Original Article

Tuberculosis in Patients Below and Above 60 years and Their Treatment Outcome Under RNTCP - A study in Rural West Bengal, India.

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Abstract

Elderly are at increased risk of tuberculosis. The present study aims to find out the disease characteristics and treatment outcome of elderly tuberculosis patients. It was carried out at a rural Tuberculosis Unit (TU), West Bengal, India. All cases registered between January 1999 and June 2005 were divided into two groups as age below 60 years and age 60 years or more, and the results were analyzed and compared. Out of the total of 3676 cases, 2868 (78%) were below 60 years, while 808 (22%) were elderly (age≥60 years). New smear positive and extrapulmonary cases were significantly more in young while new smear negative and retreatment cases were significantly more in geriatric population ($p < 0.001$). Cure and treatment completed cases were significantly lower while death and default were significantly higher in the geriatric population. Sputum conversion rate at end of 2 months was also significantly lower in the geriatric group. These patients need to be further studied to plan effective interventions, so that unfavourable outcomes can be brought down.

Key Words: RNTCP, Elderly, Tuberculosis, Outcome.

Introduction

Ageing is a natural process. Discoveries in medical sciences and improved social conditions during past few decades have increased the life span of man. This is more evident in the developed countries. The expectation of life at birth in developed countries is over 70 years. The age structure of population in the developed countries has so evolved that the numbers of old people is continually on the rise. In India, although the percentage of aged persons to the total population is low in comparison to developed countries, nevertheless, the absolute size of aged population is considerable. In India too there has been a steady increase in the life expectancy from 36.7 years in 1951 to 64.6 years in 2000.[1] At present there are more than 70 million people above the age of 60 years in India. This number is expected to rise to 177 million by 2025.[2]

It has been suggested that tuberculosis differs clinically and radiologically in the elderly compared to the young. Moreover with the decrease in cellular immune responses and an increase in the incidence of diabetes mellitus, malignancy and other co morbidities the final outcome of elderly patients is likely to be worse. This is compounded with the increased incidence of adverse effects with antitubercular drugs in the elderly resulting in increased morbidity and default from therapy.

The Revised National Tuberculosis Control Programme (RNTCP) has been operational in India since 1993 as pilot projects in 5 states. From 2006 onwards, it has covered the entire country. Over the last several years all patients are being treated with Directly Observed Treatment. Short Course Chemotherapy (DOTS) under the RNTCP. The present study was undertaken to find out the disease characteristics as well as final outcome of these elderly

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subjects treated with DOTS.

Material and Methods

It was a record based study carried out at the Bagula Tuberculosis Unit (TU), Nadia district, West Bengal, India. The TU caters to a population of approximately five lakhs where most of the people belong to lower socioeconomic status. The Bagula TU has 5 Designated Microscopy Centres (DMC) manned by 5 trained laboratory technicians and supervised by a Senior Tuberculosis Laboratory Supervisor (STLS). All these microscopy centres are attached to peripheral health institutions and all health care providers in these institutions have been trained in RNTCP. A total of 3676 cases, registered for tuberculosis treatment between January 1999 and June 2005 were taken for the study. All cases were divided into two groups as age below 60 years and age 60 years or more, and the results were analyzed and compared. The outcome cured, treatment completed, failure, died, default and transferred out were in accordance with the RNTCP definitions.[3] Chi-square test (χ^2 test) was performed for statistical analysis of categorical variables to see association. Yate's correction was done in this analysis when one cell value was less than 5.

Results

Out of the total 3676 cases, 2868 (78%) were below 60 years while 808 (22%) were elderly (age ≥ 60 years). Occurrence of new smear positive and extrapulmonary cases were significantly more in 60 years age group compared to geriatric age group ($p < 0.001$). However, new smear negative cases were significantly more in geriatric population ($p < 0.001$) while retreatment cases were marginally higher ($p > 0.05$) in geriatric patients (Table 1). There were 1194 and 264 new sputum positive cases in less than 60 years and ≥ 60 years respectively. Cure or treatment completion and failure were higher among less than 60 years age group, but it was statistically significant in cure or treatment completed only ($p < 0.01$). Both default and death was significantly more among geriatric age group, 6.4% and 8.3% respectively. The same was true in case of new sputum negative and new extrapulmonary cases. Cure or treatment completion was significantly higher in less than 60 years, default and death was more among elderly age group, while death being statistically significant ($p < 0.01$). Strikingly, failure was absent in both the age groups in new extrapulmonary cases and death was too small (0.7%) in this case in less than 60 years (Table 2). Sputum conversion rate at end of 2 months was significantly (χ^2 test = 5.52, $p < 0.05$) higher (84.3%) among less than 60 years compared to ≥ 60 years (77.9%) (Table 3). While male population was more among geriatric population (78.6% vs. 65.6%) and female predominance was observed in less than 60 years (34.4% vs. 21.4%), and this association of tuberculosis with age and sex was found to be statistically significant (χ^2 test = 43.68, $p < 0.05$) (Table 4).

Discussion

With increasing age, there is a decrease in lymphocytes especially the T lymphocytes and the proliferative responses.[4-6] There is also a decrease in the synthesis of gamma interferon levels, important in the activation of macrophage, with increased age.[7] These factors cause a progressive immune dysregulation in the elderly. Along with this malnutrition, social neglect and poverty are more common in elderly increasing the risk of tuberculosis in this group.

A high index of clinical suspicion is necessary in diagnosis of tuberculosis in elderly. Inability to give an accurate account of their symptoms due to poor memory, impairment of speech and hearing, alongwith

Table 1: Disease classification

	< 60 years (n = 2868) no. (%)	≥ 60 years (n = 808) no. (%)	χ^2 test	p value
New smear positive	1194 (41.6)	264 (32.7)	21.14	0.001
New smear negative	1003 (34.9)	409 (50.6)	65.24	0.001
Extrapulmonary	306 (10.8)	32 (3.9)	33.98	0.001
Retreatment	353 (12.3)	101 (12.5)	0.02	0.88
Incomplete records	12 (0.4)	2 (0.3)	-	-

Table 2: Treatment outcome in elderly and control group.

	< 60 years no. (%)	≥ 60 years no. (%)	χ^2 test	p value
New sputum positive	n=1194	n=264		
Cure/Treatment completion	1066 (89.3)	218 (82.6)	9.25	< 0.01
Default	44 (3.7)	17 (6.4)	4.09	< 0.05
Death	32 (2.7)	22 (8.3)	19.37	< 0.01
Failure	32 (2.7)	4 (1.6)	0.78 *	> 0.05
Transferred out	20 (1.6)	3 (1.1)	0.13 *	> 0.05
New sputum negative	n=1003	n=409		
Cure/Treatment completion	877 (87.4)	311 (76.0)	28.28	< 0.01
Default	53 (5.3)	32 (7.8)	3.31	> 0.05
Death	40 (4.0)	56 (13.8)	43.17	< 0.01
Failure	15 (1.5)	6 (1.5)	0.00	> 0.05
Transferred out	18 (1.8)	4 (0.9)	0.79 *	> 0.05
New extrapulmonary	n=306	n=32		
Cure/Treatment completion	289 (94.4)	25 (78.1)	11.70	< 0.01
Default	13 (4.2)	4 (12.5)	2.58 *	> 0.05
Death	2 (0.7)	3 (9.4)	9.73 *	< 0.01
Failure	0 (0.0)	0 (0.0)	-	-
Transferred Out	2 (0.7)	0 (0.0)	-	-

*Yates corrected Chi-square test

Table 3: Sputum conversion rate of total sputum positive cases in two groups of < 60 and ≥ 60 years age groups.

	< 60 years no. (%)	≥ 60 years no. (%)	χ^2 test	p value
Total sputum positive cases	1194	264	5.52	< 0.05
Sputum conversion at 2 months	943 (84.3%)	180 (77.9%)		

absence of typical clinico-radiological signs of tuberculosis make the diagnosis of tuberculosis in elderly difficult.[8,9] Classical symptoms of cough, expectoration or breathlessness when present are attributed to causes other than tuberculosis eg chronic bronchitis, smoking or old age.[10]

In present study the number of tuberculosis patients in the elderly group was much higher than in most studies probably because this tuberculosis unit was almost 15 kilometers from the nearest city.[8, 11] There are only few private practitioners in the area. Moreover most people living in the area belong to the lower socioeconomic strata and hence attended the government health facilities for diagnosis and treatment.

While in control group (age<60 years) one extrapulmonary case was noted for every 7 pulmonary cases; one extrapulmonary case was seen for every 22 cases of pulmonary tuberculosis in the elderly. A similar finding has been observed by Arora and co workers.[11]

Similar to the findings in other studies, occurrence of new smear positive pulmonary and extrapulmonary cases in the elderly was significantly lower than the younger age group.[12] However, smear negative pulmonary tuberculosis was significantly higher in elderly patients. This difference could be due to the difference in the clinical course of the disease in the elderly or to the inability of the elderly especially the very old to cough

out sputum for examination.

The rate of favourable outcome (cured and treatment completed) is less in the elderly and this has been attributed to the higher rates of default and death in the elderly. In the present study, incidence of default among patients less than 60 years of age was 3.7%, 5.3% and 4.2% in new sputum positive, new sputum negative and extrapulmonary tuberculosis respectively. The default rates were 6.4, 7.8 and 12.5 in these groups in geriatric patients. Similar increased default rates have been seen in other studies too.[9, 13] Poor compliance with therapy, irregular intake of drugs, and interactions with concomitant drugs for comorbid illnesses, lack of motivation and operational factors are considered to be the principal reasons for default.[8]

Death in tuberculosis under the RNTCP is defined as death due to any cause during the period that the patient is undergoing therapy for tuberculosis. Apart from the physiological causes of increased death in the elderly, other factors like COPD, diabetes and malignancy may be responsible for the increased incidence of death in these elderly patients. This finding also corroborates with the findings from other studies[8].

Elderly patients are frequently intolerant to standard antitubercular drugs.[14,15] This causes modifications in the drug regimens resulting in the prescription of regimens not potent to affect cure or sputum sterilization. This causes a decreased incidence of sputum conversion at 2 months. This has been shown by several studies as also in the present one.[16,17]

An interesting observation was an equal or lower incidence of failure in the elderly in the new sputum negative and new sputum positive groups respectively. This apparent decrease in the incidence of failure cases is probably because of the high rates of default, and a decreased tendency to report to the health centers among the elderly and their family members. This results in most cases being classified as defaults. Indeed a major proportion of defaults will include failure cases.

Conclusions

Clinical presentations of tuberculosis in the elderly are different from those observed in the young. It remains a diagnostic problem and is associated with a worse treatment outcome. However the control of tuberculosis in the elderly is essential for the successful implementation of the RNTCP. Due to these peculiarities in geriatric tuberculosis, special attention should be given to these patients in diagnosis, monitoring of side effects of drugs, arranging for social support and in initiation of defaulter action.

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