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Evaluation of Nitrate Reductase Assay for Rapid Detection of Drug Resistant Tuberculosis

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ABSTRACT

Emergence of multidrug-resistant tuberculosis (MDR-TB) urgently demands for simple, rapid and inexpensive methods of its detection for the effective treatment of drug resistant tuberculosis, particularly in low-income countries. A total of 113 clinical isolates of M. tuberculosis were tested for four first line antitubercular drugs by nitrate reductase assay (NRA) and were compared with standard proportion method to evaluate NRA efficacy. Results were available in 7 - 14 days by NRA as compared to proportion method which generally takes 4 - 6 weeks. The sensitivity and specificity of NRA were 98.1% and 100% for isoniazid, 95.1% and 98.6% for rifampicin, 91.4% and 94.9% for streptomycin, and 78.6% and 97.9% for ethambutol, respectively. Agreement between NRA and proportion method were 99.1%, 97.3%, 93.8%, 95.6% for isoniazid, rifampicin, streptomycin and ethambutol, respectively. NRA is easier, inexpensive and reliable method for susceptibility testing of Mycobacterum tuberculosis for isoniazid and rifampicin, the two most important drugs for the treatment of tuberculosis. The reduction in susceptibility testing time, and higher sensitivity and specificity of NRA method is of fundamental importance in detecting MDR-TB.

KEYWORDS

Drug Susceptibility; MDR-TB; NRA; Proportion Method

Cite this paper

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