

Outcome of Multidrug Resistant Tuberculosis at Tertiary Care Hospital, Rahim Yar Khan

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Abstract

Background: In patients of Multi drug resistant (MDR) TB, proper counseling of MDR-TB patients, regarding adherence to therapy, monitoring side effects and controlling the comorbidities, lead to better outcome.

Objective: To determine the outcome of MDR-TB at a tertiary care hospital in Rahim Yar Khan.

Methodology: This retrospective cohort study was carried out at Department of Pulmonology, Sheikh Zayed Hospital, Rahim Yar Khan. A total of 231 patients of pulmonary MDR, were included from May 2014 to December 2017, patients having age between 10 to 80 years of either sex. Extra pulmonary DR-TB, Poly drug resistant TB, XDR and patients on shorter regimen of DR –TB were excluded from the study. Treatment outcomes like cured, treatment complete, died, treatment failure and lost to follow up were defined according to WHO definitions. Data was then analyzed with SPSS version 22.0

Results: Out of 231 patients, 123 (57.1%) were male, with mean age of 36.13+ 16 years. Regarding treatment outcome, 115 (49.8%) patients cured, 1 (0.4%) completed, 67 (29.0%) patients died, 5 (2.2%) patients showed treatment failure, 6 (2.6%) patients lost to follow up, 27 (11.7%) patients are still under treatment and treatment of 10 (4.3%) patients not evaluated. Over all successful outcome (treatment completed and cured) was 50.2% while unsuccessful outcome (died, treatment failure, lost to follow up, patients still under treatment and treatment not evaluated) was 49.8%.

Conclusion: Successful outcome was noted in half of the pulmonary MDR-TB patients which is close to WHO target success rate. Younger age groups showed significantly better outcome.

Key words: MDR, Tuberculosis, Outcome

Introduction

Multidrug – resistant tuberculosis is a form of tuberculosis, which is caused by a strain of mycobacterium tuberculosis, that is resistant to at least, two of the most effective, first line Anti-TB drugs i.e. Isoniazid & Rifampicin.¹ Drug resistant TB continues to be a major public health crisis. Worldwide in 2017, 55,8000 people developed tuberculosis, that was resistant to Rifampicin (RR-TB), & of these patients, 82% were diagnosed as multidrug-resistant tuberculosis. Globally, 3.5% of new TB cases & 18% of previously treated cases had MDR-TB.² Pakistan is currently ranked 4th among the highest MDR-TB burden countries.³ As MDR-TB patients are managed with more expensive and toxic second line Anti-TB drugs and may require hospital admission for management of side effects as well as other complication associated with these drugs, a significant portion of health budget is being utilized on these patients. Due to complexity of

this problems and difficult management of drug-resistant TB, national TB control program decided to control this major health issue through a systematic and programmatic management of drug-resistant TB (PMDT) all over the country.⁴ Estimation of MDR-TB in Pakistan is variable. A review throughout the country showed that 24.3% of the previously treated cases were MDR-TB.⁵ MDR-TB is a man-made problem.⁶ Improper and mismanagement of MDR-TB may lead to the development of extensively drug-resistant TB XDR-TB.⁷ Outcome of MDR-TB management depends upon adequate information on epidemiological factors, patient education, duration of treatment, response of treatment during the course, side effect profile of medicines, reasons for default from previous treatment and regular follow-up visits.⁸

Department of Pulmonology, Sheikh Zayed Medical College / Hospital, Rahim Yar Khan is serving the patients of chest diseases in a very remote district of Punjab on indoor and outdoor basis. Being situated in

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the farthest district of province Punjab, this hospital is also providing health services to the patients of other provinces like Sindh and Baluchistan for drug-susceptible as well as drug-resistant TB. PMDT site started its work in Rahim Yar Khan in 2014. Before that, DR-TB patients were being managed privately on individual basis and there was no proper record keeping system for these patients. With start of PMDT site things were streamlined in terms of patients registration as well as their record keeping in all aspects of DR-TB management. Up till now no such study was done in this large populated area on this important aspect of DR-TB, that's why we conducted this study in our tertiary care hospital in collaboration with PMDT site, with objective to determine the outcome of MDR-TB at a tertiary care hospital in Rahim Yar Khan.

Methodology

In this retrospective cohort, a total of 231 patients of Pulmonary MDR TB, confirmed on sputum GeneXpert from May 2014 to Dec 2017, between the ages of 10 to 80 years of either sex were included. This study was conducted with the approval obtained from Institutional Review Board of Sheikh Zayed Medical College / Hospital, Rahim Yar Khan. Patients with Extra-Pulmonary TB, Poly Drug Resistant TB, Extensively Drug Resistant TB (XDR TB) and those who were registered for short term regimen of MDR TB after December 2017, were excluded from this study. Pretreatment investigations included complete Blood count, ESR, Renal and Liver function test, Serum Electrolytes, Blood sugar, Serum Uric Acid, Viral Markers (HBsAg, Anti-HCV), HIV and TSH. Audiometry and visual tests were performed every month in the intensive phase. Chest X-ray was done at the start of treatment and then every third month. Duration of treatment was 18-24 months and all the patients were followed up every month for upto 24 months. Sociodemographic data was recorded on predesigned performa. All the data was then analyzed with SPSS version 22. Mean \pm SD were taken for quantitative variable like age. Qualitative variable like gender and different outcomes were presented as frequencies and percentages. Treatments outcomes were labelled as cured, treatment completed, died, treatment

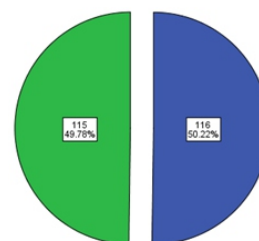
failure and lost to follow-up, according to WHO guidelines.⁹ Treatment outcomes were further grouped as:

1. Successful (Treatment Completed and Cured)
2. Unsuccessful (Died, Treatment Failure, Lost to follow up, Still under Treatment and Treatment not evaluated).

Results

In this study, out of 231 patients, 132 (57.1%) were males and 99 (42.9%) were females with mean age of 36.13 ± 16 years. Majority of patients 187 (81%) were from District Rahim Yar Khan and 44 patients (19%) were residents of other districts. One Hundred and Eleven (48.1%) patients had resistance to INH and Rifampicin only while 120 (51.9%) patients had resistance to one or more drugs in addition to INH and Rifampicin. Treatment outcome is shown in table I.

Figure I: Overall Treatment Outcome in MDR TB Patients (n=231)



Treatment outcome was further classified as successful 116 (50.2%) or unsuccessful 115 (49.8%) according to our study protocol. (Figure I) Analysis of successful or unsuccessful treatment outcome with reference to gender, age distribution, patients of district Rahim Yar Khan to other districts and drug resistance to two drugs or more than two drugs is shown in table II.

Table I: Treatment Outcome of MDR TB Patients (n=231)

Outcome	Frequency	Percentage
Complete	1	0.4%
Cured	115	49.8%
Died	67	29.0%
Failed	5	2.2%
Lost to follow up	6	2.6%
Still under Treatment	27	11.7%
Treatment not evaluated	10	4.3%
Total	231	100.0

Table I: Sociodemographic Characteristics and Outcome of MDR TB patients (n=231)

	Successful	Unsuccessful	P Value
Overall outcome	116	115	
Sex			
Male	70	62	0.323
Female	46	53	
Age group (years)			
10 to 30	59	45	0.027
31 to 50	44	42	
51 to 70	13	24	
> 70 years	00	04	
Residents			
District Rahim Yar Khan	92	95	0.523
Other District	24	20	
Drug resistance to			
INH & Rifampicin Only	56	55	0.945
INH + Rifampicin + Other Drugs	60	60	

Discussion

In the present study, 116 (50.2%) patients showed successful outcome, which is close to WHO target success rate of MDR treatment i.e. 55%.¹⁰ Different studies from various countries (India, Tamil nadu, Russia and USA) have reported higher successful rates varying from 50 – 70%.^{11,12,13,14} In Pakistan, treatment outcome is also variable in different parts of the country. Khan et al. in 2015, concluded that treatment success rate among the MDR TB patients, studied between 2008 – 2011 in Khyber Pakhtunkhwa was 63%.¹⁵ Another study from Khyber Pakhtunkhwa

reported the success rate of 74.3%.¹⁶ Similarly a study from Karachi reported 39.2% success rate of the disease.¹⁷

In our study, we also analyzed treatment outcomes with reference to gender, age distribution, patients of District Rahim Yar Khan versus from patients of other districts and number of drug resistance (2 or more than 2 drug resistance). If we talk about gender, successful treatment outcome among the males was higher (60.3%) as compared to females (39.7%) which may be explained by male dominance in our society and there is less attention towards the female population for seeking medical advice in case of their health related problems. When different age groups were analyzed with reference to treatment outcome, success rate was higher among the patients of aged 10–30 years that lowered down in 30–50 year of age group and then so on. P-value for different age groups was statistically significant (P-value = 0.027). This may be explained by absence of co-morbidities in this age group (10 – 30 years) and better compliance to treatment. As the age advances, people usually suffer from various co-morbidities affecting the treatment outcome. So early diagnosis in young age group results in better outcome.

No significant difference was found in treatment outcome among the patients of district Rahim Yar Khan and patients coming from other districts. Similarly, no significant difference was observed when treatment outcome was analyzed with reference to resistance to 02 drugs (INH and Rif) and >2 drugs containing INH and Rifampicin.

In our study, the case fatality rate was 29%, which is comparable to other studies.^{18,19,20} Possible factors responsible for high death rate in our study may be strict inclusion criteria (only Pulmonary MDR cases taken), late diagnosis of the disease and presence of co-morbidities (although we did not study the co-morbidities). Treatment failure and default rates were 2.2% and 2.6% respectively, in our study which are very reasonable as compared to a study done in India in 2015 in which Sangita V. et al showed treatment failure 06%, lost to follow up 21% and death rate 30%.²¹ The significant low treatment failure and default rate in our study are due to certain reasons. Firstly, we have treatment coordinator at our PMDT site for communication with the patients. Secondly, we have a psychologist who counsels the patients of MDR TB as well as their attendants regarding disease explanation and importance of adherence of therapy. Thirdly, in some difficult

cases, even our MDR physician, himself visits the patient's homes to facilitate their problems regarding treatment and follow up.

We could not evaluate treatment outcome in 10 patients as some patients were transferred out to other PMDT site due to their family shifting and some patients did not attend the call deliberately or changed their contact number. Our study has certain limitation. We did not study the extent of disease, duration of illness prior to the diagnosis and co-morbidities associated with MDR TB. Further studies should be planned to investigate above mentioned points. Furthermore, short course regimens have been started at our PMDT site, so two regimes (Longer vs Shorter) can be compared.

Conclusion

The successful outcome was found among half of the Pulmonary MDR TB, which is close to WHO target. Younger patients showed significantly better outcomes. Still half of MDR patients have poor (unsuccessful) outcome, which needs to be improved by addressing the responsible factors.

Authors Contribution: **HMR:**Conception, design of work , interpretation and drafting. **HSN:** Acquisition and revising. **IB:**Acquisition and analysis and revising. **AAKD:**Interpretation and revising. **SM:**Acquisition, Interpretation and revising. **MH:** Conception, interpretation and drafting . All the authors gave the final approval for publishing and agreed to be accountable for all aspect of work.

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