



## ORIGINAL ARTICLE

# Extrapulmonary Tuberculosis In M.M.I.M.S.R, Muallana Ambala: A Microbiological & Histopathological Study

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## Abstract

Clinical microbiological and histopathological confirmation plays a key role in the diagnosis of tuberculosis. The present study correlates Zeihl Nelson staining, Lowenstein Jensen culture media, Montoux test and histopathology in the diagnostic yield of extrapulmonary tuberculosis. Result of current study shows out of total 255 samples, 24 (9.4 %) showed the presence of mycobacteria by either of the following methods: LJ culture media, ZN staining, histopathology and montoux test.

## Key Words

Extrapulmonary, Tuberculosis

## Introduction

Tuberculosis is a contagious and airborne disease affecting mostly young adults in their most productive years. The vast majority of tuberculosis deaths are in the developing world, so called a disease of poverty (1). Tuberculosis can involve any organ system in the body. Extrapulmonary tuberculosis comprises 10-50% of all tuberculosis in HIV negative patients and about 35-80% in HIV infected patients (2). Important cornerstone methods for the diagnosis of tuberculosis are AFB microscopy and conventional Lowenstein Jensen culture. Diagnosis of extrapulmonary tuberculosis still faces many challenges due to its wide spectrum of clinical presentation and paucibacillary nature (3). The main drawback of these traditional methods is their low sensitivity especially in the samples containing small number of organisms (4). Montoux test is used as an aid to the diagnosis but its value is limited in adults. However, it may be of use in children aged five years or below (5). Histopathology remains one of the important methods for diagnosis but depends upon the bacillary load of the specimen material (6). For prevention of spread of infection in the community and to hasten the administration of antimicrobial therapy, a sensitive and accurate detection of these organisms in the clinical specimen is required. Therefore clinical microbiological and histopathological confirmation plays a key role in the diagnosis of tuberculosis. The present study correlates Zeihl Nelson staining, Lowenstein Jensen

culture media, Montoux test and histopathology in the diagnostic yield of extrapulmonary tuberculosis.

## Material & Methods

The present study was conducted on 255 suspected cases of extrapulmonary tuberculosis whose relevant samples were received in the department of Microbiology, M.M.I.M.S.R, Muallana from different wards and outpatient departments over a period of Jan 2010- Dec 2011. The extrapulmonary samples included 48 pus, 28 pleural fluid, 3 lymph node aspirate, 2 synovial fluid, 61 urine, 2 bone marrow aspirate, 13 ascitic fluid, 6 gastric aspirate, 5 CSF, 1 peritoneal fluid and 86 endometrial biopsy. All the samples were processed as per standard laboratory protocol for ZN staining, culture on LJ media, histopathology and correlated with Montoux test (7).

## Result

*Fig -1* Shows out of total 255 samples, 24 (9.4 %) showed the presence of mycobacteria by either of the following methods: LJ culture media, ZN staining, histopathology and montoux test. *Fig-2* Shows maximum isolation of mycobacteria was between the age group of 18- 45 years (11.97%), followed by 0-18 years (10%) and 45 years onwards (4.1%). *Fig-3* Shows isolation rate of mycobacteria was more in females (58.6%) as compared to males (41.60%).

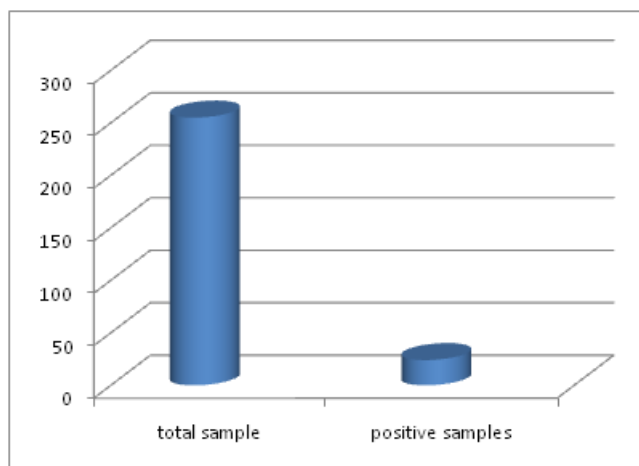
Maximum isolation of mycobacteria species was from endometrial biopsy (45.8%), followed by pus (33.3%),

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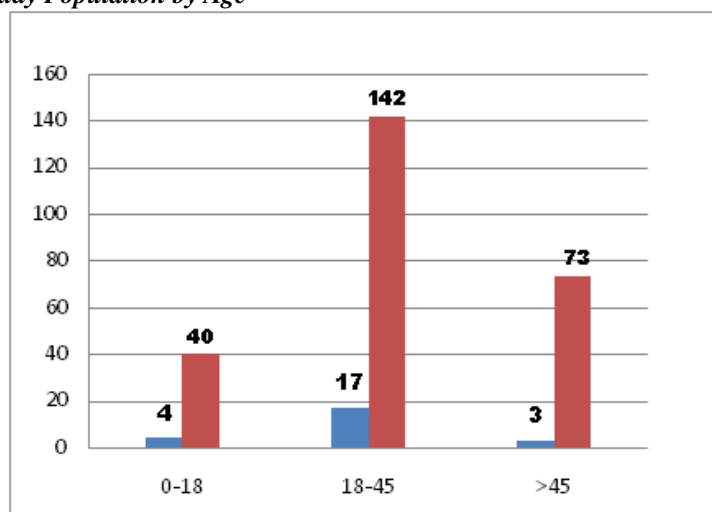
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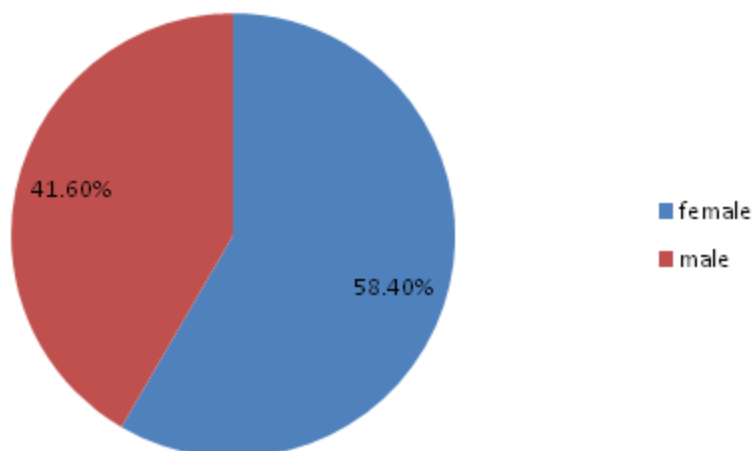
*Fig 1. Rate of Positivity in Suspected Patients of Extrapulmonary Tuberculosis*



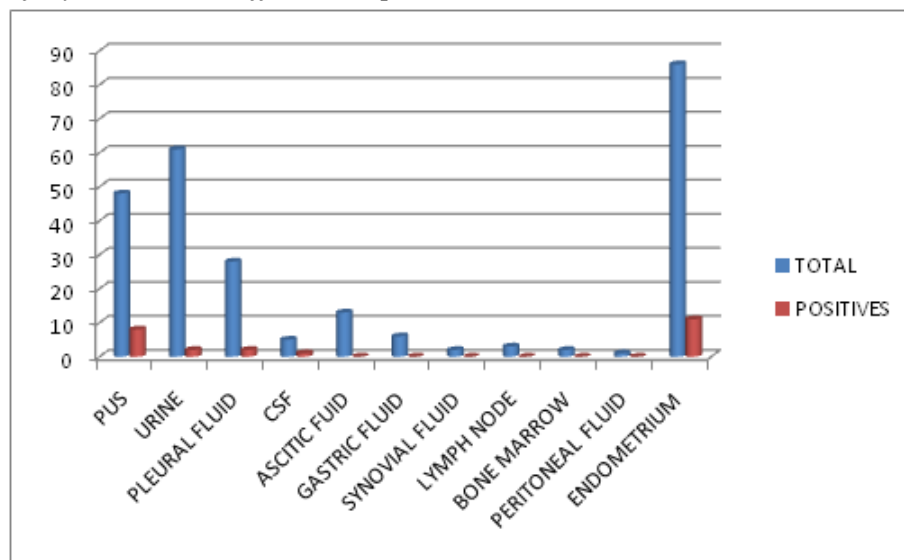
*Fig 2. Distribution of the Study Population by Age*



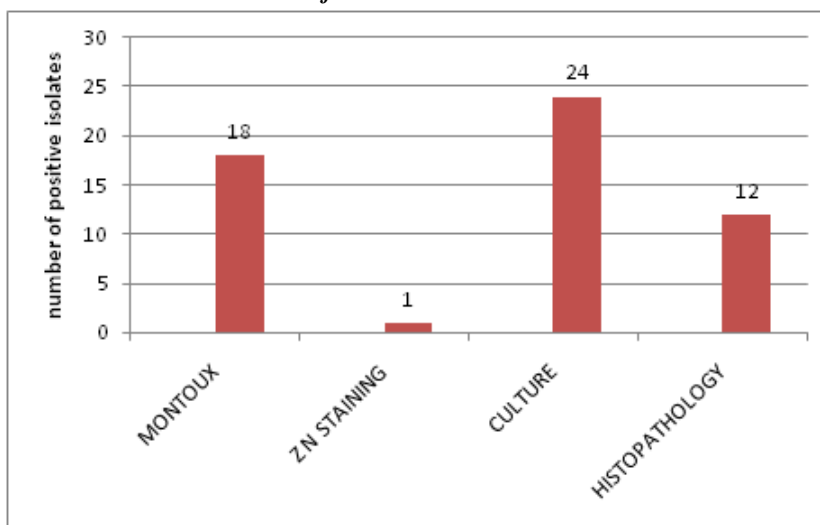
*Fig. 3 Distribution of the Study Population by Sex*



**Fig 4. Isolation Rate of Mycobacteria in Different Samples**



**Fig 5. Correlation of Mycobacterial Isolates in Terms of Tests Done**



urine (8.3), pleural fluid (8.3) and CSF (4%).distribution of mycobacteria from Other specimens was Ascitic fluid , peritoneal fluid , gastric aspirate, synovial fluid, lymph node and bone marrow (Fig-4).The maximum recovery rate of Mycobacteria was from Lowenstein Jensen culture media which showed 24 positive cases as compared to Histopathology , montoux and direct AFB smear examination which showed 12, 8 and 1 positive cases respectively (Fig- 5).

### Discussion

Tuberculosis is the leading cause of death in developing countries. Rapid and accurate diagnosis of symptomatic patients is the cornerstone of global strategies of tuberculosis control.Second to fourth decade of life are

the most productive age group in any society and therefore the exposure to the infective cases is more in this age group. Present study showed that the maximum number of patients in the age group of 18-45 years which is in consistent with the studies done by Makaju *et al* (8) who showed that the frequency of extra pulmonary tuberculosis was more in age >25 years (60.2%). Female preponderances is generally noticed in the tuberculosis owing to illiteracy and economic dependency which allow them only little access to health care. The same (58.6%) was seen in the present study. This result was consistent with the findings made by other studies like Quarem *et al* (9) who reported that 38% patients were male and 62% were females. Extrapulmonary tuberculosis results



from the dissemination of tubercle bacilli from an initial focus in the lungs soon after primary infection. Rapid and reliable diagnosis is essential to initiate timely and appropriate treatment. The paucibacillary nature of the extra pulmonary samples makes it diagnosis difficult. The total positivity rate of 9.4% was seen in this study which was found to be higher than the studies conducted by Hillemann *et al* (10) in which positivity rate was 8%. This could be attributed to the fact that the present study was conducted in developing country while that conducted by Hillemann *et al* was conducted in developed country (Germany).

Extrapulmonary tuberculosis cases more often smear negative than pulmonary cases. Grading of smear gives an idea regarding the bacterial load. It depends upon factors such as time of collection, number of nature of sample, treatment with antitubercular drugs and its duration and method of grading used. In present study 4.2% cases were found to be AFB positive with ZN microscopy which is consistent with the positivity rate of 3% reported by Ahmad *et al* (11). Another study done by Hillmann *et al* (10) showed positivity rate of 11%. Montoux skin tests are long-established screening methods for tuberculosis infection that detect the cell-mediated response to inoculation of a mixture of *Mycobacterium tuberculosis* antigens. Traditionally, Montoux have also formed part of the decision-making pathway for the diagnosis of TB disease. In present study, it showed 33% positivity which is in correlation with study conducted by Wenli Pan *et al* (12) who reported Montoux test positivity in (28.4%) cases. This shows that Montoux test is a non reliable test for the diagnosis of extrapulmonary tuberculosis. In present study histological evidence were shown by 50% cases. Histopathological findings were present in the form of granulomas characterized by epithelioid histiocytes, Langhans' giant cells, lymphocytes and fibrous tissues. This is in correlation with study conducted by Ahmad *et al* (11) who documented 67% caseating granuloma. Fatmi and Jamal (13) reported 62% caseating granulomas and 38% non caseating granulomas. Culture remains the "Gold Standard" for diagnosis of tuberculosis. Culture detects tuberculosis cases earlier, before they become infectious. Lowenstein Jensen culture media is the most commonly used medium for cultivation of tubercular bacilli. In present study, 24 mycobacteria positive cases were isolated on LJ media. This is in correlation with study conducted by Tortoli *et al* (14) who reported 14 mycobacterial isolates out of 17 extrapulmonary cases on LJ media.

### Conclusion

In the end, it is concluded that there is a need for accurate as well as sensitive methods like culture on LJ

media for detection of mycobacteria in clinical samples. Decision should not be based only on one criteria, culture

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