

## **Diagnostic challenges and Gene-Xpert utility in detecting Mycobacterium tuberculosis among suspected cases of pulmonary tuberculosis**

### **ABSTRACT**

The incidence of pulmonary tuberculosis (PTB) can be reduced by preventing transmission with rapid and precise case detection and early treatment. The Gene-Xpert MTB/RIF assay is a useful tool for detecting Mycobacterium tuberculosis (MTB) with rifampicin resistance within approximately two hours by using a nucleic acid amplification technique. This study was designed to reduce the underdiagnosis of smear-negative pulmonary TB and to assess the clinical and radiological characteristics of PTB patients. This cross-sectional study included 235 participants who went to the Luyang primary health care clinic from September 2016 to June 2017. The demographic data were analyzed to investigate the association of patient gender, age group, and ethnicity by chi-square test. To assess the efficacy of the diagnostic test, the sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV), and accuracy were calculated. The area under the curve for sputum for both AFB and gene-Xpert was analyzed to compare their accuracy in diagnosing TB. In this study, TB was more common in males than in females. The majority (50.71%) of the cases belonged to the 25-44-year-old age group and the Bajau ethnicity (57.74%). Out of 50 pulmonary TB cases (smear-positive with AFB staining), 49 samples were positive according to the Gene-Xpert MTB/RIF assay and was confirmed by MTB culture. However, out of 185 smear-negative presumptive cases, 21 cases were positive by Gene-Xpert MTB/RIF assay in that a sample showed drug resistance, and these results were confirmed by MTB culture, showing resistance to isoniazid. In comparison to sputum for AFB, Gene-Xpert showed more sensitivity and specificity with almost complete accuracy. The additional 21 PTB cases detection from the presumptive cases by GeneXpert had significant impact compared to initial observation by the routine tests which overcame the diagnostic challenges and ambiguities.