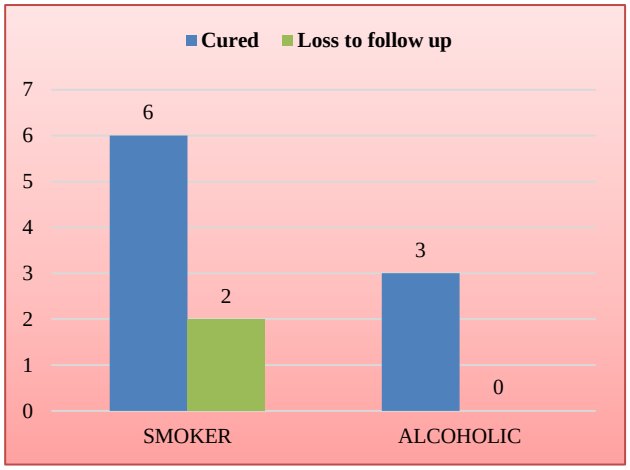

Figure 2: Habits and treatment outcome.

Loss to follow up is highest with smokers.

DISCUSSION

In present series, the success rate was 83.3% in cases. The elderly account for a major proportion of tuberculosis related morbidity, mortality. Present study showed a prevalence of 18.7% in elderly (≥50years). A similar study in the United States showed a prevalence of 21.9% in elderly Tuberculosis, suggesting a similar existing prevalence globally.[9]

A study done in Hong Kong showed that pulmonary Tuberculosis (88.1%) was much more prevalent than extra pulmonary Tuberculosis (14.7%).[10] Also, various other elderly Tuberculosis studies suggest that pulmonary Tuberculosis is more prevalent than extra pulmonary Tuberculosis which is very much consistent with our study results (82.8% vs 17.14%).[11,12]

Present study showed increased association of comorbidities like diabetes mellitus, bronchial asthma, chronic obstructive disease and hypertension among elderly patients with Tuberculosis. Similar results were found in other studies.[13-15]

Diabetes mellitus was significantly high in patients with pulmonary Tuberculosis in our study (48.57%) (p=0.04). Also, diabetes was highest among 50-60years age group (62.85%). Studies in South India by Gupta et al.,16 showed 71.13% of diabetic patients with Tuberculosis were in 41-60 year age group.[16] Also, a study conducted in the United Kingdom gave a high diabetic prevalence of 34.5%.[2]

It was also observed that an increasing number of smokers acquired Tuberculosis, predominantly pulmonary Tuberculosis (82.8%). A research in China showed 92.4% pulmonary involvement in smokers with high statistical significance.[10] Also a Japanese research group found similar results from their study.[11]

An increased association of extra pulmonary Tuberculosis among chronic alcoholics was observed in our study. Similar study by Leung et al, also suggested that extra pulmonary Tuberculosis is more prevalent in non-smokers and alcoholics.[10]

In our study it was found that the smokers and patients with bronchial asthma- had higher rate of loss to follow up. It was observed that low adherence to anti-tubercular treatment was high among subjects with more than one habits and comorbidities, giving a strong correlation between habits, comorbidities, loss to follow up and adherence to the medication.

CONCLUSION

The prevalence of Tuberculosis in elderly is high. Elderly patients and smokers are more prone to develop Tuberculosis and show low treatment adherence. More the comorbidities, higher the association with tuberculosis.

Increase in comorbidities and lack of data with respect to the older age group hinder the adherence to medication and hence the outcome. Adequate history, thorough monitoring, screening and judicious treatment of the comorbidities is essential to improve adherence and the better treatment outcome among elderly patients with Tuberculosis.

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