

Evaluation of the Microscopic-Observation Drug-Susceptibility Assay Drugs Concentration for Detection of Multidrug-Resistant Tuberculosis

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Abstract : New diagnostic tools are urgently needed to interrupt the transmission of tuberculosis and multidrug-resistant tuberculosis. The microscopic-observation drug-susceptibility (MODS) assay is a rapid, accurate and simple liquid culture method to detect multidrug-resistant tuberculosis (MDR-TB). MODS were evaluated to determine a lower and same concentration of isoniazid and rifampin for detection of MDR-TB. Direct drug-susceptibility testing was performed with the use of the MODS assay. Drug-sensitive control strains were tested daily. The drug concentrations that used for both isoniazid and rifampin were at the same concentration: 0.16, 0.08 and 0.04µg per milliliter. We tested 56 M. tuberculosis clinical isolates and the control strains M. tuberculosis H37RV. All concentration showed same result. Of 53 M. tuberculosis clinical isolates, 14 were MDR-TB, 38 were susceptible with isoniazid and rifampin, 1 was resistant with isoniazid only. Drug-susceptibility testing was performed with the use of the proportion method using Mycobacteria Growth Indicator Tube (MGIT) system as reference. The result of MODS assay using lower concentration was significance ($P < 0.001$) compare with the reference methods. A lower and same concentration of isoniazid and rifampin can be used to detect MDR-TB. Operational cost and application can be more efficient and easier in resource-limited environments. However, additional studies evaluating the MODS using lower and same concentration of isoniazid and rifampin must be conducted with a larger number of clinical isolates.

Keywords : isoniazid, MODS assay, MDR-TB, rifampin

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