



CAUSES OF DEFAULTING IN DRUG SENSITIVE & MULTI DRUG RESISTANT TUBERCULOSIS PATIENTS IN A TERTIARY CARE CENTRE IN RAJASTHAN.

Respiratory Medicine

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ABSTRACT

Back Ground: Tuberculosis (TB) is a preventable and curable infectious disease which is caused by Mycobacterium tuberculosis bacteria. Every year, 10 million people fall ill with tuberculosis (TB). Despite being a preventable and curable disease, 1.5 million people die from TB each year. The present study is intended to study the causes of defaulting in drug-sensitive and multi-drug-resistant tuberculosis patients. **Materials And Method:** This prospective observational study was conducted in the Respiratory Medicine Department of Government Medical College Kota Rajasthan from July 2022 to December 2023. 200 tubercular patients were evaluated and followed up over treatment to assess the causes of defaulting, and the causes were thoroughly inquired about. **Results:** Among the study population, 58% were males and 42% were females. The age group of the study population ranges from 18 to 85 years with a mean age of 53.02 ± 18.75 years. On analysing the reasons for defaulting, the major reason was found to be a lack of knowledge about the harm of defaulting and the severity of disease (31%); followed by other reasons such as adverse effects (18%), sense of well-being (13%), alcohol abuse (12%), poor patient-DOTS provider interaction (9%), travelling away from DOTS Centre (7%), social stigma (6%) and pill burden (4%). **Conclusion:** The study reveals that the primary reason for treatment default among tuberculosis patients in a tertiary care centre is a lack of knowledge about the harm of defaulting and the severity of the disease (31%). Improving interactions between patients and providers and proactively managing side effects are essential for better adherence.

KEYWORDS

INTRODUCTION

Tuberculosis (TB) is a preventable and curable infectious disease which is caused by Mycobacterium tuberculosis bacteria. Every year, 10 million people fall ill with tuberculosis (TB). Despite being a preventable and curable disease, 1.5 million people die from TB each year – making it the world's top infectious killer (after COVID-19) and also a major contributor to antimicrobial resistance⁽¹⁾. In 2022, an estimated 10.6 million people fell ill with tuberculosis (TB) worldwide, including 5.8 million men, 3.5 million women and 1.3 million children. In 2022, eight countries accounted for more than two-thirds of global TB cases: India (27%), Indonesia (10%), China (7.1%), the Philippines (7.0%), Pakistan (5.7%), Nigeria (4.5%), Bangladesh (3.6%) and the Democratic Republic of the Congo (3.0%)⁽¹⁾. TB is curable if therapy is started immediately, appropriately and continues throughout the treatment period⁽²⁾. However, high treatment default, treatment interruption, and non-adherence to medication, combined with a lack of knowledge about TB, contribute to poor treatment outcomes⁽²⁾. Factors identified to be associated with treatment default are lack of knowledge about the disease, distance from the health post, partial or complete regression of symptoms in the first two months of treatment, the side effects associated with the medication, male gender, age, the use of toxic substances and hospitalization during treatment⁽³⁾, pre-existing pulmonary disease, previous default, TB/HIV co-infection⁽⁴⁾, absence of supervised treatment and poor quality of patient care at the Health Unit^(5,6).

Aims And Objectives:

To study the causes of defaulting of ATT in drug-sensitive and drug-resistant-TB patients.

MATERIALS AND METHODS

This prospective observational study was conducted in the Department of Respiratory Medicine at Government Medical College Kota in collaboration with the nodal DR-TB Centre on MDR and XDR patients. During a study duration from July 2022- December 2023. After ensuring the completeness of the data, descriptive analysis was done. Measures of association were computed based on the type of variables. Categorical variables were compared using Chi-square

(χ^2 test) and continuous variables were recorded as median and interquartile ranges. Linear and multiple Logistic regression analysis was performed to seek the predictors for faster sputum conversion rates. Interim and final outcomes were recorded and analyzed for factors predicting failure. P value < 0.05 was considered statistically significant. All statistical analysis were performed using The Statistical Package for Social Science (SPSS) software version 29.0. Ethical approval was obtained from the institutional ethical committee. For follow-up, verbal consent from caregivers of the patient was also obtained.

RESULTS:

We enrolled about 200 patients during the aforementioned study period. Among the study population, 58% were males and 42% were females. The age group of the study population ranges from 18 to 85 years with a mean age of 53.02 ± 18.75 years. The age group of the study population ranges from 18 to 85 years with a mean age of 53.02 ± 18.75 years. 42.5% of the study population belongs to the age group of more than 60 years. Followed by 50 to 60 years (19%), 18 to 30 years (16%) and so on. The demographic and clinical details of the study population have been summarised in Table 1 and Figure 1, 2.

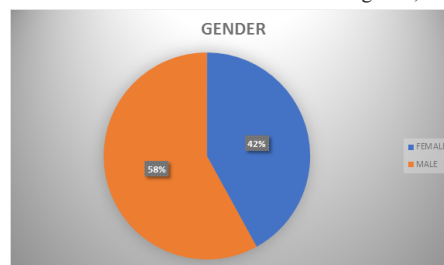


Figure-1: Gender Distribution

Table 1: Age Distribution

Age	Frequency	Percent
18-30	32	16.0

30-40	22	11.0
40-50	23	11.5
50-60	38	19.0
>60	85	42.5
Total	200	100.0

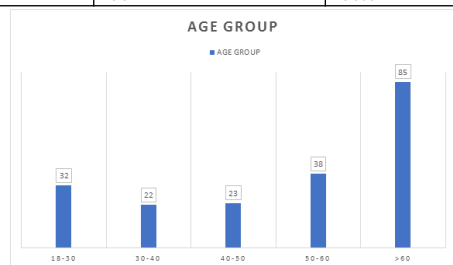


Figure-2: Age Distribution

Pulmonary tuberculosis (PTB) was diagnosed in nearly two thirds of the study participants, with extra-pulmonary tuberculosis (EPTB) accounting for the rest of the sample. Among the 134 pulmonary TB patients, 92% were drug sensitive TB (DSTB) and the remaining 8% were drug resistant TB (DRTB). Among extra-pulmonary TB patients 95.5% were drug sensitive whereas 4.5% were drug resistant cases (Figure 3,4).

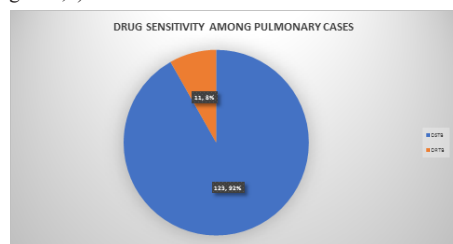


Figure-3: Drug sensitivity among pulmonary tb

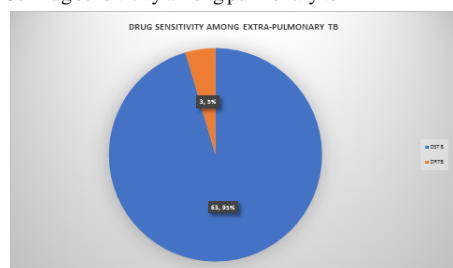


Figure-4: Drug sensitivity among extra pulmonary tb

On analyzing the reasons for defaulting, the major reason was found to be lack of knowledge about harm of defaulting and severity of disease (31%); followed by other reasons such as adverse effects (18%), sense of wellbeing (13%), alcohol abuse (12%), poor patient-DOTS provider interaction (9%), travelling away from DOTS Centre (7%), social stigma (6%) and pill burden (4%). The reasons for defaulting ATT have been summarised in Figure 2.

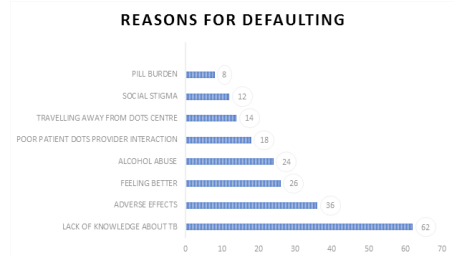


Figure 5- Reasons for defaulting ATT

DISCUSSION:

Among the study population, 58% were males and 42% were females. This data is consistent with the epidemiological trend of tuberculosis in India, where males are more affected than females. Other previous research conducted in India indicated that old males have a greater risk of tuberculosis than females. In most nations, young males tend to

engage in more social and labour-based activities than women, which may contribute to the spread of the disease. This could be one explanation for the male preponderance^(7,8). A study conducted by Sharma et al. reported the incidence of TB was higher among males as compared to females because males are more likely to also smoke and have alcohol and drug addictions compared to females, which increases their risk of contracting tuberculosis⁽⁷⁾.

According to a study by Mukherjee A et al., both sexes had comparable notification rates of tuberculosis before the age of 20. Male notification rates for tuberculosis increase with age. The difference is especially pronounced in the over-60 age group. Women have traditionally had lower levels of access to money, education, knowledge, and health. The husband or older members of the family make decisions on a woman's treatment. Women have to rely on men for treatment-related expenses and transportation⁽⁸⁾.

The age group of the study population ranges from 18 to 85 years with a mean age of 53.02 ± 18.75 years. 42.5% of the study population belongs to the age group of more than 60 years. Followed by 50 to 60 years (19%), 18 to 30 years (16%) and so on. According to a study by Sharan Murali et al., the study participants mean (SD) age was 43.7 (14.6) years; the mean (SD) for the non-senior group was 40.2 (12) years, and the mean (SD) for the elderly group was 65.8 (6.2) years. The percentage of elderly TB cases was 15.6% (95%CI: 13.6%-17.6%), with almost 71% of cases occurring in the 60–69 age group⁽⁹⁾.

Pulmonary tuberculosis (PTB) was diagnosed in nearly two-thirds of the study participants, with extra-pulmonary tuberculosis (EPTB) accounting for the rest of the sample. As per the India TB report of 2023, out of all diagnosed cases of TB, 76% were of pulmonary TB, with the rest cases being extra-pulmonary TB. In the state of Rajasthan, pulmonary tuberculosis accounts for 80.5% of all diagnosed tuberculosis cases⁽¹⁰⁾. Among the 134 pulmonary TB patients, 92% were drug-sensitive TB (DSTB) and the remaining 8% were drug-resistant TB (DRTB). Among extra-pulmonary TB patients, 95.5% were drug-sensitive whereas 4.5% were drug-resistant cases. Of the 189 cases of extrapulmonary tuberculosis that were studied by Dusthacker A et al., 37 cases (19%) were multidrug resistant (MDR), and one case (XDR) was extremely drug-resistant⁽¹⁰⁾.

On analyzing the reasons for defaulting, the major reason was found to be lack of knowledge about the harm of defaulting and the severity of disease (31%); followed by other reasons such as adverse effects (18%), sense of well-being (13%), alcohol abuse (12%), poor patient-DOTS provider interaction (9%), travelling away from DOTS Centre (7%), social stigma (6%) and pill burden (4%). Another study conducted by S Mohammed et al. stated that, of the 90 patients, 21 stopped receiving therapy, twelve of them were defaulters. 13.3% was the total proportion of treatment defaults. The age group between 50 and 65 years old had the largest percentage of defaulters, with a mean age of 53.3 years. The patients who defaulted were primarily male, lived in rural areas, were enrolled in primary education programs, and had pulmonary tuberculosis. The defaulter's main concerns were distance (58.3%), transportation (25%), being alone (16.7%), and workload (25%). Of those who expressed dissatisfaction with the conduct of the DOTS provider, 50% lacked family support. Early treatment discontinuation was experienced by patients (41.7% in the intense phase and 58% in the early continuous phase). The reasons for defaulting were feeling better after the treatment (41.7%) and side effects (25.0%). The remaining causes (8.3%) included migration, medical problems, inability to pay for transportation, and lack of access to medications, adverse consequences⁽¹¹⁾.

A similar study conducted in Assam on adherence to ATT by Ahmed M et al stated that in rural areas, the majority of defaulters (51.4%) were illiterate, while in urban areas, the majority (37.1%) completed high school. Ages 25 to 44 accounted for the largest percentage of defaulters (55.7% in urban regions and 62.9% in rural areas). In rural areas, the number of defaulters declined consistently as income increased, but this was not the case in urban areas. Compared to urban areas (57.1%), a higher percentage of new cases (82.8%) defaulted in rural areas. Reduction of symptoms was shown to be the most frequent cause of treatment discontinuation (45.7% in cities and 40% in rural regions)⁽¹²⁾. A qualitative study conducted in West Bengal by Bhattacharya T et al. reported that addiction, both improvement and lack of improvement in symptoms, side effects and the weight of pills associated with a prolonged drug regimen, loss of daily income, ignorance, stigma,

poverty, private practitioner non-referral, family issues, unfavourable advice from friends, and the belief that government-issued medications are inferior all seemed to be major factors in default⁽¹³⁾.

These factors underscore the importance of contextualizing findings within the specific regional context and considering the nuanced interplay of healthcare delivery, patient behaviours, and research methodologies when interpreting study outcomes in TB management.

CONCLUSION

The study reveals that the primary reason for treatment default among tuberculosis patients in a tertiary care centre is a lack of knowledge about the harm of defaulting and the severity of the disease (31%). Other significant factors include adverse effects (18%), a sense of well-being (13%), alcohol abuse (12%), poor interaction with DOTS providers (9%), travelling away from the DOTS centre (7%), social stigma (6%), and pill burden (4%).

These findings highlight the need for extensive educational interventions to increase patient awareness of tuberculosis and the risks associated with treatment non-adherence. Enhancing patient-provider interactions and actively managing side effects are crucial for improving adherence. Tailored support and education programs can significantly reduce default rates and improve treatment outcomes for both drug-sensitive and multi-drug-resistant TB patients.

Limitations

The generalisability of the study's findings may be restricted by regional disparities in healthcare facilities and access throughout Rajasthan. Issues with the study's methodology, such as the reliance on retrospective data, small sample sizes, and incomplete patient histories, may compromise the accuracy of the results. Additionally, cultural and behavioural differences across the region could introduce biases, affecting the applicability of the conclusions. Therefore, it is essential to approach the interpretation of these findings with caution and consider context-specific factors when formulating broader healthcare policies and tuberculosis treatment strategies.

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