UNSEEN TUBERCULOSIS: STUDY AMONG INPATIENTS OF A TERTIARY CARE HOSPITAL OF NORTH KARNATAKA

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ABSTRACT

Objective: The study aim to determine the proportion of presumptive and active TB cases among inpatients at ESIC Hospital in Kalaburagi.

Methods: A hospital-based cross-sectional study was conducted among inpatients above 18 years of age who were admitted to non-emergency wards from March to April 2023 at ESIC Hospital in Kalaburagi. A pre-existing TB diagnosis and patients admitted to critical care units were excluded. The convenient sampling method was used to recruit participants. Data was collected by using a predesigned, semi-structured questionnaire. The patients who were presented with one of the four symptoms of screening had undergone investigations like CBNAAT, chest X-ray, and sputum microscopy to confirm the diagnosis and the findings were recorded as proportion.

Results: Out of 1363 inpatients, 35 (2.5%) patients were classified as presumptive TB cases. Out of 35, 3(8.57%) actual TB cases were found. All patients who had positive results for Tuberculosis were young patients and belonged to low socioeconomic class. Two of the three were rifampicin-sensitive Tuberculosis cases.

Conclusion: Timely screening of patients is of utmost importance to avoid further spreading of Tuberculosis infection among inpatients. The higher prevalence of actual TB cases in younger adults needs further exploration.

Keywords: Tuberculosis, Presumptive, Actual, Inpatients.

INTRODUCTION

Tuberculosis (TB) remains a significant global health challenge, particularly in high-burden countries like India. According to the World Health Organization's (WHOs) Global TB Report 2023, TB is the second leading cause of death from infectious diseases worldwide, with an estimated 10.6 million new cases and 1.30 million deaths in 2022 [1]. India bears a disproportionate burden of the global TB epidemic, with an estimated 35–40 crore people living with latent TB infection and approximately 26 lakh people at risk of developing active TB disease annually [2].

High proportion of people never diagnosed or treated with TB could be the reason for high rates of mortality as well as morbidity. The stagnant burden of disease in the community has forced us to emphasize the improvement of case detection. The early detection of TB cases is crucial for effective disease control and prevention of transmission, especially in health-care settings where vulnerable populations are concentrated. Delayed diagnosis not only increases the risk of spread within families and communities but also poses a significant threat to hospital inpatients, health-care workers, and medical trainees. Systematic screening of high-risk groups, including hospital inpatients, has been recommended as a strategy to identify TB cases early and prevent further transmission [3].

Usually screening for TB is done just by asking history of cough more than 2 weeks which could be a limited approach for screening of TB. Hence, the WHO recommends a four-symptom screening approach for identifying presumptive TB cases, which includes cough lasting more than 2 weeks, fever for more than 2 weeks, significant weight loss, and night sweats [4].

This screening test serves as the first step in finding the TB cases. The one who tested positive on screening is recommended to have a chest X-ray (CXR) (acid–fast bacilli) sputum examination, and cartridge-based nucleic acid amplification test (CBNAAT). Using signs and symptoms as an independent screening tool remains a global challenge for its relatively low accuracy. However, it could still be of value when it was used in a specific target population like inpatients of hospital which could be helpful in high-burden places where resources are always at constraint.

Hence, this study is aimed to determine the proportion of presumptive and active TB cases among inpatients by utilizing four-symptom screening method at a tertiary care hospital in Kalaburagi, India.

METHODS

This is hospital-based cross-sectional study conducted at ESIC hospital in Kalaburagi. The study has included all willing inpatients above 18 years of age admitted in non-emergency wards admitted during March–April 2023.

Total number of inpatients during 2 months was 1469. Patients with a pre-existing TB diagnosis and patients admitted to critical care units were excluded from the study. Study had included 1363 participants (Figure 1). Written informed consent was obtained from all participants after explaining the study purpose in their local language. Data were collected through one-on-one interviews using a pre-designed, semi-structured questionnaire consisting of details of sociodemographic data, brief history, and responses to the four-symptom TB screening questions. The convenient sampling method was used to recruit participants admitted in a non-emergency ward. After four symptom screenings, patients were classified as presumptive TB cases. The patients who presented with one of the four symptoms for screening had undergone investigations such as CBNAAT, CXR, and sputum microscopy to confirm the diagnosis, and the findings were recorded as proportion.

Table 1: Details of the newly detected tuberculosis cases

| Details of the newly detected tuberculosis cases	Patient 1	Patient 2	Patient 3
Age/gender	30 years/Female	34 years/Male	19 years/Male
Symptoms	Fever, cough	Fever, cough	Fever, cough
Admission diagnosis	Lower respiratory tract infection	Fever under evaluation	Fever under evaluation
Socio-economic status	Class 3	Class 2	Class 3
Body mass index	19.72	20.58	17.79
Type of family	Nuclear	Joint	Nuclear
Overcrowding	Absent	Present	Absent
Chest X-ray	+	+	+
Sputum microscopy	+	+	+
Cartridge-based nucleic acid amplification test	+	+	+
Rifampicin sensitivity	Rif resistant	Rif sensitive	Rif sensitive
History of tuberculosis			
In neighborhood	No	No	No
In family	No	No	No
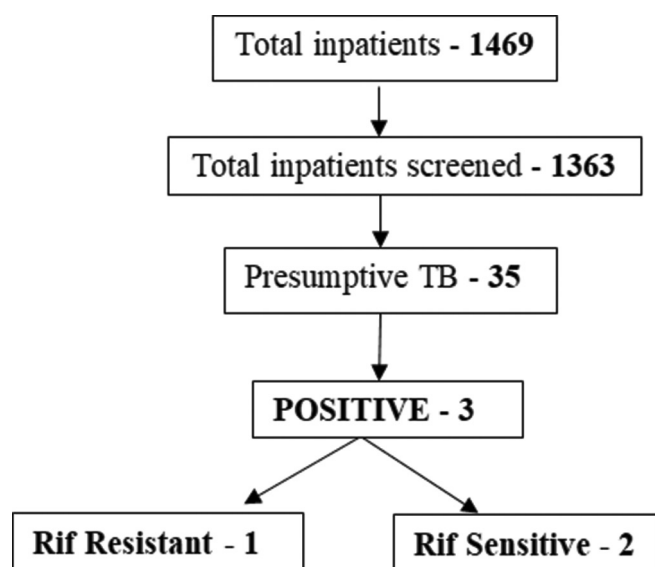
Fig. 1: Screening of inpatients for tuberculosis

RESULTS

Out of 1363 inpatients, 35 (2.5%) patients had at least two common symptoms of four-symptom screening of which had been classified as presumptive TB cases. All screening positive patients were sent for investigations including CBNAAT, sputum examination, and CXR. Out of 35 patients who were considered presumptive TB cases, 3 (8.57%) were found to be actual TB cases. All patients who had positive results for TB were young patients. These patients presented with predominant symptoms such as fever and cough with a provisional diagnosis of lower respiratory tract infection and pyrexia of unknown origin. The socioeconomic class for all of them was lower class by modified BG Prasad classification. Out of three patients, 2 were rifampicin sensitive and one was rifampicin resistant (Table 1).

DISCUSSION

The overall prevalence of actual TB cases in this study was indicated as 3 (8.6%) among those presumptive TB inpatients of hospital. In another study of Gebre and Mimano et al. showed 8.9% of the participants were confirmed either as smear positive PTB or culture positive PTB [4]. However, the prevalence of actual TB cases in presumptive TB patients has exhibited a wide range of variation. In another study of Tanzania which used GeneXpert assay, reported the prevalence of 23.7% in presumptive pulmonary TB patients, while in studies from Nigeria, Pakistan and Turkey reported that the prevalence of actual Tb cases was 14.7%, 2.2%, and 0.5% respectively [5-8]

The variation in the findings of the study can be due to different tests used for TB diagnosis, the inclusion of high-risk populations in the study like HIV and diabetic patients, overcrowding, poor health care facilities in study localities, malnutrition, low socio-economic status, and so on. In the present cross-sectional study, all the active diagnosed TB cases reported were belonging to low socio-economic status. This relationship between socioeconomic status has been reported in previous studies [9-11].

Strength and limitations

The prevalence of actual TB cases was diagnosed both radiologically and microbiologically. Provider initiated TB screening pathway systematically. Factors associated with the prevalence of actual Tb cases were not considered in the study. The short study duration is also a limitation of the study.

CONCLUSION AND RECOMMENDATIONS

It was observed that 35 (2.5%) inpatients had symptoms suggestive of TB and among them, 3 (0.22%) inpatients had active TB. Timely screening of the patient's is of utmost important to avoid further spread of TB infection among inpatients. The higher prevalence of actual TB cases in younger adults needs further exploration. The provider-initiated TB screening pathway systematically targets people at high risk of exposure or of developing TB disease and screens them by assessing symptoms using test or other procedures to identify those who might have TB following up with the diagnostic test and additional clinical assessments to make definite diagnosis.

AUTHORS CONTRIBUTION

Dr. Akash R Jadhav, Dr. Prashant Kumar, Dr. Nagappan Madhappanati, and Dr. Poonam P Shingade designed, extracted, analyzed, and interpreted the data. Dr. Akash R Jadhav conceived the study; Dr. Prashant Kumar, Dr. Poonam P Shingade guided the research project; Dr. Akash R Jadhav; Dr. Prashant Kumar, Dr. Nagappan Madhappanati, Dr. Poonam P Shingade prepared the manuscript. All the authors read and approved the final manuscript.

CONFLICT OF INTEREST

All authors declare that they do not have any conflicts of interest.

FUNDING

Nil.

ETHICAL APPROVAL

Approved.

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