

Research Article

Extra Pulmonary Tuberculosis (EPTB): A Diagnostic Enigma and how to Improve Detection?

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A B S T R A C T

Tuberculosis (TB), for many centuries, has been the most important of human infections in its global prevalence, devastating morbidity and massive mortality. The term EPTB has been used to describe isolated occurrence of TB at body sites other than the lungs. The most common anatomic sites affected by extrapulmonary TB are lymph nodes, pleura, bones & joints.

Material & Method: The SOP in our laboratory was to screen any sterile body fluid and exudate specimen received for AFB, irrespective of requisition.

Result: During the study period, a total of 1572 sterile body fluid and exudate specimen were received at the Clinical Microbiology Laboratory for bacterial culture & sensitivity. Among the 1572 specimen screened, 06 specimens were positive for AFB on smear microscopy.

Conclusion: Our findings are based on only by introducing an additional investigation of low sensitivity, i: e smear microscopy. The proportion of cases detected could be higher if Mycobacterial culture or a Rapid molecular method was performed on the specimens.

Keywords: Tuberculosis, Extra Pulmonary Tuberculosis, AFB

Introduction

Tuberculosis (TB), for many centuries, has been the most important of human infections in its global prevalence, devastating morbidity and massive mortality.¹ The World Health Organization (WHO) estimated 10.4 million incident cases of TB and 1.67 million TB deaths in 2017.² Tuberculosis is a multisystem disease with myriad presentations and manifestations; it can affect any organ or tissue, excluding only the hair and nails. Effective control programmes are necessary for controlling the spread of the disease.³ Poverty,

overcrowding, poor infection control practices and lack of financial and technical resources have hindered the effective implementation and the success of the control programmes.⁴

The term EPTB has been used to describe isolated occurrence of TB at body sites other than the lungs.⁵ The most common anatomic sites affected by extrapulmonary TB are lymph nodes, pleura, bones & joints, urogenital tract and meninges⁶. However data on extra pulmonary tuberculosis is limited. This is in part due to lack of awareness and clinical

suspicion. Secondly, there is under estimation and under reporting of EPTB either due to lack of awareness or to non-availability of reliable diagnostic method.

The study was undertaken to explore the feasibility and utility of introducing an additional investigation which would aid in detection of EPTB.

Material and Methods

The study was performed in the department of Clinical Microbiology, of medical college teaching Hospital. The SOP in our laboratory was to screen any sterile body fluid and exudate specimen received for AFB, irrespective of requisition. A thorough review was made of available records from 2015 to 2018. All above such sample are stained by conventional Ziehl-Neelsen staining and observed for Mycobacteria. Further the sample was centrifuged at 6000 rpm for 15 minutes and a smear, made from the deposit, was stained for AFB. Presence of two or more AFB was considered significant and the preliminary report was communicated to the treating doctor for clinical correlation with a request for repeat specimen, wherever possible. The specimen was also screened by CB NAAT for rapid detection of *Mycobacterium tuberculosis*.

Exclusion Criteria

Body fluid such as bile was not included in the study. Exudate sample received as swabs were not considered as they were unsuitable for demonstration of AFB.

Result

During the study period, a total of 1572 sterile body fluid and exudate specimen were received at the Clinical Microbiology Laboratory for bacterial culture & sensitivity.

Table I. Distribution of specimen

S. No.	Sample	Total (%)
1.	Pus	588 (37.40)
2.	CSF	220 (13.99)
3.	Pleural	172 (10.94)
4.	Ascetic fluid	165 (10.50)
5.	Synovial fluid	87 (5.53)
6.	Endotracheal aspirate	39 (2.49)
7.	Peritoneal	34 (2.16)
8.	Endometrium	29 (1.84)
9.	Tissue	26 (1.65)
10.	Gastric aspirate	12 (0.76)
11.	Others	200 (12.72)
Total		1572

The distribution of specimen is given in table 1. Among the 1572 specimen screened, 06 specimens were positive for

AFB on smear microscopy. All positive sample showed AFB on centrifuging the sample whereas all of them remained negative on direct smear microscopy.

Discussion

Extra pulmonary tuberculosis produces a wide spectrum of clinical manifestation which poses a challenge for effective diagnosis.⁶ In general, extrapulmonary TB affects persons with diabetes and HIV, as well as young children (<15 years of age) and older adults (>65 years of age). Recent studies have revealed that women and persons who migrate from areas of high TB incidence are at greater risk for extrapulmonary TB.⁷⁻⁹ The prevalence of EPTB ranges from 12 to 28.5% worldwide. In countries like India the prevalence of EPTB ranges from 15-20% among general population to 50% among HIV co-infected individuals.⁵ The common forms of EPTB are Lymph node and Lymphatic, Pleural, Urogenital, skeletal and CNS TB. The incidence of different forms of EPTB varies with geographical location. In developed Nations, there is predominance of Lymph node & Lymphatic TB, whereas in developing Nations, pleural TB is most common followed by Lymphatic TB.¹⁰⁻¹⁴

The positivity rate of detection of AFB, on smear microscopy, was less than one percentage. The sensitivity of smear microscopy for detection of AFB ranges from 45-60%.^{15,16} A minimum of 5000 to 10,000 bacilli should be present in one ml of specimen for it be visualised under routine microscopy. The bacillary load in EPTB, unlike pulmonary TB, is usually not to such extent for it to be visualised in smear microscopy. Hence, the diagnosis of EPTB is based either on culture proven or clinical suspicion with initiation of ATT.

It must be noted in our study that, the specimen processed in our laboratory was irrespective of request for AFB study. The specimens, which were positive for AFB, did not carry any requisition for AFB staining/ culture. Hence, it is prudent to note that, even in unsuspected cases of EPTB a small proportion of case still harboured AFB. However small be the proportion of the cases, it is still significant while considering the epidemiology of tuberculosis. In the absence of suspicion, such undetected cases would be treated as any chronic infection with antibiotics and in many cases with adjunct steroids. This is not only a waste of resource but also increase the patient morbidity & mortality, cost of patient care and unnecessary health care visits & hospitalisation. The delayed initiation of specific ATT in such cases is an ideal setting for spread of the infection in the community. In the era of increasing incidence of Multi Drug Resistant (MDR), it may not be justified to provide nonspecific antimicrobial chemotherapy to patients. Furthermore, with large number of patients with HIV co-infection, the disease manifestation may be varied to extent of masking the classical signs and symptoms of Tuberculosis.

Conclusion

The findings of the present study, though statistically miniscule, have greater implication at the community level, where controlling tuberculosis by breaking the transmission is of utmost priority. Our findings are based on only by introducing an additional investigation of low sensitivity, i.e smear microscopy. The proportion of cases detected could be higher if Mycobacterial culture or a Rapid molecular method was performed on the specimens. Introduction of a Mycobacterial culture or a rapid Molecular method, like CB NAAT/ GeneExpert, may not be a financially viable option in resource poor countries like India. Nevertheless, it is in these resource poor Nation where the incidence of tuberculosis is high with large proportion EPTB going unnoticed. More evidence needs to be gathered by further studies to prove the utility of introducing an additional investigation as a routine practices.

Limitations of the Study

Mycobacterial culture could have been performed in a representative sample size. However, the authors did not anticipate such findings and could not make appropriate arrangements for Mycobacterial culture.

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Conflict of Interest: None

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