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A study on prevalence of multi drug resistance tuberculosis and factors influencing it in Davangere district, Karnataka, India

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ABSTRACT

Background: India is one of the high tuberculosis (TB) burden countries in the world accounting for nearly 20% of the global incidence. Standard anti-TB drugs have been used for decades, and resistance to the medicines is growing. The emergence and spread of multi-drug resistant tuberculosis (MDR-TB) is threatening to destabilize global tuberculosis control.

Methods: Case records of all the patients put on DOTS plus therapy for MDR-TB were obtained from District Tuberculosis Centre (DTC) located at Chigateri General Hospital Davangere. Details of all the suspected MDR-TB patients registered in the DTC during January 2013 to June 2015 and sent for culture and drug sensitivity testing (DST) were obtained. MDR-TB was defined as Tuberculosis caused by bacilli showing resistant to Isoniazid and Rifampicin. Cases are analysed based on MDR Suspect criteria as per RNTCP. Further details about the influencing factors were obtained by calling the patients on their contact numbers. Corroborative evidence of the details provided by the patients regarding the influencing factors was substantiated from STLS or DOTS providers.

Results: The prevalence of MDR-TB cases in three years was 32/4136 cases. Among the factors age, gender, pattern of resistant and high Random Blood Sugar level were the key determining factors influencing MDR-TB.

Conclusions: A main component in stopping the spread of MDR-TB is to rapidly diagnose infectious TB disease cases and treat these so the patient can be cured and the chain of transmission will be stopped.

Keywords: MDR-TB, Factors influencing, RNTCP

INTRODUCTION

India ranks second in harbouring multi drug resistant (MDR)-TB cases, i.e., about 99,000 cases. Among these, 50,000 cases are recorded in retreatment pulmonary TB cases. Although previous treatment for TB is the most important risk factor for development of MDR-TB, incidence is increasing in treatment-naïve patients also due to transmission of drug-resistant strains.

Tuberculosis (TB), a communicable disease is the leading cause of death worldwide second to HIV/AIDS. The emergence and spread of multi-drug resistant tuberculosis (MDR-TB) is threatening to destabilize global tuberculosis control. Globally, 5% of TB cases were estimated to have had MDR-TB in 2013 (3.5% of new and 20.5% of previously treated TB cases). Drug resistance surveillance data show that an estimated 480 000 people developed MDR-TB in 2013 and 210 000 people died. On average, an estimated 9% of people with

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MDR-TB will have Extensively Drug Resistant Tuberculosis (XDR-TB). A new analysis of trends focusing on the years 2008–2013 shows that, at the global level, the proportion of new cases with MDR-TB remains unchanged at around 3.5%.³

India is one of the high tuberculosis (TB) burden countries in the world accounting for nearly 24% of the global incidence.4 Standard anti-TB drugs have been used for decades, and resistance to the medicines is growing and developing Multidrug-resistant tuberculosis. India ranks second in harboring multi drug resistant (MDR)-TB cases, i.e., about 99,000 cases. Among these, 50,000 cases are recorded in retreatment pulmonary TB cases.⁴ Although previous treatment for TB is the most important risk factor for development of MDR-TB, incidence is increasing in treatment-naïve patients also due to transmission of drug-resistant strains. The risk of transmission of resistant strains TB to others and to close contacts is increasing day-by-day because of the growing burden of MDR-TB patients.³ As of 2013, percentage of TB cases with MDR-TB is 2.2 per 100,000 in new cases. The incidence is higher in those with previously treated pulmonary tuberculosis is almost 15 per 100,000 population.²

A main component in stopping the spread of MDR-TB is to rapidly diagnose infectious TB disease cases and treat these so the patient can be cured and the chain of transmission will be stopped. As part of the prevention and control efforts for MDR-TB it is also important to trace people who have been in contact with the source case and are likely to have been exposed to infection.

In order to deal with these resistant forms of TB and avoid further MDR TB and XDR TB cases, a comprehensive approach, as with drug-susceptible TB, needs to be taken to ensure rapid detection, proper treatment and public health measures to cure the patients and prevent further transmission of the infection. Intensive case finding and contact tracing are key components of the public health action required to promptly detect infected individuals.

Objectives

- To study the prevalence of Multi Drug Resistant Tuberculosis (MDR-TB) in Davangere District.
- To study factors influencing Multi-Drug Resistant Tuberculosis (MDR TB).

METHODS

Case records of all the patients put on DOTS plus therapy for MDR TB were obtained from District Tuberculosis Centre (DTC) located at Chigateri General Hospital Davangere. Details of all the suspected MDR TB patients registered in the DTC during January 2013 to June 2015 and sent for culture and drug sensitivity testing (DST)

were obtained. MDR-TB was defined as Tuberculosis caused by bacilli showing resistant to Isoniazid and Rifampicin. Cases are analysed based on MDR Suspect criteria as per RNTCP. Further details about the influencing factors was obtained by calling the patients on their contact numbers. Corroborative evidence of the details provided by the patients regarding the influencing factors was substantiated from STLS or DOTS providers.

Inclusion criteria

All the patients categorized as MDR TB suspect as per the RNTCP criterion.

RESULTS

We examine the case records of all the patients put on DOTS plus therapy for MDR TB were obtained from District Tuberculosis Centre (DTC) located at Chigateri General Hospital Davangere. On comparison more number of cases was seen in 2013 than 2014 and 2015. In the year 2013 there were about 1642 sputum positive cases out of which 17 were MDR positives and 10 were transferred in. In the year 2014 there were 1637 sputum positive cases out of which 7 were MDR positive and 6 were transferred in. In the year 2015 there were about 857 sputum cases out of which 8 were MDR positive.

Prevalence of MDRTB

Prevalence of MDRTB was 1.16/1000cases. On comparison more number of cases was seen in 2013 than 2014 and 2015. In the year 2013 there were about 1642 sputum positive cases out of which 17 were MDR positives and 10 were transferred in. In the year 2014 there were 1637 sputum positive cases out of which 7 were MDR positive and 6 were transferred in. In the year 2015 there were about 857 sputum cases out of which 8 were MDR positive (Table 1).

Table 1: Prevalence of multi-drug resistant tuberculosis.

Year	Sputum positives	MDR positives	Transferred in
2013	1642	17	10
2014	1637	7	6
2015 (first 2 quarters)	857	8	0
Total	4136	32	16

Factors influencing MDRTB cases

Majority of cases were seen in the younger age than older age group A bout 21(39.6%) patients were seen in the age group of 15-30 years. About 20 (37.7%) of the MDRTB patients were in the age group of 31-45 years. About 11 (20.8%) were in the age group of 46-60 years (Table 2).

Table 2: Distribution of multi-drug resistant cases according to age.

Age	No. of patients	Percentage
15-30	21	39.6
31-45	20	37.7
46-60	11	20.8
>60	1	1.9
Total	53	100

More number of resistant cases was seen in male patients (62.3%). About 20 (37.7%) were females and about 33 (62.3%) were males (Table 3).

Table 3: Distribution of multi-drug resistant cases according to gender.

Gender	No. of patients	Percentage
Female	20	37.7
Male	33	62.3
Total	53	100

More no of cases were seen in rural area (60.4%) than urban area (39.6%). About 32 (60.4%) of the MDRTB cases were belonging to rural area and about 21 (39.6%) were belonging to urban area (Table 4).

Table 4: Distribution of multi-drug resistant cases according to residence.

Residence	No. of patients	Percentage
Rural	32	60.4
Urban	21	39.6
Total	53	100

Based on the type of patient's majority (45.3%) of cases were retreatment sputum positive. 16 (30.2%) of the MDRTB were all failures. Sputum positive cases in were seen in mid follow up. Sputum positive among contact persons were 4 (7.5%) and sputum positive retreatment were 24 and follow up positives were 5 (9.4%) (Table 5).

Table 5: Type of patients going for multidrug drug resistant.

Type	No. of patients	Percentage
All failures	16	30.2
Sputum + in mid follow-up	4	7.5
Sputum + among contact persons	4	7.5
Sputum + retreatment	24	45.3
Follow-up positives	5	9.4
Total	53	100

About 54.7% of the MDRTB cases were both rifampicin and INH resistant. About 5 (9.4%) cases were INH positive and 19 (35.8%) of the cases were Rifampicin positive. And about 29 (54.7%) of the cases were both rifampicin and INH positive (Table 6).

Table 6: Pattern of resistant among cases.

Resistant	Frequency	Percentages
INH	5	9.4
Rifampicin	19	35.8
Both	29	54.7
Total	53	100

DISCUSSION

Studies conducted over the past two decades have shown MDR-TB rates varying from 14 to 49 per cent among previously treated cases. The World Health Organization (WHO) fourth Global Project reported a MDR-TB prevalence of 17.2 per cent among previously treated cases in India.

Reddy noted that, based on 2008 data, MDR TB represents an estimated 2.3 percent of new TB cases in India (compared with 3.3 percent worldwide) and 17 percent of retreatment cases. These figures represent about 99,000 MDR TB cases in the country. 11-12

We found a low prevalence of MDR-TB among new cases of pulmonary TB in Delhi. The reported prevalence of MDR-TB among new TB cases has varied from 0.14 to 5.3 per cent in previous studies from different parts of India8-19 and our findings are in consonance with such observations. But there are a few studies which have reported a high prevalence of MDR-TB among new TB cases. ^{13,14} Bias in patient selection and differences in methodology may account for such high prevalence of MDR-TB noted in these studies.

Nation-wide and State-wide representative data on the prevalence of MDR-TB are an urgent need of the hour to design effective empirical regimens, to monitor functioning and progress of the national TB control programme and for continued surveillance of MDR-TB among category I TB patients.

CONCLUSION

A main component in stopping the spread of MDR-TB is to rapidly diagnose infectious TB disease cases and treat these so the patient can be cured and the chain of transmission will be stopped. As part of the prevention and control efforts for MDR-TB it is also important to trace people who have been in contact to reduce exposure.

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