

## CLINICAL PROFILE OF TUBERCULOSIS PATIENTS (PULMONARY AND EXTRA-PULMONARY) PRESENTING TO A TERTIARY CARE HOSPITAL

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Received: 10 April 2024, Revised and Accepted: 22 May 2024

### ABSTRACT

**Objective:** The objective of the study is to estimate the burden of tuberculosis (TB) patients, both pulmonary and extra-pulmonary, presenting to a tertiary care hospital in southern Rajasthan and to understand the resistance pattern among them.

**Methods:** It is a retrospective observational study. The duration of the study was 3 years (January 2021–December 2023). Data were collected from TB registers maintained by the respiratory medicine department. The inclusion criteria were all suspected TB patients (pulmonary and extra-pulmonary). Both microbiologically confirmed and clinically diagnosed TB patients were included in the study.

**Results:** The total number of sputum samples received of suspected pulmonary TB patients was 1923, out of which 600 (31.2%) were acid-fast bacilli (AFB) smear positive. The total number of samples received for CBNAAT testing was 1292, out of which 266 (20.59%) were CBNAAT positive. Total multidrug-resistant (MDR) TB patients were 58 (49 pulmonary TB and 9 extra-pulmonary TB (EPTB) [5 lymph, 3 pleural, and 1 bone]). The percentage of MDR-pulmonary TB patients among total sputum samples tested was 2.55%. The total number of pulmonary TB patients diagnosed was 1016 (microbiologically confirmed 866 + clinically diagnosed 150). Total EPTB patients diagnosed were 805 (microbiologically confirmed 141 + clinically diagnosed 664).

**Conclusion:** 31.2% of total sputum samples tested of suspected pulmonary TB patients were AFB smear positive, and 20.59% were CBNAAT positive. Most of the patients diagnosed with EPTB were diagnosed on a clinoradiological basis. The percentage of MDR-PTB among all sputum samples tested was 2.55%.

**Keywords:** Pulmonary tuberculosis, Extrapulmonary tuberculosis, Multidrug-resistant tuberculosis, CBNAAT.

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### INTRODUCTION

TB is an infectious disease caused by mycobacterium, mainly *Mycobacterium tuberculosis* (TB). It is a major cause of death and disability in most parts of the world, especially in developing countries. The disease can affect multiple body systems. Pulmonary TB remains the most common form of TB worldwide, although children and patients, who are immunocompromised, such as HIV patients, are more prone to develop extrapulmonary TB (EPTB). About 75% of cases are pulmonary TB, and the remaining 25% cases are EPTB [1]. TB has been the second most common cause of death among infectious diseases after HIV/acquired immunodeficiency syndrome [2]. EPTB is the result of the dissemination of tubercle bacilli from an initial focus in the lungs soon after primary infection. The dissemination is primarily by way of a lympho-hematogenous route [3]. The aim of this research was to understand the clinical profile and resistance pattern of pulmonary and EPTB patients presenting to a tertiary care medical college and hospital in southern Rajasthan.

### METHODS

It is a retrospective observational study. The duration of the study was 3 years (January 2021–December 2023). Data were collected from registers maintained by the Respiratory Medicine Department of Geetanjali Medical College and Hospital, Udaipur, Rajasthan. The inclusion criteria were all suspected TB patients (pulmonary and extra-pulmonary) whose sputum samples (pulmonary) or other fluid/biopsy samples (extra-pulmonary) were sent for analysis. Both microbiologically confirmed and clinically diagnosed TB patients

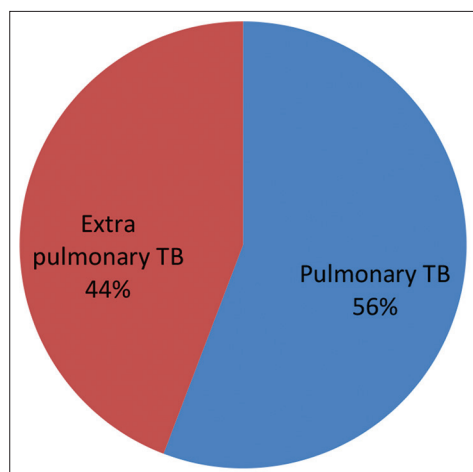
who were started on anti-TB medications were included in the study. Microbiologically confirmed TB was labeled when TB was confirmed either by sputum/fluid samples that were positive for TB or biopsy specimens suggestive of TB. Clinically diagnosed TB patients were labeled when anti-TB medications were started based on high clinical and radiological suspicion without microbiological confirmation.

### RESULTS

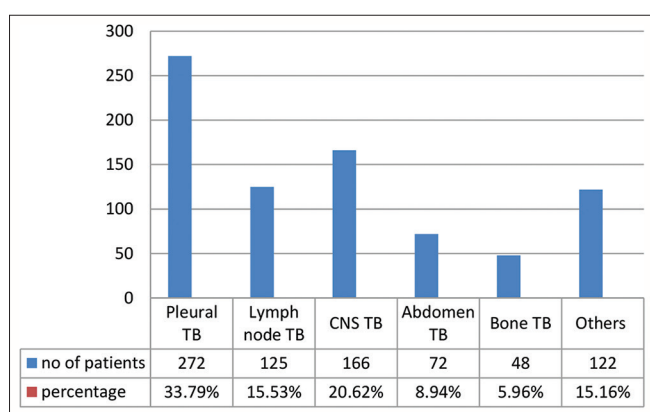
The total number of sputum samples received for testing of suspected pulmonary TB patients was 1923, out of which 600 (31.2%) were acid-fast bacilli (AFB) smear positive. The total number of samples received for CBNAAT testing was 1292 samples, out of which 266 (20.59%) were CBNAAT positive. Total multidrug-resistant (MDR) TB patients diagnosed were 58 (49 pulmonary TB and 9 EPTB [5 lymph, 3 pleural, and 1 bone]). The percentage of MDR pulmonary TB patients among total sputum samples tested was 2.55%. The total number of pulmonary TB patients diagnosed (Fig. 1) was 1016 (out of which 866 patients were microbiologically confirmed and 150 patients were clinically diagnosed). The total number of EPTB patients diagnosed was 805 (out of which 141 patients were microbiologically confirmed and 664 patients were clinically diagnosed). Among EPTB patients, lymph node TB patients were 125 (15.53%), pleural TB 272 (33.79%), abdomen TB 72 (8.94%), bone TB 48 (5.96%), and central nervous system (CNS) TB 166 (20.62%), and other EPTB patients were 122 (15.16 %) (Fig. 2).

### DISCUSSION

In this study, 31.2% of total sputum samples sent to suspected pulmonary TB patients were AFB smear positive, while 20.59% were



**Fig. 1: Breakup of total tuberculosis patients (pulmonary tuberculosis [TB] - 56%, Extrapulmonary TB - 44%)**



**Fig. 2: Extrapulmonary tuberculosis patients according to the site involved**

CBNAAT positive. The total number of sputum samples received for AFB smear testing was 1923, while for CBNAAT testing, only 1292 samples were received as some of the patients were not willing for CBNAAT testing. Percentage of MDR pulmonary TB patients among total sputum samples tested was 2.55%. Most of the studies done generally show incidence of MDR pulmonary TB between 2 and 3%, which is similar to our study [4,5]. The total number of MDR TB patients diagnosed was 58 (49 pulmonary TB, 9 EPTB [5 lymph, 3 pleural, 1 bone]). This study highlighted the fact that the incidence of MDR-TB was higher among pulmonary TB patients compared to EPTB patients which is usually the case in most studies [6,7]. Furthermore, most of the patients diagnosed with pulmonary TB were diagnosed on a microbiological basis while most of the patients diagnosed with EPTB were diagnosed on a clinical and radiological basis. This study showed a slightly higher incidence of EPTB (44.2%) among total TB patients diagnosed. Usually, EPTB cases are about 15–25% of all TB cases [1]. About 15–20% of cases of EPTB were reported by Fanning and 10% by Haegi [8,9]. A study conducted in China showed 33.4% of all TB cases as EPTB [10]. The higher incidence of EPTB cases in our study may be because most of the patients of EPTB were started treatment based on clinical suspicion alone. Microbiological confirmation is sometimes difficult in EPTB patients and hence over-reliance on clinical and radiological pictures in cases of EPTB may be one the reason. Furthermore, being a referral center, most difficult cases of EPTB patients were being referred here, while

most pulmonary TB patients are usually treated even in peripheral hospitals. Pleural TB was the most common form of EPTB (33.79%), followed by CNS-TB (20.62%) and lymph node TB (15.53%). Most studies usually report pleural, CNS, and lymph node TB as the most common EPTB [10,11].

## CONCLUSION

31.2% of total sputum samples tested of suspected pulmonary TB patients was AFB smear positive and 20.59% were CBNAAT positive. The percentage of MDR pulmonary TB among all sputum samples tested was 2.55%. Most of the patients diagnosed with EPTB were diagnosed based on a clinico-radiological basis. This is in contrast to pulmonary TB patients most of whom were diagnosed on the basis of microbiological confirmation. There was a higher incidence of EPTB patients in our study (44.2%). Pleural TB was the most common EPTB (33.79%), followed by CNS-TB, lymph node TB, abdominal TB, and bone TB. Multi-drug resistance TB is more prevalent among pulmonary TB patients as compared to EPTB patients.

## INSTITUTIONAL ETHICAL COMMITTEE APPROVAL

Approval was taken before starting the study.

## CONFLICT OF INTEREST

Nil.

## AUTHOR'S FUNDING

Nil.

## REFERENCES

- Hetmann DL. Control of Communicable Disease Manual. 18<sup>th</sup> ed. Washington, DC: APHA; 2004. p. 560-72.
- Frieden TR, Sterling TR, Munsiff SS, Watt CJ, Dye C. Tuberculosis. Lancet. 2003;362(9387):887-9. doi: 10.1016/S0140-6736(03)14333-4, PMID 13678977
- Youmans G. Tuberculosis. Philadelphia, PA: W. B. Saunders Company; 1979.
- Institute of Medicine (US). Drug-resistant TB in India. In: Facing the Reality of Drug-resistant Tuberculosis in India: Challenges and Potential Solutions: Summary of a Joint Workshop by the Institute of Medicine, the Indian National Science Academy, and the Indian Council of Medical Research. Ch. 2. Washington, DC: National Academies Press US; 2012.
- Dutt R, Singh R, Majhi J, Basu G. Status of drug resistant tuberculosis among patients attending a tuberculosis unit of West Bengal: A record based cross-sectional study. J Family Med Prim Care. 2022 Jan;11(1):84-9. doi: 10.4103/jfmpe.jfmpe\_576\_21, PMID 35309659
- Peto HM, Pratt RH, Harrington TA, LoBue PA, Armstrong LR. Epidemiology of extrapulmonary tuberculosis in the United States, 1993-2006. Clin Infect Dis. 2009;49(9):1350-7. doi: 10.1086/605559, PMID 19793000
- Sandgren A, Hollo V, van der Werf MJ. Extrapulmonary tuberculosis in the European Union and European Economic Area, 2002 to 2011. Euro Surveill. 2013;18(12):20431. doi: 10.2807/ese.18.12.20431-en, PMID 23557943
- Fanning A. Tuberculosis: Extrapulmonary disease. CMAJ. 1999;160(11):1597-603. PMID 10374005
- Haegi V. Extrapulmonary tuberculosis today. Schweiz Med Wochenschr. 1987 Sep 19;117(38):1403-8. PMID 3118456
- Pang Y, An J, Shu W, Huo F, Chu N, Gao M, et al. Epidemiology of extrapulmonary tuberculosis among inpatients, China, 2008-2017. Emerg Infect Dis. 2019 Mar;25(3):457-64. doi: 10.3201/eid2503.180572, PMID 30789144
- Solovic I, Jonsson J, Korzeniewska-Koseła M, Chiotan DI, Pace-Asciak A, Slump E, et al. Challenges in diagnosing extrapulmonary tuberculosis in the European Union, 2011. Euro Surveill. 2013;18(12):20432. doi: 10.2807/ese.18.12.20432-en, PMID 23557946