

SOCIO-DEMOGRAPHIC AND COMORBIDITY PROFILE OF DR-TB PATIENTS TREATED IN MEDICAL COLLEGE HOSPITAL IN SOUTH INDIA

Anand P¹, Venkatesh G², Karthikeyan K³, Nithiya S⁴

¹Assistant Professor, Department of Tuberculosis and Respiratory Medicine, Government Thiruvannamalai Medical College, Tamil Nadu, India.

²Associate Professor, Department of Community Medicine, Government Thiruvannamalai Medical College, Tamil Nadu, India.

³Assistant Professor, Department of General Medicine, Government Thiruvannamalai Medical College, Tamil Nadu, India.

⁴Assistant Professor, Department of Community Medicine, Government Thiruvannamalai Medical College, Tamil Nadu, India.

Received : 15/12/2022
Received in revised form : 22/01/2023
Accepted : 07/02/2023

Keywords:

Drug resistant Tuberculosis, Socio-demographic profile, MDR-TB, Diabetes mellitus.

Corresponding Author:

Dr. Nithiya S

Email: nithi27389@gmail.com

DOI: 10.47009/jamp.2023.5.2.44

Source of Support: Nil.

Conflict of Interest: None declared

Int J Acad Med Pharm
2023; 5 (2); 214-217



Abstract

Background: According to WHO global TB report (2022), around 6.4 million TB cases were notified globally in 2021. In India, 1.93 million TB cases were notified, out of which nearly 70000 cases were drug-resistant tuberculosis (DR-TB) cases in 2021.^[1] Various socio-demographic factors and comorbid conditions prevent the success of TB treatment. DR-TB is also a hindrance in achieving TB elimination. This study analyses the socio-demographic and comorbidity profile of DR-TB patients in Tamil Nadu, South India. **Materials and Methods:** A retrospective cross-sectional study was conducted to evaluate the socio-demographic and comorbidity profile of DR-TB patients who were treated in DR-TB centre at Government Tiruvannamalai medical college hospital from January 2021 to September 2022. **Results:** A total of 108 DR-TB patients' records were analysed. In age group distribution, 32.4% were in the age group 46 to 55 years, 21.3% were in the age group 36 to 45 years and 20.4% were in the age group 56 to 65 years. Out of 108 patients, 72.2% were males and 27.8% were females. Isoniazid resistant TB cases were 59.3%, MDR-TB cases were 38%, and Pre XDR TB cases were 2.7%. During the initiation of treatment, 60.2% of patients weighed less than 45 kg. Among them, 20.4% were alcoholics. 12% were smokers, 30.6% of patients had diabetes mellitus and 5.6% patients had HIV infection. **Conclusion:** DR-TB cases were more common in the middle age population of more than 45 years. NTEP should focus more on this middle-aged population who have DR-TB and should address issues like nutritional status, alcohol abuse, tobacco use and treatment for comorbidities like diabetes mellitus & HIV infection in order to achieve the TB elimination.

INTRODUCTION

Tuberculosis (TB) is a contagious disease that remains the largest infectious disease killer worldwide. Although mostly preventable and treatable, TB remains one of the leading causes of mortality worldwide and has a long history of damaging nations. India has the largest prevalence of tuberculosis among all countries, making up nearly one-fourth of the global incidence. According to the 2022 WHO Global TB Report, 6.4 million TB patients were notified in 2021, out of which 1.93 million TB cases originated in India. Around 70,000 drug resistant TB (DR-TB) cases was diagnosed which constitute 3.6% of total TB cases notified in India^[1]. There are five categories of drug-resistant

TB in the national health programme at present: Isoniazid (INH) resistant TB, RR-TB and MDR-TB (RR and INH resistant), plus pre-extensively drug-resistant TB (pre-XDR-TB) and XDR-TB. Pre-XDR-TB is TB that is resistant to rifampicin (MDR/RR-TB) and any fluoroquinolone (a class of second-line anti-TB drug). XDR-TB is TB that is resistant to rifampicin (MDR/RR-TB), plus any fluoroquinolone, plus at least one of the drugs, bedaquiline and linezolid.^[1] In India, many TB patients also have comorbidities like malnutrition, alcoholism, smoking, diabetes mellitus and HIV infection. Apart from these factors, numerous socio-demographic factors also contribute to the increasing incidence and development of TB, which are age, gender, socio-economic status, lifestyle, literacy,

family history, overcrowding, poor hygiene, poor ventilation, malnutrition, and occupational factors.^[2] Comorbidities like malnutrition, diabetes mellitus, HIV infection, tobacco usage and alcohol abuse weaken the immune system and results in the progression of TB infection to TB disease within a shorter time and can also lead to an increase in severity of TB illness.^[1]

These conditions are risk factors and important contributors to the TB burden and poor TB treatment outcomes. Poor nutrition brought on by poverty makes the immune system weak. It also drives people to live in overcrowded conditions, which raises the chance of disease transmission within the family.^[3] Diabetes increases the risk of tuberculosis by 2–3 times. TB may present atypically with more frequent and severe symptoms and signs in those with diabetes. DM also adversely affects TB treatment outcomes by causing delays in microbiological conversion and being associated with increased rates of death, failure, and relapse after completion of treatment.

If a drug sensitive TB patient with a comorbidity is not treated properly for both TB and the comorbidity, then the chance of developing complications and lost to follow up is high. Inadequate treatment may lead to high chance of developing DR-TB. In order to treat and control drug-resistant TB, proper planning and research are required.

The present study was undertaken to study the impact of socio-demographic and comorbidity profile on TB patients because published data and literature are absent on the topic specifically relevant to this location.

MATERIALS AND METHODS

A retrospective cross-sectional study was conducted on DR-TB patients to evaluate the socio-demographic profile of 108 patients who attended the DR-TB centre at Government Tiruvannamalai medical college hospital from January 2021 to September 2022.

All 108 patients were with pulmonary DR-TB. All the patients were included in the study.

Socio-demographic data including age and gender were collected. Also, data on types of DR-TB cases and comorbid conditions including the status of diabetes, HIV, and addiction habits were collected.

Data were presented as mean, standard deviation, frequency and percentage.

RESULTS

The age group-wise distribution of study participants was shown in Figure 1, which indicates that 32.4% of

DR-TB patients were in the age group 46 to 55 years, 21.3% of DR-TB patients were in the age group 36 to 45 years and 20.4% were in the age group of 56 to 65 years. Only 11.1% of patients were in the age group 15 to 25 years, 9.3% were in the age group 26 to 35 years, and 4.6% were in the age group 66 to 75 years. Out of 108 DR-TB patients who were analysed, 72.2% were male and 27.8% were females [Figure 2].

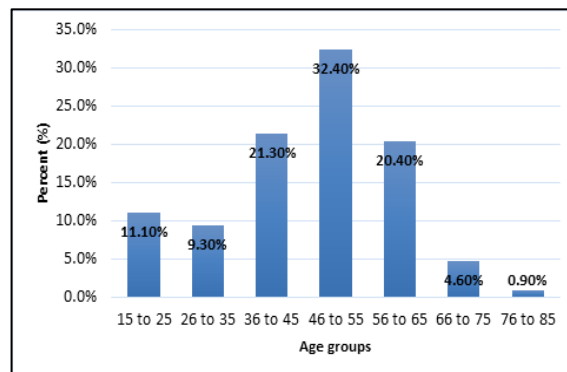


Figure 1: Age-groupwise percentage of TB cases in the study

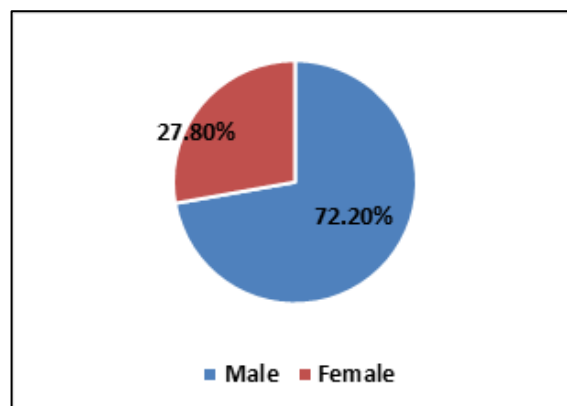


Figure 2: Percentage of male and female patients in the study

In the present study, Isoniazid (INH) resistant TB cases were 59.3%, MDR TB cases were 38%, and Pre XDR TB cases were 2.7% [Table 1].

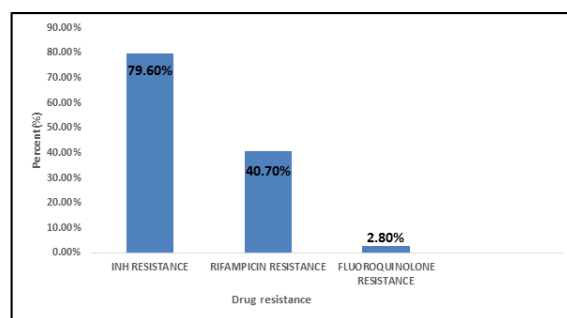


Figure 3: Drug-resistance pattern of DR-TB cases

Table 1: Percentage of Isoniazid-resistant, Rifampicin-resistant, and Pre-XDR TB cases

Type of DR-TB Case	Frequency	Percent
INH Resistant TB	64	59.3
MDR TB	41	38
Pre XDR TB	3	2.7

During the initiation of treatment, 60.2% of patients weighed less than 45 kg, and 39.8% of patients weight more than 45 kg. Regarding comorbidities, 20.4% were alcoholics, 12% were smokers, 30.6% of patients had diabetes mellitus and 5.6% of patients had HIV infection [Table 2].

Table 2: Comorbidities and other clinical conditions among all DR-TB patients

		Frequency	Percent
Weight band	less than 45 kg	65	60.2
	more than 45 kg	43	39.8
Alcohol	Yes	22	20.4
	No	86	79.6
Smoking	Yes	13	12.0
	No	95	88.0
Diabetes Mellitus	Yes	33	30.6
	No	75	69.4
HIV	Reactive	6	5.6
	Non-reactive	102	94.4

Figure 3 shows drug-resistance pattern of DR-TB cases which indicates that 79.6% of patients had INH-resistance, 40.7% of patients had Rifampicin resistance. However, 2.8% of patients had Fluroquinolones resistance.

DISCUSSION

In our study most of the patients were in their middle age, with 32.4% of DR-TB patients were in the age group 46 to 55 years followed by 21.3% in the age group 36 to 45 years. Thus nearly 53.7% of the patients were in their productive period of their life. Only 11.10 % of the patients were in the young age group 15 to 25 years and 9.3% in the age group 26 to 35 years. The present study's findings are in contrast to study performed by Dholakia et al.^[4] Javia et al.^[5] and Mukati et al.^[6] who stated DR-TB are common in young people. We observed that DR-TB is most predominant in middle age group (46 -55 years) than reported by Dholakia et al. (15 to 35 years), Javia et al. (18 to 35 years), and Mukati et al. (31 to 40 years).^[4-6]

In our study, out of 108 DR-TB patients, 72.2% were male and 27.8% were females. This result aligns with studies conducted by Dholakia et al.^[4] Javia et al.^[5] and Mukati et al.^[6] where also DR-TB cases were common among males. The conclusion most likely reflects the "male-dominance" nature of our society and the fact that, as the family's primary breadwinner, men are required to report to the hospital before their female counterparts.

In our study, according to NTEP classification of DRTB categories, Isoniazid (INH) resistant TB cases were 59.3%, MDR TB cases were 38%, and Pre XDR cases were 2.7%. Among drug resistance pattern, INH resistance was found in 79.6% of cases, Rifampicin resistance was found in 40.7% of cases and Fluroquinolone resistance was seen in 2.8% of cases. This is in contrast to study performed in kolkata by Rivu basu et al.^[7] where rifampicin resistance was more than isoniazid resistance. We cannot afford to lose INH, a critical medication for

the treatment of TB. It is affordable, efficient, has a low rate of adverse events. Yet, unexpectedly, non-MDR INH resistance is widespread in our study. Resistance, at least for specific disease sites and with

particular regimens, may increase the chance of adverse treatment outcomes, post-treatment recurrence, and death.^[11]

The existence of Pre XDR-TB is a serious health concern. Even though in our study, it is present in 2.7% of cases only, rampant unjustified use of fluoroquinolones for any other respiratory infection may lead to resistance to fluoroquinolones which is an important second line antitubercular drug.

In our study 60.2% of patients weighed less than 45 kg. This aligns with the study done by Om Prakash giri et al.^[12], where 72.56% weighed less than 45 kg. Nutritional support to TB patients improves weight gain, adherence to therapy, muscle strength, quality of life, and reduced mortality. It also leads to a shorter time to sputum conversion and a greater sustained microbiological cure, thereby decreasing relapse of TB disease.^[1]

In our study, it was found that 20.4% of patients were alcoholics and 12% of patients were smokers. A study in Orissa found that alcohol use was prevalent in 22.4% of the study population, smoking was present in 26.3% of male patients, and 58.7% of the patients exhibited addiction to tobacco of some kind.^[8]

Among comorbidities, in our study 30.6% of patients had diabetes whereas in a study conducted by Mukati et al.^[6] it was only 9.23%. Long-term inadequate glycaemic control plays a critical role in the increased risk of TB and poor response to treatment.

In our study, 5.6% were found to have infected with HIV. However, previous studies, including studies conducted by Dholakia et al.^[4] Javia et al.^[5] Mukherjee et al.^[9] Mukati et al.^[6], and Datta et al.^[10]

reported that 8.82%, 5.2%, 2.9%, 1.5%, and 1.9% were infected with HIV, respectively.

Following the preposition, the corrective actions that must be taken include providing adequate nutrition, promoting education, awareness, and information among the DR-TB patients regarding their comorbid conditions and the need to get treated for both TB and the comorbidity. Such scientific information and practical expertise can be further updated by carrying out even larger sample-size research to gain a deeper understanding of the condition and diagnose and treat it more effectively

CONCLUSION

The middle age group of population, involve in the most social activities, and is productive. DR-TB in this group has to be treated adequately and their comorbidities addressed appropriately. Nutritional status of the DR-TB patients should be taken care of in the programme. DR-TB patients who are alcohol users need counselling, linkages to de-addiction centres, and social support systems. Tobacco cessation services can be offered to DR-TB patients who are smokers. TB-Diabetes collaborative framework implementation is to be done to identify TB among diabetes mellitus patients and ensure treatment for both TB and diabetes mellitus. HIV DR-TB patients should be monitored closely as they will be taking both ART and DR-TB drugs which have many interactions and adverse effects. The present study's finding needs further exploration and additional research with the larger dataset. We endorse the consolidation of the TB care system in South India.

REFERENCES

1. National Tuberculosis Elimination Programme. India TB report 2022. Central TB Division, Ministry of Health and Family Welfare; 2022.

2. Dhingra VK. Risk factors for the development of tuberculosis. In: Tuberculosis treatment and prevention. 1st ed. Peepee Publishers and Distributors, New Delhi; 2008: 8-9.
3. Mishra P, Hansen EH, Sabroe S, Kafle KK. Socio-economic status and adherence to tuberculosis treatment: a case-control study in a district of Nepal. *Int J Tuberc Lung Dis* 2005; 9:1134-9.
4. Dholakia YN, Shah DP. Clinical profile and treatment outcomes of drug-resistant tuberculosis before directly observed treatment strategy plus: Lessons for the program. *Lung India* 2013; 30:316-20.
5. Javia A, Mehta D, Ganchi F, Rathod B, Chopada K, Bhandari M. Clinical profile of MDR-TB patients and their early response to DOTS PLUS: An Indian perspective. *Eur Respir J* 2013; 42:P2800.
6. Mukati S, Julka A, Varudkar HG, Singapurwala M, Agrawat JC, Bhandari D, et al. A study of the clinical profile of cases of MDR-TB and evaluation of challenges faced in initiation of second-line Anti-tuberculosis treatment for MDR-TB cases admitted in drug resistance tuberculosis center. *Indian J Tuberc* 2019; 66:358-63.
7. Rivu Basu , Susmita Kundu, Debabani Biswas , Saswati Nath , Arnab Sarkar , Archita Bhattacharya. Socio-Demographic and Clinical Profile of Drug Resistant Tuberculosis Patients in a Tertiary Care Centre of Kolkata. *Indian journal of community health / vol 33 / issue no 04 / oct-dec 2021*
8. Moharana, P. R., Satapathy, D. M., Sahani, N. C., Behera, T. R., Jena, D., & Tripathy, R. M. An analysis of treatment outcomes among TB patients put under DOTS at a tertiary level health facility of Orissa. *J Community Med* 2009; 5: 5-8.
9. Mukherjee P, Karmaker PR, Riva Basu, Lahiri SK. Socio-demographic and clinical profile of multi-drug resistant tuberculosis patients: a study at drug-resistant tuberculosis centres of Kolkata. *J. Med. Dent. Sci* 2015; 14:52-58.
10. Datta BS, Hassan G, Kadri SM, Qureshi W, Kamili MA, Singh H, Manzoor A, Wani MA, u Din S, Thakur N. Multidrug-resistant and extensively drug-resistant tuberculosis in Kashmir, India. *J Infect Dev Ctries* 2019; 4:19-23.
11. Stagg, H. R., Lipman, M. C., McHugh, T. D., & Jenkins, H. E. Isoniazid-resistant tuberculosis: a cause for concern? *Int J Tuberc Lung Dis* 2017; 21:129-139.
12. Giri OP, Giri VP, Nikhil N. Socio-demographic Profile of MDR-TB and XDR-TB Patients Admitted in DR-TB Centre, North India. *J Assoc Physicians India*. 2019 Oct;67(10):61-64.