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EVALUATION OF THE BACTEC MGIT 320 TB SYSTEM FOR THE RECOVERY AND IDENTIFICATION OF MYCOBACTERIUM TUBERCULOSIS AT AMHARA PUBLIC HEALTH INSTITUTE, BAHIR DAR, NORTH WEST ETHIOPIA

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Background: Tuberculosis (TB) is still a serious global public health problem and a leading cause of morbidity and mortality throughout the world. A major factor driving the spread of tuberculosis is the considerable delay in diagnosis and treatment. For this reason, early detection is paramount. The present study was carried out to compare the automated BACTEC MGIT 320 with conventional LJ culture media and direct AFB smear examination.

Methods: This prospective study was carried out in Amhara Public Health Institute (APHI) microbiology department tuberculosis laboratory which is equipped with gene expert, BACTEC™ MGIT™ 320 and Löwenstein-Jensen (LJ) culture infrastructures over a period of nine months, from November 2016 to July 2017. A total of 282 consecutive clinical sputum samples were obtained through postal system from 273 follow up and nine new suspected cases of TB from different parts of Amhara region.

Results: A total of 282 sputum samples were processed on conventional LJ solid media, MGIT 320 and direct AFB smear examination methods. Out of 282 specimens, 50 (17.7%) were positive with either MGIT or conventional culture from which 16 (32%) were smear positive and 34 (68%) were smear negative. The recovery rate of MGIT and LJ from smear positive samples was 77.8% (14/18) and 66.7% (12/18), respectively while smear negative samples was 11.7% (31/264) and 4.5% (12/264) for MGIT and LJ methods, respectively. On comparing the overall mycobacterial recovery rate of MGIT and LJ culture, 45 (16%) were positive with MGIT-320 whereas 24 (8.5 %) were positive with LJ culture. The MDGIT320 has improved significantly the recovery rate of *M. tuberculosis* complex (MTBC) ($P<0.005$). For MGIT, 88% *Mycobacterium* were recovered within the first two weeks whereas for LJ, 76% were recovered within fourth to eight weeks. Relatively fair agreement has been observed between MGIT 320 and LJ methods with Kappa value of 0.277. Contamination rates for MGIT and LJ were 18.1% and 4.6% respectively.

Conclusion: The BACTEC MGIT 320 liquid culture system showed better performance than conventional LJ method for rapid recovery of *Mycobacterium tuberculosis* complex with shorter turnaround time for both smear positive and negative clinical specimens. However, the high contamination rate is a concern that should be carefully managed.

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