



## Frequency of Depression in Patients with Pulmonary Tuberculosis

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## ABSTRACT

**Background:** Pulmonary Tuberculosis (PTB) is a chronic infectious disease caused by mycobacterium tuberculosis. PTB remains a global health problem with an enormous burden of disease. It is a preventable disease and the associated mortality is reduced in recent few decades but it still remains one of the top ten causes of death globally. It has enormous psychological and social effects on affected individuals. A lot of patients develop depression during illness which can be managed in a better way with timely intervention. The present study was conducted to determine the frequency of depression in pulmonary tuberculosis patients.

**Methodology:** This descriptive, cross-sectional study was conducted at Pulmonology Department of a tertiary care teaching hospital in Pakistan from January 2020 till July 2020. Patients of both genders and age between 20-80 years having PTB with duration of 5 months or more were enrolled for study. Each patient underwent history, clinical examination and sputum microscopy, Gene Xpert and mycobacterial culture for the diagnosis of PTB. Depression was diagnosed using Hospital Anxiety and Depression Scale (HADS). All the above mentioned information along with age, gender and address was recorded on a proforma. Data was entered into SPSS version 24 for analysis. Depression was stratified among age and gender. Post stratification chi square test was used at 5% level significance.

**Results:** Out of total 225 patients 35% were in age range 20-40 years, 46% in age range 41-60 years and 19% in age range 51-80 years. Mean age of the participants was 41 ( $\pm$  14.49) years. There were 155 (69%) male patients while 70 (31%) patients were females. Mean weight was 63 ( $\pm$  11.45) Kg. Depression was diagnosed in 19% (n=43) patients while 81% (n=182) patients had no depression.

**Conclusion:** The frequency of depression was 19% in patients presenting with pulmonary tuberculosis. Proper assessment of these patients is required for timely diagnosis and management of depression in order to reduce the problems of these TB patients.

**Key Words:** Depression; Mycobacterium Tuberculosis; Pulmonary Tuberculosis

## Introduction

**P**ulmonary Tuberculosis (PTB) is a chronic disease known since centuries ago. It is an infectious disease caused by mycobacterium tuberculosis. TB remains a global health problem with an enormous burden of disease.<sup>1</sup> The health care workers and even the general community have become well aware that PTB is a preventable disease. Despite all measures taken for its prevention it still remains one of the top ten causes of death globally.<sup>2</sup> Global incidence of TB has been estimated to be 8.8 million cases annually. Among these, 81% of cases occur in 22 high TB burden countries alone.<sup>3</sup> In our country too TB is causing great sufferings in terms of mortality and morbidity. It is the ninth leading cause of death in our country and our country ranks fifth globally in terms of the absolute number of PTB cases.<sup>4</sup> Although TB incidence rates have been falling worldwide, the rate of decline is still very slow, and the rate of poor outcomes remains high.<sup>5</sup>

TB affects not only the physical health but also the psychosocial well being of patients.<sup>6</sup> Patients with TB may suffer from mental disorders. The causes include its long-term treatment, side effects of TB medications, social stigma and TB relapses in a majority of cases.<sup>7</sup> A depressive disorder is an illness that involves the body, mood and thoughts. It affects sleep, eating and thinking about surrounding world and about oneself. People suffering from depression cannot control his or her life events properly. This condition may last for weeks, months or years without treatment. According to World Health Organization (WHO) more than 350 million people suffer from depression and almost a million people take their own lives each year. In low - or middle - income countries most people with mental health problems remain either undiagnosed or don't receive proper treatment. The prevalence of depression is high among people with chronic diseases and several studies have reported that psychiatric morbidities are common in TB patients as well.<sup>8</sup> There is higher risk of depression in TB patients as compared to the general population.<sup>9</sup> Fears of TB infection and the perception of TB stigma causes serious socioeconomic consequences.<sup>5</sup> Depression and TB are important public health concerns, contributing 2.5% and 2.0%, respectively to Global Burden of Disease.<sup>10</sup>

The prevalence of depression has been studied by various researchers with varying reports. Ambaw et al reported probable depression in 54% of TB patients.<sup>11</sup> A Chinese study revealed that 17.73% of TB patients had probable depression.<sup>7</sup> In another study by Duko, et al in Ethiopia, depression was noted in 43.4 % of TB patients.<sup>9</sup> In our country a study reported depression in 80.1% of TB patients.<sup>12</sup>

The purpose of this study was to find out the frequency of depression in PTB patients in our population. The compelling force behind this idea was the finding that there is very limited data available in our Pakistani literature regarding this major problem. Therefore this study was conducted to determine the frequency of depression in pulmonary tuberculosis patients

### Operational Definitions:

**Pulmonary tuberculosis (PTB):** PTB was diagnosed if mycobacterium tuberculosis was detected in the sputum of an individual by smear microscopy with ZN staining, culture or by gene expert along with fever, anorexia, weight loss and cough of more than 2 weeks duration. It was also diagnosed when an individual with above symptoms had upper zone consolidation on chest radiograph but lacked any evidence of mycobacterium on smear microscopy with ZN staining, culture or gene expert.

**Depression:** Depression was diagnosed using a questionnaire, Hospital Anxiety and Depression Scale (HADS).

### Methodology

This descriptive, cross-sectional study was conducted at Pulmonology Department Ayub Teaching Hospital Abbottabad, Pakistan from January 2020 to July 2020 on 225 patients using consecutive non probability sampling technique. Sample size was calculated by using WHO software of sample size determination with the following assumption: Expected frequency of Depression in Pulmonary tuberculosis =17.73%; Confidence level =95%; Absolute precision =5%. Patients of both genders and age between 20-80 years having PTB with duration of 5 months or more as per operational definitions above were included while patients who were already diagnosed as cases of depression and were undergoing treatment for depression prior to onset of PTB, patients with multi

Table 1. Stratification of Depression with respect to age distribution (N=225)

| Depression | 20-40 years | 41-60 years | 61-80 years | Total | P-value |
|------------|-------------|-------------|-------------|-------|---------|
| Yes        | 15          | 20          | 8           | 43    |         |
| No         | 64          | 83          | 35          | 182   | 0.9929  |
| Total      | 79          | 103         | 43          | 225   |         |

Table 2. Stratification of depression with respect to gender distribution (n=225)

| Depression | Male | Female | Total | P-Value |
|------------|------|--------|-------|---------|
| Yes        | 30   | 13     | 43    | 0.8899  |
| No         | 125  | 57     | 182   |         |
| Total      | 155  | 70     | 225   |         |

drug resistant TB and retreatment cases of PTB were excluded.

After ethical approval from hospital ethical committee all new cases with PTB admitted in Pulmonology Department were enrolled. The purpose and benefits of the study were explained to the patients and informed written consent was obtained from every patient. Detailed history and clinical examination followed by relevant investigations including sputum microscopy, Gene Xpert and mycobacterial culture were done. For assessing depression Hospital Anxiety and Depression Scale (HADS) was utilized and patients of score 11 or above were considered as cases of depression. The obtained data was recorded on a proforma which was analyzed via SPSS version 24. Quantitative variables like age and weight were described as Mean±Standard deviation. Categorical variables like gender and depression were expressed as frequencies and percentages. Depression was stratified among age and gender. Post stratification chi square test was used with significance p value <0.05.

## Results

Among all 225 patients 79 (35%) were in age range 20-40 years, 103 (46%) in age range 41-60 years while 43 (19%) in age range 61-80 years. Mean age of the participants was 41 ( $\pm$  14.49) years. There were 155 (69%) male patients while 70 (31%) patients were female. Mean weight of the participants was 63 ( $\pm$  11.45) kg. Depression was diagnosed in 43 (19%) patients while 182 (81%) patients had no depression. Stratification of depression with different age groups and gender revealed no significant differences among different age and gender groups (p-values of 0.99 and 0.89 respectively) (table 1, 2).

## Discussion

Our study revealed that 19% patients with PTB had depression while 81% patients didn't have depression. Some researchers reported that 18.13% of their PTB patients suffered from depression. Those researchers used Patient Health Questionnaire-9 (PHQ-9) for the diagnosis of depression. They also reported significant anxiety symptoms in 18.37% of those patients according to HADS scale. Around one third of depressed patients also had anxiety symptoms, and vice versa. They investigated for any factors associated with depression and found that patients with dyspnea along with TB were

affected more by depressive symptoms compared to those having no dyspnea. They also observed that factors like age, divorce, abnormal body mass index (BMI) and low income were also related with the occurrence of depression.<sup>8</sup> We didn't study the associations and risk factors for depression in our TB patients.

An Ethiopian study revealed 43.4% prevalence of depression in TB patients. They found that the factors associated with depression were co-morbid HIV infection, poor social support and perceived TB stigma.<sup>9</sup> Ambaw et al revealed the prevalence of probable depression in 54.0% of TB patients. They used PHQ-9 for diagnosing depression in their study participants. They included patients of age 18 years and above in contrast to our study where patients of age range 20-80 years were included. Their inclusion criteria consisted of patients presenting to primary health care setting for TB treatment who were within one month of starting anti-TB treatment. In contrast to their study our inclusion criteria consisted of patients having PTB with duration of 5 months or more without taking into account the duration of TB treatment. They found that depression was more common in women as compared to men while our study didn't reveal any significant difference between male and female subjects regarding prevalence of depression.<sup>11</sup>

A local study observed the presence of depression in 80.1% patients suffering from PTB. This study revealed a higher number of patients suffering from depression as compared to the numbers in our study. There seems to be many reasons for this high level prevalence. They used Hamilton Rating Scale for Depression (HAMD) for diagnosis and quantification of depression in their subjects. They also demonstrated higher ratio of female patients suffering from depression as compared to male patients with PTB. This was in contrast to our findings where there was no significant difference among male and female patients. The average age of their study participants was 43.14 years  $\pm$ 14.9 SD which is very near to our findings, i.e; 41 years  $\pm$  14.49 SD. They also revealed no significant difference in the prevalence of depression among different age groups in their study participants. We also had the same findings where no significant difference could be observed among different age groups.<sup>12</sup>

Level of education as the probable cause of depression in different PTB individuals was studied by some research-

ers. They found that majority (i.e; 50%) of patients with PTB who suffered from depression were illiterate and 29.69% had education primary or below.<sup>12</sup> We were unable to study the level of education in our study participants but the findings of those researchers need attention and should be studied in a large population at multiple settings.

**Limitations of Study:** This was a small scale study and comprised of participants from a single center only. We didn't study the role of so many factors which may be responsible for the causation of depression in different individuals. Studying various possible factors in this regard in large scale multicenter longitudinal trials are recommended for exploring this problem.

### Conclusion

The frequency of depression was 19% in patients presenting with pulmonary tuberculosis. Proper assessment of these patients is required for timely diagnosis and management of depression in order to reduce the problems of these TB patients.

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