

Original Research Article

PREVALENCE OF DEPRESSIVE ILLNESS IN TUBERCULOSIS PATIENTS WITH POSITIVE SMEAR RESULTS, EXPERIENCE FROM A TERTIARY CARE HOSPITAL

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ABSTRACT

Background: Tuberculosis is the most common infectious disease worldwide. Tuberculosis is sometimes accompanied by psychological disturbance, of which depression is the most common. This study is designed to determine frequency of depression in smear positive tuberculous patients and to bring awareness to tuberculous patients to deal depression as a separate entity like TB. The objective is to establish the frequency of depressive illness in patients with pulmonary tuberculosis having positive smear results in a tertiary care hospital of Karachi by using CES-D scale. Study duration and place of study: This study was conducted at department of Medicine, Liaquat National Hospital, Karachi from March 2025 to March 2026

Materials and Methods: A total of 215 patients with pulmonary tuberculosis having positive smear results were included in the study. Depression was evaluated using prescribed questionnaire based on Centre for Epidemiologic Studies Depression Scale (CES-D). Patients with CES-D score >15 were considered having depression.

Results: The average age of the patients was 37.67±9.50 years. Frequency of depression in smear positive patients of pulmonary tuberculosis was observed in 46.05% (99/215).

Conclusion: We found that patients with pulmonary tuberculosis having positive smear results had high incidence of depression.

Keywords: Tuberculosis, Depression, Smear positive, CES-D scale, Anxiety.

INTRODUCTION

Tuberculosis is the most common infectious disease worldwide. Incidence in U.S. is about 6.3 cases per 100,000.^[1] Pakistan is on fifth number for high-burden of tuberculosis worldwide. It accounts for 61% of the TB burden in the WHO Eastern Mediterranean Region. In Pakistan, prevalence of tuberculosis is 620 per 100,000.^[2] Tuberculosis is frequently accompanied by psychological disturbance, of which depression is the most common.^[3] A survey performed in Philippines by Masumoto, 16.8% depressive disorder were reported among tuberculosis patients. Likewise, in another

research on tuberculosis patients, 72% incidence of anxiety disorder including moderate and severe anxiety was reported in tuberculosis patients. According to an observation 22% patients with anxiety and depression had multi drug-resistance (MDR-TB).^[4] These observations are very much critical since it could be crucially important negative survival factor among tuberculosis patients.^[5] Clinical manifestation of psychiatric illness in tuberculosis patients needs understanding by both, primary care provider and psychiatrist. This approach is mandatory for proper supplementation of successful anti tuberculous therapy among tuberculosis patients with depressive disorder.

Depression in the form of episodes of major depressive disorder have been observed to cause abandonment of Anti tuberculous therapy and sometimes, lead to death.^[6]

Since the smear positive patients require isolation for at least 6 weeks (or even more till they become smear negative), depression and anxiety rates expected to be much higher among these patients. We wanted to establish the exact prevalence of depressive disorder among this group of tuberculosis patients so that we could highlight the importance of psychiatric evaluation of these patients for successful tuberculosis eradication therapy.

Objective

We aimed to determine the frequency of depression in patients of pulmonary tuberculosis with positive smear results using CES-D scale.

MATERIALS AND METHODS

We performed a single center cross sectional study in which we collected data from outpatient department of medical unit Liaquat National Hospital, Karachi. It was a cross sectional study. We used a Non probability Consecutive sampling technique to collect the data.

Sample size: Using WHO calculator for sample size calculation we set the confidence interval (CI) of 95%, significance level of 0.05 and frequency of depression in tuberculosis patient of 16.8% (4), we measured a sample size of 215 patients.

Data Collection Procedure

Data was collected from patients coming to outpatient department of Medicine unit of Liaquat national hospital, Karachi after written consent. We randomly collected patients who were coming to OPD for routine/ medical check-up. This took 2 years to collect data for 215 patients. Strict protocols for isolation maintenances was followed including face mask application by both the patient and the interviewer. Only those patients were included in study who were having positive smear results for pulmonary tuberculosis. Depression assessed using a manual questionnaire based on Centre for Epidemiologic Studies Depression Scale (CES-D) (7), patient was considered depressed if CES-D score >15. Details of CES-D score are mentioned below.

Data Analysis Procedure

Data analysis was done by using SPSS version 21. Percentages and frequencies was computed for depression and gender. Quantitative variables like age, duration of Tuberculosis, CES-D score was presented by mean and standard deviation. Stratification was done to control effect modifiers like age, gender, duration of tuberculosis to observe the effect on depression in selected patients by using Chi-square test; p value ≤ 0.05 was considered as significant.

Screening for Depression

We have used Center for Epidemiologic Studies Depression Scale (CES-D) scale to assess depression in smear positive tuberculosis patients. This scale was published in 1977. It consists of 20 items included 4 positively worded and 16 negatively worded items. It measures somatic and affective aspects of depression. (8) scores for each response ranges from 0 to 60. Higher score indicates severity of depression.

Operational Definition

Pulmonary Tuberculosis with Positive Smear Results

Smear positive pulmonary tuberculosis was defined as at least one sample of sputum positive for Acid Fast Bacilli (AFB) smear by Zeihl Nielsen Staining.

Depression

Patients having Centre for Epidemiologic Studies Depression Scale (CES-D) score > 15 were labeled as depressed.

RESULTS

We included total of 215 patients with pulmonary tuberculosis who had positive smear results. The average age of the patients was 37.67 ± 9.50 years. Most of the patients were between 31 to 40 years of age. Incidence of depression was significantly high below 40 years of age as compared to above 40 years. 33% in age below 40 years and 12% in age above 40 years (p-value 0.011). Out of 215 cases, 115(53.49%) were male and 100(46.51%) were female. Depression rate 49% in female and 43.5% in males. This gender base difference was not statistically significant (p-value 0.418). Average duration of tuberculosis 11.07 ± 2.99 months. Frequency of depression in smear positive patients of pulmonary tuberculosis was observed in 46.05% (99/215).

Table 1: Descriptive Statistics of Study Patients

Statistics		Age (Years)	Duration of Tuberculosis (Months)
Mean		37.65	11.07
95% Confidence Interval for Mean	Lower Bound	36.37	10.67
	Upper Bound	38.93	11.48
Median		35	9
Std. Deviation		9.50	2.99
Minimum		21	6
Maximum		60	18
Interquartile Range		13	6

Table 2: Frequency of Depression in Patients of Pulmonary Tuberculosis with Positive Smear Results by Using Ces-D Scale with Respect to Age Groups

Age Groups (Years)	Depression		Total
	Yes	No	
21 to 30 Years	33(64.7%)	18(35.3%)	51
31 to 40 Years	39(42.9%)	52(57.1%)	91
41 to 50 Years	20(41.7%)	28(58.3%)	48
51 to 60 Years	7(28%)	18(72%)	25

Chi-Square=11.16; p=0.011

Table 3: Frequency of Depression in Patients of Pulmonary Tuberculosis with Positive Smear Results by Using Ces-D Scale With Respect To Gender

Gender	Depression		Total
	Yes	No	
Male	50(43.5%)	65(56.5%)	115
Female	49(49%)	51(51%)	100

Chi-Square=0.65; p=0.418

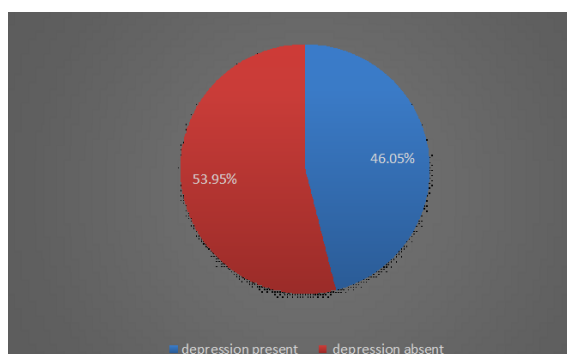


Figure 1: Showing Frequency of Depression in Patients of Pulmonary Tuberculosis with Positive Smear Results

DISCUSSION

Psychiatry and Tuberculosis

Psychological aspects of tuberculosis have been studied since early 1863.^[9] studies from congested populations including asylums reported a relationship between death and tuberculosis. While working on psychopathology of tuberculosis, researchers established diagnosis of euphoria and lack of awareness of illness among tuberculosis patients.^[10] Some authors have used terminologies of “ill of mind” and peoples with “abnormal mental state” to describe personality disorders of tuberculosis patients. even words of self-centered and childish also have been used by some authors to explain personality deficit of tuberculosis patients. Altered mentation or mental illness itself is a predisposing factor for tuberculosis.^[7] A mutual relationship between physical and mental illness have been reported.^[11] Various psychiatric disorders found among TB patients include anxiety disorders, minor depression, major depressive disorder, personality disorder including aggression, dependence and alcoholism. Psychopathy could be seen as a result of anti-tuberculous therapy is well established.^[12] INH-induced psychosis and Cycloserine,^[13] induced psychosis are some examples. Environmental and genetic factors have some role in anti-tuberculous medications induced psychopathology.^[14] risk

factors for ATT induced psychopathology are advancing age, infection with HIV and hepatitis C, malnutrition and isoniazid-metabolizing enzyme gene polymorphisms.^[15]

Study findings

We performed a single center survey to establish the prevalence of depressive disorders among smear positive tuberculosis patients. We did a comprehensive interview of 215 patients who were tested smear positive for pulmonary tuberculosis. The average age of the patients was 37.67±9.50 years. 115 patients were male and 100 patients were female. Association between gender and psychological distress have been reported in literature. We observed that out of 115 male patients 50 patients (43.5%) had depression. While out of 100 female patients 49 (49%) patients had depression. With these results we observed that depression was relatively more common in female patients in comparison to male patients. These findings are contradictory to what has been reported previously by other observers. A cross-sectional survey of tuberculosis patients performed by Peltzer et al,^[16] in South Africa reported male predominance with (54.5 %) male and 45.5 % female with tuberculosis. Another important finding of our study is, we found that patients had age below 40 years were suffering from depression in greater proportion than with age above 40 years (39% vs 20%). Again, this is in contrary to the already reported findings from European world. Possible explanation for this in partly could be low socioeconomic status and poor financial system of our population. This may be due to the increased responsibilities borne by a younger age group in our country including self-care, child care and family care. Employment related issues could be another reason for such findings in younger age group. In contrary, among the population of European world, weak family system and residence in old asylums could a possible explanation for prevalent depression in older than in younger tuberculosis victims. Patients with severe chronic disease develop severe depression and the risk of severity increases as the severity of chronic disease is increased.^[17] Hospital

dependency and frequent hospitalization are the factors associated with depression in tuberculosis patients. psychogenic and somatic pain also contribute in occurrence of depression.^[18] We also evident the similar findings. We reported 46.05% depression in smear positive

TB patients. Similar results have been observed worldwide, 27.7 %-30 % depression among TB patients in Nigeria (19), 64 % in Ethiopia, from 76 % in India, 46% in South Africa and 19 %-26 % form Turkey. Depression is a risk factor for relapse of tuberculosis along with other factors like alcoholism and substance abuse.^[20] High prevalence of depression among smear positive pulmonary tuberculosis patients enlightened the importance of knowledge regarding depression among patients who suffer the isolation trauma. It can improve outcome, reduce frequency of treatment failure, and reduce social burden and rate of suicide if depression is addressed properly in this specific population.

CONCLUSION

Depression is common among tuberculosis patient with positive smear results. Identification and prompt management of depression may improve treatment success in this group of patients. considerations are recommended for screening of all tuberculosis patients with positive smear results for depression to improve compliance and adherence to anti-tuberculous therapy. Directly observed therapy (DOT) should include screening and management policies for depression among tuberculosis patients.

REFERENCES

1. CDC. Reported Tuberculosis in the United States, 2012. Atlanta, GA: U.S. Department of Health and Human Services; Oct 2012.
2. World Health Organization. Global Tuberculosis Control 2012. Geneva, Switzerland: WHO press; 2012.
3. Peltzer K, Naidoo P, Matseke G, Louw J, McHunu G. Prevalence of psychological distress and associated factors in tuberculosis patients in public primary care clinics in South Africa. *BMC Psychiatry*. 2012 Jul 27;12:89.
4. Aisha AS. Co-morbid anxiety and depression among pulmonary tuberculosis patients. *J Coll Physicians Surg Pak*. 2010 Oct;20(10):703-4.
5. Ige OM, Lasebikan VO. Prevalence of depression in tuberculosis patients in comparison with non-tuberculosis family contacts visiting the DOTS clinic in a Nigerian tertiary care hospital and its correlation with disease pattern. *Men Health Fam Med*. 2011 Dec;8(4):235-41.
6. Ugarte-Gil C, Ruiz P, Zamudio C, Canaza L, Otero L, Kruger H, et al. Association of major depressive episode with negative outcomes of tuberculosis treatment. *PLoS One*. 2013 July 29;8(7):e69514.
7. Fantl K. *Psychiatry and tuberculosis*. California Med. 1950;73(6):538-40.
8. Shafter AB. Meta-analysis of the factor structures of four depression questionnaires: Beck, CES-D, Hamilton, and Zung. *J Clin Psychol*. 2006;62(1):123-46.
9. Clouston TS. "Tuberculosis and insanity. *Br J Psychiatry*. 1863;9:36-65.
10. Muhl AM. Fundamental personality trends in tuberculous women. *Psychoanalytical*. 1923;10:380-430.
11. deHert M, Correll CU, Bobes J. Physical illness in patients with severe mental disorders. I. Prevalence, impact of medications and disparities in health care. *World Psychiatry*. 2011;10(1):52-77.
12. Strecker EA, Braceland FJ, Gordon B. Mental attitudes of tuberculous patients. *Merit Hygiene*. 1938;22:529.
13. Pasargiklian M, Biondi L. Neurologic and behavioural reactions of tuberculous patients treated with cycloserine. *Scand J Respiratory Dis*. 1970;71:201-8.
14. Xia YY, Hu DY, Liu FY. Design of the anti-tuberculosis drugs induced adverse reactions in China national tuberculosis prevention and control scheme study (ADACS). *BMC Public Health*. 2010;10:267.
15. Sun F, Chen Y, Xiang Y, Zhan S. Drug-metabolising enzyme polymorphisms and predisposition to anti-tuberculosis drug-induced liver injury: a meta-analysis. *Int J Tuberculosis Lung Dis*. 2008;12(9):994-1002.
16. Vega P, Sweetland A, Acha J. Psychiatric issues in the management of patients with multidrug-resistant tuberculosis. *Int Tubercul Lung Dis*. 2001;8(6):749-59.
17. Trenton AJ, Currier GW. Treatment of comorbid tuberculosis and depression. *Primary Care Companion. J Clin Psychiatry*. 2001;3:236.
18. Moussas G, Tselebis A, Karkanas A. A comparative study of anxiety and depression in patients with bronchial asthma, chronic obstructive pulmonary disease and tuberculosis in a general hospital of chest diseases. *Ann GenPsychiat*. 2008;7:7.
19. Issa BA, Yussuf AD, Kuranga SI. Depression comorbidity among patients with tuberculosis in a university teaching hospital outpatient clinic in Nigeria. *Mental Health Fam Med*. 2009;6:133-8.
20. Rose N, Shang H, Pfyffer GE, Brandli O. *TuberkulosetherapieimKanton Zu'rich.-1993: Was sind die Ursachenfu'rRezidive und Therapieversager? Schweiz Med Wochenshr*. 1996;126:2059-67.