



## ORIGINAL ARTICLE

# Microbiological Investigation In Dead Bodies For Prevalence of Tuberculosis

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## Abstract

Despite the availability of effective treatment for most cases, tuberculosis is still a cause of death in our country. Some cases of active tuberculosis are not identified until after the patient had died and an autopsy has been performed. This study was done to determine the prevalence of tuberculosis in autopsy cases. We aimed to determine the infection with *Mycobacterium tuberculosis* using Tuberculosis culture in samples that were obtained from lungs of forensic cases whose autopsies had been performed in the mortuary of our institution. In our autopsy study, out of the 168 tissue samples that were obtained from lungs over a period of three years, only 9 (5.36%) were positive for Tuberculosis in Lowenstein-Jensen medium. For this reason, we think that autopsy workers have to be careful about tuberculosis during their autopsy working. Awareness of tuberculosis and its high prevalence in India is essential for minimising missed diagnoses. Absence of suspicion and delayed diagnosis mean increased risk in health care and at autopsy. Although this is a burning issue but the forensic medicine departments in India seem to be taking it lightly.

## Key Words

Autopsy, *Mycobacterium*, Tuberculosis, Culture

## Introduction

Tuberculosis (TB) is a chronic necrotizing granulomatous bacterial infection caused by "*Mycobacterium tuberculosis* complex." Tuberculosis is still one of the most important disease and death cause in whole around the world particularly in Asia and Africa. Tuberculosis is still a relevant infectious disease, which is often not diagnosed during the lifetime of a patient. India is home to over 3.4 million tuberculosis patients - about one-fifth of the global figure - making it the most Tuberculosis prevalent country. 325172 people in India had died of the disease in 2005 alone. In 2006, India recorded 1.9 million new cases. Across the globe, there were 9.2 million new cases of Tuberculosis during the same period. Of all fresh cases in the country, 1.2 % are infected with HIV and 2.8 % of all new cases have been diagnosed with multi-drug resistant Tuberculosis. Against all these figures, 30 % of the cases are not even detected in the country (1).

## Material and Methods

In this study, it is aimed to determine the infection with *Mycobacterium tuberculosis* using acid fast bacilli (AFB) microscopy, and Tuberculosis culture in tissue samples that were obtained from lungs of cases whose autopsies performed in Forensic Medicine Department of our institution. During the post mortem examination, about one cubic centimeter of tissue was sampled from the apical and middle of lungs by sterile scalpel. Tissue samples obtained were cut to very small pieces with a sterile scalpel in a sterile petri dish. These tissue pieces were brought to the Microbiology Department so that cultures were performed in sterile phosphate buffer solution. The samples were homogenised in sterile distilled water and after centrifugation sediment were cultured on Lowenstein-Jensen medium. The cultured media were incubated for 8 weeks and checked once a week for growing. If there were no growing on culture media at the end of 8 weeks smears were made from the

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surface of the medium to investigate AFB. If the results were negative for AFB they were reported as "there is no growth."

### **Results**

In this research, 168 cases of post mortem examination were examined from July 2009 to June 2012. According to Lowenstein-Jensen medium culture results, 9 (5.36%) of 168 cases were positive for mycobacterium tuberculosis. Of total, 3 (1.79%) of culture positive cases were female and 6 (3.57%) were male. The culture results of 159 cases were evaluated as negative. The BCG vaccine scar was found in 65.5% (110) of the cases.

### **Discussion**

Tuberculosis is caused by repeated exposure to airborne droplets contaminated with mycobacterium tuberculosis. During autopsy, saw is used for taking out the organs from the body. Many micro particles (aerosols) can be generated while taking out the organ from the body, washing out the body, or oscillating saw usage. These aerosols can easily infect the health personnel. The number of generated particles/mL differs. Speaking, coughing, sneezing and oscillating saw usage have been reported to generate particles (2).

A study from Ireland identified 15 cases of active Tuberculosis (0.3%) by retrospective search of the autopsy records and review of histologic slides (3). Another study from Rohtak reported that 8.7% of 115 autopsies were diagnosed with active disease (4). In our study, we conducted 168 medicolegal autopsies and found 9 (5.36%) active Tuberculosis cases. It was demonstrated that Tubercle bacilli were present in the lung tissue samples in the Lowenstein-Jensen culture. Active Tuberculosis was seen in 1.9% of autopsies performed in Switzerland and in 1% autopsies performed in Japan (5,6).

The importance of diagnosis is that disease is curable, if diagnosed, but fatal if undiagnosed. An undiagnosed infective person is of epidemiological importance when he is in contact with person not immunised to the disease. There is evidence in literature to suggest that there are grounds for suspecting that the autopsy room might be a centre for dissemination for tuberculosis. Post mortem

attendants might be exposed to risk, as many of them do not understand the elementary rules of hygiene, let alone the problem of bacterial contamination. Post mortem room is a source of potential hazard and risk, not only to doctors and technicians, but also to visitors to the mortuary and those handling body after autopsy. Post mortem staff has ethical and legal responsibility to make themselves aware of, and to minimize these dangers. The upsurge of tuberculosis has been associated with HIV infection and immunodeficiency. It is therefore necessary to suspect and screen all tuberculosis patients for possible HIV positivity. Absence of suspicion and delayed diagnosis mean increased risk in health care and at autopsy. Staffs of laboratories and autopsy rooms are estimated to be between 100 and 200 times more likely than the general public to develop tuberculosis (4,7-9).

The tuberculosis cases in India are now also including those which are multi-drug resistant (MDR) especially in cases where patients have left the medication and treatment midway. Such cases that feel improvement in their symptoms leave treatment but are actually still infected and such cases develop into MDR tuberculosis. DOTS provides a sure cure for tuberculosis and is available free of cost to the patient. But the entire strategy to combat tuberculosis becomes ineffective if the patient does not have the will and patience to complete the course, which spans to 6-8 months (10). Calling the patients weekly to collect the medicines appears to be a major cause of discontinuation of treatment in many cases as sometimes patients forget to collect medicines or a labourer may not get leave to attend clinic. Chances of compliance may be more if full medication is issued once to an educated patient or monthly in illiterates or otherwise domiciliary or home visit to medicate on case to case basis, if we are really interested in eradicating tuberculosis from our country. The staff needs to be more vigilant in cases like unclaimed emaciated dead bodies including beggars, sadhus, labourers, etc. Callousness in such cases may prove fatal for the staff including doctors.

Primary tuberculosis accounts for approximately 90% of cases and is acquired by inhalation of aerosols or dried material. Cutaneous infection accounts for 5-10% of cases, the bacillus being introduced into previously

traumatised skin or via a skin puncture. Muco-cutaneous transmission of tuberculosis at autopsy has not been reported (8).

### Conclusion

Tuberculosis causes unnecessary death, because of failure to diagnose and treat, what is today a curable disease. There is a need for more awareness of the disease, especially in the light of recent reports showing a growing incidence of extra-pulmonary tuberculosis. The risk of unrecognized tuberculosis not only extends to public but also to the health professional. Measures to minimise the risk to mortuary staff include the use of proper respiratory masks and performing the autopsy in the infection suit, which isolates the body and minimises exposure to staff. Autopsies are still indispensable for providing quality control and disease statistics.

Similarly staff in microbiology and pathology laboratories who are testing such cases must be careful in handling them and take utmost precautions while performing the necessary procedures in line with the new guidelines of WHO. To address the issue of airborne infection control, a National Airborne Infection Control Committee (NAICC) was constituted in 2008, and has developed National Guidelines on Airborne Infection Control in health care and other settings (10).

Knowing the medical history of the cadaver is the basic precaution for reducing the risk of exposure of infection. Although surgical masks have been used in the autopsy rooms, they filter only 58% of airborne particles. Autopsy rooms could be decontaminated with 0.5% sodium hypochlorite. A great attention must be paid for screening tests for Tuberculosis infection of health workers. Autopsy workers must be checked up every 6 months with chest x-ray, sputum microscopy, tuberculin skin test, and culture (2). In the autopsy room, biosafety is very important for autopsy workers. So, the autopsy room design and ventilation, choice of protective equipment, assessment of the risk of a case being infected are important for the protection against infected aerosols.

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