



ABSTRACT

The hydrolysis of wheat straw was carried out using hyperthermophilic cellulolytic enzymes. Three different samples of wheat straw were screened including two pretreated and one untreated sample. Different hydrolysis parameters were optimized to enhance saccharification. Pretreated wheat straw II gave best results with maximum percentage saccharification of 24.13% ($p < 0.05$) with simultaneous addition of enzymes: 150 units of endoglucanase, 200 units of exoglucanase and 400 units of β -glucosidase. Optimum conditions for hydrolysis of pretreated wheat straw (II) were found to be citrate phosphate buffer (pH 7.0), buffer volume: total enzyme volume ratio of 0.25:1.0, 0.075% biomass concentration (w/v), at 80°C after four hours of incubation.



ABSTRACT

The current work was performed to evaluate the diagnostic accuracy of the new emerging technique GeneXpert (MTB/RIF) assay with ELISA (IgM and IgG) and conventional methods (LJ culture and ZN smear) for the detection of *M. tuberculosis* in pulmonary and extra-pulmonary specimens. During a period of one year, 90 clinically TB suspects were selected for TB diagnosis. A set of 10 healthy controls were also added in current study. The cohort comprised of 60 suspects of pulmonary TB and 30 of extra-pulmonary TB (EPTB) samples along with blood specimens were collected. All samples were studied with both conventional (ZN smear and culture) methods and compared their results with ELISA (IgM and IgG) and GeneXpert (MTB/RIF) assay. The sensitivity and specificity of all methods were determined by considering LJ culture results as the gold standard. Out of 90 samples, 61 (67.73%) were detected by GeneXpert (MTB/RIF), 32 (35.7%) were smear positive on ZN staining, 56 (62.85) were culture positive. IgM and IgG antibodies were found in 30 (33.0%) and 39 (43%) respectively. The overall sensitivity, specificity of ZN was 53.6% and 94%. The values for GeneXpert (MTB/RIF) was 98.2% and 82.4% and for IgM antibodies were 50.0% and 100% and IgG antibodies were 54.0% and 76.5% respectively. It is concluded that GeneXpert (MTB/RIF) is a sensitive method for diagnosis of Tuberculosis especially in smear negative cases and in EPTB as compared to the conventional methods. In current study the least sensitivity was observed in IgM and IgG antibodies By ELISA. Among pulmonary and EPTB cases the highest yield of positivity was determined by GeneXpert (MTB/RIF) with sensitivity and specificity of 98.2% and 82.6% respectively. So it was concluded that maximum sensitivity and specificity can be achieved by GeneXpert(MTB/RIF) in 2 hours. It is a potential tool for countries endemic of TB. GeneXpert can serve as a sensitive and time saving diagnostic modality for pulmonary and EPTB.