Xpert Mtb/Rif Assay for the Diagnosis of Pulmonary And Extra Pulmonary Tuberculosis in Paediatric Population

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Abstract: *Detecting patients with active Tuberculosis (TB) disease is an important component of tuberculosis control programs, as early diagnosis and treatment of tuberculosis is essential in reducing the morbidity, mortality and the escalating costs associated with advanced disease. We conducted this study to access the usefulness of Gene Xpert MTB/RIF assay technique in the diagnosis of childhood tuberculosis. We retrospectively reviewed the clinical records and rapid diagnostic results of children less than 14 yrs of age with suspected Tuberculosis who visited the pulmonary clinic of Government Rajaji Hospital (GRH), Madurai from January 2017 to June 2017. Various pulmonary and extra pulmonary specimens were collected under aseptic precautions. These Xpert MTB/RIF samples were processed according to the manufacturer's specifications. A total of 96 consecutive pulmonary and extra pulmonary clinical samples were included. Fifty eight (60.4%) of them were females. Out of 96 samples, 1 (1.1%) tested positive for M.tuberculosis and all were sensitive to Rifampicin.This study shows that GenXpert is useful in the early diagnosis of tuberculosis and that prevalence of Rifampicin resistance is not high in paediatric population.*

Keywords: *Gene-Xpert, tuberculosis, children*

I. Introduction

Detecting patients with active Tuberculosis (TB) disease is an important component of tuberculosis control programs, as early diagnosis and treatment of tuberculosis is essential in reducing the morbidity, mortality and the escalating costs associated with advanced disease. Tuberculosis in children has been relatively neglected, mainly due to challenges in the availability of effective diagnostic tools. Xpert MTB/RIF assay is an automatic molecular test based on semi nested real-time PCR and molecular beacon technology targeting the rpoB gene. It can detect MTB and Rifampicin resistance within 2 hours, which means the turnaround time is much shorter than MTB culture .In December 2010, Xpert MTB/RIF assay was endorsed by WHO and then recommended that it needs to be evaluated in paediatric TB. This study evaluated the usefulness of the Xpert MTB/RIF in the diagnosis of childhood TB.

II. Materials and methods

Study Design: Retrospective data record review.
Setting: Study was conducted in the Department of TB and Respiratory Diseases, Government Rajaji Hospital, Madurai Medical College, Madurai
Study Procedure: We retrospectively reviewed the clinical records and rapid diagnostic results of children less than 14 yrs of age with suspected Tuberculosis who visited the pulmonary clinic of Government Rajaji Hospital (GRH), Madurai from January 2017 to June 2017. The study was approved by the Hospital Ethics Committee. A waiver of consent was obtained due to the retrospective nature of the study. Various pulmonary and extra pulmonary specimens(gastric juice aspirates, sputum, CSF, pleural fluid aspirate) were collected under aseptic precautions. These Xpert MTB/RIF samples were processed according to the manufacturer's specifications.

III. Results & discussion

All the records were scrutinized, checked, and computerized by trained data entry operators. Data entry was done in Excel 2013 and analysis was performed using SPSS 20. Descriptive statistics were performed. A total of 96 consecutive pulmonary and extra pulmonary clinical samples were included. These samples were obtained from 96 children less than 14 years of age with suspicion of TB, with a median age of 6 yrs. Fifty eight

(60.4%) of them were females (Table 1). Out of 96 samples, 1 (1.1%) tested positive for *M.tuberculosis*and all were sensitive to Rifampicin.

IV. Conclusion

This study shows that GenXpert is useful in the early diagnosis of tuberculosis and that prevalence of Rifampicin resistance is not high in paediatric population.

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Table 1: Clinical Characteristics and Xpert results of study patients

Variables	n (%)
Age (in yrs)	
Median (IQR)	6 (3, 9)
Sex	
Male	38 (39.6)
Female	58 (60.4)
Type	
CSF	6 (6.2)
Gastric juice	52 (54.2)
Pleural fluid	2 (2.1)
Pyothorax	2 (2.1)
Sputum	34 (35.4)
Result	
Negative	92 (98.9)
Positive	1 (1.1)
DST	
Sensitive	1 (100.0)