CASE REPORT

Problems and Solution to Diagnose Extrapulmonary Tuberculosis in Central Region of Nepal

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ABSTRACT

Extrapulmonary Tuberculosis is high, challenging the clinicians to make correct diagnosis. Microscopy, culture and fine needle aspiration cytology have their limitations in regard to specificity and sensitivity. In this report, polymerase chain reaction is used for detecting and distinguishing Extrapulmonary Tuberculosis. A case of retropharyngeal abscess was selected from which pus was collected which was negative for microscopy and culture in routine microbiology as well as mycobacteriology. Cytopathological examination was also negative. Polymerase chain reaction was applied to detect *Mycobacterium tuberculosis* specific IS6110 gene. The patients responded with anti-tuberculosis treatment well. Polymerase chain reaction was introduced for diagnosis of Extrapulmonary Tuberculosis since it can be done within hours, monitor therapy and also differentiate *Mycobacterium tuberculosis* from other Mycobacterial species.

Keywords: Extrapulmonary, Nepal, Polymerase chain reaction, Tuberculosis

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INTRODUCTION

Tuberculosis (TB) is a major cause of morbidity and mortality globally, with most cases occurring in developing countries.[1] In Nepal, about 45 percent of the total population is infected with tuberculosis, and 60 percent are in the adult group. Every year 40,000 people develop active tuberculosis, 20000 peoples result in infectious pulmonary disease and 5000-7000 people die every year.[2] Tuberculosis affect various systems in the infected body.[3]

Extrapulmonary Tuberculosis (EPTB) has not yet been ascertained in developing countries because of the difficulty in conformation by clinical and laboratory diagnosis.[4] The diagnosis of EPTB poses a special challenge, as it is often missed or misdiagnosed due to its atypical presentations. The first step in its diagnosis is awareness and a high index of suspicion by the physician.[5] It is also difficult to isolate *Mycobacterium tuberculosis* due to the small number of organisms present at these sites.[4] Various international studies in the world have focused on the problem of EPTB, reporting a high frequency.[4, 5]

A diagnosis of tuberculosis is confirmed by the presence of Acid Fast Bacilli (AFB) and isolation of *M. tuberculosis* on culture. The paucibacillary nature of the specimens, the sensitivity of AFB smear and cultural growth, only mycobacteria grow in 39 to 80% of cases.[6] conventional methods and cytological investigations are used in combination with polymerase chain reaction (PCR) technique in detection and characterization of pathogenic mycobacteria associated with human lymphadenitis.[7]

The study evaluates the importance of PCR in combination with histo-cytopathological examination in the diagnosis of tuberculous retropharyngeal abscess in case of extrapulmonary tuberculosis.

CASE DETAILS

A 17 years old male was admitted in ENT ward with the complaints of (i) a rapidly progressive swelling of the neck below the lower jaw in right side, with difficulty in breathing and dysphasia for solid food for about one week, and (ii) low grade irregular fever for about 10 days. There was no history of pain in neck, impaction of foreign bodies, infection in ear, dental extraction, endoscopy or any other invasive procedures, blood transfusion, sexual exposure. He had a past history of tuberculosis three years back which was diagnosed by FNAC for which he had taken Anti-tubercular drugs for six months.

On examination, the patient was mild anemic. There was no pedal edema, icterus, cyanosis, nor clubbing of fingers. Pulse rate was regular with 80/min, BP 130/70 mm Hg. There was a palpable mass of 7cm x 2cm in size projecting beneath the anterior border of sternomastoid deep to the muscle on the right side. It was irregular in outline, cystic in consistency and non-tender. Cervical spine was devoid of bony tenderness. Similarly, there were no lymphadenopathy, splenomegaly and hepatomegaly. Examination of cardiovascular, respiratory and nervous systems did not show any abnormality.

Investigations revealed: Hb 9.5 g%, total leucocytes 10,600/cmm, DLC-N 45, L 55, E 01 and M 01. Platelet count 258000/cmm, ESR 19/1st hr, blood sugar (R) 70 mg%, sodium 129 mmol/L, potassium 3.6 mmol/L, prothrombin time 18 sec, blood group-AB positive, total calcium 7.8mg/dL, urea 19 mg% and creatinine 0.7 mg%.

FNAC repot was negative for tuberculous. Chest X-ray showed no evidence of pulmonary tuberculosis. CT scan of neck showed a huge retropharyngeal abscess pushing the trachea and esophagus to the left. Findings by indirect laryngoscopy were - Fullness of right pyriform fossa, larynx normal and right pharyngeal wall swollen.

Aspiration of pus was done from the bulging site of the lesion. Pus from the retropharyngeal abscess was negative for bacteriological culture, negative for AFB and positive by PCR for AFB (eppendorf, Germany) (Figure 1 and 2), was to detect *Mycobacterium tuberculosis* specific IS6110 gene in case as Extrapulmonary tuberculosis. The patient was treated with four antituberculosis drugs (e.g. HRZE) and was discharged.

Figure 1: PCR machine

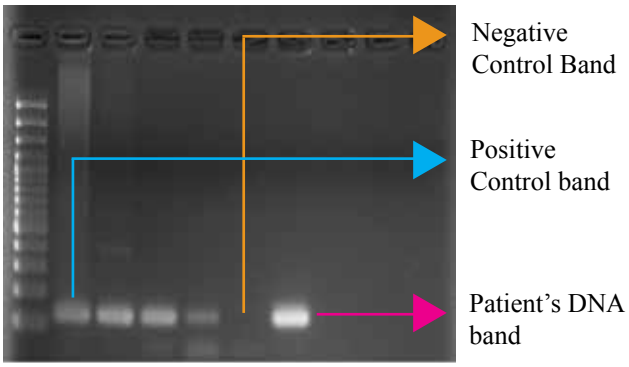

Figure 2: Bands showing *Mycobacterium tuberculosis*

DISCUSSION

Definitive and rapid diagnosis of extrapulmonary tuberculosis is very difficult due to small sample size and amounts; the apportioning of the sample for various diagnostic tests (histology/cytology, biochemical analysis, and microbiology), resulting in non-uniform distribution of microorganisms; paucibacillary nature of the specimens; and the lack of an efficient sample processing technique universally applicable on all types of extrapulmonary samples.[5]

Reteropharyngeal abscess where conventional diagnosis fails and where the provisional

diagnosis of tuberculosis is made on the basis of clinical presentation and histology/cytology examination without evidence of AFB.[6]

PCR was thus introduced for diagnosis EPTB since it can be done within hours, monitor therapy and also differentiate *Mycobacterium tuberculosis* from other Mycobacterial species.

CONCLUSION

The application of this technology could attain a particular relevance in developing countries such as Nepal, where there is a burden of Extrapulmonary diseases. However, establishment of the set up is expensive.

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Cite this article as: Gupta RS, Khatun T, Ansari AA, Shidiki A, Bhargava D. Problems and solution to diagnose Extrapulmonary Tuberculosis in central region of Nepal. MED PHOENIX 2016;1(1):41-43