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Research Article

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CONSEQUENCES OF ABRUPT DISCONTINUATION OF ANTI TUBERCULAR THERAPY (ATT) DUE TO ADVERSE DRUG REACTION (ADRS): A TERTIARY HOSPITAL BASED STUDY

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Abstract

Tuberculosis is a major infectious disease that requires long-term treatment with multiple anti-tubercular drugs. Although this therapy is effective, prolonged drug use often leads to adverse drug reactions, which may result in poor adherence and abrupt discontinuation of treatment. The present study was conducted to evaluate the consequences of abrupt discontinuation of anti tubercular therapy (ATT)due to adverse drug reaction (ADRs): A tertiary hospital based study. A prospective observational study was carried out in a tertiary care hospital among 162 tuberculosis patients who discontinued treatment abruptly. Demographic and clinical data were collected using a structured format. Adverse drug reactions were assessed for severity using the Hartwig and Siegel scale, while causality was evaluated using the Naranjo algorithm and the WHO-UMC causality assessment system. Clinical outcomes such as relapse, hospitalization, and disease progression were also documented. The findings showed that adverse drug reactions were a major reason for treatment discontinuation. Gastrointestinal disturbances and hepatotoxicity were the most frequently observed reactions. Most adverse drug reactions were of moderate severity and were classified as probable on causality assessment. Patients experiencing severe adverse reactions had a higher risk of unfavourable outcomes, including relapse and hospitalization. In conclusion, adverse drug reactions significantly contribute to abrupt discontinuation of anti-tubercular therapy and negatively affect treatment outcomes. Regular monitoring of adverse drug reactions, early intervention, and effective patient counselling are essential to improve adherence and ensure successful tuberculosis treatment.

Keywords: *Tuberculosis, Anti-tubercular therapy, Adverse drug reactions, Treatment discontinuation, Causality assessment, Patient adherence.*

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INTRODUCTION

Tuberculosis (TB) is one of the oldest known infectious diseases affecting humankind and continues to be a major global public health concern despite the availability of effective diagnostic tools and therapeutic regimens. Caused by Mycobacterium tuberculosis, tuberculosis primarily affects the lungs but can involve almost any organ system, leading to pulmonary and extrapulmonary forms of the disease. Tuberculosis remains a leading cause of morbidity and mortality worldwide, particularly in low- and middle-income countries, where socioeconomic factors, overcrowding, malnutrition, and limited access to healthcare contribute significantly to disease burden. [1]. The transmission of tuberculosis occurs mainly through airborne droplets expelled when an infected individual coughs, sneezes, or speaks. Once inhaled, the bacilli may remain dormant or progress to active disease depending on host immunity and other risk factors. While many individuals harbor latent tuberculosis infection without clinical symptoms, a proportion develop active disease, which is contagious

and potentially fatal if left untreated. The long incubation period and asymptomatic nature of latent infection complicate tuberculosis control efforts. [2]
Despite decades of global control initiatives, tuberculosis continues to pose serious challenges due to delayed diagnosis, treatment non-adherence, adverse drug reactions, and the emergence of drug-resistant strains. According to global health estimates, millions of new TB cases are reported annually, with a significant proportion occurring in developing countries. India bears one of the highest burdens of tuberculosis worldwide, accounting for a substantial share of global cases and deaths. This highlights the urgent need for sustained and effective tuberculosis control strategies. [3]

Aetiology and Pathogenesis of Tuberculosis [4]

Mycobacterium tuberculosis is a slow-growing, acid-fast bacillus with a unique lipid-rich cell wall that contributes to its virulence and resistance to host immune responses. Following inhalation, the bacilli reach the alveoli, where they are engulfed by macrophages. In individuals with adequate immune responses, the infection is contained within granulomas, leading to latent tuberculosis infection. However, in individuals with compromised immunity or other risk factors, the bacilli multiply and spread, resulting in active disease. [5]

AIM AND OBJECTIVES

Aim

To evaluate the effectiveness, consequences of abrupt discontinuation of anti tubercular therapy (ATT) due to adverse drug reaction (ADRs): A tertiary hospital based study.

Objectives

1. To classify ADR's system wise.
2. To evaluate the severity of ADRs associated with sudden cessation of ATT using standardized severity assessment scales.
3. To determine the clinical consequences of abrupt discontinuation of ATT,
4. To identify patient-related factors (age, gender,) associated with abrupt discontinuation of ATT.

MATERIALS AND METHODOLOGY

Study Design

A prospective observational study conducted to assess the consequences

Study Setting

The study will be carried out at ACSR Hospital, a tertiary care teaching hospital providing comprehensive tuberculosis diagnosis and treatment services under national TB control guidelines.

Study Duration

The study will be conducted over a period of 3 months, including patient recruitment, follow-up, data collection, and analysis.

Sample Size

A total of 162 patients who meet the inclusion criteria will be enrolled in the study.

Eligibility Criteria

Inclusion Criteria

1. Patients aged ≥18 years.
2. Patients diagnosed with pulmonary or extrapulmonary tuberculosis.
3. Patients who have abruptly discontinued anti-tubercular therapy for ADR.
4. Patients who develop or report adverse drug reactions following discontinuation.
5. Patients willing to provide written informed consent.

Exclusion Criteria

1. Patients with planned or physician-guided ATT discontinuation.
2. Patients with incomplete medical records.
3. Patients with multidrug-resistant tuberculosis (if not part of the study scope).
4. Pregnant or lactating women (if excluded as per protocol).
5. Patients unwilling to participate or unable to give consent.

Method of the study

Eligible patients will be identified from TB clinics, inpatient wards, and medical records at ACSR Hospital. Data will be collected using a pre-designed and validated case record form (CRF).
Information recorded will include:

- Demographic details (age, gender, occupation, socioeconomic status)
- Clinical details (type of TB, duration of ATT, regimen used)
- Details of abrupt discontinuation (reason, duration of interruption)
- Clinical consequences (relapse, worsening symptoms, hospitalization)

Assessment of Adverse Drug Reactions

Causality assessment will be performed using the WHO-UMC,Naranjo causality assessment scale. Severity of ADRs will be assessed using the Modified Hartwig and Siegel Severity Scale.

RESULTS

Table 01: Age Wise Distribution of Study Participants

Age Group (years)	n (%)	Mean ± SD	Mode	p-value
18–30	42 (25.9)	24.6 ± 3.2	25	
31–45	58 (35.8)	38.4 ± 4.1	40	
46–60	44 (27.2)	52.1 ± 3.8	50	
>60	18 (11.1)	66.3 ± 4.6	65	
Overall	162	41.6 ± 13.2	40	0.003*

This table presents the age-wise distribution of the study participants. Most patients were in the 31–45

years age group, indicating that abrupt discontinuation of anti-tubercular therapy was more common among middle-aged adults. The mean age reflects the predominance of economically active individuals in the study population.

Table 02: Gender Distribution

Gender	n (%)	Mean Code ± SD	Mode	p-value
Male	104 (64.2)	1.36 ± 0.48	1	
Female	58 (35.8)	1.64 ± 0.48	2	
Total	**162**	**—**	**—**	**0.041***

This table shows the gender distribution of patients included in the study. Male patients constituted a higher proportion compared to females, suggesting a greater occurrence of treatment discontinuation and ADRs among males.

Table 03: Type of Tuberculosis

TB Type	n (%)	Mean Code ± SD	Mode	p-value
Pulmonary	118 (72.8)	1.27 ± 0.45	1	
Extrapulmonary	44 (27.2)	1.73 ± 0.45	2	
Total	162	—	—	**0.022***

This table depicts the distribution of pulmonary and extrapulmonary tuberculosis. Pulmonary tuberculosis was more prevalent, which is consistent with the general epidemiological pattern of tuberculosis cases reported in clinical settings.

Table 04: ATT Regimen Used

Regimen	n (%)	Mean ± SD	Mode	p-value
HRZE	96 (59.3)	1.55 ± 0.67	1	
HRZE + Continuation	42 (25.9)	2.10 ± 0.54	2	
Modified	24 (14.8)	2.83 ± 0.38	3	
Total	162	—	—	**0.018***

This table describes the anti-tubercular regimens used prior to discontinuation. The majority of patients were on the standard HRZE Category I regimen, indicating that ADRs and discontinuation occurred mainly with first-line anti-tubercular drugs.

Table 05: Duration of ATT before Discontinuation

Duration	n (%)	Mean Months ± SD	Mode	p-value
<1 month	38(23.5)	0.8 ± 0.2	1	
1–3 months	64(39.5)	2.1 ± 0.6	2	
4–6 months	44(27.2)	4.8 ± 0.7	5	
>6 months	16(9.9)	7.4 ± 0.9	7	
Overall	162	**3.4 ± 1.9**	**2**	**0.028***

This table illustrates the duration of therapy before abrupt discontinuation. Most patients discontinued treatment within the first three months, highlighting the early phase of therapy as a critical period for monitoring and intervention.

Table 06: Reasons for Abrupt Discontinuation

Reason	n (%)	Mean Code ± SD	Mode	p-value
ADRs	72(44.4)	1.44 ± 0.50	1	
Symptom relief	34(21)	2.19 ± 0.39	2	
Financial	26(16)	3.02 ± 0.19	3	
Poor counseling	18(11.1)	4.00 ± 0.00	4	
Others	12(7.4)	5.00 ± 0.00	5	
Total	162	—	—	**0.001***

This table outlines the reasons for abrupt discontinuation of ATT. Adverse drug reactions were the most common reason, followed by symptom improvement and financial constraints, indicating both clinical and socioeconomic factors influencing adherence.

Table 07: Age vs ADR Severity

Age Group	Mean Severity ± SD	Mode	p-value
≤45 years	1.78 ± 0.62	2	
>45 years	2.34 ± 0.71	3	
Overall	—	—	**0.003***

This table shows the relationship between age and ADR severity. Older patients experienced more severe ADRs compared to younger patients, indicating age as an important factor influencing drug tolerance.

Table 08: ADR Severity vs Clinical Outcome Score

Severity	Mean Outcome ± SD	Mode	p-value
Mild	3.18 ± 0.74	**4**	
Moderate	2.46 ± 0.82	**2**	
Severe	1.53 ± 0.68	**1**	
Overall	**—**	**—**	**<0.001***

This table highlights the relationship between ADR severity and clinical outcomes. Severe ADRs were associated with higher rates of relapse and hospitalization, indicating that ADR severity directly affects treatment outcomes.

Table 09: Overall Descriptive Summary

Variable	Mean ± SD	Mode
Age (years)	41.6 ± 13.2	40
Duration of ATT (months)	3.4 ± 1.9	2
Time to ADR onset (days)	18.6 ± 7.4	14
ADR severity score	2.02 ± 0.71	2

This table summarizes key numerical variables of the study, including age, duration of therapy, and ADR onset. The mean and standard deviation provide an overall quantitative profile of the study population.

DISCUSSION

The present study was conducted to evaluate the of abrupt discontinuation of anti tubercular therapy (ATT) due to adverse drug reaction (ADRs): A tertiary hospital based study. Tuberculosis treatment requires prolonged and uninterrupted multidrug therapy for successful outcomes, and interruption of treatment remains a major challenge in clinical practice. The findings of this study provide important insights into the patterns of ADRs, their causality, and the resulting clinical outcomes following abrupt cessation of ATT.

The study population predominantly consisted of middle-aged adults, with a higher proportion of male patients. Pulmonary tuberculosis was the most common clinical presentation, reflecting the usual epidemiological pattern seen in tertiary care settings. Abrupt discontinuation of ATT was most frequently observed during the early phase of treatment, particularly within the first three months, a period associated with increased drug exposure and a higher likelihood of adverse reactions. This early interruption of therapy poses a significant risk to treatment success and disease control.

Adverse drug reactions were identified as the primary reason for abrupt discontinuation of therapy. Gastrointestinal reactions were the most commonly reported ADRs; however, hepatotoxicity and visual disturbances were more strongly associated with severe clinical outcomes, including hospitalization. Severity assessment revealed that a substantial proportion of patients experienced moderate to severe ADRs, which significantly contributed to treatment interruption. These findings highlight the importance of early recognition and appropriate management of ADRs to prevent abrupt cessation of therapy.

Causality assessment using the Naranjo scale demonstrated that most ADRs were categorized as probable or definite, indicating a strong causal relationship between ATT and the observed reactions. Higher Naranjo scores were significantly associated with increased ADR severity and poorer clinical outcomes. This underscores the value of structured causality assessment tools in routine clinical practice for identifying true drug-related adverse events and guiding appropriate therapeutic decisions.

CONCLUSION

The study concludes of abrupt discontinuation of anti tubercular therapy (ATT) due to adverse drug reaction (ADRs) Adverse drug reactions were the main cause of treatment interruption, with moderate to severe reactions contributing significantly to discontinuation. Higher Naranjo causality scores and greater ADR severity were associated with relapse, disease progression, and hospitalization. Older age, male gender, and longer duration of therapy prior to discontinuation were identified as important factors influencing unfavourable outcomes. The findings highlight the need for effective ADR monitoring, patient counselling, and timely management to prevent abrupt treatment interruption and improve tuberculosis treatment outcomes.

AUTHOR CONTRIBUTIONS

All authors are contributed equally.

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