Performances of real time PCR for diagnosis of respiratory tuberculosis. Does it replace 3 day microscopic sputum examination?

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Background: PCR is a widely used method for rapid and accurate clinical diagnosis of mycobacteriosis. Initially respiratory tuberculosis is diagnosed by chest x-ray and direct microscopy of three sputum samples following result of Tb culture. Three day sputum sampling is inconvenient for patient. We find out whether one day PCR plus same day one acid-fast bacilli (AFB) smear of expectorated sputum is more helpful than three day microscopy test for initial diagnosis in outpatient clinic.

Method: We conducted a prospective observational study of patients with respiratory tuberculosis who visited outpatient clinic between March 2009 and March 2011 in Jeju National University Hospital, Jeju, Korea. We compare baseline characteristics, chest x-ray, Tb culture and one day PCR plus same day one AFB smear of expectorated sputum sample with AFB smear of three day sputum samples. Results: A total 224 patients (112 PCR group, 112 microscopy only group) were evaluated. PCR group is older than microscopic group. Overall Tb culture positive rate is 32.1% (37 PCR group, 35 microscopy only group). Among 37 Tb culture positive cases PCR positive for Tb is 35 cases (94.6%). Initial diagnostic rate is higher of PCR plus microscopy group (37.5% vs. 17.9%; p < 0.0001). Conclusion: One day PCR plus same day one AFB smear of expectorated sputum has the potential to be an effective and convenient tool.