

Clinical Utility of Polymerase Chain Reaction in the Detection of *Mycobacterium Tuberculosis* in Different Types of Cutaneous Tuberculosis and Tuberculids

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Abstract

Introduction: The role of polymerase chain reaction (PCR) in the diagnosis of cutaneous tuberculosis in clinical practice has not been defined as no PCR assay has been tested in a large-scale clinical study. The objective of this study was to test the clinical utility of a PCR assay in the diagnosis of different types of cutaneous tuberculosis and tuberculids. **Materials and Methods:** Analysis of archival biopsy specimens by a nested PCR assay targeting IS6110 of *Mycobacterium tuberculosis* (M.tb) DNA was performed in a tertiary-care skin hospital in Singapore. PCR results were compared with cultures and concordance with final diagnosis. **Patients and Specimens:** One hundred and nineteen skin biopsies from 105 patients comprising 58 cases of confirmed or highly probable cutaneous tuberculosis, ranging from multibacillary infections to paucibacillary forms and 47 cases of possible tuberculids were analysed. Twenty-four subjects with non-tuberculous granulomas and normal skin controls were included. **Results:** In 14 immunocompromised patients with multibacillary mycobacterial infections (AFB+ on biopsy), PCR was positive in 9 patients. Correlating PCR results with the final diagnosis, the PCR technique was 100% sensitive and specific in this group. In paucibacillary tuberculosis, PCR positivity rates were 55% for tuberculosis verrucosa cutis (38 cases) and 60% for lupus vulgaris (5 cases). When confirmed cases of tuberculosis were considered, the overall sensitivity was 73%. In 26 cases of erythema induratum, PCR was positive in 54% and correlated with a documented response to anti-tuberculous treatment in 80%. **Conclusions:** The use of PCR in the routine diagnostic panel for cutaneous tuberculosis should take into consideration the differential sensitivities for different clinical types. In the setting of an immunocompromised patient with AFB+ lesions, PCR has a definite role in rapid diagnosis and in differentiating atypical mycobacterial infection from tuberculosis. Where paucibacillary tuberculosis is suspected, clinical decision should not be based on PCR results alone. In erythema induratum, we found some correlation between PCR results and response to anti-tuberculous therapy.

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