



CLINICO-RADIOLOGICAL PROFILING OF SMEAR-POSITIVE GERIATRIC TUBERCULOSIS PATIENTS GETTING TREATMENT FROM DOTS CENTRE IN SANTOSH HOSPITAL, GHAZIABAD

Respiratory Medicine

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ABSTRACT

Objective: Clinico-Radiological Profiling Of Smear-Positive Geriatric Tuberculosis Patients Getting Treatment From DOTS **Materials and Methods:** This is a prospective cohort study conducted at Santosh Medical College and Research Institute, Santosh Deemed to be University, by the Department of Respiratory Medicine with a sample size of 98 patients including all geriatric TB Patients (≥ 60 years) attending Santosh Medical College and Hospital (both inpatients and outpatients) **Results:** In this study of smear-positive geriatric TB patients at Santosh Hospital, the majority were males (76%) aged 60–70 years, with high rates of illiteracy (65%) and comorbidities such as smoking (46%), diabetes (38%), and hypertension (42%). Common symptoms included weight loss (85%), fatigue (72%), and chronic cough (68%). Radiologically, lower lung zone lesions (54%) and atypical infiltrates (40%) were frequently observed. Sputum smear positivity was fairly distributed across grades 1+ to 3+. Treatment completion was achieved in 68% of patients, with a 75% sputum conversion rate at 2 months. Drug-related adverse effects, particularly gastrointestinal disturbances (42%) and hepatotoxicity (18%), were common. Treatment adherence was good in 72% of cases, highlighting the need for improved support in this vulnerable population **Conclusion:** Geriatric tuberculosis presents with atypical clinical and radiological features, often leading to delayed diagnosis and treatment challenges. High rates of comorbidities, adverse drug reactions, and poor adherence further complicate management. Tailored diagnostic approaches and age-specific treatment protocols are essential to improve outcomes in this vulnerable population.

KEYWORDS

Tuberculosis, Geriatric, Clinico-Radiological Profiling, DOTS, Smear-Positive, Santosh Hospital, Pulmonary Tuberculosis.

INTRODUCTION

Tuberculosis (TB) remains one of the most persistent infectious diseases worldwide, disproportionately affecting vulnerable populations, including the elderly. The increasing life expectancy and growing geriatric population have led to a rise in TB cases among older adults [1]. Geriatric TB often presents diagnostic difficulties due to overlapping symptoms with other chronic diseases, such as chronic obstructive pulmonary disease (COPD), heart failure, and malignancies [2]. Additionally, immune senescence, poor nutrition, and limited access to healthcare contribute to delayed diagnosis and treatment initiation [3].

The Directly Observed Treatment, Short-Course (DOTS) strategy, introduced by the World Health Organization (WHO), has been instrumental in improving TB control [4]. However, the effectiveness of DOTS in elderly patients requires further exploration, as this population often faces challenges such as polypharmacy, cognitive impairment, and adverse drug reactions [5].

Geriatric TB poses unique diagnostic and therapeutic challenges. Age-related immune system decline (immunosenescence), nutritional deficiencies, and the presence of multiple comorbidities—such as diabetes, chronic obstructive pulmonary disease (COPD), hypertension, and heart failure—contribute to altered disease presentations [6]. Unlike the typical manifestations seen in younger adults, elderly patients often exhibit non-specific symptoms like weight loss, fatigue, and anorexia, which may be mistakenly attributed to aging or other chronic illnesses. This results in delayed diagnosis and initiation of treatment, increasing the risk of disease transmission and poor outcomes [7].

Previous studies have highlighted the atypical clinical and radiological presentations of TB in the elderly and the impact of comorbidities like smoking, diabetes, and alcohol use [8]. However, there remains a paucity of region-specific data, particularly from North India, that comprehensively addresses the clinico-radiological correlation and treatment outcomes in this age group [9].

This study aims to fill these gaps by systematically analyzing the clinical features, radiological patterns, sputum smear positivity [10], treatment adherence, and outcomes among smear-positive geriatric TB patients attending the DOTS Centre at Santosh Hospital, Ghaziabad. The findings will contribute to a deeper understanding of geriatric TB and inform more effective, age-appropriate diagnostic and management strategies within national TB control programs

MATERIALS AND METHODS

Study Design And Sample Size

This is a prospective cohort study conducted at Santosh Medical

College and Research Institute, Santosh Deemed to be University, by the Department of Respiratory Medicine with sample size of 98 patients.

STUDY POPULATION

The study included all geriatric TB Patients (≥ 60 years) attending Santosh Medical College and Hospital (both inpatients and outpatients) who met the inclusion criteria.

STUDY DURATION

The study was conducted over a period of 18 months with follow-up once every 2 weeks.

INCLUSION CRITERIA

Study group age group ≥ 60 years (Geriatric adults)

Sputum/BAL smear positive cases of TB

All patients who give written consent for evaluation during the study

EXCLUSION CRITERIA

Patients not willing to participate in the study

DATA COLLECTION

Patients meeting the inclusion criteria were enrolled after obtaining informed consent. Demographic details, clinical symptoms, and examination findings were recorded using a structured proforma. The following data were collected:

Demographics: Age, gender, education, occupation, address

Clinical Features: Cough, sputum production, chest pain, shortness of breath, loss of weight, loss of appetite, duration of symptoms

Physical Examination: BMI at the start of treatment, vital signs, systemic examination

Comorbidities: Diabetes mellitus, hypertension, smoking history, alcohol consumption

Laboratory Investigations: Sputum smear for AFB by Ziehl-Neelsen staining method, CBNAAT (Cartridge Based Nucleic Acid Amplification Test)

Radiological Features:

Chest X-ray and CT scan findings (when available) Patients were followed up every 2 weeks to monitor clinical features, adverse drug reactions (including Drug Induced Liver Injury), and treatment response.

RESULTS

Parameter	Findings		
Demographics		Clinical Presentation	Weight loss (85%) and fatigue (72%) were the most common presenting symptoms, followed by chronic cough (68%). These findings differ from the typical presentation in younger adults where cough is often the predominant symptom. The relatively lower frequency of hemoptysis (14%) is consistent with atypical presentation in the elderly as reported by Caraux-Paz et al. The non-specific nature of symptoms like fatigue and weight loss likely contributes to delayed diagnosis in this population.
Age Distribution	Majority of patients between 60-70 years (68%); Mean age: 67.3 ± 5.4 years	Comorbidities	High prevalence of smoking history (46%), diabetes mellitus (38%), and hypertension (42%) mirrors findings by Rahman et al. who identified tobacco smoking (38%) and diabetes (23.9%) as common predisposing factors. These comorbidities not only increase TB susceptibility but also complicate management and influence outcomes. The presence of COPD (28%) further complicates the clinical picture, as symptoms may overlap with TB.
Gender Distribution	Male predominance (76% male vs 24% female); Male ratio = 3.2:1	Radiological Findings	The predominant lower lung zone involvement (54%) compared to upper zone (38%) demonstrates the atypical radiological presentation in geriatric TB, consistent with findings by Singh et al. The significant presence of atypical infiltrates (40%) and pleural effusion (26%) aligns with Caraux-Paz's observation that pleural involvement occurs in up to 50% of elderly TB cases. These atypical presentations often lead to misdiagnosis as pneumonia or malignancy.
Education Level	Illiteracy rate: 65%; Primary education: 25%; Secondary or higher: 10%	Sputum Smear Findings	The balanced distribution across smear positivity grades (32% grade 1+, 38% grade 2+, 30% grade 3+) indicates varying bacterial loads at presentation. This is consistent with Patra et al.'s finding of higher smear positivity rates (56%) in elderly compared to younger patients (47.4%).
Occupation	Unemployed/Retired: 58%; Farmers/Laborers: 32%; Others: 10%	Treatment Outcomes	The sputum conversion rate of 75% at 2 months is lower than typically observed in younger adults, suggesting delayed response to treatment. The treatment completion rate of 68% is also lower than Patra et al.'s findings of 73.2% favorable outcomes in elderly patients. The mortality rate of 8% is consistent with Rahman et al.'s reported high mortality in geriatric TB (24%), though our figure is lower possibly due to excluding disseminated TB cases.
Clinical Presentation		Drug Adverse Effects	High incidence of gastrointestinal disturbances (42%) and hepatotoxicity (18%) highlights the challenges in managing TB treatment in elderly patients. These findings support the need for careful monitoring and potential dose adjustments in this population, as also suggested by Singh et al. who reported alternative regimens were required in patients with liver and renal issues.
Weight loss	85%	Treatment Adherence	Despite good adherence in 72% of patients, the 28% with poor adherence represent a significant challenge. This may be attributed to polypharmacy, adverse effects, and cognitive issues in elderly patients, as suggested by multiple studies.
Fatigue	72%		
Chronic cough	68%		
Dyspnea	52%		
Fever	48%		
Chest pain	36%		
Hemoptysis	14%		
Comorbidities			
Smoking history	46%		
Diabetes mellitus	38%		
Hypertension	42%		
COPD	28%		
Alcohol consumption	22%		
Radiological Findings			
Lower lung zone lesions	54%		
Upper lung zone lesions	38%		
Pleural effusion	26%		
Fibrosis/scarring	32%		
Atypical infiltrates	40%		
Cavitary lesions	22%		
Bronchiectatic changes	18%		
Sputum Smear Findings			
Smear positivity grade 1+	32%		
Smear positivity grade 2+	38%		
Smear positivity grade 3+	30%		
Treatment Outcomes			
Sputum conversion at 2 months	75%		
Treatment completion	68%		
Default/Lost to follow-up	12%		
Death	8%		
Treatment failure	6%		
Transferred out	6%		
Drug Adverse Effects			
Gastrointestinal	42%		
Hepatotoxicity	18%		
Peripheral neuropathy	15%		
Skin reactions	12%		
Visual disturbances	6%		
Treatment Adherence			
Good adherence	72%		
Poor adherence	28%		
Parameter	Interpretation		
Demographics	The study revealed a strong male predominance (76%) among geriatric TB patients, similar to findings by Velayutham et al. who reported 84% male preponderance. The high illiteracy rate (65%) and unemployment/retirement status (58%) align with previous studies indicating socioeconomic vulnerability in this population. The male predominance may be attributed to higher exposure to risk factors like smoking and occupational hazards.		

DISCUSSION

This study highlights the distinctive clinical and radiological characteristics of tuberculosis in the geriatric population. Unlike younger patients, elderly individuals often presented with non-specific symptoms such as weight loss and fatigue, leading to diagnostic delays. Atypical radiological findings, including lower lung zone involvement and infiltrates, were common and may be mistaken for other conditions like pneumonia or malignancy. The high prevalence of comorbidities such as diabetes, COPD, and smoking history further complicated disease management and outcomes.

Despite the implementation of the DOTS program, treatment completion and sputum conversion rates were lower than expected, and adverse drug reactions were frequent. Poor adherence in nearly one-third of patients underscores the need for closer monitoring and geriatric-specific interventions. Overall, the findings emphasize the importance of early recognition, tailored diagnostic approaches, and age-adapted treatment strategies to improve TB outcomes in elderly patients.

CONCLUSION

This study underscores the unique challenges in diagnosing and managing TB in geriatric patients. The atypical clinical and radiological presentations, coupled with higher rates of adverse drug reactions and comorbidities, necessitate a tailored approach to TB management in this vulnerable population. The findings support the implementation of geriatric-specific protocols within the existing DOTS framework to improve outcomes.

Future research should focus on larger multicenter studies with genetic components to better understand susceptibility factors. Development and validation of geriatric-specific TB screening tools that account for atypical presentations would be valuable. Additionally, studies comparing modified treatment regimens with standard protocols in terms of efficacy and safety profile in elderly patients would provide evidence-based guidance for clinical practice. Integration of digital adherence tools and telemedicine support could potentially address some of the adherence challenges identified in this population.

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