ejpmr, 2018,5(5), 311-313

SJIF Impact Factor 4.897

EUROPEAN JOURNAL OF PHARMACEUTICAL AND MEDICAL RESEARCH

www.ejpmr.com

Research Article

ISSN 2394-3211

EJPMR

RAPID DETECTION OF MYCOBACTERIA TUBERCULOSIS IN SPUTUM SAMPLES BY CBNAAT IN HIV SEROPOSITIVE INDIVIDUALS-A CLINICAL STUDY

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Article Received on 25/02/2018 **Article Revised on 18/03/2018** **Article Accepted on 08/04/2018**

ABSTRACT

Introduction: CBNAAT (Cartridge Based Nucleic Acid Amplification Test) is an automated test where the Mycobacterium is detected at earliest with turnaround time of approximately 2hours. As HIV seropositive patients are most vulnerable group to get infected with TB, rapid detection in this group, helps in earliest diagnosis and management. The study group involved HIV seropositive individuals who attend to ART centre. **Methodology:** The study was conducted in District TB control Office, Nalgonda, Telangana from period of May 2016 to August 2016. All the patients attending ART centres were asked for current cough, weight loss, night sweats and sputum and were referred to District TB Centre for CBNAAT. **Results:** There were a total cases of 548 cases tested. Of them 289 were females and 258 were males and one transgender. There was detection of mycobacterium in 63 cases. Four cases were found to be Rifampicin resistant. Rest 59 cases were Rifampicin sensitive. Rifampicin resistance in females were noticed in younger age group when compared with females (<25 years).

KEYWORDS: HIV seropositive individual, CBNAAT, Mycobacterium tuberculosis.

INTRODUCTION

Tuberculosis, caused by Mycobacterium tuberculosis in India is sharing one fourth of global burden. Tuberculosis can occur at any stage of HIV disease and it presents differently according to level of immunosuppression. With TB-HIV duo it has extended its wings by increasing mortality and morbidty. HIV infection is a well recognised risk factor for both activation of initial infection and reactivation of latent infection.

In PLHIV, we observe scanty sputum production, lack of caseous necrosis leading to decreased number of bacilli in sputum and high incidence of non tubercular Mycobacterial infection, making sputum smear microscopy a least sensitive and specific diagnostic tool.

Genotypic methods have considerable advantages in terms of scaling up the programmatic management and surveillance of drug-resistant TB, offering quicker diagnosis, standardized testing, the potential for high throughput and having fewer requirements for ensuring laboratory biosafety.

METHODOLOGY

The study was conducted in District TB control Office, Nalgonda, Telangana and ART centre, Nalgonda from period of 4 months i.e. May 2016 to August 2016.

All the patients attending ART centres were screened for 4 symptom complex (Current cough, weight loss, night sweats) and sputum and were referred to District TB Centre for CBNAAT.

All the specimens were collected in sterile falcon tubes or Denver Centrifuge tubes provided.

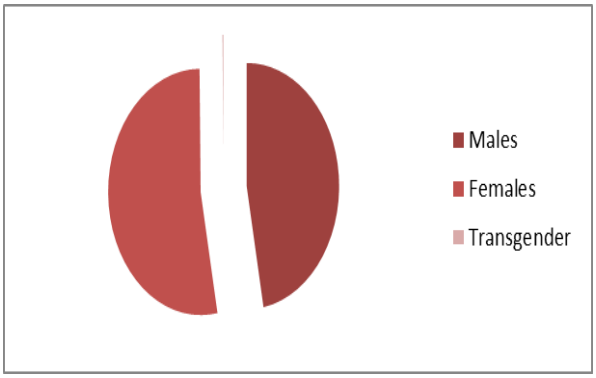
Each sample was processed according to standard operating procedure and CBNAAT was done.

All the Results were entered in excel format and analysis was made using appropriate statistics.

RESULTS

There were total of 548 CBNAAT tests performed in PLHIV who presented to ART clinic with atleast one of 4 Symptom complex (Current cough, Fever, Night Sweats, Weight loss).

There were 289 Females, 258 males and one Transgender tested in CBNAAT.



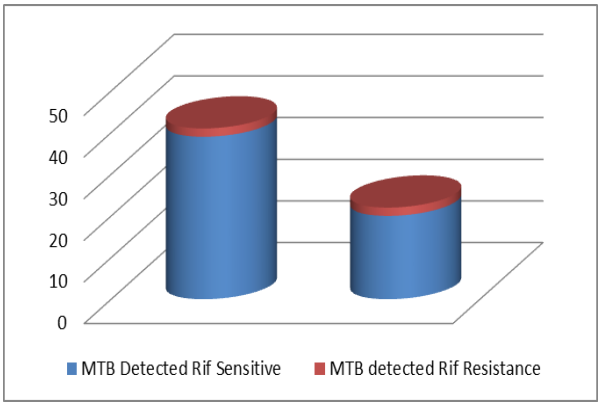
The Total 258 males had results in following manner.11 were invalid and there were 5 errors.

TB was not detected in 200 males. MTB was detected in 43 males. Rif Sensitive TB was detected in 39 males. Rif indeterminate was seen in only one male.

There were 2 males with Rifampicin resistance TB.

There were 289 Females. There were 3 Errors. There were 29 Invalids.

There was no detection of MTB in 234 patients. MTB detection and Rif Sensitive was seen in 20 cases. There were 2 Rifampicin Resistant cases. In one case the test stopped due to Technical reasons.



MTB was not detected in One transgender case tested.

DISCUSSION

This study was from a data analysis and observe the demographic trends of occurrence of TB in PLHIV population. Tuberculosis is a major challenge for anti-retroviral therapy (ART) services in resource-limited countries like India where patients typically enrol with advanced immunodeficiency.[1] To address the challenges of risk of MDR-TB in the affected population, simple rapid diagnostic test was offered for early detection of TB and drug resistance.

Sputum microscopy needs atleast 10000 bacilli /ml to give a positive result and high chance of subjective error. Moreover in PLHIV, the condition is paucibacillary most of the times.

The WHO policy guidance on the use of CBNAAT was issued in December 2010. The recommendations were that it should be used as the initial diagnostic test in individuals at risk of having MDR-TB or HIV-associated TB (strong recommendation), and that it could be used as a follow-on test to microscopy in settings where MDR and/ or HIV is of lesser concern, especially in smear-negative specimens.[2]

RNTCP adopted CBNAAT in 2012 to only 12 sites all over India. Now the CBNAAT facility is available at all district head quarters. Steingart et al made a Cochrane study where he also recommended that in patients where TB can be suspected with or without HIV, then CBNAAT proves to be one of the sensitive and specific tool when compared to Smear Microscopy.[3]

Tuberculosis is most common opportunistic infection among PLHIV. It is estimated that there are 2.1 million people living with HIV in India with an estimated adult HIV prevalence of 0.27% (range: 0.2%–0.4%). TB accounts for 25% of deaths among People Living with HIV and AIDS (PLHIV) in India.

The national programs for TB control upfront CBNAAT to all PLHIV where not only diagnosis of TB is made but also resistance of Rifampicin is detected.

Critical Challenge in providing TB care in PLHIV is well addressed by upfronting CBNAAT not only in Pulmonary TB cases but also in Extra Pulmonary Cases.[4]

Raizada et al demonstrated availability of rapid results, with upfront information on rifampicin susceptibility with Xpert testing enabled early initiation of appropriate treatment regimen may have contributed to surprisingly good treatment outcomes among PLHIV. Study has reported high treatment success rate, however, with routine ART in policy and widely available and early detection of RIF-resistant TB, still had too-high death rates, which needs to be further investigated.[5]

CONCLUSION

Our study demonstrated a feasibility of providing upfront Xpert MTB/RIF testing to HIV infected presumptive TB, with a rapid turnaround time of 2 hours under field conditions. These findings establish the usefulness and feasibility of efficiently addressing this diagnostic gap with upfront of Xpert MTB/RIF testing, leading to overall all strengthening of care and support package for PLHIV.

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