

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 0.04 μ g 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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