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Detection of Multidrug-Resistant Tuberculosis Using PCR Compared to the Conventional Proportional Method

Mogahid M Elhassan, PhD* Samar M Saeed, Msc** Miskelyemen A Elmekki, PhD***
Ahmed A Al-Jarie, MD**** Mohamed E Hamid, PhD*****

Objective: To evaluate the PCR technique for the rapid defection of Multidrug-Resistant (MDR) *Mycobacterium tuberculosis* compared to the conventional proportional drug sensitivity testing.

Design: Cross sectional laboratory based study.

Setting: Alshaab Teaching Hospital, Abu-Angah Hospital and the National Health Laboratory, Sudan.

Method: One hundred thirty tuberculosis suspected individuals of both sexes and of different ages were included in the study. Sputum samples were cultured on Lowenstein-Jensen (LJ) medium. Resistant strains were tested for the presence of mutations conferring resistance using molecular techniques to amplify 315 base pair (bp) rifampicin (RIF) and 146 bp isoniazid (INH), as markers for MDR among *Mycobacterium tuberculosis.*

Result: One hundred nineteen (91.5%) showed *Mycobacterium tuberculosis*-like colonies, 65 of which were randomly subjected to PCR and examined for the presence of IS6110 insertion sequences. Fifty-six (86.2%) were confirmed members of the *Mycobacterium tuberculosis*. The result of antibiotics susceptibility testing revealed that 32/56 (57.1%) of the strains were resistant to RIF, 36/56 (64.3%) to INH and 30/56 (53.6%) were resistant to both drugs (MDR). The conventional method showed 21/56 (37.5%) were resistant to RIF, 32/56 (57.1%) to INH and 16/56 (28.6%) were resistant to both drugs (MDR).

Conclusion: Not all resistant strains detected by conventional were detected by PCR method; 14 (25%) were missed for RIF, 9 (16.1%) for INH and 4 (7.1%) for both. This represents a significant lack of sensitivity of the PCR technique, which could be due to the presence of other types of mutations that needs other primers and PCR protocol.

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