A STUDY OF EPIDEMIOLOGICAL PATTERN OF MULTIDRUG RESISTANT PULMONARY TUBERCULOSIS PATIENTS PRESENTING TO A TERTIARY CARE CENTRE IN CENTRAL INDIA

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ABSTRACT

BACKGROUND

In the present scenario, drug resistance is a huge obstacle in managing TB, as it is not only drug resistant, so difficult to treat, but also has huge financial and social burden.

Objectives of the study are-

1. To study the epidemiological pattern of pulmonary MDR-TB in central part of Madhya Pradesh.
2. To assess the risk factors for pulmonary MDR-TB.

MATERIALS AND METHODS

226 MDR-TB patients (with in-vitro resistance to rifampicin and isoniazid via line probe assay) presented to MY Hospital, Indore, were analysed over a period of one year of August 2015 to August 2016. This is a retrospective descriptive study. Analysis was done to know the epidemiological profile and assessment of risk factor for MDR-TB.

RESULTS

63.3% patients were from age group 21 - 40 years. 61.9% patients were male and 38.1% were female. In terms of socio-demographic profile, grand total of 72.2% (urban slums 49.6%, rural 22.6%) belonged to underdeveloped area, whereas rest belonged to urban areas. 5.8% (13) of total patients have positive family history, 10% (22) were HIV positive, 10.6% (24) were primary MDR patients, 15% (34) were treatment failure, 59.3% (134) treatment interrupted and 61.9% patients have mean body index between 10 - 15 kg/m² (p value 0.163).

CONCLUSION

As young males are most commonly affected with MDR Tuberculosis, greater emphasis should be given on screening and treatment of young males. High percentages of patients were found to have low BMI. Awareness regarding proper nutrition and proper dietary supplements should be ensured since early adulthood. Health education and awareness program should be conducted in rural area and urban slums, as they form main source for the drug resistance TB. The bulk of patients are from treatment interrupted group, so strict compliance monitoring of all the patients on anti-tubercular treatment should be ensured. History of contact with MDR and PLHA are also independent risk factor for MDR-TB.

KEYWORDS

Tuberculosis, MDR, LPA.

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BACKGROUND

MDR-TB is caused by strains of mycobacterium tuberculosis, resistant to both rifampicin and isoniazid with or without resistance to other drugs.¹ In present scenario drug resistant TB is a huge obstacle in managing tuberculosis, as it is not only difficult to treat but also has huge financial and social burden. In 2015, there were an estimated 480,000 new cases of multidrug-resistant TB (MDR-TB) and an additional 100,000 people with rifampicin-resistant TB (RR-TB) who

were also newly eligible for MDR-TB treatment.² Drug resistance surveillance data show that 3.9% of new and 21% of previously treated TB cases was estimated to have rifampicin or multidrug-resistant tuberculosis (MDR/RR-TB) in 2015. As in 2014, MDR-TB accounts for 3.3% of new TB cases.² In India total 130,000 patients developed MDR-TB with incidence rate of 9.9/100,000.² With primary MDR, rate of 2.5% and 16% retreatment case. In India prevalence of MDR is 2% - 3% among new cases and 12% - 17% among re-infectious cases.³ Management of MDR-TB is expensive, prolonged and associated with various adverse effects with only 52% treatment success rate for patients who were started treatment in 2013.² Due to this prolonged course, drug resistance tuberculosis is associated with higher chance of transmission to contacts and health care providers. The root problem for the development of drug resistance is improper use of first line anti-tubercular drugs like inadequate dose, wrong regime, inadequate follow-up and poor counselling for adherence to treatment.

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Objectives of the Study

1. To study the epidemiological pattern of pulmonary MDR-TB in central part of Madhya Pradesh.
2. To assess the risk factors for pulmonary MDR-TB.

MATERIALS AND METHODS

The study was conducted in Department of Respiratory Medicine, MGM Medical College and MY Hospital, Indore during period of one year from August 2015 to August 2016. It is a retrospective descriptive study including only 226 LPA proven pulmonary MDR tuberculosis cases presented to respiratory medicine outpatient department. The detailed history including socio-demographic profile was obtained from patients, relatives, medical records and DOTS provider.

The Analysis was done to know Epidemiology Profile and to assess Various Risk Factors-

Inclusion Criteria

Patient must be a known case of drug resistance pulmonary TB.

Exclusion Criteria

Concomitant extrapulmonary tuberculosis.

RESULTS

63.3% patients were from age group 21 - 40 years (Table 1). 61.9% patients were male and 38.1% female. In terms of socio-demographic profile, grand total of 72.2% (urban slums 49.6%, rural 22.6%) belongs to underdeveloped area, whereas rest belonged to urban areas. 5.8% (13) of total patients have positive family history, 10% (22) were HIV positive. 10.6% (24) were primary MDR patients, 15% (34) were treatment failure and 59.3% (134) were treatment interrupted (Table 2). As shown in Table 3, 61.9% patients have mean body index between 10 - 15 kg/m² (p value 0.163).

Age	Frequency	Percent
0-21	27	11.9%
21-40	143	63.3%
41-60	47	20.8%
>60	09	4%
Total	226	100

Table 1. Showing Age-Wise Distribution

Diagnosis	Frequency	Percent
Relapse	34	15
Failure	34	15
Treatment Interrupted	134	59.2
Primary Contact	24	10.6
Total	226	226

Table 2. Diagnosis Wise Distributions

BMI	10-15	16-20	21-25	25
Age	132	64	14	12

Table 3. BMI Wise Distributions

DISCUSSION

In our study, it was found that young male population (21-40 years) is most commonly affected with MDR-TB, which is similar to study conducted by Mishra et al with 96.10% belonging to age less than 49 years, males 60.8% and Kapadia

et al with mean age of presentation of 31 +/- 2 and male predominance of 64.22%.^{4,5} Low BMI (p value 0.163) is significantly associated with higher occurrence of drug resistance TB, which is similar to study conducted by Kumar et al⁶ with 68.6% found to be undernourished with a mean BMI of 17.33 + 1.99 kg/m². 1.2 million people living with HIV worldwide fell ill with TB in 2015.² MDR-HIV co-infection rate is 9.6% which in comparison to Deivanayagam et al (4.42%)⁷ is on higher side. Increased incidence can be attributed to various predisposing factors like poor immunity, higher chance of exposure due to more hospital visit and hospitalisation for other ailments, poor adherence to ATT and ART treatment and incomplete absorption of drug.⁸ In comparison to WHO 2015 - 16 data (3.4%) and study conducted by K Sharma et al⁹ (1.1%), our study revealed higher percentage of primary MDR (10.6%) which may be due to increased number of index MDR case leading to higher primary contacts. Close contacts of drug resistant TB when developed active TB mostly have resistant TB.¹⁰ Odds of drug resistant TB is 4 - 7 times higher in previously treated compared to persons with no history of previous treatment.¹¹ Our study also revealed 89.2% having previous treatment history. Due to significant relationship between previous ATT history and possibility of MDR, all such patients should be subjected to MDR workup.¹²

CONCLUSION

Our study concludes that young males are most commonly affected with MDR tuberculosis. Greater emphasis should be given on screening and treatment of young males, as they form the economic base of the family. Proper nutritional support is the need of the hour and high percentage of patients were found to have low BMI. Awareness regarding proper nutrition and proper dietary supplements should be ensured since early adulthood, as they form bulk of patients. Health education and awareness program should be conducted in rural area and urban slums, as they form main source for the Drug resistance TB. The bulk of patients are from Treatment interrupted group, so strict compliance monitoring of all the patients on anti-tubercular treatment should be ensured. We also conclude that MDR Tuberculosis as HIV MDR-TB co-infection was found on the higher side in our study.

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REFERENCES

- [1] Prasad R. Drug resistance and multidrug resistance tuberculosis. In: Clinical tuberculosis diagnosis and treatment. 1st edn. New Delhi: Jaypee Brothers Medical Publisher 2015:312-3.
- [2] WHO MDR TB Factsheet (PDF) 2016. http://www.who.int/tb/challenges/mdr/mdr_tb_factsheet.pdf.
- [3] Sachdeva KS. Overview of drug-resistant TB in India and National Scale up of MDR TB Diagnosis and

- Treatment. Speaker presentation at the Institute of Medicine Workshop on Facing the Reality of Drug-Resistant Tuberculosis in India: Challenges and Potential Solutions. New Delhi, April 18, 2011.
- [4] Mishra JK, Sehgal D, Anupurba S, et al. Pattern of drug resistance in tuberculosis patients attending tertiary care hospital, Varanasi. *Indian J Prev Soc Med* 2009;40(1-2):101-5.
 - [5] Kapadia VK, Tripathi SB. Adverse drug reactions and outcome analysis of MDR TB patients on DOTS plus regimen. *Ntl J Community Med* 2015;7(1):5-9.
 - [6] Amit K, Rakesh K, Kandpal SD, et al. Nutritional status in multi-drug resistance-pulmonary tuberculosis patients. *Indian Journal of Community Health* 2014;26 Suppl 2:204-8.
 - [7] Deivanayagam CN, Rajasekaran S, Venkatesan R, et al. Prevalence of acquired MDR-TB and HIV co-infection. *Indian J Chest Dis Allied Sci* 2002;44(4):237-42.
 - [8] Sharma KS, Mohan A. Multidrug-resistant tuberculosis. *Indian J Med Res* 2004;120:354-76.
 - [9] Sharma SK, Kaushik G, Jha B, et al. Prevalence of multidrug-resistant tuberculosis among newly diagnosed cases of sputum-positive pulmonary tuberculosis. *Indian J Med Res* 2011;133(3):308-11.
 - [10] Prasad R. Multi drug resistant tuberculosis contacts: management. In: *Clinical tuberculosis diagnosis and treatment*. 1st edn. New Delhi: Jaypee Brothers Medical Publisher 2015:362-6.
 - [11] Prasad R. Drug resistant and multidrug resistant tuberculosis. In: *Clinical tuberculosis diagnosis and treatment*. 1st edn. New Delhi: Jaypee Brothers Medical Publisher 2015:296-310.
 - [12] Kandi S, Prasad SV, Reddy PNS, et al. Prevalence of multidrug resistance among retreatment pulmonary tuberculosis cases in a tertiary care hospital, Hyderabad, India. *Lung India* 2003;30(4):277-9.