

STUDY OF DRUG SUSCEPTIBILITY AND RESISTANCE PATTERN OF MULTI-DRUG RESISTANT TUBERCULOSIS PATIENTS AT A TERTIARY CARE CENTRE-A RETROSPECTIVE STUDY

Medicine

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ABSTRACT

OBJECTIVE: To study the sensitivity and resistance pattern of multi-drug resistant tuberculosis patients at a tertiary care centre.

METHODS: Retrospective study will be conducted at tertiary care centre in Aurangabad from which data of patients will be collected who have registered under RNTCP from Jan 2018 to Jan 2020. Drug resistant patterns will be studied over a span of 3 years.

RESULTS: In this study most of the patients of MDR-TB patients were of female gender with maximum involvement of pulmonary origin. Rifampicin resistance was most common.

CONCLUSION: The present study emphasizes on the need for strengthening of laboratory services in diagnosis of MDR-TB, adequate and strict drug regimes to be followed in order to curtail the MDR-TB cases.

KEYWORDS

INTRODUCTION

Tuberculosis is an infectious bacterial disease caused by mycobacterium tuberculosis, which commonly affects the lungs (1). Recent global estimates indicate that half of about a million new rifampicin resistant TB (RR-TB) occurred in 2019 with 78% of them having confirmed MDR-TB. Estimated number of MDR/RR-TB cases in India is 1,24,000 (9.1/lakh population). (2) Drug resistant tuberculosis have been emerged as a challenging situation in treatment of tuberculosis. Much of the drug resistance in India is diagnosed presumptively based on patient's lack of clinical improvement or relapse of symptoms (3). Two main underlying causes of drug resistance include non-adherence to prescribed therapy and use of inadequate regimes (4). Important risk factors for drug resistance include previous treatment with anti-tubercular drugs and contact with a person who has infectious drug resistant TB (5). Genetic mutations by tubercle bacilli marks another important factor in emergence of drug resistant tuberculosis.

AIMS AND OBJECTIVES

- To understand the drug resistant and susceptibility pattern of MDR patients by specimen analysis of CBNAAT as well as first, second line probe assays.
- Specimen sample of suspected MDR patients getting registered under RNTCP for treatment of pulmonary and extra pulmonary tuberculosis from Jan 2018 to Jan 2020 were subjected to CBNAAT and first, second line probe assays. Study of the drug susceptibility and resistance pattern were analyzed over these three years.

INCLUSION AND EXCLUSION CRITERIA

INCLUSION CRITERIA

People of all age groups who were MDR suspects, i.e. who either had relapse of tuberculosis, i.e. being sputum positive at the end of intensive phase, had a recent MDR contact, or who were defaulters and were getting registered under RNTCP and who were willing to be part of the study were included.

EXCLUSION CRITERIA

Smear negative tuberculosis.

MATERIALS AND METHODS

MATERIALS

- Acid fast bacilli smear by Ziehl-Neelsen staining

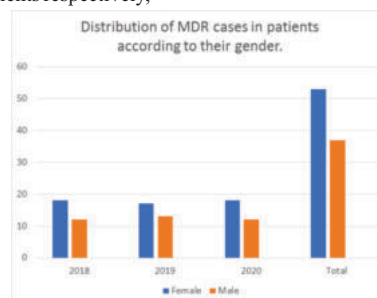
- Cartridge based nucleic acid amplification test (CBNAAT)
- Line probe assays.

METHODS

- A retrospective study will be conducted at tertiary care centre in Aurangabad from which data of patients will be collected who have registered under RNTCP from Jan 2018 to Jan 2020. The specimen sample will be subjected to acid fast bacilli by Ziehl-Neelsen staining, after identifying the mycobacterium, these samples will be sent for drug susceptibility and resistance pattern testing by cartridge based nucleic acid amplification test and line probe assay.

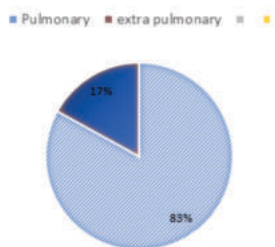
RESULTS

- A total of 100 patients were included in the study. All the patients were diagnosed case of pulmonary and extra pulmonary MDR tuberculosis (tubercular pleural effusion, tubercular lymphadenitis) by various means of diagnostic modalities such as chest X-ray, bacteriologically confirmed cases on AFB smear, sputum smear, histopathology reports. Samples of these patients were subjected to CBNAAT as well as first line and second line line-probe assays respectively.
- The prevalence of MDR cases were further analyzed upon gender and it was seen that out of 40 patients of MDR in 2018 18 were female and 22 were male, in 2019 out of 30 patients 17 were female and 13 were male, and in 2020 out of 18 were female and 12 were male patients respectively.

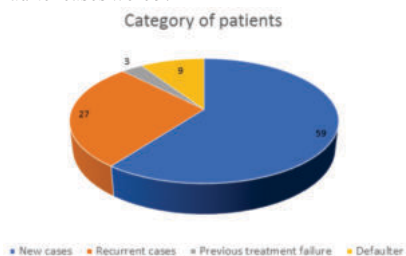


It was further noticed that out of 100 patients of MDR tuberculosis, 83 were of pulmonary origin and 17 of extra pulmonary in origin.

SITE OF INVOLVEMENT

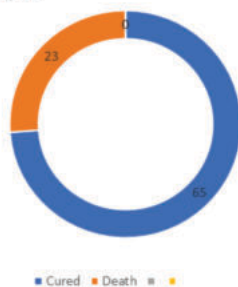


- Furthermore it was observed that out of 100 patients of MDR tuberculosis, newly diagnosed cases were about 59 patients, recurrent cases were 27, previous treatment failure cases were 3 and defaulter cases were 9.



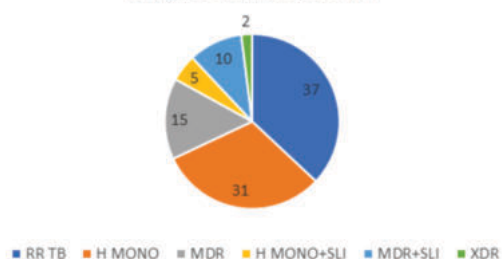
- Out of 100 patients of MDR tuberculosis, 23 died due to complications and 65 patients were totally cured.

Treatment outcome



On further study it was seen that out of 100 MDR patients, the drug susceptibility and sensitivity pattern was analyzed out of which, 37 patients were found to be RR TB (Rifampicin resistant), 31 were H mono (isoniazid resistant) TB, 15 were MDR (resistant to rifampicin as well as isoniazid) TB, 5 were H mono+ SLI (isoniazid resistant+second line injectable resistant) TB, 10 were MDR+SLI (resistant to rifampicin, isoniazid, and second line injectable) TB, 2 were XDR TB (extensively drug resistant i.e. to rifampicin, isoniazid, plus and fluoroquinolones and one of the three second line injectables).

Drug resistance pattern



DISCUSSION

- TB is a serious global public health concern. TB is the ninth leading cause of death worldwide and the leading cause from a single infectious agent, ranking above HIV/AIDS.
- Pulmonary tuberculosis with multi-drug resistant mycobacterium tuberculosis is a major cause of concern in many of the developing countries. Isoniazid and rifampicin are the two most potent drugs and mainstay in treatment of tuberculosis. The treatment of MDR-TB as well as XDR-TB patients is much more difficult and 100 times more expensive than the regular treatment. Lack of adequate regime, treatment failure, defaulter etc poses a major health impact

and burden on TB patients.

- The present study was carried out to study the drug resistance and susceptibility pattern of MDR patients at a tertiary care centre in Aurangabad. 100 patients were enrolled for the study from Jan 2018 to Jan 2020. Samples obtained were subjected to drug susceptibility and resistance pattern via CBNAAT, first line and second line LPA.
- Study revealed maximum number of patients who were MDR TB belonged to female gender and Rifampicin resistance TB was the most frequently encountered.

CONCLUSION

- Out of 100 patients, nearly 53 patients were female and 47 were male who were diagnosed with MDR-TB.
- It was further noted that nearly 83 patients have MDR-TB involvement of the lungs and 17 had extra pulmonary involvement of MDR-TB.
- Furthermore it was noted that 59 patients were newly diagnosed MDR-TB, 27 patients were recurrent cases, 3 patients were previous treatment failures and 9 patients were defaulters.
- Nearly 65 patients were cured from the disease, and 23 patients succumbed during the treatment phase of MDR-TB.
- Out of 100 patients, maximum number of patients were found to have Rifampicin resistance (RR) i.e. 37 patients, followed by 31 patients with isoniazid resistance (H), followed by 15 patients of MDR (i.e. resistant to both rifampicin and isoniazid), 5 patients were H mono+ SLI (isoniazid resistant+second line injectable resistant), 10 patients were MDR+SLI (resistant to rifampicin, isoniazid, and second line injectable), 2 patients were XDR (extensively drug resistant i.e. to rifampicin, isoniazid, plus and fluoroquinolones and one of the three second line injectables).

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