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Psychiatric Illness (Depression, Anxiety, Psychosis) in patients of Drug-Resistant Tuberculosis

[1]Sarandha Srivastava, [2]Sameer G. Kotalwar, [3]Jigna Dave, [4]Bharat N. Panchal and [5]Jilan R. Mehta

[1]Department of Psychiatry, B.J. Medical College, Ahmedabad, Gujarat, India

[2]Consultant Pulmonologist, Nanded, Maharashtra, India

[3]Department of Pulmonary Medicine, Govt. Medical College, Bhavnagar, Gujarat, India

[4]Department of Psychiatry, Govt. Medical College, Bhavnagar, Gujarat, India

[5]Consultant Pulmonologist, Bhavnagar, Gujarat, India

ABSTRACT

Tuberculosis (TB) is an infectious disease caused by the bacteria Mycobacterium tuberculosis, affecting various systems of the body. It is a leading cause of mortality worldwide. Psychological factors, including stigma, isolation, limited social support, feelings of helplessness and the negative impact of medication side effects, can significantly affect treatment adherence. The aim of this study was to examine the occurrence of major depressive disorder, anxiety disorders and psychosis in patients with Drug Resistant-Tuberculosis. This study was observational and cross-sectional, conducted at a single-center using interviews. Forty-one consecutive patients diagnosed with drug resistant-tuberculosis according to the WHO-RNTCP definition were enrolled from a tertiary care hospital. All patients were interviewed to assess the presence of Major Depressive Disorder, anxiety disorders and psychosis using the criteria outlined in the DSM-5. The severity of depressive symptoms, anxiety symptoms and psychosis were evaluated using the Hospital Depression Scale, Hospital Anxiety Scale and Brief Psychiatric Rating Scale, respectively. The proportions of participants were compared using the chi-square test, while the scores from the HADS A, HADS D and BPRS scales were analyzed using the Mann Whitney test and Kruskal-Wallis test, followed by Dunn's post-hoc multiple comparisons. The study found that 56% of patients with drug-resistant tuberculosis had a psychiatric illness. Among these, the frequencies of Major Depressive Disorder, anxiety disorders and psychosis were 41 and 20%, respectively. Patients with drug-resistant tuberculosis demonstrated a high prevalence of depression, anxiety and psychosis.

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Key Words
MDR tuberculosis, depression, anxiety, psychosis

Corresponding Author
Sameer G. Kotalwar,
Consultant Pulmonologist, Nanded, Maharashtra, India

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INTRODUCTION

Tuberculosis (TB) is an infectious disease caused by the bacterium Mycobacterium tuberculosis, which affects various systems of the body. It is a major cause of death globally[1]. Multiple Drug Resistant-Tuberculosis (MDR-TB) refers to strains of Mycobacterium tuberculosis that are resistant to at least two of the most effective anti-tuberculosis drugs, isoniazid (INH) and rifampicin. Second-line drugs used to treat MDR-TB, such as fluoroquinolones, cycloserine, ethionamide/protionamide, kanamycin/amikacin, capreomycin and para-aminosalicylic acid, are generally less effective and more toxic than the first-line medications. The treatment for MDR-TB is prolonged, lasting 18-24 months and patients often experience frequent adverse reactions, making successful management of MDR-TB challenging[1].

Individuals with compromised immune systems are at the highest risk of exposure and illness. The emergence of drug-resistant tuberculosis (TB) strains is contributing to a global public health crisis. A survey conducted in 2000 found that multidrug-resistant TB (MDR-TB) was present in all 72 countries surveyed[2]. Current estimates suggest that there are approximately 273,000 new cases of MDR-TB annually[3]. From 1985 onwards, there has been a resurgence of TB, primarily affecting specific groups such as the homeless, individuals who are HIV positive[4-6], those with a history of alcohol or drug abuse[7] and immigrants from countries where TB is widespread[8]. Many mentally ill patients possess one or more of these risk factors[9], potentially leading to an overrepresentation of TB in this population. Conversely, psychiatric disorders may develop after TB infection, with mood disorders being particularly prevalent among TB patients compared to individuals with other medical conditions[10,11].

Research studies have shown that psychiatric comorbidity[12], regardless of the timing of tuberculosis onset and psychological factors such as stigma, isolation[13], lack of social support, feelings of helplessness and psychological reactions to the diagnosis and medication side effects all have a negative impact on treatment adherence[14].

Studies have also found a high prevalence of psychiatric comorbidity among patients with drug-resistant tuberculosis and the frequency of depression is significantly correlated with the severity and duration of the disease[14-15]. Although, adverse effects associated with MDR-TB treatment can be effectively managed, specific side effects require special attention[16]. Psychiatric illnesses such as psychosis and depression greatly impact the quality of life for patients, highlighting the importance of managing and treating these psychiatric conditions. Psychiatric complications associated with anti-tuberculosis therapy have been observed since the 1950s[17]. While cycloserine (CS) and isoniazid (INH) are commonly associated with significant psychiatric morbidity, other drugs like ethionamide (ETH), ethambutol (EMB) and fluoroquinolones have also been reported in individual cases[18,19]. Severe psychiatric conditions, including suicidal ideation/attempts, depression and anxiety, have been reported in 9.7-50% of individuals receiving cycloserine[18,19]. Less commonly, isoniazid has been linked to neuropsychiatric side effects such as depression, obsessive-compulsive neurosis and attempted suicide[20].

In addition to drug toxicity, psychosocial factors contribute to the development of psychiatric complications during MDR-TB therapy, ultimately affecting patients' adherence to their treatment regimens.

MATERIALS AND METHODS

We conducted a study to examine the occurrence of psychiatric disorders, namely Major Depressive Disorder (MDD), anxiety disorders and psychosis, in patients with drug-resistant tuberculosis (DR-TB). Additionally, we explored the relationship between various socio-demographic factors and the duration of anti-tuberculosis treatment (AKT) with the aforementioned psychiatric disorders.

This study was observational, cross-sectional and conducted at a single centre. It involved interviewing forty-one consecutive patients diagnosed with DR-TB (according to the WHO-RNTCP definition) in a tertiary care hospital from October 2015 to March 2016. The patients provided written and informed consent before participating. The diagnosis of Major Depressive Disorder, anxiety disorders and psychosis was made using the criteria outlined in the DSM-5. The severity of depressive symptoms, anxiety symptoms and psychosis were assessed using the Hospital Depression Scale, Hospital Anxiety Scale and Brief Psychiatric Rating Scale, respectively[21-23].

Furthermore, patients were interviewed to determine the severity of their depression and anxiety using the Hospital Anxiety and Depression Scale (HADS)[22]. The HADS is a self-assessment scale specifically designed to measure the psychological condition of patients with physical illnesses, enabling the evaluation of depression and anxiety independent of physical factors. It consists of 7 items related to anxiety (HADS-A) and 7 items related to depression (HADS-D).

Each item is scored from 0 to 3, with a diagnosis of the respective symptoms made according to the following scale:

- 0-7 points indicate no symptoms present
- 8-10 points indicate possible affliction
- 11-21 points indicate that symptoms are present

The brief psychiatric rating scale (BPRS) is one of several tools that help researchers study people with schizophrenia and related psychotic disorders. They use it to track changes in symptoms over time. The standard 18-item version has been used for more than 40 years, with each symptom rated on a severity scale of 1-7:

- Somatic concern
- Anxiety
- Depression
- Guilt
- Hostility
- Grandiosity
- Suspiciousness
- Hallucinations
- Unusual thought content
- Disorientation
- Conceptual disorganization
- Blunted affect
- Emotional withdrawal
- Motor retardation
- Tension
- Uncooperativeness
- Excitement
- Mannerisms
- Posturing

With the expansion of its application beyond inpatient settings, three new scales were incorporated into the assessment tool to detect potential deterioration in outpatient individuals: (1) Bizarre behaviors, (2) Self-neglect and (3) Suicidality. Additionally, three scales were included to evaluate symptoms specifically associated with a manic phase of the illness: (1) Elated mood, (2) Distractibility and (3) Motor hyperactivity[24].

The duration of the administration can vary between 10-40 min, depending on the familiarity of the interviewer with the patient and the number of reported symptoms. To ensure consistent results, the use of anchor points, rater training and a standardized interview protocol are employed[25].

Qualitative data was presented as percentages, while quantitative data was expressed as median ± interquartile range. Statistical analysis was performed using GraphPad InStat version 3.06 (San Diego, California, US). The proportion of participants was compared using the chi-square test, while the scores from the HADS-A, HADS-D and BPRS scales were analyzed using the Mann-Whitney test and Kruskal-Wallis test. Dunn's post-hoc multiple comparisons were subsequently applied.

RESULTS

We enrolled a total of forty-one consecutive patients who were diagnosed with Drug-Resistant Tuberculosis (DR-TB) according to the WHO-RNTCP Definition. These patients were registered in a tertiary care hospital between October 2015 and March 2016. Their recruitment was based on consecutive order, meaning that patients were included in the study as they presented themselves sequentially.

During the enrolment process, we collected socio-demographic information as well as other relevant historical characteristics of these patients. These details provide insight into their background and contextual factors that may be important for the study.

Table 1 presented as percentage. In the present study, 63 (%) were males and 37(%) were females among 41 patients. The mean age of the patient was 31 years.

Table 2 presented as No. (%). Diagnosis of major depressive disorder was made by clinical interview as per the DSM-V criteria[26].

Table 1: Socio-demographic characteristics and other factors suffering from DR-TB

Variables	Frequency (%)
Age	
<30	34
30-40	48
41-50	04
51-60	12
Gender	
Male	63
Female	37
Residence	
Rural	16
Urban	5
Town	25
Socio-economic status (BG prasad classification)	
Lower class	28
Lower middle class	39
Middle class	16
Upper middle class	12
Education	
Illiterate	36
Primary	49
Secondary	13
Graduate	02
Religion	
Hindu	73
Muslim	25
Others	2
Past h/o psychiatric illness	
Yes	0
No	100
Family h/o psychiatric illness	
Yes	0
No	100
Treatment	
Phase 1	63
Phase 2	37
Treatment modalities	
Category 1	07
Category 2	93
Tobacco use	
Yes	58
No	42

Table 2: Frequency of major depressive disorder and poor quality of sleep in patients with chronic low backache according to DSM-V criteria and on the basis of PQSI scores (global score >5) respectively

Variables	No of chronic low backache patients (N = 41) (%)
Major depressive disorder	41 (100%)
Psychosis	21 (51.21%)
Anxiety disorders	31 (75.61%)
Generalized anxiety disorder	17 (41.46%)
Phobia	07(17.07%)
Panic disorder	14 (34.14%)

There is higher frequency of MDD and anxiety in male patients and those who had tobacco addiction.

DISCUSSIONS

The prevalence of depression (41% vs. 2.7%), anxiety (41% vs. 3.5%) and psychosis (21% vs. 4.1%) observed in our cohort at baseline was higher than the prevalence in the general population of India[29]. Similar high rates of depression and anxiety among tuberculosis patients have been reported in other studies and these rates are likely influenced by social stigma, insufficient social support and the physiological impact of chronic illness[28-30] (Fig. 1 and 2).

The presence of psychopathology has been identified as a contributing factor to non adherence with therapy in respiratory conditions[31,32]. Psychiatric patients are not only at risk of contracting TB due to factors such as homelessness, unstable housing conditions and lack of basic necessities, but they also frequently struggle to comply with treatment for the same reasons[33]. In a previous study conducted on a tuberculosis population, a diagnosable mental disorder was found in 30.2% of the population[28]. TB is a chronic illness and research on chronic diseases has shown that psychological factors, particularly depression, as well as patients' perceptions of their illness, predict poor treatment adherence. To enhance adherence rates, healthcare workers involved in managing these patients should be alert to the possibility of underlying psychopathology and utilize available consultation and liaison psychiatric services[34]. Addressing psychological issues in patients with tuberculosis has the potential to significantly improve treatment adherence.

In the case of patients with Drug-Resistant Tuberculosis (MDR-TB), it is crucial for all healthcare professionals involved in their treatment to collaborate closely with psychiatric services. This is because there is a significant prevalence of depression and anxiety among these patients, which is often associated with the chronic nature of the disease and the socioeconomic stressors related to it. Numerous studies have consistently demonstrated that the presence of psychopathology, particularly depression, is a major contributing factor to treatment non-adherence among individuals with tuberculosis, regardless of regional or population differences.

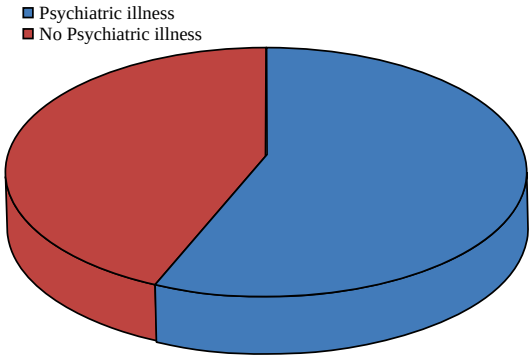

Fig. 1: DR-TB Patients classification according to psychiatry Illness

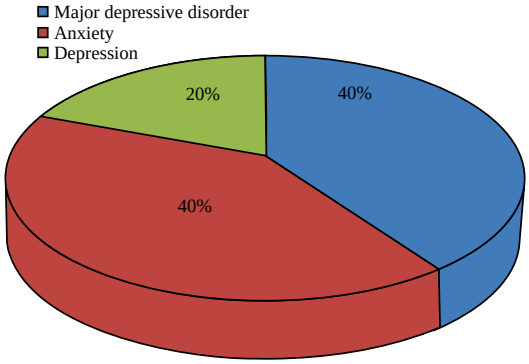

Fig. 2: Frequency of Psychiatric Illness in DR-TB Patients

Given the high incidence of depression among these patients, it is essential to effectively manage their mental health in order to improve treatment adherence and enhance their overall quality of life. The findings from these studies emphasize the importance of adopting a more comprehensive approach to healthcare programs, which includes the integration of mental health services. This would involve conducting pre-treatment psychiatric assessments, providing necessary interventions and ultimately reducing the default rate in tuberculosis control programs.

CONCLUSION

Tuberculosis continues to be a significant infectious cause of death globally. Research indicates that tuberculosis patients often experience elevated rates of depression and anxiety, which can be attributed to factors such as social stigma, limited social support and the physiological effects of living with a chronic disease. Moreover, patients with drug-resistant tuberculosis demonstrate a high prevalence of depression, anxiety and psychosis.

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