

Diagnosing Mycobacterium tuberculosis by smear, culture and Real time PCR technique in pleural fluid samples

Heena Rajani

VMMC and Safdarjung Hospital

E-mail: heena.rajani@gmail.com

Background

Tuberculous pleural effusion is one of the most common forms of extra pulmonary tuberculosis. For its definitive diagnosis, getting pleural fluid as smear positive followed by culture positive for Mycobacterium tuberculosis is traditionally considered the gold standard. However the utility of these conventional tests is tedious and has a low sensitivity in pleural fluid samples including the delay in obtaining the results. As reported by various studies, the sensitivity (31.3–81%) and specificity (96.6–100%) of PCR are variable. This study was undertaken to evaluate the utility of a molecular tool in the reconfirming a clinical diagnosis of pleural tuberculosis.

Objectives

Detection of Mycobacterium tuberculosis in pleural fluid samples by direct smear, culture and Real time PCR and estimating the utility of PCR for determining the diagnosis of pleural TB.

Methodology

An observational descriptive study was conducted on 30 patients with high clinical suspicion of tuberculous pleural effusion on the basis of clinical history, cytological and biochemical examination of pleural fluid and eventually response to anti tubercular therapy. Pleural tap was done under aseptic conditions and samples tested for Mycobacterium tuberculosis by Ziehl-Neelsen microscopy, Culture by BacT-Alert 3D Automation Method and Real Time Polymerase Chain Reaction (using primers complimentary to 16s RNA target sequence).

Results

Out of the 30 samples, Mycobacterium could be detected by ZN smear in 2 samples, 9 were culture positive and 25 were positive by Real Time PCR making the percentage positivity with Smear, Culture and Real Time PCR to be 6.67%, 33.33% and 76.67% respectively.

Conclusion

Real Time PCR, being a rapid test and showing highest percentage positivity appears to be a suitable option available for detection of mycobacterium tuberculosis in pleural fluid samples. However, to validate the statistical parameters, further expansion of this study is required.