Original Research Paper



Medicine

A STUDY OF CLINICORADIOLOGICAL PROFILE OF ELDERLY PATIENTS OF PULMONARY TUBERCULOSIS

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ABSTRACT Atypical clinical manifestation of tuberculosis in elder persons can result in delay diagnosis and initiation of treatment. In this study we assessed clinical and radiological profile of 46 newly diagnosed drug sensitive sputum positive pulmonary tuberculosis aged ≥ 60 years. Detailed history, Chest x-ray (PA view) and all routine investigations (CBC, RFT, LFT, CRP, SERUM PROTEIN, etc) done. Follow up of patients weekly on 1st month of the treatment than monthly till the end of the treatment. All parameters like age, gender, BMI, co morbidities, radiological and clinical profile etc. Analyzed. All the patients had cough followed by 42 patients (91.30%) had anorexia and weight loss. Total 34 (73.91%) patients experienced ADR. Most common ADR was gastrointestinal. Patients in whom upper zone involvement and cavitory lesion in CxR (PA) showed statistically favourable outcome (P value = < 0.05). Patients with normal BMI had significant cured rate (P value = < 0.05). Lower bacillary load showed higher cure rate though statistically not significant (P value = 0.5849).

KEYWORDS : Tuberculosis, Elderly patients, Clinical and radiological outcome.

Introduction

Tuberculosis (TB) is one of the most prevalent and serious of all human infectious diseases. Despite the implementation of strong TB initiatives, this highly infectious disease continues to affect all susceptible populations, including the aged people. Its clinical and radiographic features may be atypical, nonspecific and confused with coexisting diseases¹.Underlying illnesses, age related diminution in immune function, the increase frequency of adverse drug reactions and institutionalization can complicate the overall clinical approach to tuberculosis in elderly patients. Adverse social factors and poor living conditions also affect the elderly much more than the young. Tuberculosis in old people may be either exogenous or endogenous in origin. Over 90% of cases in the elderly represent endogenous tuberculosis, i.e., reactivation of dormant infection in the lungs or elsewhere in the body². Tuberculosis is the prototype of a disease in which cellmediated immunity plays an important part in controlling the infection. It is well known that age related decline in the cellmediated immunity influences reactivation of latent infection in the elderly³.

Objectives:

- To know the most common presenting symptom
- To know average duration of the symptoms
- To evaluate clinical and radiological profile
- To study various adverse drug reactions.

Methodology:

Elderly patients who came to Respiratory medicine department, LG Hospital with pulmonary tuberculosis during January 2019 to July 2019 included in the study after informed consent. Detailed history was taken. Chest x-ray (PA view), sputum AFB and all routine investigations(CBC, RFT, LFT, CRP, SERUM PROTEIN, etc) done. Sputum GENE X PERT and sputum for culture and sensitivity for pyogen sent. HRCT Thorax and Bronchoscopy done when indicated.

Inclusion criteria:

- All patients of drug sensitive pulmonary tuberculosis with age $\geq 60\, years$
- Patients who give consent.

Exclusion criteria:

- Age < 60 years
- Patients who do not give consent
- Patients of extra pulmonary tuberculosis
- Patients having drug resistance tuberculosis.

Sputum sample:

- · One Spot sample on the first day.
- Second early morning sample on next day.

Samples were examined by Fluorescent staining as per the IUATLD/WHO scale 400 x magnifications and categorized as scanty, +1, +2, +3.⁴

Drug regimen:

All patients were administered anti tuberculosis drugs under DOTS regimen according to

RNTCP REGIMEN (NEW AND PREVIOUSLY TREATED) - HRZE (75/150/400/275 mg per tablet) for 2 month + HRE (75/150/275 per tablet for 4 month according to weight^{δ}.

The sputum for GeneXpert (CBNAAT) was done at the starting of treatment.

Follow up:

Follow up CxR (PA) and smear examination at specified intervals:

- At the End of 2nd month(end of intensive phase)
- At the end of 6th month(end of treatment)

Follow up of patients weekly on 1st month of the treatment than monthly till the end of the treatment.

Last follow up of the last patient was in January,2020. Total study period was from January 2019 to January 2020.

All parameters like age, gender, BMI, co morbidities, radiological and clinical profile etc. entered in proforma then data analyzed according to appropriate statistical tests (chi square test).

Treatment outcome is defined as per RNTCP guideline⁵.

Radiological feature: Parenchymal involvement: Consolidation:

The lesion is usually single, of variable size, often less than 2 cm in diameter, homogeneous with ill-defined margins, with air bronchogram^{6,7}. Computed tomography is superior then plain chest radiography in demonstrating the parenchymal changes. In endobronchial spread the nodules are distributed in the peribronchial and centrilobular regions and the pattern

is known as "tree-in-bud" appearance as seen in HRCT[®].

Cavitation:

Cavitation occurs when an area of caseous necrosis liquefies and communicates with bronchial tree. It may also resulting in endobronchial spread of the liquefied caseous material and causes bronchopneumonia. Size of the cavity is variable [few mm to several cm] depending on the extent of caseation⁸.

Tuberculoma:

A tuberculoma is a persistent mass-like opacity which may be seen either in primary or post-primary TB. It is a round or oval lesion, most commonly seen in the upper lobes, more often on the right side. Tuberculoma range from 0.5 to 4 cm or more in diameter, though majority are less than 3 cm in size⁹.

Miliary tuberculosis:

Dissemination of organisms via the haematogenous route

Table 1: Variables and chest x-ray pattern.

leads to miliary TB in the lungs and other organs. The lesions appear as tiny, discrete, pinpoint opacities, evenly distributed throughout both the lungs with some basal predominance¹⁰.

Lymph node involvement:

Along with parenchymal lesion, lymph nodes draining that area are enlarged. Right hilum and right paratracheal areas are the most commonly involved¹¹.

Pleural Involvement:

Pleural effusion as a manifestation of primary TB occurs less commonly in elderly patients. It is usually accompanied by radiological evidence of pulmonary diseased¹².

Air way involvement:

Tracheobronchial disease is common and usually is the result of the compression of the bronchi by enlarged lymph node and less commonly tuberculous granulation tissue resulting in narrowing or segmental/lobar atelectasis¹².

Results:

Total 496 patients were diagnosed as sputum positive pulmonary TB from January 2019 to July 2019. Total 46(9.27%) patients were enrolled in this study who fulfilled the inclusion criteria. In which 35 (76.08%) were male and 11 (23.91%) were female. Most of the patients were <70 years of age.

Clinical profile:

As per clinical examination all patients had cough. 25 (56.34%) patients had fever in which 18 (39.13%) patients had low grade fever, 07 (15.21%) patients had high grade fever. 42 (91.30%), 42 (91.30%), 29 (63.04%) and 11 (23.91%) patients had anorexia, weight loss, breathlessness and chest pain respectively. Some patients presented with more than one symptom.

Cavitory lesions were most common radiological pattern seen in all symptomatic patients. Patients had longer duration of symptoms presented with cavitory lesion. All the patients with infiltrations without co morbidities showed higher cure rate. Cavitory lesions were more commonly seen in patients having normal BMI. Patients with normal BMI showed higher cure rate compared to underweight. Patients with cavitory lesions showed higher bacillary load compare to infiltrative lesions. Table 1 shows correlation of chest x-ray pattern in different variables.

Symptoms	CxR(PA) pattern			
	Infiltration	Cavity with or without infiltration	Other (pleural e mediastinal	effusion, hilar or lymphnode)
Cough	Cough with expectoration $= 20$	09	11	00
	Cough without expectoration = 26	11	15	00
Fever	Low grade = 18	07	10	01
	High grade = 07	03	04	00
Ānorexiα	42	17	25	00
Weight loss	42	18	24	00
Breathlessness	29	08	21	00
Chest pain	21	08	12	01
Duration of Symptoms	< 15 days = 16	10	06	00
	>15 days = 30	04	24	02
Co morbidity	DM type 2 = 05	00	04	01
	HTN = 07	03	04	00
	Other = 09	04	05	00
	No co morbidity = 25	07	17	01
Cure rate of co morbidity	With co morbidity = 21	05 (71.42%)	09 (69.23%)	00 (00%)
	Without co morbidity = 25	07 (100%)	09 (52.94%)	01 (100%)

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BMI	Underweight = 27	11	15	01
	Normal BMI = 17	03	13	01
	Over weight = 01	00	01	00
	Obese = 01	00	01	00
Cure rate of BMI	Underweight $= 27$	09 (81.81%)	07 (46.66%)	00 (00%)
	Normal BMI = 17	03 (100%)	11(84.61%)	01 (100%)
	Over weight $= 01$	00 (00%)	00 (00%)	00 (00%)
	Obese = 01	00 (00%)	00 (00%)	00 (00%)
Bacillary load	Scanty = 15	05	09	01
	+1 = 17	06	10	01
	+2 = 10	03	07	00
	+3 = 04	00	04	00
Cure rate of bacillary load	Scanty = 15	04 (80%)	08 (88.88%)	00 (00%)
	+1 = 17	04 (66.66%)	06 (60%)	01 (100%)
	+2 = 10	03 (100%)	02 (28.57%)	00 (00%)
	+3 = 04	00 (00%)	02 (50%)	00 (00%)

Adverse drug reaction (ADR) :

Table 2 shows details of anti-TB drug adverse reactions. Total 34 (73.91%) patients experienced ADRs. Most common ADR was related to gastrointestinal 13 (28.26%) followed by hepatobiliary 6 (13.04%), dermatological 7 (15.21%). 3(6.52%) patients developed thrombocytopenia. Only 1 (2.17%) patient had diagnosed DRESS SYNDROME.

Table 2 : Adverse Drug Reaction

System	Manifestation	Patients	Actions for ADR
Gastrointestinal	Nausea, Vomiting, Epigastric pain	13 (28.26%)	Symptomatic Treatment
Hepatobiliary	Jaundice	06 (13.04%)	Rifampicin, Pyrazinamide and
			isoniazide stopped temporarily
Skeletal	Joint pain	04 (8.69%)	Symptomatic treatment.
			Pyrazinamide stopped temporarily
Ophthalmic	Visual blurring	00 (00%)	
Dermatologic	Itching, Rashes	07 (15.21%)	Symptomatic treatment
Blood	Thrombocytopenia	03 (6.52%)	Rifampicin stopped temporarily
DRESS SYNDROM	Fever, Cutaneous eruption and	01 (2.17%)	Rifampicin, Pyrazinamide, Ethambutol,
	Thrombocytopenia		Isoniazide stopped temporarily

Treatment outcome:

Out of 46 (100%) patients 31 (67.39%) cured, 10 (21.73%) expired, 3 (6.52%) defaulted and 2 (4.34%) patients were failure the treatment in whom re-evaluation and treatment was started.

Sex:

Out of 35 (76.08%) males and 11 (23.91%) females, 23 male and 08 female were cured.

Comorbidity:

Out of 46 patients, total 21 patients had co morbidities. 5 (10.86%), 7 (15.21%), 9 (19.56%) patients had diabetes type II, HTN and other (COPD, asthma) in which 03 (60%), 4 (57.14%), 7 (77.77%) were cured respectively.

Addiction:

As per personal history total 10 (21.73%) patients were smoker, 09 (19.56%) alcoholic, 08(17.39%) tobacco chewer. Out of them 05 (50%), 06 (66.66%), 07 (87.5%) were successfully treated respectively.

Radiological Zonal involvement:

Radiological evaluation showed that upper zone involvement was more common. Out of 46 patients 16 (34.78%), 2 (4.34%), 3 (6.52%) and 25 (54.34%) patients had upper, mid, lower and more than one zonal involvement respectively. As per zonal involvement cure rate was 15 (93.75%), 1 (50%), 2 (66.66%) and 13 (52%) in upper, mid, lower and more than one zonal involvement respectively. Upper zone involvement is associated with statistically favourable outcome (P-<0.05).

Type of lesion in Chest Radiograph:

As per radiological analysis 14 (30.43%), 09 (19.56%), 21 (45.65%), 2 (4.34%) patients had infiltration, cavity, mixed (infiltration, cavity) and other (pleural effusion, mediastinal or hilar lymphnode) lesions amongst them 12 (85.71%), 08 (88.88%), 10 (47.61%), 1 (50%) were successfully treated respectively. In chest radiography cavitory lesion showed higher cure rate compared to other lesions, which is statistically significant (P-<0.05).

BMI:

Out of 46 patients 27 (58.69%), 17 (36.95%) patients were underweight, normal BMI amongst them cure rate was 16 (34.78%), 15 (32.60%) respectively. Elderly patients of tuberculosis having normal BMI is associated with higher cure rate, which is statistically significant. (P-<0.05).

Bacillary load :

Out of 46 patients, 15 (32.60%), 17 (36.95%), 10 (21.73%), 4 (8.69%) had bacillary load as scanty, +1, +2, +3 in which cure rate was reported 12 (80%), 11(64.70%), 6 (60%), 2 (50%) respectively.

Table 3: Variables And Treatment Outcome.

Variable	Treatment Outcome			
	N	Success n (%)	Failure/Death/Default n (%)	P value
Sex	Male = 35	23 (65.71%)	12 (34.28%)	0.6651
	Female = 11	08 (72.72%)	03 (27.27%)	
Co morbidity	DM type 2 = 05	03 (60%)	02 (40%)	0.6421
	HTN = 07	04 (57.14%)	03 (42.85%)	
	Other (COPD) = 09	07 (77.77%)	02 (22.22%)	

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	No Co morbidity = 25	17 (68%)	08 (32%)	0.9245	
Addiction	Current Smoker = 10	05 (50%)	05 (50%)	0.2450	
	Current Alcoholic = 09	06 (66.66%)	03 (33.33%)		
	Tobacco chewer = 08	07 (87.5%)	01 (13.5%)		
	No Addiction = 19	13 (68.42%)	06 (31.57%)	0.9005	
Radiological zonal	Upper zone = 16	15 (93.75%)	01 (6.25%)	< 0.05	
involvement	Mid zone = 02	01 (50%)	01 (50%)		
	Lower zone = 03	02 (66.66%)	01 (33.33%)		
	More than one zone = 25	13 (52%)	12 (48%)		
Type of lesion in chest	Infiltration =14	12 (85.71%)	02 (14.28%)	< 0.05	
radiograph	Cavity = 09	08 (88.88%)	01 (11.11%)		
	Mixed = 21 (Infiltration + Cavity)	10 (47.61%)	11 (52.38%)		
	Other = 02 (Pleural effusion,	01 (50%)	01 (50%)		
	Mediastinal or Hilar Lymphnode)				
BMI	Underweight = $27 (< 18.5)$	16 (59.25%)	11 (40.74%)	< 0.05	
(Body Mass Index)	Normal = 17 (18.5 - 24.9)	15 (88.23%)	02 (11.76%)		
	Overweight = 01 (25 – 29.5)	00 (00%)	01 (100%)		
	Obese = 01 (>30)	00 (00%)	01 (100%)		
Bacillary load	Scanty = 15	12 ((80%)	03 (20%)	0.5849	
_	+1 = 17	11 (64.70%)	06 (35.29%)		
	+2 = 10	06 (60%)	04 (40%)		
	+3 = 04	02 (50%)	02 (50%)]	

Discussion:

Tuberculosis is a more devastating disease in the elderly with increased morbidity and mortality, affecting quality of life¹³. Co morbidities, poor memory, impairment of speech, increase frequency of adverse drug reactions can complicate the overall clinical approach to tuberculosis in elderly patients. Atypical clinical signs of TB in elderly patients can result in delay in diagnosis and beginning of treatment¹⁴.

The male predominance among elderly patients could be explained by their higher social and labor activities than females, thus favouring the transmission of TB. In our study we found male predominance which is consistent with study by Hussein et al¹⁵.

Febrile sense and elevated body temperature were less frequently recorded in elderly patients. This can be explained by the decreased pyrogenic response with aging and reduced perception of fever in elderly. The lower frequency of sweating in older patients is likely related to the lower frequency of fever in them. The elderly TB patients commonly presented with nonspecific general symptoms such as anorexia, weight loss, weakness and mental changes. In our study clinical feature like anorexia, weight loss, cough are more common than fever and chest pain in elder patients. These results were in agreement with those of other studies¹⁶.

In our study 21 (45.65%) patients had co morbidities like chronic obstructive lung disease, hypertension, diabetes because this disease increasing with the aging. The prevalence of chronic obstructive lung disease, hypertension, diabetes because this disease increasing with the aging. The prevalence of immunocompromising co morbidities increases with age increasing the susceptibility of older patients to TB. This result was consistent with the results of other studies¹⁷.

Upper zone more commonly involved than mid and lower zone in our study which is disagreed with the study of Jagdish Rawat, Girish Sindhwani and Ruchi Juyal18 in which higher involvement of lower zone. Mixed lesion (cavity + infiltration) involvement is more commonly seen in our study than cavity & infiltration alone, which is consistent with other study¹⁹.

In our study most common ADR was related to gastrointestinal system followed by dermatological. Elderly patients have lower immunity which leads to higher frequency of adverse drug reactions which is in agreement of different Egyptian and world-wide studies²⁰.

Underweight (BMI<18.5) patients are more prone to develop tuberculosis than normal and overweight patients. This result is agreed with large cohort of elderly health-centre patients in Hong Kong²¹.

In our study low bacillary load shows high sputum conversion rate. These findings were in congruence with other studies with alternate day regimen²²⁻²⁴.

CONCLUSION:

In conclusion, this study shows that elderly pulmonary tuberculosis patients are more likely to present with nonspecific symptoms and atypical radiographic findings. Moreover, we found a higher frequency of co-morbidities and higher TB related mortality in elderly TB patients. Atypical clinico-radiological manifestation of tuberculosis in older persons can result in delay in diagnosis and initiation of treatment. A high index of suspicion and prompt investigations in elderly patients are mandatory for early diagnosis and treatment of TB hoping for decreasing TB related morbidity and mortality.

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