



BURDEN OF EXTRA PULMONARY TUBERCULOSIS (EPTB) AMONG PATIENTS ATTENDING A TERTIARY CARE MEDICAL COLLEGE OF EASTERN INDIA

Medical Microbiology

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ABSTRACT

Tuberculosis (TB) remains a major global health threat, ranking as the seventh leading cause of death. While pulmonary TB has seen some control, Extrapulmonary tuberculosis (EPTB), which affects organs outside the lungs, presents significant diagnostic and management challenges, especially in resource-limited regions. This study focuses on the prevalence, diagnostic methods, and epidemiology of EPTB at a tertiary care medical college in Eastern India. Conducted from January 2023 to June 2024, the study included consecutive EPTB samples such as pleural fluid, lymph node aspirates, biopsy tissues, urine, and semen. Samples were processed using Ziehl-Neelsen (ZN) and fluorescent staining, with Cartridge-Based Nucleic Acid Amplification Test (CBNAAT) used for Mycobacterium tuberculosis detection. Of the 528 samples analyzed, 58.14% were male, and the majority (25.37%) were in the 16-29 age group. Lymph nodes (27.46%) and pus aspirates (24.24%) were the most common sites of infection. Smear microscopy and fluorescent staining revealed a 5.68% positivity rate, while CBNAAT showed a higher 10.41% positivity, with 53% of smear-negative samples testing positive. One case of multidrug-resistant (MDR) EPTB was identified. The study underscores the diagnostic challenges posed by the paucibacillary nature of EPTB and the limitations of current techniques, particularly in under-resourced settings. The findings highlight the need for improved diagnostic protocols, including the establishment of culture and drug susceptibility testing (CDST) facilities, better sample referral practices, and more comprehensive training for healthcare workers. Early and accurate diagnosis, along with timely treatment, are critical for reducing the burden of EPTB and preventing drug resistance in high-burden areas like West Bengal.

KEYWORDS

INTRODUCTION

As the seventh most common cause of death globally, tuberculosis (TB) continues to be a major public health concern. 10.6 million tuberculosis incident cases were recorded worldwide in 2022, with India accounting for 28% of all notified cases. 1.4 million HIV-negative and 1,87,000 HIV-positive people die each year from tuberculosis (1).

An Extra-pulmonary tuberculosis (TB) refers to tuberculosis infection that occurs outside the lungs, affecting other organs and tissues in the body. Although pulmonary disease is the most prevalent manifestation of tuberculosis, extrapulmonary disease is not uncommon. Extrapulmonary tuberculosis (EPTB) accounted for 16% of the 7.5 million recorded cases of tuberculosis worldwide, and 19% of cases in SouthEast Asia, according to The global TB Report 2023 (2). Globally EPTB accounts for 15-20 per cent of all TB in HIV-negative patients and 40-50 per cent of in HIV-positive new cases. In India, between 15-20% of tuberculosis cases are caused by EPTB (3) with most prevalent types are lymph node (35%) followed by pleural (20%), bone (10%) genitourinary (9%) and remaining 26% are made up from other sites (4). According to the NTEP NSP 2017-2025, one of the essential foundations for attaining TB eradication is early TB identification (5). On the other hand, the diagnosis of EPTB is still difficult because of its atypical presentation, difficulty in clinical samples collection from inaccessible areas, paucibacillary nature of sample which lowers the sensitivity of diagnostic procedures. Therefore difficulty in diagnosis, difficulty in treatment response monitoring, reduced drug efficacy due to poor penetration into tissues, unclear duration of treatment are some of the factors which make EPTB management challenging and ineffective which may result in the development of drug resistance even in cases of extra pulmonary tuberculosis (6). To the best of our knowledge, there is little or no information available regarding the prevalence of extra pulmonary tuberculosis in eastern India. Hence the purpose of this study is to ascertain the pattern of EPTB in terms of dominance and epidemiology of Mycobacterium tuberculosis complex among the patient who were receiving care at our tertiary care medical college in Eastern India.

METHODS:

A descriptive record based study was undertaken in the TB laboratory,

Department of Microbiology, All India Institute of Medical Sciences, Kalyani. Consecutive, Non-duplicate Extra pulmonary samples e.g. (Pleural fluid, Lymph node Aspirate, Biopsy tissue, Urine, semen, Aspirate from TB spine, etc.) were included from January 2023 to June 2024. All suspected EPTB samples were processed by Smear Microscopy using Ziehl nelson and Fluorescent staining. Fluorescent staining for AFB in EPTB samples involves staining with auramine-rhodamine dye, followed by examination under a fluorescence microscope for bright yellow-green bacilli indicative of Mycobacterium tuberculosis. Cartridge Based Nucleic Acid Amplification Test was performed on all the samples received for the detection of M tuberculosis detection as per manufacturer instruction. Genexpert manufactured by Cepheid was used for CBNAAT. Patient and sample details including demographic data, clinical features, type of samples, quality of samples, Smear microscopy result and CBNAAT findings were recorded in Excel sheet TB Laboratory. No patients of EPTB who are <15 years of age were included. The total number of Extra-pulmonary samples received in the studied duration along with demographic details were analysed. Analysis of the samples were done by using Microsoft excel.

RESULTS:

A total 528 extra pulmonary samples were received during the study period (Jan 2023 to June 2024). ZN staining and fluorescent staining using auramine was done. CBNAAT using Gene-Xpert was performed on the EPTB samples. Among suspected EPTB cases male were more in number (58.14%) as compared to females 41.86%. (Fig 1). Detailed analysis of age group interval showed most of the patients are in age group 16-29 years ie 25.37% (134/528). Most of the EPTB samples were lymph node aspirates 27.46% (145/528) followed by pus 24.24% (128/528), which is depicted in (Fig 2). Microscopy positivity for acid fast bacilli by fluorescent microscopy and ZN staining were seen in 30 samples 5.68% (30/528). CBNAAT positivity was 10.41 % (55 / 528) with 53% positivity in smear negative samples.

We have got one MDR EPTB case which is newly detected. 12.31% of EPTB samples were only tested by Microscopy, samples were not received for CBNAAT shown in Table 1.

Table 1 : Microscopy and CBNAAT reports of the samples

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