

ORIGINAL ARTICLE**TREATMENT STRATEGIES FOR MDR TB AT PULMONOLGOY WARD ALLAMA IQBAL MEMORIAL TEACHING HOSPITAL, SIALKOT**Muhammad Jahangir¹, Adan Siddique², Ayesha Arif³, Amina Rani⁴, Zainab Baraka⁵, Tayyaba Ambreen⁶

<p>Affiliations</p> <p>1. Consultant Pulmonologist Allama Iqbal Memorial Teaching Hospital, Sialkot drjahan@hotmail.com</p> <p>2-6 4th year MBBS students adansiddique10@gmail.com ayeshaarif804@gmail.com zainabbarka78@gmail.com raniamina155@gmail.com tayyabaamber01@gmail.com</p> <p>Corresponding Author: Dr. Muhammad Jahangir, Consultant Pulonologist, Allama Iqbal Memorial Teaching Hospital, Sialkot. Contact # 0300-6139406 Email: drjahan@hotmail.com</p>	<p>Abstract:</p> <p>Objective: To search for MDR-TB strategy to determine the & regimen design that was implemented for multi-drug resistant tuberculosis (MDR-TB) patients at Allama Iqbal Memorial Teaching Hospital and to evaluate the frequency of cure rate, treatment failure and death rate.</p> <p>Methodology: Retrospective descriptive and observational study was conducted to collect the data of hundred consecutive patients, diagnosed and treated with short term regimen (STR) and long term regimen (LTR) regimens at AIMTH</p> <p>Results: Pooled data reported that success rate was 4% in patients who received STR, while there were 2% failure rates and 11% death (fatality) during treatment who received LTR. There were 44 males and 56 females between 10 to 85 years of age. Among them 70% were with no previous medical ailment, 30% presented with comorbidities like Diabetes 26%, Hepatic pathologies 2%, Cardiac diseases 1% and Psychiatric problems 1%. Average age was 46 years and weight was 50 kg.</p> <p>Conclusion: It was concluded that MDR TB is developing in the patients without any age and gender discrimination, but inadequate regimen, deficient time duration and lack of awareness were main contributing factors. The patients who responded to MDR TB treatment were depending upon their past medical and drug history, drug along with drug susceptibility test.</p> <p>Keywords: MDR TB, treatment regimen, drug susceptibility test, short term regimen, long term regimen.</p> <p>Cite this Article as: Jahangir M., Siddique A., Arif A., Rani A., Baraka Z., Ambreen T.; Treatment Strategies for MDR TB at Pulmonology Ward Allama Iqbal Memorial Teaching Hospital, Sialkot. <i>SIAL J Med. Sci.</i> 2023 V-2 (Issue-06):14 -19</p>
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Introduction

Tuberculosis is a menace that has been threatening the health status of not only man but animals for centuries. It is notorious as second most fatal infectious disease. TB is-a-bacterial disease caused by Mycobacterium tuberculosis-It's most prominent manifestations are seen in lungs but also including other body parts such as kidney brain and bones. While heart, c. Pyrazinamide thyroid, pancreas and skeletal muscles are also affected by it. The reason for this sparing nature of the pathology is still unknown. It isn't all

infections lead to sickness because it can stay latent for years in-the-body-rendering-the-patient asymptomatic inept to infect others. In early days a drug regime consisting of four first line drugs was found to be triumphant:

- a. Isoniazid
- b. Rifampin
- c. Pyrazinamide
- d. Ethambutol

With passing years, the bacteria gained resistance to these drugs and producing a number of resistant strains- including

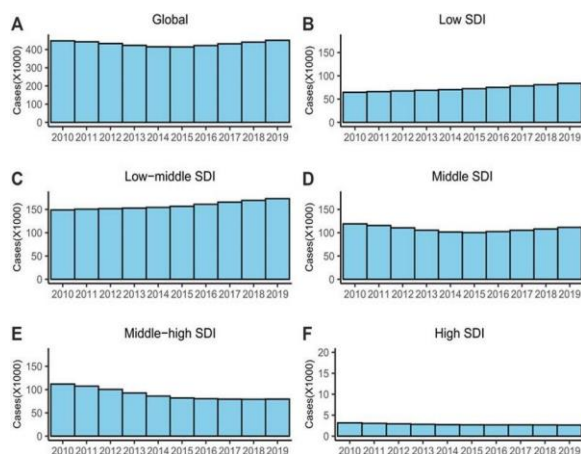
rifampin resistant TB (RR-TB) and isoniazid.

- a. 34 MDR TB patients in 1997
- b. 38 MDR TB patients in 1998
- c. 31 MDR TB patients in 1999
- d. 25 MDR TB patients in 2000

Patients prone to get hold of the disease are more prevalent among:

- a. Patients discontinuing the treatment.
- b. Treatment followed by a wrong diagnosis.
- c. Using a broad spectrum antibiotic.³

In global settings the prevalence of MDR TB was found to be 5.30% in 2019. Given are some statistics from which the incidence of MDR TB can be analyzed globally³:



(Table 1) cases of MDR-TB from 2010-2019

The cases of MDR-TB from 2010 to 2019. (A) Global, (B) low SDI (Socio-demographic Index) regions, (C) low-middle SDI regions, (D) middle SDI regions, (E) middle-high SDI regions and (F) high SDI regions.⁴

In Pakistan, which is considered to be a TB burdened country the latest incidence of MDR TB was found to be 2.89% (Out of 518000 cases of TB, 15000 were MDR TB cases).

As far as literature review is concerned we could not find the MDR TB figures of Sialkot and Punjab.

This small study particularly about the patients of Sialkot region, would contribute in the scientific knowledge of MDR TB Cases.

A study was performed by R. Lodden Kemper, D. Sage Biel and A. Brendel aiming at the strategies against multi drug resistant TB, concluded that MDR-TB is labeled when the organisms get resistant to at least isoniazid (INH) and rifampin. This showed serious health disturbances in highly prevalent countries but may also have effect on people residing in countries with less or no prevalence to TB. They quoted that World Health Organization (WHO) estimated 50 M with MDR-TB. Higher risk factors for MDR-TB were supposed to be previous treatment failure, imprisonment histories, homelessness and possibly HIV. The treatment of MDR-TB is onerous due to complications showing low success rate.⁵

Another study was done by a group of seven people who objected to propose the treatment outcome projections for MDR-TB and procedures for conducting cohort analysis under the DOTS-plus strategy. They used the published definitions for drug susceptible TB as a guide and a 2-year long series of meetings and conferences. Their results, discussions and correspondence was taken to review the published literature. The outcomes of the performed treatment were scaled on the basis of cure rate, treatment course completion, deaths, default, failures and transfer outs. They also concluded that the optimal or standardized management programs for MDR-TB had still not been observed on a controlled medical/clinical trial system.⁶

This study was conducted to work on the management strategies for MDR-TB with bacillary resistance to at least isoniazid and rifampicin in vitro. The directly observed therapy, short-course (DOTS) strategy was of paramount importance. However, with established MDR-TB, the treatment with alternative and specific chemotherapy was necessary to achieve a beneficial outcome. Second-line (reserve) drugs utilized in the treatment of MDR-TB which was generally less potent and more toxic, but perhaps with the notable exceptions of some fluoroquinolones and injectable agents⁶.

Surgery has a distinct adjunctive role for the management of MDR-TB in selected patients. The emergence of extensively drug-resistant tuberculosis (XDR-TB), that was, MDR-TB with additional bacillary resistance to the fluoroquinolones and injectables, has provided a very alarming challenge to global health. So now, the disease currently has a low cure rate and high mortality. In order to combat XDR-TB, strengthening of DOTS and DOTS-Plus programs is mandatory, especially in the face of surging HIV infection. Furthermore, more attention needs to be focused on developing new drugs with potent bactericidal and sterilizing activities and low side-effects, and above all, drugs that are affordable for communities worldwide.⁷

Objectives:

The purpose of study was to analyze the treatment strategies acquired by health professionals of Allama Iqbal Memorial Teaching Hospital, Sialkot for Multidrug Resistant Tuberculosis alongwith cure rate, treatment failure and death rate.

Methodology

A retrospective observational and descriptive study was conducted in April-June 2023 on 100 patients of Allama Iqbal Memorial Hospital. The 100 patients from last two years, who responded to the new techniques of MDR TB treatment were included in this study. We excluded those who did not respond well. Data was collected from the pulmonary department of Govt. Allama Iqbal Memorial Teaching Hospital, Sialkot.

Variables

Independent variables:

The Independent variables were;

1. Age
2. Gender
3. Living situation
4. BMI and
5. Knowledge about health status.

Dependent variable:

The dependent variable was Multi Drug Resistance of Mycobacterium Tuberculosis in patients.

Results

Data of 100 patients was taken from the authorities of Govt. Allama Iqbal Memorial Teaching Hospital, who were diagnosed as MDR-TB and were being treated for this purpose. Results were analyzed on the basis of their gender, residential area, age, previously existing ailments and treatment strategies at the time of diagnosis of MDR-TB.

1. Gender

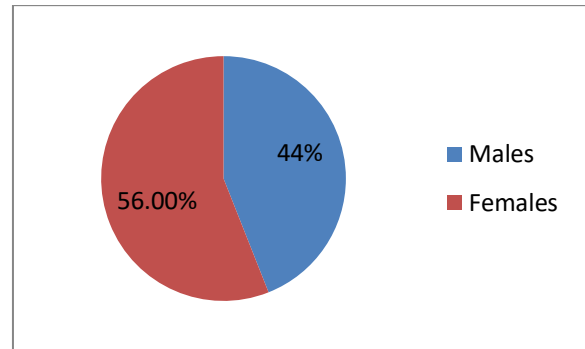


Figure-I; Gender analysis males 44% and Female 56%

2. Medical History

The 70 out of 100 patients presented with no previous medical illness (comorbidities) while 26 patients had a medical history of diabetes mellitus, 2 of patients with liver disease (chronic liver failure), 1 patient with heart disease (congestive heart failure) and 1 patient with psychiatric ailment.

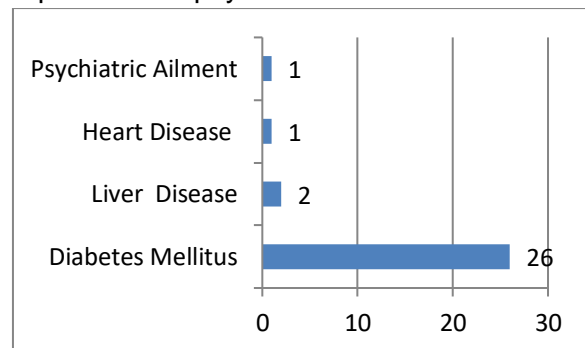


Figure-II; previous medical ailments

3. Treatment strategy:

- The management plan of 100 sequential patients treated for MDR-Tuberculosis at Allama Iqbal Memorial Teaching Hospital were included. Following types of MDR-TB regimens were included;

1. Shorter treatment regimen STR
 2. Longer treatment regimen LTR
- (In treatment strategy for MDR-tuberculosis LTR1, LTR2 and LTR3 depend upon past medical, drug history and drug susceptibility test.)

Sr. No	Treatment type	No. of patients
1.	LTR-1	51
2.	LTR-2	30
3.	LTR-3	10
4.	m-STR	5
5.	STR	4

Table-I; treatment regimens

4. Ages

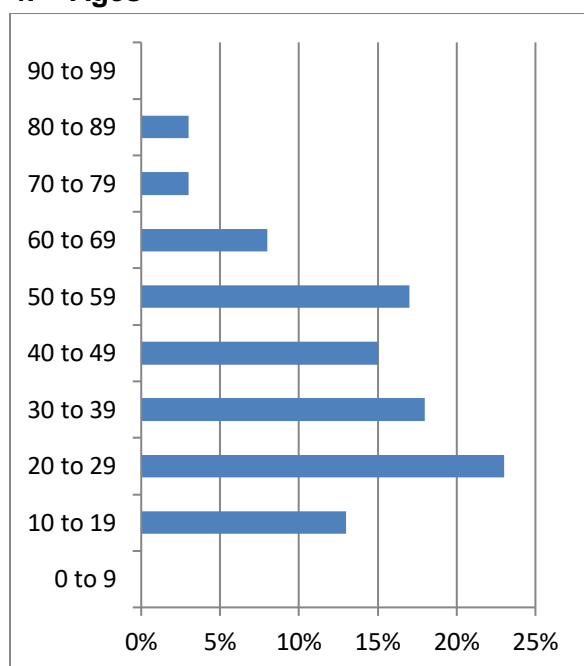


Figure-III: age ranges of patients (Range: 10-85 years)

5. Treatment Outcomes

Out of 100 patients who were sampled, 72 were still under treatment at pulmonology department at the time of data collection. Out of remaining 28 patients, 5 were cured, 5 were lost to follow up and 12 died while 2 of them failed to carry out the treatment and 4 of them were transferred out.

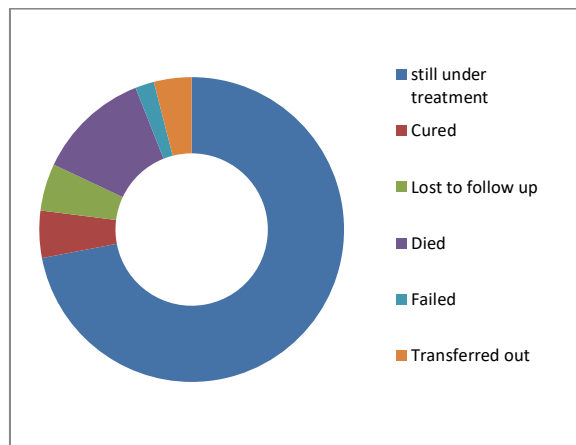


Figure-IV: age ranges of patients (Range: 10-85 years)

6. BMI of patient

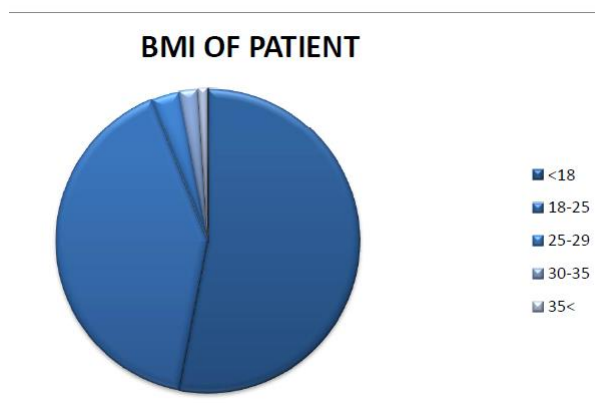


Figure-V: BMI of patient at beginning of the treatment

Discussion:

We have compared our research with patients of MDR TB in Lucknow (uttar Pradesh) India in year (2007) where 171 patients were diagnosed as MDR TB. The health ministry launched DOTs(directly observed treatment)plus therapy for MDR TB in year 2007 which was the TB control strategy recommended by the WHO. In our study we saw that;

- a. 51 of reported cases received LTR-1 treatment
- b. 30 of patients treated with LTR-2 regimen
- c. 10 with LTR-3
- d. 5 of 100 undergo m-STR
- e. 4 cases received STR

WHO says that:

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"The more effective way to prevent the spread of TB in communities with a high incidence is by curing it. The best curative method for TB is known as DOTs"

In New York from 1995 to 2000, out of total 6228 TB patients, 241 (4.9%) patients were diagnosed as MDR Tuberculosis and most of them had HIV infection.

- a. 106 MDR TB patients in 1995
- b. 81 MDR TB patients in 1996
- c. 34 MDR TB patients in 1997
- d. 38 MDR TB patients in 1998
- e. 31 MDR TB patients in 1999
- f. 25 MDR TB patients in 2000

MDR TB continues to decline in New York City at a rapid rate (New York City department of health and public health research institute). We did not see a single MDR TB case in HIV patients.

TB in Nepal on current programmatic standardized regimen: retrospective single center study. retrospective chart reviews of patients with MDR TB receiving standardized regimen at the German Nepal TB project clinic, Nepal between 2014 and 2016) regimen.

A high treatment success rate of 86.7% for Tuberculosis author: Dr. Sanchari Sinha MDR TB shown in cohort type of studies and may be because in study of Nepal the years were 2014-2016 and at that time MDR might responded to second line drug but not now. Secondly if now in these days Nepal people would study the success rate might be lower.

In a previous study by Malla, 70% of the out patients with MDR TB were reported to be cured on a regimen containing ofloxacin." In our study we also used quinolones as a second line treatment form of moxifloxacin. A Canadian study revealed that out of 1459 TB cases only 21 were labeled as MDR TB. With passing years, the bacteria gained resistance to these drugs and producing a number of resistant strains including rifampin resistant TB (RR-TB) and isoniazid resistant TB (IR-TB), or those resistant to both of these drugs called the MDR-TB.2 Other strains may also show resistance to

fluoroquinolones and other second line drugs that were once considered gold standard drugs.

Conclusion:

This study aimed to evaluate the treatment strategy for MDR TB at Allama Iqbal memorial hospital Sialkot in year 2022. This study was based on 100 patients who received treatment for MDR TB at Allama Iqbal memorial teaching hospital Sialkot the age group of this research ranges from 10 to 80 years. The success rate was 4%. It was high in those treatment outcome of patients with MDR patients who responded to mSTR treatment regimen.

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