RETROSPECTIVE ANALYSIS OF INH MONORESISTANT TUBERCULOSIS IN MADURAI DISTRICT IN 2018

General Medicine

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ABSTRACT

INH is the most potent anti-TB drug and is the main part of any first-line treatment regimen for TB. Loss of therapeutic efficacy of this important anti-TB drug has considerable implications for control strategies and potential for patients. The present study was designed to provide the clinical profile of patients with INH-monoresistance in Madurai district. This retrospective study was performed at the IRL attached to Madurai Medical College. The classical information i.e., age, gender, sputum sample grading and drug susceptibility testing (DST) patterns for each patient that was referred to IRL from January 2018 to December 2018 was retrospectively analyzed. The LPA was performed according to the manufacturer's protocol. During the study period, a total of 1317 clinical isolates of TB were collected from different parts of Madurai district, of which 227 samples were found to be INH monoresistant (17.2%). Most of these INH monoresistant patients were in the age group 46 to 55 yrs (33%) and 73% were males. An important challenge for TB control is the emergence of strains that are resistant to the most potent anti-TB agents i.e. INH.

KEYWORDS

Tuberculosis, drug resistance, Anti –TB drugs, INH.

1.INTRODUCTION

Tuberculosis (TB) is considered as one of the most common infectious diseases in India. Some important challenges for TB control strategies include the increasing prevalence and rapid distribution of drug-resistant TB. Although resistance to first and second line drugs poses the important risk to patients, resistance to isoniazid (INH) alone is also important. INH is the most potent anti-TB drug and is the main part of any first-line treatment regimen for TB. Loss of therapeutic efficacy of this important anti-TB drug has considerable implications for control strategies and potential for patients. Treatment of patients infected with INH-monoresistant *Mycobacterium tuberculosis* (MTB) strains using standardized chemotherapy has been associated with increased risk of treatment failure and further acquired resistance, including new multidrug resistant-TB (MDR-TB). Given the emergent role of INH in treatment strategies for TB cases, measuring the burden of INH resistant TB is regarded as one of the most important aspects of NTP. Till now, a few studies have documented INH-monoresistant TB in India. Therefore, the present study was designed to provide the clinical profile of patients with INH-monoresistance in Madurai district.

2.MATERIAL AND METHODS
Setting
This retrospective study was performed at the IRL attached to Madurai Medical College. The Tamil Nadu State has implemented Programmatic Management of Drug Resistant TB services since 2009. For every 10 million population one Drug Resistant TB centre was established and as such 6 DR TB centres were functional. The study was approved by the ethics committee of Government Rajaji hospital, Madurai. A waiver of consent was obtained due to the retrospective nature of the study.

STUDY POPULATIONS
The classical information i.e., age, gender, sputum sample grading and drug susceptibility testing (DST) patterns for each patient that was referred to IRL from January 2018 to December 2018 was retrospectively analyzed.

CLINICAL SAMPLES
A total of 1317 sputum specimens (one sample each) from suspected DR-TB patients in the Madurai district were received at the Institute of Clinical Microbiology Madurai Medical College for LPA testing under the programmatic management of drug-resistant tuberculosis (PMDT) plan of the revised national tuberculosis control program (RNTCP). The laboratory is accredited as an intermediate reference laboratory (IRL) for LPA testing by RNTCP, India, and certified by the Foundation for Innovative New Diagnostics (FIND)/Stop TB for phenotypic DST.

SAMPLE PROCESSING
All sputum samples were received through courier delivery in a cold chain and were processed using the *N*-acetyl-L-cysteine-sodium citrate-NaOH (NALC-NaOH) method. Samples were decanted following centrifugation, and the sediments were resuspended in 3 ml of phosphate buffer solution. Several aliquots were prepared from the processed sample, per the quantity of the original sample. Processed samples were used to perform Ziehl-Neelsen (ZN) staining, MGIT960 culture, and LPA, according to the manufacturers' instructions. Remaining sample aliquots were stored at −80°C for further use and quality control.

Line probe assay
The LPA was performed according to the manufacturer's protocol. The test is based on DNA strip technology and has three steps: DNA extraction, multiplex PCR amplification, and reverse hybridization.

Statistical Analysis
Statistical analysis was carried out using SPSS version 18 (SPSS Inc., Chicago, IL, USA). Associations of variable (age group, gender, nationality, place of residency) with the INH-monoresistance were assessed using Chi-square test.

3.RESULTS
During the study period, a total of 1317 clinical isolates of TB were collected from different parts of Madurai district, of which 227

samples were found to be INH monoresistant (17.2%). Most of these INH monoresistant patients were in the age group 46 to 55 yrs (33%) and 73% were males (Table 1). Based on patient clinical records, cases had previous history of treatment including those with incomplete treatment or treatment failure. The sputum samples were mucoid in nature (49%) and the grading was 1+ in most cases (44%).

4.DISCUSSION

After a hundred years of discovery of the tubercle bacilli, TB still remains one of the most challenging issues in global health. According to the latest report released by WHO, there were an estimated 8.6 million new cases of TB and 1.3 million TB-related deaths worldwide. An important challenge for TB control is the emergence of strains that are resistant to the most potent anti-TB agents i.e. INH. The study shows an increased trend in INH monoresistant cases in Madurai district.

Table 1: Characteristics of patients found to be INH monoresistant

Variables	n (%)
Age Group (in yrs)	
15 - 25	25 (11.5)
26 - 35	25 (11.5)
36 - 45	44 (20.2)
46 - 55	71 (32.6)
56 - 65	36 (16.5)
66 - 75	15 (6.9)
76 - 85	2 (0.9)
Sex	
Male	166 (73.1)
Female	61 (26.9)
Culture	
Neg	6 (2.7)
Scanty	35 (15.8)
1+	97 (43.7)
2+	63 (28.4)
3+	21 (9.5)

5.REFERENCES

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