



“OUTCOME OF BEDAQUILINE(BDQ) CONTAINING SHORTER REGIMEN FOR MULTI-DRUG RESISTANT TUBERCULOSIS AT NODAL DRTB CENTRE, NASHIK: RETROLECTIVE STUDY.”

Respiratory Medicine

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| Dr. Geet Sanjeevkumar Doshi | Dr. Vasant Rao Pawar Medical College Hospital And Research Centre, Adgaon, Nashik-411003. |
| Dr. Prashant Laxman Jadhav | Dr. Vasant Rao Pawar Medical College Hospital And Research Centre, Adgaon, Nashik-411003. |
| Dr. Mayur Vikram Devraj | Dr. Vasant Rao Pawar Medical College Hospital And Research Centre, Adgaon, Nashik-411003. |
| Dr. Ravindra Janardan Shinde | Dr. Vasant Rao Pawar Medical College Hospital And Research Centre, Adgaon, Nashik-411003. |
| Dr. Nilam Deepak Karanjkar | Dr. Vasant Rao Pawar Medical College Hospital And Research Centre, Adgaon, Nashik-411003. |

ABSTRACT

Tuberculosis(TB) is the leading cause of death from a single infectious agent. The incidence of drug resistant TB has increased steadily in the past years, threatening the goal to end the TB pandemic. In this study we have summarized the outcome of Shorter Bedaquiline Regimen at a tertiary care centre. In our study we had total 50 patients out of which 22 were Male and 28 were Females. Of the 50 patients 47 were case of Pulmonary RRTB/MDR-TB and 2 were Extra-Pulmonary TB and 1 was Pulmonary+Extra-pulmonary TB. We assessed the outcome of these patients who were initiated on Shorter BDQ regimen and noted that out of 22 male patients, 13 were cured, 6 were shifted on longer BDQ regimen and 3 died. Out of 28 female patients, 4 were shifted on longer BDQ regimen, 2 were defaulter and 2 of them died.

KEYWORDS

RRTB(Rifampicin Resistance Tuberculosis), MDR-TB(Multidrug Resistance Tuberculosis), Bedaquiline(BDQ), Shorter BDQ Regimen.

INTRODUCTION

India accounts for about one-fourth of the global burden of MDR-TB. ⁽⁵⁾ Despite the brief decline in TB notifications observed around the months corresponding to India's two major COVID-19 waves, the National Tuberculosis Elimination Programme (NTEP) reclaimed these numbers. ⁽¹⁾ Tuberculosis (TB) is the leading cause of death from a single infectious agent. The incidence of drug resistant TB has increased steadily in the past years, threatening the goal to end the TB pandemic. ⁽⁴⁾ Accordingly, 2021 witnessed a 19% increase from the previous year in TB patients' notification—the total number of incident TB patients (new and relapse) notified during 2021 were 19,33,381 as opposed to that of 16,28,161 in 2020 ⁽¹⁾ Unfortunately, MDR-TB treatment outcomes are still suboptimal ⁽⁶⁾

There is very less data available on the Shorter Bedaquiline containing MDR-TB Regimen since its implementation June 2021 regarding Treatment outcomes & ADR's. This study will highlight the treatment outcome, ADR's during the treatment, success rates with the new regimen. All patients diagnosed with MDR-TB should be tested for XDR-TB. This includes testing for resistance to the three second-line injectable drugs (kanamycin, amikacin, and capreomycin) and at least one fluoroquinolone. ⁽³⁾

The “Guidelines for Programmatic Management of Drug-resistant TB (PMDT) in India - 2021” were also released which included- Shorter oral Bedaquiline (Bdq)-containing MDR/RR-TB regimen was introduced and scaled up across the country. ⁽¹⁾

AIMS AND OBJECTIVES –

To study the clinical outcome of drug resistance tuberculosis patients receiving Bedaquiline containing Shorter regimen.

Study Design: Retrospective Study.

Study Setting:

Study was conducted at Nodal DRTB Centre in Department of Respiratory Medicine, Dr. Vasant Rao Pawar Medical College, Hospital & Research Centre, Adgaon, Nashik. Patients who were started on Shorter Bedaquiline containing Regimen from the period of June 2021 till December 2021 (6months) were included in the study.

Inclusion And Exclusion Criteria-

According to the Guidelines for Programmatic Management of Drug Resistant Tuberculosis in India. ⁽²⁾

Table no – 1 : Age wise distribution

| AGE GROUP | NO.OF PATIENTS | PERCENTAGE |
|-----------|----------------|------------|
| 5-10 | 0 | 0 |
| 10-20 | 10 | 20 |
| 21-30 | 13 | 26 |
| 31-40 | 8 | 16 |
| 41-50 | 10 | 20 |
| 51-60 | 3 | 6 |
| 61-70 | 5 | 10 |
| >70 | 1 | 2 |
| TOTAL | 50 | 100 |

In our study Maximum no. of patients were in the age group of 21-30 - 13 patients followed by 10-20 and 41-50 - 10 patients in each group. 31-40 age group had 8 patients, 61-70 age group had 5 patients, 51-60 group had 3 patients. Only 1 patient was above 70yrs age group and no patients were seen below the age of 10 years.

Table No – 2 : Gender wise distribution

| SEX | TOTAL | PERCENTAGE |
|--------|-------|------------|
| MALE | 22 | 44 |
| FEMALE | 28 | 56 |
| TOTAL | 50 | 100 |

In our study we had total 50 patients of which 22 were Male (44%) and 28 were Female (56%).

Table No 3 : Co-morbidities

| COMORBIDITY | NO.OF PATIENTS | PERCENTAGE |
|--------------------------|----------------|------------|
| Diabetes mellitus | 9 | 18 |
| Hypertension | 1 | 2 |
| Cardiovascular disorders | 0 | 0 |
| Neurological disorders | 0 | 0 |
| Psychiatric disorders | 0 | 0 |
| Kidney diseases | 0 | 0 |

| | | |
|---------------------|---|---|
| Liver diseases | 0 | 0 |
| HIV | 3 | 6 |
| Respiratory illness | 0 | 0 |

In our study maximum number of patients had type 2 diabetes mellitus – 9 patients. 1 patient was a known case of hypertension and 3 patients were HIV positive.

Table no 4 : Distribution as per site

| Site | Adults | Percentage |
|------------------|--------|------------|
| Pulmonary | 47 | 94 |
| Lymphnodes | 1 | 2 |
| Pleural effusion | 1 | 2 |
| Bones & joints | 0 | 0 |
| Pulmonary+EP | 1 | 2 |
| Total | 50 | 100 |

Of the total 50 patients, 47 patients were case of Pulmonary tuberculosis and 3 patients were case of extra-pulmonary tuberculosis. Of the 3 patients of extra pulmonary tuberculosis 1 patient was a case of Pleural effusion (Diagnosed as RRTB on pleural fluid Genexpert), 1 patient was case of Lymphnode TB and 1 patient was case of pulmonary+ Skin tuberculosis.

Table No 5 : Outcome of Shorter BDQ Regimen-

| OUTCOME | NO.OF PATIENTS | PERCENTAGE |
|----------------|----------------|------------|
| Defaulter | 2 | 4 |
| Cured | 33 | 66 |
| Death | 5 | 10 |
| Regimen change | 10 | 20 |
| Total | 50 | 100 |

In our study out of total 50 patients, 2 patients (4%) were defaulter, total number of patients cured were 33 (66%), death was seen in 5 patients (10%) and regimen change was seen in 10 patients (20%). Out of the 47 patients with pulmonary tuberculosis, 32 were cured, 1 was defaulter, 10 were shifted to longer BDQ regimen and 4 patients died. 1 patient with extra-pulmonary tuberculosis died while on treatment. 1 patient with pleural effusion was cured. 1 patient with pulmonary and skin tuberculosis was defaulter.

Table No 6 –ADR seen in Patients

| Sr.No | ADR | No.of Patients |
|-------|-----------------------|----------------|
| 1. | Arthralgia/Joint pain | 17 |
| 2. | Gastritis | 31 |
| 3. | Prolonged QTc | 0 |
| 4. | Hyperpigmentation | 28 |
| 5. | Itching/Rash | 5 |
| 6. | Others | 0 |

Most common ADR in our study was Gastritis seen in 31 patients(62%) followed by Hyperpigmentation seen in 28 patients (56%) which was clofazimine induced. 17 patients (34%) had Arthralgia and 5 patients (10%) had rash and itching which is illustrated in the diagram below. None of the patients in our study had QTc prolongation.

Table No 7 - Outcome Vs Co-morbidities

| Co-Morbidity | Total Patient | Patients cured | No.of Patient's died | Regimen-change |
|--------------------------|---------------|----------------|----------------------|----------------|
| Type 2 Diabetes mellitus | 9 | 6 | 3 | 0 |
| Hypertension | 1 | 1 | 0 | 0 |
| HIV | 3 | 1 | 2 | 0 |
| COPD/Br.Asthma | 0 | 0 | 0 | 0 |
| Past history of TB | 12 | 8 | 2 | 2 |

Out of the 50 patients in our study 9 patients had type 2 diabetes mellitus of which 6 were cured and 3 died. There was only 1 patient with hypertension and he was cured. There were 3 patients with HIV positive of which only 1 was cured and 2 of them died. None of the patients in our study had cardiac/ischaemic heart disease history or history of COPD or Bronchial Asthma. Total 12 patients had a history of previous tuberculosis (drug sensitive). Few had completed the 6 months course while few were diagnosed as RRTB/MDR TB while on drug sensitive AKT. Of these 12 patients 8 patients were cured, 2 patients died and 2 were shifted to longer BDQ regimen.

Table No 8 – Outcome Vs Gender

| Gender | Cured | Shifted to Longer BDQ Regimen | Defaulter | Death |
|--------|-------|-------------------------------|-----------|-------|
| MALE | 13 | 6 | 0 | 3 |
| FEMALE | 20 | 4 | 2 | 2 |
| TOTAL | 33 | 10 | 2 | 5 |

Out of the total 22 male patients 13 were cured, 6 were shifted to longer BDQ regimen and 3 died. Out of 28 female patients, 20 were cured, 4 were shifted to longer BDQ regimen, 2 were defaulter and 2 died.

CONCLUSION-

An oral shorter regimen, containing Bedaquiline shows excellent outcomes in RR-TB/MDR-TB patients. In spite of the effectiveness of this regimen, mortality was 10% and there is additional support needed to reduce lost to follow-up as well. India similar to South Africa has shown a way for rapid implementation of new regimens under programmatic conditions, using WHO group A drugs to combat RR-TB epidemic. Given the effectiveness and the feasibility of this regimen, the country can hopefully serve as a model for others to improve RR-TB care for patients worldwide.

Limitations -

The limitation of our study was small sample size and retrospective collection of the data.

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