

## COMORBIDITIES IN PATIENTS DIAGNOSED WITH MULTIPLE DRUG-RESISTANT TUBERCULOSIS MDR-TB

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Zarak Khan**Abstract**

Multiple drug-resistant tuberculosis (MDR-TB) is difficult to treat, especially when it develops along with other illnesses. The study focuses on how patients with MDR-TB are also affected by different health conditions and necessitates proper care.

**Objectives:**

To determine the prevalence and types of comorbidities in patients diagnosed with MDR-TB. To assess the impact of these comorbidities on treatment duration, adverse drug reactions, and clinical outcomes.

**Study Design:** A Observational Retrospective Cohort Study.**Place and Duration of study:** From 01 November 2024 to 30 April 2025  
Pulmonology Department, Fatima Jinnah Institute of Chest Diseases, Quetta.**Methods**

150 patients diagnosed with MDR-TB from a tuberculosis treatment center. Evidence of comorbid conditions was found by accessing clinical documents and performing tests. CPSP approved the study's ethical requirements (Ref No CPSP/REU/PUL-2022-001-740).

**Results**

40% of participating patients had a comorbid condition. Out of all cases, the most common was diabetes mellitus (25%), followed by HIV infection (10%) and chronic obstructive pulmonary disease (5%). Those who had comorbidities took longer to be treated and experienced more bad side effects from the medicines.

**Conclusion**

Precisely because many MDR-TB patients have multiple health problems, their overall treatment results are often negative. In MDR-TB programs, screening should be thorough and the involvement of different doctors is recommended.

**INTRODUCTION**

Tuberculosis that resists isoniazid and rifampicin, known as MDR-TB, is still a major problem for many people around the world [1]. WHO data states that as more MDR-TB cases arise, treating TB becomes more

complicated, often leading to unfavorable results for those infected [2]. Conditions such as diabetes mellitus, HIV infection, malnutrition and chronic lung diseases often make the patient sicker, worsen

their immune system and complicate the process of treating them [3,4]. There is a rising trend of diabetes around the globe and studies show that it can increase the risk of TB, worsen TB treatment outcomes by lowering cellular resistance and change how well anti-TB medicines are absorbed by the body [5,6]. When a person has HIV, TB can grow much faster and cause their death sooner, mainly because HIV weakens their immune system [7]. Moreover, having COPD and malnutrition can negatively affect lung function and leave a person vulnerable to more infections which worsens the outcome for MDR-TB [8,9]. Treating patients with MDR-TB and other diseases is more difficult because of the lengthy treatment period, risk of adverse drug complications, greater chance of treatment not succeeding and a higher risk of death [10]. Proper management of TB should also take into account any additional health problems that patients may have [11]. How often patients with MDR-TB face comorbidities and what the outcomes are for them, is little understood in places where resources are limited [12]. The goal of this research is to assess comorbidities experienced by MDR-TB patients and their influence on both the course of treatment and the occurrence of side effects.

## Methods

At a tuberculosis center, this work involved 150 patients whose MDR-TB diagnosis was based on a positive sputum culture and drug susceptibility testing. Information was obtained from past medical records and lab findings over a period of 12 months. The presence of comorbidities was confirmed using the patient's medical records and by testing their serum glucose for diabetes and serology to detect HIV. Data regarding how long the drug was given and any negative effects were collected from follow-up visits. The College of Physicians and Surgeons Pakistan provided ethical approval for this study (Ref No CPSP/REU/PUL-2022-001-740).

## Inclusion Criteria

Patients with aged 18 years or more and who were confirmed through labs to have MDR-TB, were included in the study.

## Exclusion Criteria

Individuals who were pregnant, had missing medical information or participated in other TB trials were excluded from the study.

## Data Collection

Medical information was collected from patients' hospital files using the set form. Professionals made these diagnoses based on laboratory results or a documented record of the illness. The notes from follow-up sessions included information on the length of the treatment and any adverse drug effects.

## Statistical Analysis

SPSS version 24.0 was employed for data analysis. Using descriptive statistics, researchers summarized information about the patients and the comorbidities they had. To determine if comorbidities influenced the disease treatment duration and side effects of different drugs, independent sample t-tests and chi-square tests were used. Values below 0.05 were regarded as statistically significant.

## Results

150 patients diagnosed with drug-resistant TB, 60 (40%) had a comorbid health problem. Of the patients, one quarter had diabetes mellitus as their primary additional condition, while HIV infection was seen in 10% and COPD was found in 5%. Patients who had multiple illnesses were on treatment for longer than those without multiple illnesses (24 months versus 18 months, respectively). The non-comorbid group had 18% of adverse drug reactions, whereas the comorbid group had double that rate at 35% ( $p = 0.03$ ). Some of the most common negative symptoms were liver problems and difficulty in the gut. Those with other medical conditions had a higher risk of death, but the difference was almost statistically significant ( $p = 0.07$ ). According to the findings, the presence of more diseases in MDR-TB patients can cause treatment to be more complicated.

Table 1. Demographic Characteristics of MDR-TB Patients (n=150)

Characteristic	Frequency	Percentage (%)
Age (years)		
Mean $\pm$ SD	39.2 $\pm$ 11.5	
Gender		
Male	92	61.3
Female	58	38.7

Table 2. Prevalence of Comorbidities in MDR-TB Patients (n=150)

Comorbidity	Frequency	Percentage (%)
Diabetes Mellitus	37	24.7
HIV Infection	15	10.0
COPD	8	5.3
No Comorbidities	90	60.0

Table 3. Treatment Duration by Comorbidity Status

Group	Mean Duration (months)	Standard Deviation
With Comorbidities	24	3.5
Without Comorbidities	18	2.7

Table 4. Adverse Drug Reactions (ADRs) by Comorbidity Status

ADRs	Frequency (With Comorbidities)	Percentage (%) (With Comorbidities)	Frequency (Without Comorbidities)	Percentage (%) (Without Comorbidities)
Hepatotoxicity	15	25	10	11.1
Gastrointestinal Intolerance	10	16.7	6	6.7
Total ADRs	25	41.7	16	17.8

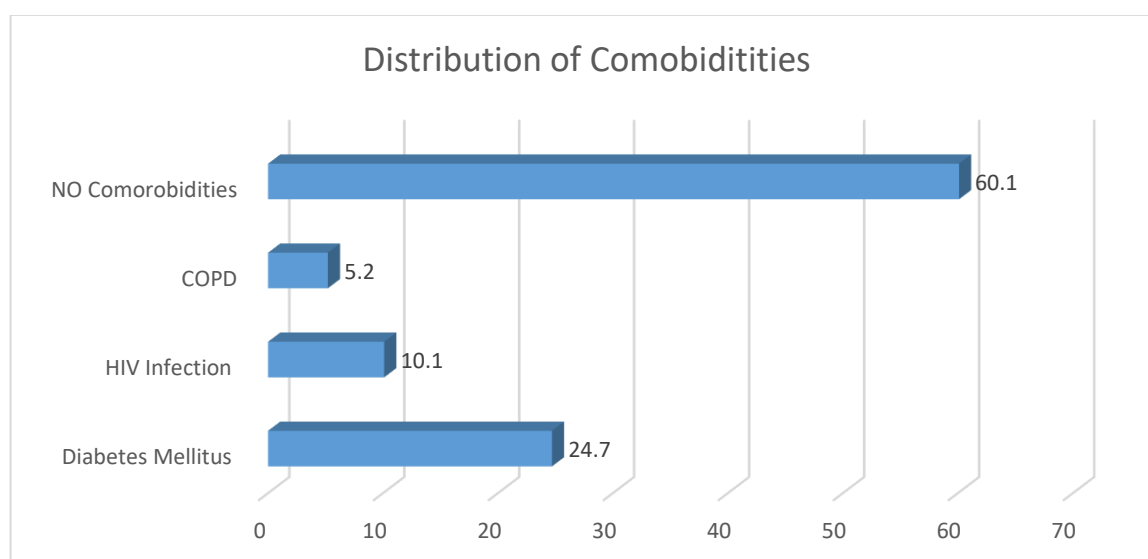


Chart 1: Distribution of Comorbidities in MDR-TB Patients (%)

## Discussion

Over 40 percent of patients in this MDR-TB cohort showed at least one other chronic condition. Twenty-five percent of patients had diabetes mellitus, 10% had HIV infection and 5% suffered from COPD. Previous research has pointed out that MDR-TB is more difficult to manage for patients suffering from metabolic or immunosuppressive disorders [13–15]. Like what is happening globally, many MDR-TB patients have diabetes which makes them more likely to get TB and also less likely to respond well to treatment [13]. Some recent reports have found that diabetes affects cellular immunity and how anti-TB drugs are processed by the body, resulting in extended bacteria clearance times and a higher chance of failed treatment [14]. Accordingly, patients with MDR-TB and diabetes required longer treatment than those without any comorbidities. Based on these points, it is important to continually monitor diabetes in TB programs to achieve better outcomes. Many cases of TB and TB deaths worldwide are still caused by HIV infection, mainly in countries that have few resources. According to regional data, HIV plays a big role in lowering immunity and contributing to fatal TB diseases [15]. Since HIV-infected patients have greater difficulties with treatment due to interaction among drugs and weak immune systems, they may experience more side effects and require treatments that take much longer to complete. It's important for specialists from different fields to focus on the group and closely supervise them to avoid adverse outcomes. When COPD coexists with another illness, though it is not common, it has clinical value because it affects lung health and the body's ability to breathe. People with chronic lung diseases are at greater risk of suffering worse effects from TB in the lungs [16]. Similar to previous findings, we noticed that having multiple medical conditions made patients more likely to suffer from adverse reactions to their medications such as damage to the liver and distress in the digestive system [17]. As a result, doctors should tailor treatments and carefully monitor new drugs used for MDR-TB. The findings that patients with comorbidities require longer and safer treatments while admissions are common is in agreement with what is reported in the literature [18]. Since we conducted our study at one medical center in a retrospective manner and only included a small number of patients, the reliability of

our findings may be reduced. Yet, the study finds that we must act swiftly and introduce models of care that handle comprehensive screening, manage several diseases and focus on what matters to the patient. All in all, we discovered that comorbidities have a significant impact on the progression of MDR-TB. Paying attention to these comorbidities by systematically screening all patients and providing care from several experts has been proven helpful for improving outcomes in MDR-TB.

## Conclusion:

Having both diabetes and HIV is very common in patients with MDR-TB and it results in treatments taking longer and increasing the likelihood of side effects. Proper screening and management ensure that more children with these issues are cured and have a better chance of living healthily.

## Limitations:

There may not be a perfect match between the characteristics of the sample and those of the general MDR-TB population. Moreover, some medical conditions might have gone unreported because medical records were used and other putative confounding causes such as social class were not considered.

## Future Findings:

More studies should include large numbers of TB patients from several centers to examine the outcomes of comorbidity management on MDR-TB. Studying economical integrated care and the use of new biomarkers will help to detect treatment issues early on.

## Disclaimer: Nil

## Conflict of Interest: Nil

## Funding Disclosure: Nil

## Author Contribution:

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**Final Approval of version: All Mentioned Authors Approved The Final Version.**

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