

Socio-demographic profile of Multi-drug Resistant Tuberculosis patients

Neeta P. N.

Assistant Professor, Department of Community Medicine, Vijayanagar Institute of Medical College, Bellary -583104

Prashanth N.

Senior Resident, Department of Anesthesiology, Vijayanagar Institute of Medical College, Bellary -583104

G Ramaprasad

Professor, Department of Chest and TB, Vijayanagar Institute of Medical College, Bellary -583104

Abstract

Background: Considering that TB, as well as MDR-TB, are related to social inequalities, it is important that interventions be founded not only on the clinical- epidemiological profile of the population, but also on the socio-demographic profile, in order to make the interventions pertinent and effective. *Methodology:* It was a cross sectional, hospital based study among MDR-TB patients admitted in DR-TB Centre, Bellary, during the period between Jan 2013 to July 2013. *Results:* A total of 66 patients were interviewed and examined. Among them 75.6% belonged to 21-40 years of age group, 87.9% were from class IV & class V socio-economic group according to modified B.G. Prasad classification. Smoking was the most common co-morbidity. 47% of them exposed to ATT in the past for 1-2 years and 98.5% patient's last ATT outcome was treatment completed. Among them 78.8% were resistant to both rifampicin and isoniazid. Most (59.1%) belonged to 26-45 kg weight band. The knowledge and practices regarding MDR-TB was good among them. *Conclusion:* Proper follow up was not done during past ATT, which led to MDR-TB. Health education regarding spread of disease, early detection of MDR-TB by strengthened laboratory support, effective therapy, implicating innovative control measures, would interrupt the ongoing transmission and control this emerging epidemic.

Keywords: Multi-Drug Tuberculosis; Demographic Factors; RNTCP.

Introduction

The emergence of resistance to drugs used to treat tuberculosis (TB), and particularly multidrug-resistant TB (MDR-TB), has become a significant public health problem in a number of countries and an obstacle to effective TB control. The term "Programmatic

Management of Drug Resistant TB" (PMDT) (erstwhile DOTS Plus), refers to program based MDR-TB diagnosis, management and treatment. MDR-TB case is a TB patient whose sputum is culture positive for *Mycobacterium tuberculosis* and is resistant in-vitro to isoniazid and rifampicin with or without other anti-tubercular drugs based on DST results from an RNTCP-certified Culture & DST Laboratory [1].

Since the inception of PMDT services in India, a cumulative total of 38155 MDR TB Suspects have been examined for diagnosis; 10263 MDR TB cases have been confirmed and 6994 MDR TB cases have been initiated on regimen for MDR TB through 50 DOTS Plus Sites across the country [2]. In India, MDR-TB amongst new cases are estimated at 2-3% and amongst re-treatment cases at 14-17% [3].

Corresponding Author: Neeta P. N., C-128,5th Main, 3rd Cross, Kuvempu Nagar, Opposite Vishnu Vardhan Park, Cantonment, Bellary- 583104.

E-mail: drnita10@gmail.com

The factors that are associated with MDR-TB include prior treatment, cavitary pulmonary TB, treat-ment failure, inadequate drug regimens, and illicit drug use, human immunodeficiency virus (HIV) infection, hospitalization two years prior to TB diagnosis, diabetes and alcohol dependence [4].

Considering that TB, as well as MDR-TB, are related to social inequalities, it is important that intervention be founded not only on the clinical-epidemiological profile of the population, but also on the socio-demographic profile, in order to make the interventions pertinent and effective [5].

With the purpose of contributing with the knowledge regarding MDR-TB and improving the disease control measures, this article presents the results of a study performed with the objective to describe the socio-demographic of individuals with MDR-TB, enrolled at Drug Resistant Tuberculosis Centre (DR-TB) – a Reference Center for TB control for 5 districts in the state of Karnataka, between January 2013 and June 2014.

Methodology

It was a cross sectional, hospital based study among MDR-TB patients admitted in DR-TB Centre, Bellary – a reference centre for 5 districts in the state of Karnataka.

The duration of study was six months. All MDR-TB positive patients admitted in the MDR-TB ward (DR-TB Centre, Bellary) of the above mentioned hospital during the study period constituted the study population. Inclusion criteria were Sputum positive tuberculosis patients with proven Isoniazid and Rifampicin or Rifampicin only resistance, from RNTCP certified culture and drug sensitivity laboratory (DST) by using Line Probe Assay method (LPA). DR-TB Centre in Bellary district was started in January 2013. As per PMDT guidelines, the suspect criteria for MDR-TB [1] are as follows:

Criteria A: All failures of new TB cases (on CAT I), Sputum smear positive re-treatment Cases who remain smear positive at four month or later (on CAT II), All Pulmonary TB cases that are contacts of known MDRTB case.

Criteria B: All Re treatment smear positive at diagnosis Any smear positive follow up of new or retreatment cases.

Criteria C: Retreatment smears negative cases at diagnosis, HIV TB co infected cases in addition to the suspects in Criteria B.

A pre-designed, semi-structured questionnaire was prepared including topics related to age, sex, education, type of tuberculosis detected, whether received any anti-tubercular drugs before detection of multidrug resistance, any change in category during

course of treatment, reason behind such change, mean duration of Anti Tubercular Treatment (ATT) taken before start of category IV, patterns of drug resistance, HIV status, clinical symptoms and their respiratory system examination findings.

The study protocol was approved by the ethics committee of the institute. A written informed consent was taken from each patient for inclusion in the study. The information thus collected was computerized and analyzed by using Statistical Package for Social Science (SPSS 10.0) software program for Windows. Data was expressed in terms of rates, ratios and percentages.

Results

A total of 66 patients were interviewed and examined from the DR TB Centre, Bellary. In the

Table 1: Socio-demographic profile of the study population n=66

Variable	Frequency	Percentage (%)
Age in years		
<20	3	4.5
21-30	22	33.3
31-40	28	42.5
>40	13	19.7
Sex		
Male	46	69.7
Female	20	30.3
Occupation		
Cooli	33	50
Others	33	50
Religion		
Hindu	57	86.4
Muslim	9	13.6
Marital status		
Married	50	75.8
Unmarried	11	16.7
Widow/Widower	5	7.6
Type of family		
Nuclear	29	43.9
Joint	31	47
Broken	6	9.1
Socio-economic status		
I & II	0	0
III	8	12.1
IV	34	51.5
V	24	36.4

study population, most (75.6%) of them belong to 21-40 years of age group, 70% were male patients, 50% were coolie by occupation. Majority (86%) of them Hindu by religion, followed by Muslim. Most (75.8%) were married. There were 31 (47%) patients belonging to joint family, followed by 29 (43.9%) to nuclear family and 6 (9.1%) to widow/ widower. Majority (87.9%) patients belonged to class IV and class V socio-economic group according to Modified B.G. Prasad’s classification.

There were 43 (65.2%) patients who never had tobacco or alcohol, 10(15.2%) patients were ex-addicts and 13 (19.6%) patients were addicted at the time of interview. In the present addicts as well as ex-addicts, in 90%, type of addiction was tobacco in any form, of which smoking was the most common.

77.3% patients started ATT from RNTCP source, while one patient from non RNTCP and rest 21.2% had received from both RNTCP as well as non RNTCP. All patients had pulmonary tuberculosis. 31 (47%) patients had exposed to ATT in past for about 1-2 years, followed by 18 (27.3%) took for more than two years and rest for less than one year. More than half of the patients 38 (57.5%) had taken two episodes of ATT. Almost 98.5% of patients outcome of last ATT treatment was declared as treatment completed. 40 patients fall in the range of 76-100% of adherence with the ATT, but none had 100% adherence. Among them eight (12.1%) patients had received 2nd line drugs, which were drug of choice for treatment of MDR-TB.

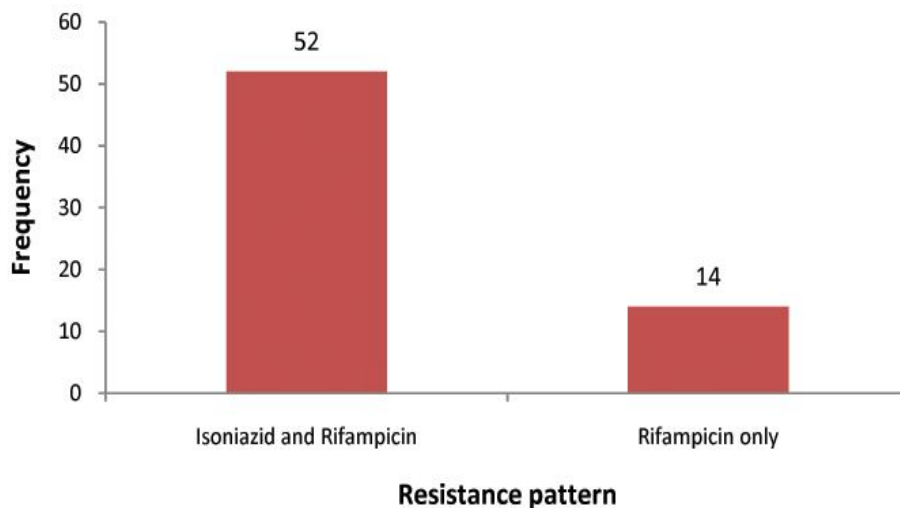
53% of the patients were suspected for MDR-TB and sent sample for 2nd line DST, because of failure in the past ATT treatment (Graph 2). Among the

Table 2: Previous history of TB[#] treatment n=66

Variable	Frequency	Percentage (%)
Total duration of disease (in years)		
< one	17	25.7
one –two	31	47
> two	18	27.3
No. Of ATT Episodes		
once	10	15.1
Twice	38	57.6
Thrice	15	22.7
> three times	3	4.5
Source of ATT		
RNTCP	51	77.3
non RNTCP	1	1.5
Both	14	21.2
Outcome/ Response of the last treatment		
Treatment completed	65	98.5
Failure	1	1.5
Adherence with ATT*		
<50%	6	9.0
50-75%	20	30.3
76-100%	40	60.6
Exposure to 2nd line drugs		
Yes	8	12.1
No	58	87.9

study patients, 52(78.8%) were resistant to Rifampicin as well as Isoniazid, rest were resistant to Rifampicin only.

Graph 1: Drug Resistant pattern among study population n=66



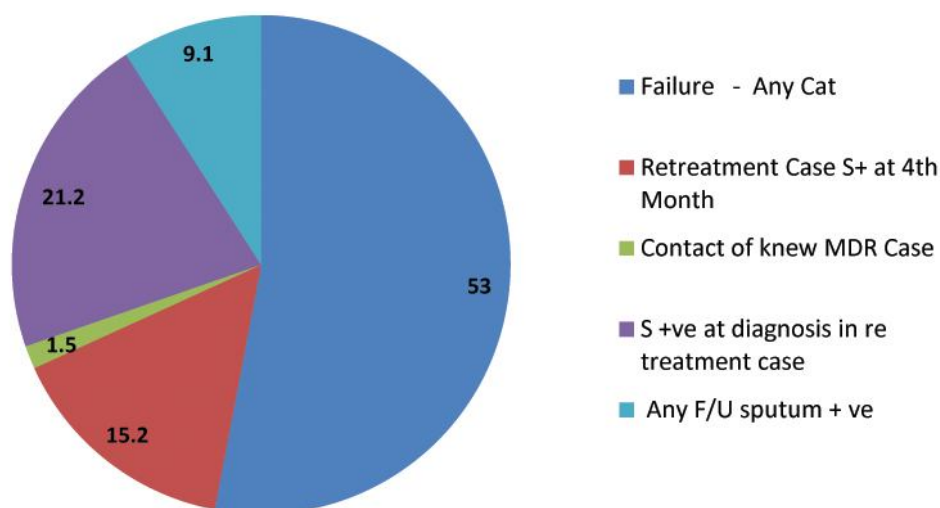
Only one patient was HIV (human immunodeficiency virus) reactive among the study population. 39 (59.1%) patients were not having BCG scar. 39 (59.1%) patients belonged to weight band of 26-45kg, followed by 25 (37.9%) belonged to 46-70 kg weight band [1].

Initial patient interview

Among the study patients, 48 (72.7%) had

understood what is MDR-TB. Ten patients (15.2%) revealed that they knew the source of MDR-TB infection. Majority (80.3%) of patients were having knowledge about MDR-TB therapy. Two thirds of patients (45) had ability to keep appointments, and to adhere to medications. All the patients knew their HIV status and knew about cough hygiene. 60% of the patients had knowledge about importance of good ventilation as well as good nutritional diet.

Graph 2: Reasons for MDR Suspect n=66



Discussion

Present study was conducted with a view to analyze social and demographic characteristics of MDR-TB patients, diagnosed at IRL by LPA (line probe assay) method [1], during the first year of implementation of the DOTS PLUS project in Bellary city, Karnataka.

Of the study subjects, more than 2/3rd patients were males and more than 3/4th belong to productive age group 21-40 years. Similar findings were found in other studies [4,5,6]. 86.4% of the study participants were hindu by religion and 3/4th of them were married. Similar findings in the one study [6].

It was found that the subjects used the Primary Care system as their entrance to health care, as recommended in the decentralization policies for TB control. The results found regarding the subjects' clinical-epidemiological profile reveal that, in the addressed historical series, the number of new notified cases per year was 17-18% in retreatment cases, which implies the MDR-TB prevention

measures were deficient, because most did not reach cure after more than two treatments before MDR-TB. Failure is intrinsically related to the treatments being unsuccessful.

Smoking and alcoholism, which are co-morbidities identified in the studied population, are pointed out as elements associated to the occurrence of MDR-TB [10, 11]. It is worth emphasizing that the DOT is a strategy recognized due to its importance in strengthening treatment adherence among subjects with TB so as to prevent occurrence of MDR-TB [1]. In this study, most individuals in the past TB treatment had not followed treatment schedule and adherence was not 100%. And some study population received 2nd line drugs from the other sources, which is one of the predisposing factors for MDR-TB.

Drug resistance was checked by a rapid DST using LPA method, 78.8% patients in our study were resistant to Rifampicin as well as Isoniazid and 21.2% were resistant to Rifampicin only. A study done in Kolkata, showed 53.7% resistant to rifampicin only and 46.3% had both isoniazid and rifampicin resistance [9]. Many studies showed difference in the

resistance pattern depends on the availability of the laboratories and testing methods [10, 11, 12].

All the study participants were aware about the immune-compromise status for HIV. Only one patient was reactive and was on ART therapy.

During the initial patient interview before start of MDR-TB treatment, many patients were not knowing the source of disease as well as not having knowledge about the disease. Many did't have ability to keep appointments and adhere with the treatment. This makes difficult to treat the patients and cure the disease. Emergence and spread of MDR TB can threaten the global TB control. The treatment of MDRTB is prolonged, expensive and often unsuccessful. Hence, prevention of MDR TB is more important rather than treatment. Strengthening the program by intensely evaluating treatment regimens, assuring treatment adherence, supporting true DOTS, aggressive and proactive management of adverse events and infection control are very essential.

Conclusion

In summary, this study showed, poor adherence with the past ATT and none had declared cure of the disease after completing full course of DOTS treatment. Health education regarding spread of disease, early detection of MDR-TB by strengthened laboratory support, effective therapy, implicating innovative control measures, would interrupt the ongoing transmission and control this emerging epidemic. Issues such as poverty, malnutrition should be addressed, control of infections and improved hygiene and strong commitment and collaboration among health care providers should become a priority. Present study was confined only to MDR-TB cases and there was no comparison or follow ups, hence conclusion of factors affecting development of resistance cannot be drawn. Hence further study can be framed out and the relationship between various social, behavioral and environmental aspects and drug resistance can be better studied.

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