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Comparison of Mycobacterium Growth Indicator Tube (MGIT) method and Nitrate Reductase Assay (NRA) with agar proportion method (APM) for detection of Rifampicin resistance

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Testing of drug susceptibility prior to initiating treatment is vital for controlling and managing drug resistant TB. Drug susceptibility testing by the nitrate reductase assay (NRA) and manual Mycobacterium Growth Indicator Tube (MGIT) method has been used extensively for detection of growth. The objective of the study was to compare Mycobacterium Growth Indicator Tube (MGIT) method and Nitrate Reductase Assay (NRA) with agar proportion method (APM) for detection of rifampicin resistance.

Three hundred and seventy three clinical isolates of Mycobacterium tuberculosis were collected from Chest Clinic Colombo, Chest Hospital, Welisara and Prisons of Colombo from March 2008 to May 2010. Rifampicin susceptibly tests were carried out by APM (gold standard), MGIT method and NRA with 14 days old fresh cultures. The final rifampicin concentration used was 1.0µg/ml in all three methods.

Thirty one rifampicin resistant isolates were detected from among 373 Mycobacterium tuberculosis isolates by APM, NRA and MGIT methods. Twenty seven isolates out of 31 were identified as rifampicin resistant by the APM. MGIT and NRA methods were able to identify 28 rifampicin resistant isolates each. One resistant isolate was identified only by MGIT method and another 3 isolates by NRA only. The sensitivity and specificity of the NRA method was 93% and 99% respectively and there was very good agreement between NRA and APM. There was complete agreement between APM and manual MGIT methods with 100% sensitivity and 99.7% specificity.

Rapid identification of drug resistance is a prerequisite for initiating effective anti- TB treatment. Newer methods (NRA and MGIT) showed a high level of agreement with the gold standard, APM. The NRA and MGIT methods are rapid and easy to perform and results could be used for timely management of patients.

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