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COMPARATIVE STUDY OF CLINICO-RADIOLOGICAL PROFILE OF PULMONARY TUBERCULOSIS IN NEW AND PREVIOUSLY TREATED PATIENTS OF GERIATRIC AGE

Pulmonary Medicine

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ABSTRACT

BACKGROUND: Tuberculosis is a more devastating disease in the elderly with increased morbidity and mortality, affecting quality of life in geriatric age group. Its clinical and radiographic features may be atypical, non-specific, or confused with coexisting diseases .AIM: To compare clinical and radiological finding between new and previously treated pulmonary tuberculosis cases of geriatric age group.

METHODS: This prospective study was conducted on 110 pulmonary tuberculosis patients of age ≥60 years. Blood investigations, chest x-ray, sputum smear examination by microscopy under RNTCP, sputum /BAL for CBNAAT was performed. The results were analysed using appropriate statistical tests.

RESULTS: In both groups, majority were male (83.64%), 42% of them were smokers. COPD (29%), Diabetes mellitus (17%) and hypertension (10%) were the common co-morbidities. There was no statistically significant difference in symptoms between study groups. In both groups consolidation was the most common radiological finding. Infiltration and hilar adenopathy was found significantly more in new TB cases. Fibrocavitary lesion and pulmonary fibrosis were common in previously treated patients.

CONCLUSION: The two groups do not differ clinically but to some extent radiological presentation varied .Treating physician should be aware about the radiographic features of previously treated pulmonary TB in geriatric age group and strictly adhere to the diagnostic algorithm proposed by RNTCP for early management to improve quality of life because geriatric patients already have co-morbidities.

KEYWORDS

pulmonary tuberculosis, geriatrics, new case, previously treated case.

INTRODUCTION:

Government of India adopted "National Policy on Older Persons" in January, 1999 which defines "senior citizen" or "elderly" as a person who is of age 60 years or above [1]. By 2025, the number of elderly people is expected to rise more than 1.2 billion with about 840 million of these in developing countries. With an increase in geriatric population, also an increase in the incidence of tuberculosis seen in elderly, the burden of tuberculosis is bound to increase in the country. In recent years, there has been increased focus on active case finding among groups considered to be vulnerable to develop tuberculosis, including people living with HIV, people with diabetes and children. However, despite increased attention on vulnerable groups, there has been ongoing neglect of older people, especially in low and middle-income countries [2]. No such study is available comparing the new and previously treated pulmonary tuberculosis patients of geriatric age group .The aim of present study was to compare clinical and radiological finding of pulmonary tuberculosis between new and previously treated cases of geriatric age group.

METHOD : This was a prospective study conducted in the Department of Tuberculosis and Respiratory disease, R.N.T. Medical College, Udaipur on 110 pulmonary tuberculosis patients of geriatric age (above 60 years), from July 2016 to December 2016 with and without a previous history of ATT from any source and of any duration. We got approval from the ethical committee of this medical college for the present study. The demographic profile, socioeconomic status, occupation, personal history, family history of TB, clinical history and previous ATT history of each patient were carefully assessed and documented. In them detailed history and physical examination was done. Blood investigations, chest x-ray, sputum smear examination by microscopy under RNTCP, sputum /BAL for CBNAAT was performed (in sputum smear negative cases). On bacteriological, clinical and radiological basis patients were labelled as new (who have never been treated for TB or have taken anti-TB drugs for less than 1 month) and previously treated cases (who have received 1 month or more of anti-TB drugs in the past). The CXR presentations were classified according to site, extent, and type of lesion.

Statistical analysis: All data were entered in predesigned proforma formed in Microsoft Excel version 7 and Statistical Package for Social Sciences ver. 16 (SPSS. 16) and results were analysed using appropriate statistical tests e.g. Chi square test and 't' test. P value less than 0.05 was taken as statistically significant difference.

RESULTS:

Table 1.Characteristics of study population.

Characteristics	New cases (n= 60)	Previously treated cases(n=50)
Male : Female	4.45: 1	6.14: 1
Urban: rural	7:53	2:48
Smoking index		
<100 (mild)	7 (11.66%)	3 (6%)
101-300(moderate)	12 (20%)	7 (14%)
>300(heavy)	9 (15%)	11(22%)
Co-morbidity		
COPD	15 (25%)	14 (28%)
DM	7 (11.6%)	10 (20.00%)
HTN	6 (10.00%)	4 (8.00%)
ILD	2 (3.33%)	2 (4.00%)
Others(CKD,CLD,CAD)	4(6.67%)	2(4%)
Total duration of illness		
< 2 WEEK	4(6.67%)	2(4.00%)
2-4 WEEK	12(20.00%)	11(22.00%)
>4 WEEK	44(73.33%)	37(74.00%

Table 1. Show that there was male predominance in new (male: female=4.45: 1) and previously treated (6.14: 1) geriatric age group. Majority of the patients belonged to rural area. In both groups, moderate and heavy smokers were more. Co-morbid illness was common in both groups with COPD being most frequent (25% vs 28%) ,followed by diabetes mellitus(11.6% vs 20%) ,hypertension (10% vs 8%) and others(CKD,CLD,CAD) .Most of the patients in both groups had respiratory symptoms for more than 4 weeks .

Table 2. Clinical features of pulmonary tuberculosis in new and previously treated patients of geriatric age group.

Characteristics	New cases (n= 60)	Previously treated cases (n=50)	P value
RESPIRATORY SYMPTOMS			
Cough	59(98.33%)	48(96.00%)	0.45
Expectoration	49(81.67%)	44(88.00%)	0.36

Dyspnoea	42(70.00%)	31(62.00%)	0.37
Chest pain	18(30.00%)	10(20.00%)	0.23
Blood in sputum	10(16.67%)	11(22.00%)	0.47
CONSTITUTIONAL SYMPTOMS			
Fever	40(66.67%)	33(66.00%)	0.94
Loss of appetite	23 (38.33%)	19 (38.00%)	0.97
Wt. Loss	16 (26.67%)	13 (26.00%)	0.93
Weakness	8 (13.33%)	6 (12.00%)	0.83
PHYSICAL SIGNS			
Pallor	34(56.67%)	25 (50.00%)	0.48
Icterus	3 (5.00%)	0 (0.00%)	0.10
Cyanosis	0 (0.00%)	2(4.00%)	0.11
Clubbing	11 (18.33%)	12 (24.00%)	0.46
Edema	7 (11.67%)	7(14.00%)	0.71
Lymphadenopathy	0(0.00%)	0(0.00%)	-

The proportion of patients with different symptoms is compared in Table 2.There was no statistically significant difference between the two groups. Cough was the predominant respiratory symptom experienced by both groups (p=0.45) which was followed by expectoration (p=0.36), Dyspnoea (p=0.37), chest pain (p=0.23), blood in sputum (p=0.47). Fever was most common constitutional symptom, followed by loss of appetite, weight loss and weakness. There was no statistically significant difference between the two groups. Pallor was most common physical sign present in both groups and there was no significant difference in physical sign between both groups.

Table3. Radiographic features of pulmonary tuberculosis in new and previously treated patients of geriatric age group.

Characteristics	New cases (n= 60)	Previously treated cases (n=50)	P value
Site of lesion			
Bilateral	39(65.00%)	37(74.00%)	0.30
Unilateral	21 (35.00%)	13 (26.00%)	0.30
Radiological extent of lesion			
Minimal disease	16 (26.67%)	9 (18.00%)	0.28
Moderately advanced disease	34 (56.67%)	26(52.00%)	0.62
Far advanced disease	10(16.67%)	15(30.00%)	0.09
Involvement of zone in chest radiograph			
Lower / mid zone	16(26.6%)	9(18%)	0.28
Mixed	22(36.6%)	24(48%)	0.23
Upper zone	22(36.6%)	17(34%)	0.78
Type of Lesion			
Consolidation	46(76.67%)	37(74.00%)	0.74
Fibrocavitary*	5(8.33%)	21(42.00%)	<0.001
Pleural effusion	9(15.00%)	7(14.00%)	0.88
Cavity	22(36.67%)	17(34.00%)	0.77
Bronchiectasis	7(11.67%)	13(26.00%)	0.05
Pulmonary fibrosis *	0(0.00%)	13(26.00%)	<0.001
Infiltration*	29(48.33%)	10(20.00%)	<0.01
Hilar adenopathy*	13(21.67%)	3(6.00%)	0.02
Hydropneumothorax	0(0.00%)	1(2.00%)	0.27

*p< 0.05

The radiographic features of both groups is summarised in Table 3. Bilateral, moderately advanced, mixed and upper zone involvement was prevalent in both group, but no statistical significant difference. Consolidation in chest radiograph was the most common finding present in 76.67% new and 74.00% previously treated patients. Fibrocavitary lesion and pulmonary fibrosis were more common in previously treated patients, which was statistically significant whereas infiltration and hilar adenopathy was significantly more in new TB cases. Cavity was present in 36.67% new and 34.00% previously treated patients.

DISCUSSION: TB is a very significant health problem in elderly population and control of TB in this age group is crucial for the overall success of RNTCP.

In this study, there were 92 (83.64%) male and 18 (16.36%) female patients and the male to female ratio in new and previously treated cases was 4.45: 1 and 6.14: 1 respectively. Other workers like Jagdish rawat et al [3], Khwaja ubedullah shaik et al [4], Arun babu et al [5], VK Arora et al [6] also reported male predominance. One possible explanation for this may be that in low income countries, women often have a reduced access to economic resources and fewer educational opportunities as compared to male. 91.82% were from rural areas whereas 8.19% were from urban areas similar to study done by Jagdish Rawat et al [3],VK Arora et al. [6].Most of the patients of both groups were current smokers, mainly moderate and heavy smoker which was consistent with studies done by Dheeraj Gupta et al [7], VK Arora et al [6], Banu Rekha Vaithilingam Velayutham et al [8]. By virtue of age, it is expected that elderly patients would have smoked more. However, heavy smoking is associated with a relative risk of 2 to 4 for developing TB [9][10] .Current smokers, in comparison with never-smokers, have a higher risk of developing PTB but not EPTB.

In present study COPD (29%), Diabetes mellitus (17%) and hypertension (10%) were the most common co-morbidities present in both new and previously treated pulmonary tuberculosis cases. Findings were consistent with studies by Jagdish Rawat et al [3], Dheeraj Gupta et al [7], Mayank Vats et al[11].Several co-morbidities that are prevalent in ageing populations may further increase the risk of developing active TB disease. Diabetes mellitus increases the risk of active TB by approximately three fold, in all age groups but may contribute to age related TB as the prevalence of diabetes increases with age [12]. Furthermore elderly patients are more frequently treated with medication that may suppress protective immunity. The most common example of this is corticosteroids, especially in those with COPD. Both regular inhalers and short courses of high dose corticosteroids during exacerbations are associated with an increased risk of TB in younger and older patients, in a dose-dependent fashion [13][14][15]. In both new and previously treated groups, most of the patients presented to our department were with respiratory symptoms for more than 4 weeks (73.73%) which was consistent with studies done by VK Arora et al[6], Bashir Bhatti et al [16] .It reflects the low clinical suspicion of pulmonary TB in the elderly, especially in those with predominant nonspecific symptoms and atypical X-ray findings. Other potential explanations include the difficulty that the elderly have in expressing their complaints and the presence of accompanying diseases with similar symptoms like COPD or sequelae of TB, which can mask the symptomatic profile of pulmonary TB for weeks or months.

Cough was the predominant respiratory symptom experienced by both groups (p=0.45) which was followed by expectoration (p=0.36), Dyspnoea (p=0.37), chest pain (p=0.23), blood in sputum (p=0.47). Fever was most common constitutional symptom, followed by loss of appetite, weight loss and weakness. There was no statistically significant difference between the two groups. Pallor was most common physical sign present in both groups and there was no significant difference in physical sign between both groups. Similar findings were present in studies by Jagdish Rawat et al [3], Arun Babu. V et al [5], Dheeraj Gupta .et al [7], VK Arora et al [6] . Associated COPD contributes for cough and expectoration. The elderly TB patients commonly presents with nonspecific symptoms like anorexia, weight loss, weakness and mental changes because many elderly patients visit physicians after the disease had progressed to advanced stage due to lower awareness of the disease among them and poor socioeconomic status.

In present study, most of the study subjects in both groups had moderately advanced disease in chest radiograph (54.55%) and bilateral pulmonary disease (69.09%). Mixed and upper zone involvement was common in both groups. There was no statistically significant difference between the two groups in radiological extent, zone involvement and radiological involvement of the disease. We could not find similar studies comparing clinical and radiological presentation of pulmonary tuberculosis in new and previously treated geriatric patients but various studies comparing geriatric patients with young patients suggested that our findings were consistent with Jagdish Rawat et al [3], Arun babu. V et al [5], João Paulo ,Cantalice Filho et al [17], VK Arora et al [6] in regard to geriatric patients. This is consistent with the higher immunological susceptibility and longer symptomatic period observed in this group, suggesting that diagnostic delay allows greater progression of pulmonary TB.

Consolidation in chest radiograph was the most common finding present in 76.67% new and 74.00% previously treated patients. Fibrocavitary lesion and pulmonary fibrosis were more common in previously treated patients, which was statistically significant whereas infiltration and hilar adenopathy was significantly more in new TB cases. Cavity was present in 36.67% new and 34.00% previously treated patients. Findings were consistent with studies done by Mona T. Hussein et al [18] , Jae Ho Lee el al [19], VK Arora et al [6] Consolidation in chest radiograph may lead to misdiagnosis of pulmonary TB as pneumonia or lung cancer mainly in sputum smear negative patients which leads to delay in starting treatment for tuberculosis.

This study concluded that two groups do not differ clinically but to some extent radiological presentation varied. Pulmonary tuberculosis in such patients typically involves upper zone but good number of patients also had mid and lower zone involvement in their chest radiograph. So, pulmonary tuberculosis should be considered in the differential diagnosis in evaluation of such patients. Hence sputum and/BAL should be sent for AFB smear examination by microscopy and also for CBNAAT, if required. Treating physician should be aware about the clinical and radiographic features in geriatric age group patients suffering from pulmonary TB and strictly adhere to diagnostic algorithm proposed by RNTCP.

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