Asian Pac. J. Health Sci., 2017; 4(1):137-139 e-ISSN: 2349-0659, p-ISSN: 2350-0964

Document heading **doi: 10.21276/apjhs.2017.4.1.22** **Research Article**

To study the incidence of Pulmonary Tuberculosis in newly diagnosed HIV patients

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ABSTRACT

Introduction: Tuberculosis is a major health problem in India. India accounts for 26% of global TB burden. HIV-TB coinfection is commonly seen. WHO and RNTCP India recommends screening of all newly diagnosed HIV patients with a cartridge based nucleic acid amplification test called Gene Xpert. **Aim**: To study the incidence of Pulmonary Tuberculosis in newly diagnosed HIV patients. **Methods**: All newly diagnosed HIV positive patients were referred from HIV Centre to Pulmonary Medicine OPD for screening of tuberculosis before starting anti-retroviral drugs. Patients underwent sputum Gene Xpert apart from other investigations required as per clinical examination. 210 such patients were screened for pulmonary tuberculosis from March 2016 to December 2016 and were included in the study. **Results**: A total of 210 patients were included in the study undergoing Gene Xpert. In 24 (11.42%) HIV positive patients, MTB was detected. 2(0.95%) patients were rifampicin resistant. **Conclusion**: Screening with Gene Xpert in all HIV positive patients helps in early diagnosis and treatment of TB and active case finding of patients with drug resistant tuberculosis. The results are available in less than 2 hours. Use of Gene Xpert will thus help in reducing morbidity, mortality and transmission of tuberculosis.

Keywords: Tuberculosis, MDR Tuberculosis, HIV, Gene Xpert

Introduction

Tuberculosis is a major public health problem in India and worldwide. According to the World Health Organization (WHO) global TB report of 2015[1], India accounts for 26% of the total global TB burden. 2.0-2.5million new cases are added annually. Out of all TB notified cases in India, 53% are smear positive cases, 28% are smear negative cases and 19% are extra pulmonary cases. It is estimated that 2.2% cases of TB in India are of MDR TB. 4% of patients of TB in India are HIV positive.[2]. In 2015, HIV prevalence in India was an estimated 0.26%.[3]This figure is small compared to most other middle-income countries but because of India's huge population (1.2 billion) this equates to 2.1 million people living with HIV.[4] TB cases are increasing worldwide after HIV epidemic and development of multidrug resistance tuberculosis. Gene Xpert MTB/RIF, a new nucleic acid amplification technology, offers rapid and accurate diagnostic results from biological specimens with minimal staff training requirements [5,6,7]. It has showed high sensitivity and specificity for the diagnosis of active TB (97% and 99.2%, respectively) and the detection of rifampicin (RIF) resistance (97.6% and 98.1%, respectively), the cornerstone of TB treatment regimens . A recent review of published evaluation reports confirmed that the use of Xpert as an initial test replacing smear microscopy was highly accurate [6]. In 2010 and with the encouraging initial evaluation reports, the WHO endorsed Xpert to be used as the initial TB diagnostic test for individuals with HIV-infection or those suspected of having MDR-TB [8].The most common method to diagnose pulmonary TB is sputum AFB smear. Sputum AFB smear by fluorescent technique can detect TB in 20-80% cases

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[10]. Sufficient bacillary load is a must for Sputum AFB smear. It cannot detect drug resistance. As the numbers of bacilli in sputum of severely immunosuppressed HIV patients is low, TB often goes undetected with sputum AFB smear [9].

Methods

The study was carried in department of pulmonary medicine of H.B.T. Medical college and R.N. Cooper hospital, Mumbai. All newly diagnosed HIV patients were referred from HIV OPD to Pulmonary Medicine OPD for ruling out tuberculosis infection. Patients underwent Chest X-ray, Sputum ZN staining and USG abdomen routinely. Additional investigations were done as per clinical findings. All these patients were given falcon tubes to collect 2 morning sputum samples for cartridge based nucleic amplification testing i.e. Gene Xpert. Gene Xpert gave result of MTB detection and its resistance to rifampicin in 2 hours. 210 such patients from March 2016 to December 2016 were included in the study.

Results

A total of 210 patients were included in the study undergoing. In 24 (11.42%) HIV positive patients, MTB was detected. 2(0.95%) patients were rifampicin resistant. The incidence of both HIV and HIV TB coinfection were higher in 3rd, 4th and 5th decade of life.

Table 1: MTB detected on gene xpert vs number of patients and their respective age

Age	No of HIV patients	MTB detected on Gene Xpert
< 20	8	0
21-30	31	4
31-40	70	8
41-50	63	9
51-60	32	3
>60	6	0
Total	**210**	**24**

Out of 210 patients 76 were females and 134 were males. MTB was detected in 8 out of 76 female patients and 16 out of 134 male patients. The incidence of HIV TB coinfection was almost equal in both males and females.

Table 2: MTB detected on gene xpert vs number of patients and their sex

Sex	No of HIV patients	MTB detected on Gene Xpert
Male	76	8
Female	134	16

Discussion

Our study aimed for screening pulmonary tuberculosis in newly diagnosed HIV patients. In the past sputum ZN staining was routinely used for screening HIV patients. There needs to be 10000 bacilli/ml of sputum to be graded as sputum positive.[11] In our study, Gene Xpert helped in over diagnosis of pulmonary TB in sputum smear negative HIV patients. The sensitivity of Gene Xpert in detecting tuberculosis in HIV positive patients was 93.9%.[12]Gene Xpert gives the results in 2 hours only and also resistance to rifampicin. Resistance to Rifampicin is a surrogate marker of MDR Tuberculosis.[13]Our study showed 11.42% newly diagnosed HIV patients to have Pulmonary tuberculosis. A similar study was carried out in newly detected HIV positive prisoners in Malaysia. Gene Xpert detected MTB in 12% patients.[14]. In 2014, Nguyen T et al found Rifampicin resistance in 3.7% of HIV positive patients with Tuberculosis[15]. In 2009, Rajsekaran S et al found that HIV was found to coexist with 14.2 % of Multi drug resistant TB patients[16].Our study showed Rifampicin resistance in 0.95% patients. Bansal D el al carried a similar study in which the incidence of rifampicin resistance was 0.99% in newly diagnosed HIV patients.[17]Early diagnosis of pulmonary tuberculosis in HIV patients helps in decreasing morbidity and mortality in TB-HIV patients and decreasing transmission and emergence of drug resistance. WHO and RNTCP India has

recommended Gene Xpert as the primary test for screening tuberculosis in newly diagnosed HIV patients.[18]

Conclusion

Gene Xpert detects MTB in HIV with greater efficacy than sputum microscopy, also helps in diagnosis in less than 2 hours. It detects rifampicin resistance with high sensitivity and specificity and can be used for screening for MDR-TB so that early therapy can be started, thus decreasing the incidence of MDR-TB. WHO recommends Gene Xpert for diagnosis of pulmonary tuberculosis and rifampicin resistance, especially in PLHIV and re-treatment cases who are at risk of MDR-TB11

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Source of Support: Nil
Conflict of Interest: None