Original Research Article

Study of clinical profile of patients with multi-drug resistant tuberculosis

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Abstract

Background: MDR-TB has posed a challenge with an estimated 71000 MDR-TB cases emerge annually from the notified pulmonary TB cases in India and now India has become the country with highest MDR-TB burden. Present study was conducted at tertiary care centre to evaluate clinical profile and treatment outcome of drug resistant tuberculosis patients who were treated with standardized MDR-TB regimen. **Material and Methods:** Present study was observational, hospital based, descriptive study conducted in patients attending outpatient department of chest and TB department drug resistant TB cases, confirmed with either Line Probe Assay (LPA) or Gene-expert assay. **Results:** Based on the study criteria, a total of 72 patients with MDR-TB were included in the present study. Most common age group was 21-30 years (36.11 %), followed by 31-40 years (27.78 %) and 41-50 years (15.28 %). Male patients were 55.56% while female was 44.44 % in this study. We noted incidence of addiction as smoking (38.89%), alcohol (30.56 %), tobacco chewing (33.33 %) in present study. Pulmonary MDR-TB was noted in 93.06 % patients, rest 6.94 % were extra-pulmonary. Other co-morbidities were diabetes (16.67 %), COPD (15.28 %), positive HIV status (12.5 %), others (8.33 %) noted in present study. Treatment outcome were noted as cured patients (33.33 %), treatment completed (25 %), died (18.06 %), defaulted (15.28 %), failure (switch to cat-5) (8.33 %). Successful treatment was noted in 58.33 % patients. **Conclusion:** MDR-TB is common in middle aged, male population, with history of smoking, alcoholism, COPD, diabetes. Success rate is variable and mainly depending upon early detection and close follow-up. Morbidities and mortalities can be reduced with standard treatment.

Key Words: MDR-TB, Demography, smoking

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INTRODUCTION

Multi-Drug Resistant Tuberculosis (MDR-TB) defined as Mycobacterium tuberculosis strain resistant to both isoniazid and rifampicin and becoming a major public health problem. MDR-TB is not only difficult and costly to diagnose, but also tough to treat with increased morbidity and mortality as compared to the drug-susceptible TB. India accounts for one-fourth of global TB burden. Revised National Tuberculosis control programme (RNTCP) accepted Directly Observed Treatment Short-course (DOTS) strategy which covered the entire nation in March 2006. But MDR-TB has posed a challenge with an estimated 71000 MDR-TB cases emerge annually from the notified pulmonary TB cases in India and now India has become the country with highest MDR-TB burden[1]. Poverty, under nutrition, HIV infection and smoking are major factors influencing on tuberculosis epidemic and also affecting treatment outcome. Most important factor in causation of MDR-TB is previous treatment with antitubercular drugs which may be inadequate[2]. Other important factors are coinfection with HIV, associated diabetes mellitus, low socioeconomic class groups, intravenous drug abusers, other immunocompromised states, etc. Patients with

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MDR-TB required 24 months duration treatment which is costly, may result in social isolation, loss of employment, long term socioeconomic effects and experience higher mortality[3]. Adverse drug reactions on second line anti tuberculosis drugs and poor management of adverse drug reactions led to irregular adherence of treatment, increasing risk of default and may lead to death and permanent morbidity.[4] Due to all these factors, treatment outcome of Drug-resistant Tuberculosis is extremely variable success rates.[5,6] though WHO has reported 46% overall success rate in India.[7] Present study was conducted at tertiary care centre to evaluate clinical profile and treatment outcome of drug resistant tuberculosis patients who were treated with standardized MDR-TB regimen.

MATERIAL AND METHODS

Present study was a prospective and observational study, conducted in patients of department of Skin and Venereal Diseases, Dr Ulhas Patil Medical College and hospital, Jalgaon. Total study duration was 1 year. Institutional human ethics committee approval for present study was taken.

Inclusion criteria

All drug resistant TB cases were confirmed with either Line Probe Assay (LPA) or Gene-expert assay were included in present study.

Exclusion criteria

1) Not willing for standardized MDR-TB regimen
2) Not fit for initiation of treatment
3) Patients with abnormal pre-treatment laboratory values (as they need modified or individualized regimen).

All records of MDR-TB cases were collected from pre-treatment evaluation records. For all MDR-TB cases history, pre-treatment investigations (complete blood count, urine examination, serum electrolytes, renal function tests, serum TSH, etc.) were collected. All MDR-TB cases were treated with standardized regimen which consists of 6-9 months of intensive phase with kanamycin, levofloxacin, ethionamide, pyrazinamide, ethambutol and cycloserine and continuation phase of 18 months with ethambutol, levofloxacin, ethionamide and cycloserine on daily basis. Treatment outcome of MDR-TB patients done according to WHO 2013 guidelines[8].1. Cured: patient who has completed MDR-TB treatment, is culture-negative in the last month of treatment and has been culture-negative during the preceding 11 months of treatment. 2. Treatment completed: patient who completed MDR-TB treatment but did not meet the definition for cure or failure due to lack of bacteriologic results. 3. Treatment failure: defined as more than one positive culture in the last 12 months of treatment, with a minimum of five cultures performed during the last 12 months, or if patient is persistently culture-positive and a clinical decision has been made to terminate treatment early.4. Death: defined as patient who dies for any reason during the course of MDR-TB treatment.5. Treatment default: defined as patient whose MDR-TB treatment was interrupted for two or more consecutive months. All data from these patients was entered in proforma. Statistical analysis was done.

RESULTS

Based on the study criteria, a total of 72 patients with MDR-TB were included in the present study, all records were entered in a proforma. Most common age group was 21-30 years (36.11 %), followed by 31-40 years (27.78 %) and 41-50 years (15.28 %). Incidence was relatively low in extreme age groups of less than 20 years (8.33 %) and more than 60 years (12.50 %). Male patients were 55.56% while female was 44.44 % in this study. Male to female ratio was 1.25:1.

Table 1: Sociodemographic characteristics

Sociodemographic characteristics	Number of patients	percentage
Age (years)		
1–10	0	0
11–20	6	8.33
21–30	26	36.11
31–40	20	27.78
41–50	11	15.28
51–60	6	8.33
>61	3	4.17
Mean age	27.43±11.76 years	
Gender		
Male	40	55.56
Female	32	44.44

Symptomatically fever (100 %), cough (95.83 %), expectoration (94.44 %), anorexia (83.33 %), weight loss (75 %) were most common symptoms noted.

Table 2: Symptoms profile

Symptom	No of patients	percentage
Fever	72	100
Cough	69	95.83
Expectoration	68	94.44
Anorexia	60	83.33
Weight loss	54	75
Breathlessness	36	50
Hemoptysis	12	16.67
Chest pain	7	9.72

We noted incidence of addiction as smoking (38.89%), alcohol (30.56 %), tobacco chewing (33.33 %) in present study. Addictions mainly affect adherence to treatment, while smoking adversely affects lung parenchyma. Pulmonary MDR-TB was noted in 93.06 % patients, rest 6.94 % were extra-pulmonary. Other co-morbidities were diabetes (16.67 %), COPD (15.28 %), positive HIV status (12.5 %), others (8.33 %) noted in present study.

Table 3: other characteristics

Characteristic	No of patients	Percentage
ADDICTION		
Smoking	28	38.89
Alcohol	22	30.56
Tobacco Chewing	24	33.33
SITE OF DISEASE		
Pulmonary	67	93.06
Extra Pulmonary	5	6.94
Co Morbidities		
Diabetes	12	16.67
COPD	11	15.28
Positive HIV Status	9	12.5
Others	6	8.33

Treatment outcome were noted as cured patients (33.33 %), treatment completed (25 %), died (18.06 %), defaulted (15.28 %), failure (switch to cat-5) (8.33 %). Successful treatment was noted in 58.33 % patients.

Table 4: Treatment outcome of MDRTB patients treated with standardized regimen

Outcome	No of patients	percentage
Cured	24	33.33
Treatment completed	18	25
Died	13	18.06
Defaulted	11	15.28
Failure (Switch to Cat-5)	6	8.33

DISCUSSION

Despite progress made in the diagnosis and treatment, mortality associated with TB remains high. TB was classified by WHO in 2016 as the deadliest infectious disease with 5,000 deaths per day[7]. MDR-TB is a major hurdle in effective control of the disease. Prompt and appropriate management of MDR-TB cases, including strict adherence to therapy, is required to achieve control over the disease. In the present study, middle age groups (21–40 years) with a mean age of 27.43±11.76 years were commonly affected as compared to other age groups. Mukherjee *et al*[9] noted that age group of 21–30 years with mean age of 32.52 years was commonly affected with MDR-TB in their study. Similar age groups with mean age were also commonly affected in studies by Gaude *et al*[10]., Kapadia and Tripathi[11] and Sharma *et al*[12]. Male patients were 55.56% while female was 44.44 % in this study. Male to female ratio was 1.25:1. Male dominated involvement has been found in various studies done by Mukherjee *et al*[9]., Kapadia and Tripathi[11], Sharma *et al*[12], and Datta *et al*[13]. Male dominance can be justified by their involvement in more outdoor activities and because of their high-risk behaviour such as smoking, alcoholism as compared to females. Smoking is a known risk factor for tuberculosis with studies showing two-fold increase of risk of progression to active tuberculosis[14], similarly alcohol consumption according to studies too increases the risk of development of tuberculosis up to three times with consumption of around 40 g or more alcohol per day[15]. Other studies also showed statistically

significant association between alcohol abuse and MDR TB[16,17].The commonest comorbidity among our study group was diabetes (16.67 %), COPD (15.28 %), positive HIV status (12.5 %). Diabetes was present as a comorbid illness among 7.6% in a study carried out by Datta *et al*[13]. And also found COPD to be the commonest comorbid disease among MDR-TB cases. Globally, MDR-TB has been a particular concern among HIV infected persons, whose rate of survival is substantially lower than that of those not infected, and testing for HIV is recommended for all TB patients[18]. Very little data is available regarding HIV in MDR-TB in India with Datta *et al*[13]. reporting 1.9% HIV seropositivity among MDR -TB cases. However, in the present study 12.5% MDR-TB patients found to be HIV seropositive. Majority of patients in our study had pulmonary TB (90.60%), while 2.5% patients had both PTB and EPTB and 9.4% had only EPTB. Similar findings have been reported by others[19].

Drug-resistant TB can be diagnosed by any of the three methods. They are the gold standard LJ culture, liquid culture (Mycobacterium Growth Indicator Tube) or molecular genotype test such as LPA or cartridge based nucleic acid amplification test or GeneXpert test. The early detection of MDR-TB is essential with the best appropriate measures. The genotypic methods allow for faster availability of results and have been found suitable in the clinical setting. A successful outcome was seen in 58% patients in our study, WHO has reported 46% overall success rate in India[7]. Higher treatment success rates were observed in patients living in urban area, moderately advanced disease, early diagnosis and standard treatment. Patients diagnosed with GeneXpert test has a fairly high treatment success, because report is available within 90 minutes compared to LPA, where diagnosis takes 72 hours. Individualized treatment, which is advised by few physicians is expensive and difficult to implement in the majority of low-income countries, which bear the highest burden of MDR-TB. Therefore, the use of standardized treatment regimens for MDR-TB patients, reduces the number of health care facilities need and lowers the overall cost of treatment by five to ten times[21].

CONCLUSION

MDR-TB is common in middle aged, male population, with history of smoking, alcoholism, COPD, diabetes. Success rate is variable and mainly depending upon early detection and close follow-up. Morbidities and mortalities can be reduced with standard treatment.

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