Rapid Mycobacterial Tuberculosis Detection in Bronchoalveolar Lavage Samples by Polymerase Chain Reaction in Patients with Upper Lobe Infiltrates and Bronchiectasis

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Abstract

In areas where tuberculosis is endemic, a positive sputum acid-fast bacilli (AFB) smear is frequently regarded as almost diagnostic of pulmonary tuberculosis (PTB). The main problem arises when the AFB smear is negative. The main aim of this study was to determine the clinical utility of rapid mycobacterial tuberculosis (MTB) detection in bronchoalveolar lavage (BAL) samples by polymerase chain reaction (PCR) in 52 patients who underwent diagnostic bronchoscopy for suspected PTB. These patients had either upper lobe infiltrates (n = 31) or bronchiectasis (n = 21).

Mycobacterial culture is usually used as the gold standard of diagnosis. We chose to define active PTB based on positive mycobacterial cultures and/or histological evidence of caseous necrosis and AFB, and/or when there was clinical plus radiological improvement following therapy. We compared AFB smear, respiratory mycobacterial culture, BAL PCR for MTB and clinical active PTB.

Four patients who were smear and culture negative had clinical and radiological clearance following anti-tuberculous therapy showing that using mycobacterial culture as a gold standard may have its limitations. When Kappa (a chance-corrected measure of agreement) was calculated for acid-fast bacilli smear and BAL PCR against our definition of active PTB, it was 0.28 (fair agreement) and 0.73 (substantial agreement), respectively. BAL PCR gave a sensitivity, specificity, positive and negative predictive values of 66.7%, 100%, 100% and 88%, respectively, for the group with upper lobe infiltrates. We also demonstrated that BAL for PCR has a good concordance with the final diagnosis of active tuberculosis.

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