Pak J Med Res
Vol. 58, No. 3, 2019

Original Article

Frequency of Mental Disorders Among Tuberculosis Patients as Compared to their Household Contacts

Muhammad Kashif Munir[1], Sana Rehman[1], Rizwan Iqbal[1], Arooj Saeed Butt[2], Saqib Saeed[3]
PHRC TB Research Centre[1], Programmatic Management of Drug Resistant TB Site[2], Department of Pulmonology, King Edward Medical University/ Mayo Hospital[3], Lahore.

Abstract

Background: In spite of great progress and success in tuberculosis treatment, incidence rate is still growing by 1% each year globally. Comorbidities are also quite common among TB patients. However, anxiety and depression though highly prevalent mental disorders remains neglected.
Objective: To study the frequency of mental disorders (Depression, Anxiety, Psychosis, and Schizophrenia) among TB patients and its comparison with household contacts.
Study type, settings and duration: This comparative cross sectional study was undertaken at Pakistan Health Research Council TB Research Centre in collaboration with department of Pulmonology, King Edward Medical University, Lahore from July 2017 to June 2018.
Methodology: After taking informed consent, the study participants were interviewed. A predesigned questionnaire was used to collect the information. General Health Questionnaire comprising twelve items and Hamilton Scale to measure depression were used for psychiatric morbidity. A trained psychologist examined each participant. Data was analyzed in SPSS version 20.0.
Results: A total of 280 participants consisting of two groups (140 patients and 140 contacts in each group) were enrolled in this study. There were 170 (60.72%) males and 110 (39.28%) females with a female to male ratio of 1:1.54. Mean age of patients group was 40.56±17.42 years and that of contacts group as 36.11±11.80 years. Psychological distress and social dysfunction related to schizophrenia was found to be significantly high (*p*-value <0.05, CI~95%) among patients as compared to contacts group. Although no patient developed psychosis in present study, however 61.4% patients had mild (28.5%), moderate (19.3%) or severe (13.6%) depression as compared to the contacts group where of the 17.2% having depression 10.7% had mild and 6.4% had moderate depression.
Conclusion: Despite the presence of similar factors like poverty, age, lower formal education and overcrowding among both patients and contacts groups; patients are significantly more prone to mental disorders like depression and anxiety etc. while psychosis was not observed in any case.
Key words: Mental state, pulmonary TB, depression, hamilton scale.

Introduction

Tuberculosis (TB) is an infectious disease caused by the Mycobacterium tuberculosis complex (MTBC). At present, Pakistan ranks 5th in TB burden and even worse, ranks 4th in multidrug resistance TB (MDR-TB). There are about 420,000 new TB cases in Pakistan annually. National TB contacts Program (NTP), Pakistan is endorsing and implementing World Health Organization's (WHO) recommendations to stop TB disease and contacts its spread effectively.[1]

Although NTP, after implementation of Directly Observed Treatment Short-course (DOTS) program, is providing maximum coverage and aimed to increase the number of notified cases up to 420,000 and maintaining the treatment success rate of 91%.[2] In spite of great progress and success in DOTS strategy, incidence rate is still growing by 1% each year globally. Nine million people suffer from TB and two million die due to TB annually.[2]

Corresponding Author:
Rizwan Iqbal
PHRC TB Research Centre
King Edward Medical University/ Mayo Hospital, Lahore.
Email: rizwaniqbal1@live.com

Received: 14 May 2019, **Accepted:** 23 July 2019,
Published: 15 October 2019

Authors Contribution

MKM conceptualized the project. SR & ASB did the data collection. MKM & SR did the literature search. MKM, SR & RI preformed the statistical analysis. Drafting, revision and writing of manuscript was done by MKM, RI & SS.

This situation has created great panic among people that has led to intolerable obstacle in socioeconomic improvement.

History of smoking and addiction along with comorbidities including hypertension, diabetes and liver diseases are also common among TB patients that.[3]. Other neglected and highly prevalent mental disorders are anxiety and depression. It has been reported that co-existence of depression and anxiety with tuberculosis can results in poor adherence to TB treatment which ultimately results in drug resistant TB. Drug resistant TB is associated with increased risk of mortality creating hurdles in global TB control.[3] Depression is a communal mental health complication characterized by losing interest and pleasure, low energy, feeling guilty, low self-confidence, restlessness, disturbed appetite and poor focus.[4] It is considered as a forefront cause of illness affecting 121 million people globally which may lead to suicide.[4] About 850,000 people commit suicide every year.[4] Life time risk of depression has been calculated as 10-25% among females and 5-12% among males in generalized population during entire life.[5] Clinical depression is also higher up to 5-9% among females compared to 2-3% among males.[5] Another study done in Ethiopia presented the life time risk of depression 2.7%, recurrent depression as 0.2%, 0.3% for bipolar and 1.6% for persistent mood complications.[6] Depression prevails at much higher rates of 25-33% among patients suffering from chronic illnesses.[5]

Highest comorbidity of depression among TB patients was 68% reported in a study from South Africa.[7] Other studies have reported prevalence of 52.5% and 45.5% respectively.[8,9] Severity of depression has been reported up to 8% in India and 22.5% in Nigeria.[9,10] Comorbid depression along any chronic physical illness has been reported to increase the risk of mortality and severity of illness.[11]

Pakistan has high burden of TB and even higher burden of MDR TB which threatens lives of poor community of country. Therefore, it is complementary to study mental health of TB patients for their better compliance, proper treatment, management and control of disease. Conditions like chronic psychosis and somatic discomfort, multiple hospital admissions of patients or spouse, complete dependency on hospital and death of spouse due to such chronic disease are factors thought to be related to depression.[12] Such conditions may lead to poor or non-compliance, relapse, treatment failure and mortality of patients. Therefore, current study was undertaken to assess the frequency of mental disorders like depression, anxiety, psychosis and schizophrenia among TB patients in comparison with household contacts.

Methodology

This comparative cross sectional study was undertaken in Pakistan Health Research Council TB Research Centre in collaboration with Department of Pulmonology, King Edward Medical University Lahore during from 1st July 2017 to 30th June 2018. A sample size of total 280 TB patients (140 in each group) was calculated by using 5% margin of error and 95% confidence level. Prevalence of depression among TB patients is taken as 45.5% and in contacts as 13.4%[9] by using sample size determination in health studies software.

Non-probability consecutive sampling technique was used. All pulmonary TB patients registered at Mayo Hospital and seeking treatment under DOTS and their attendants of age 18 and above of either gender with equal number of two groups presented as “patients” and “contacts” were included in the study. Newly diagnosed patients with AFB smear positive result but not registered under DOTS were placed under patients group and attendants who were household members of patients were categorized as contacts group however attendants who were not household contacts were excluded from the study. Patients and contacts suffering from other chronic diseases like Diabetes, hypertension, hepatitis, chronic obstructive pulmonary disease (COPD) and cardiac patient etc. were excluded from the study

After taking informed written consent study subjects were interviewed. A predesigned questionnaire was used to collect demographic characteristics, history, socio economic status and other related information. General Health Questionnaire comprising twelve items (GHQ-12)[13] was used for psychiatric morbidity. Conventional scoring system described in questionnaire was used and any score >2 was considered as positive. Hamilton depression rating scale[14] was also used to assess the severity of depression. A trained psychologist examined each study participant.

Data was entered in SPSS version 20.0. Qualitative variables were presented as frequency and percentages while quantitative variables were presented in mean and standard deviation. Depression among TB patients and their attendants was applied independent sample t-test and *p*-value ≤0.05 was considered as significant. Chi square test was used to compare two proportions of each variable by using MEDCALC online software.

The ethical approval was taken from the institutional review board of King Edward Medical University, Lahore.

Results

A total of 280 subjects consisting of two groups (140 in each group) were enrolled in this study. There were 170 (60.72%) males and 110 (39.28%) females with a female to male ratio of 1:1.54. (Table-1) Mean age of patients group remained 40.56±17.42 years and that of contacts group as 36.11±11.80 years while mean age of male subjects (39.34±15.76) also remained high as compared to female subjects (36.79±13.73). Most of the study subjects (71.4%) were from District Lahore followed by 13.6% from District Sheikhupura.

Table 1: Assessment of mental health using GHQ-12 among patients and contacts.

General Health Questions	Status				*p-value*
	Patients		*Contacts*		
	Mean	*SD*	*Mean*	*SD*	
Able to concentrate?	2	0	1	0	<0.05
Been loss of sleep over worry?	1.97	0.36	1.16	0.38	<0.05
Been playing a useful part?	1.95	0.35	1.14	0.36	<0.05
Been capable of making decisions?	2.04	0.84	1.16	0.39	<0.05
Been feeling constantly under strain?	1.98	0.35	1.19	0.43	<0.05
Could not overcome difficulties?	1.96	0.37	1.15	0.38	<0.05
Been able to enjoy normal day-to-day activities?	1.99	0.42	1.16	0.41	<0.05
Been able to face up the problems?	2.03	0.83	1.19	0.43	<0.05
Been feeling unhappy and depressed?	2.01	0.37	1.20	0.44	<0.05
Been losing self-confidence?	1.52	0.53	1.05	0.22	<0.05
Been thinking self-worthless?	1.46	0.53	1.05	0.22	<0.05
Been feeling reasonably happy?	2.11	2.67	1.14	0.37	<0.05

Signs and symptoms for TB were noted among all study participants including patients and contacts group. All the sign and symptoms were significantly high (*p*-value <0.05) among patients as compared to contacts group validating the true study population. History of TB contact was established among 89.3% of patients.

Most of the patients (number, 76.4%) and households were living in semi furnished homes and 77.2% families had an income of less than Rs. 20,000. Knowledge, attitude and practices of study participants regarding spread, contacts and treatment of TB were also observed and there was not much difference among patients and contacts group as contacts group population was household member of patients. Both patient and contacts groups had good knowledge of treatment but lacked the understanding of TB transmission. Contact investigation was done in only 7.2% respondents and 27.2% patients had plenty of visitors. There were only 31.4% patients who slept in separate rooms while 33.6% socialized outdoor. Overall poor hygienic conditions and bad habits prevailed in both groups.

Comparison and assessment of mental health among patients and contacts was done by using standard GHQ-12. Significant difference (*p*-value <0.05) among patients and contacts in all the twelve items was observed (Table-1). Patients were more prone to psychological distress and social dysfunction as compared to contacts group. Patient and contacts groups were also assessed for depression using Hamilton Rating Scale which uses 21 variables (Table-2).

Table 2: Comparison of depression among patients and contacts groups using hamilton scale.

Variables	Status				*p-value*
	Patient		*Contacts*		
	Mean	*SD*	*Mean*	*SD*	
Depressed mood	0.90	0.44	0.65	0.48	<0.05
Feeling of guilt	0.80	0.51	0.55	0.50	<0.05
Suicide	0.20	0.40	0.05	0.22	<0.05
Insomnia early	0.50	0.50	0.55	0.50	>0.05
Insomnia middle	0.45	0.50	0.35	0.48	>0.05
Insomnia late	0.50	0.74	0.35	0.48	<0.05
Work and activities	0.95	0.59	0.50	0.50	<0.05
Retardation: Psychomotor	0.50	0.59	0.30	0.46	<0.05
Agitation	0.65	0.66	0.40	0.49	<0.05
Anxiety: Psychological	0.85	0.57	0.50	0.59	<0.05
Anxiety somatic	0.70	0.56	0.40	0.49	<0.05
Somatic symptoms (GIT)	0.55	0.59	0.35	0.48	<0.05
Somatic symptoms general	0.60	0.59	0.42	0.50	<0.05
Genital symptoms	0.65	0.57	0.35	0.48	<0.05
Hypochondriasis	0.40	0.49	0.30	0.46	>0.05
Loss of weight	0.80	0.51	0.55	0.50	<0.05
Insight	0.65	0.57	0.40	0.49	<0.05
Diurnal variation 1	0.45	0.50	0.30	0.46	<0.05
De personalization and de-realization	0.40	0.49	0.25	0.43	<0.05
Paranoid symptoms	0.50	0.50	0.30	0.46	<0.05
Obsessional and compulsive systems	0.40	0.49	0.40	0.49	>0.05
Total score	12.40	5.19	8.20	2.21	<0.05

Patients were more sensitive and showed high values (*p*-value <0.05) in most of the variables. Semi quantification of Hamilton score was done as per protocol and revealed that 61.4% of the patients had mild (28.5%), moderate (19.3%) or severe (13.6%) depression however none developed psychosis while only 17.2% of the contacts had mild (10.7%) or moderate (6.4%) depression (Table-3).

Proportion of both groups was calculated using Chi square test and significantly high depression was observed among patient group as compared to contacts group (Figure).

Table 3: Comparison of Patient and Contacts groups regarding intensity of depression.

Value (Total Score)	Status				p-value
	Patient (n=140)		Contacts (n=140)		
	N	%	N	%	
Normal (<10)	54	38.6	116	82.8	<0.05
Mild depression (10-13)	40	28.5	15	10.7	<0.05
Moderate depression (14-17)	27	19.3	9	6.4	<0.05
Severe depression (>17)	19	13.6	-	-	-

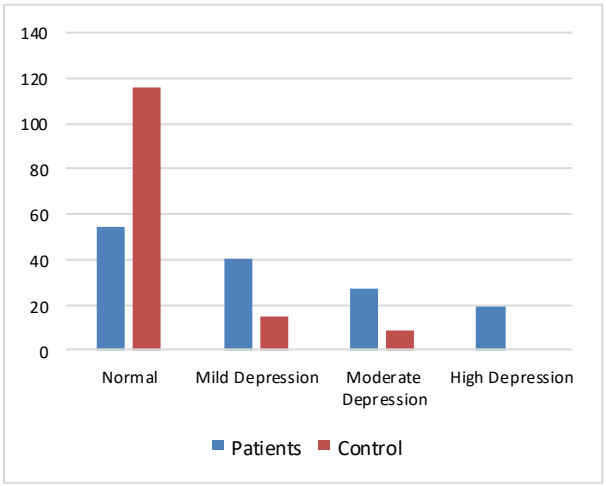

Figure: Distribution of severity of depression among patients and contacts groups.

Discussion

Psychological distress may be designated as unpleasant thoughts or feelings which affects the level of functioning while social dysfunction is projected to distractions of social life. In present study significantly high psychological distress and social dysfunction was observed among patients comparable with the study conducted in Iran which also presented similar results.[15] A recent study aimed to observe psychological distress among TB patients taking ATT reported association of low economic status with psychological distress at the start and end of the treatment.[16] Another study from South Africa narrated age, lower formal education, marital status and poverty as associated factors of social distress[17] which is in agreement with present study except for marital status.

Depression is a common and serious at some instances, medical ailment which negatively affects the feeling, thinking and actions of individuals suffering from it. Although it is treatable however may lead to sever outcome if remained untreated. Patients suffering from chronic diseases like Asthma, Chronic Obstructive Pulmonary Disorder, Diabetes, heart diseases and tuberculosis are easiest target of depression and anxiety. Apart from the factor placed at seventh position (enjoy normal activities) of GHQ-12 all the factors define two distinct groups called psychological distress and social dysfunction.[15]

Among patients in this study, 61.4% had mild (28.5%), Moderate (19.3%) or severe (13.6%) depression as compared to contacts group who had 17.2% of which10.7% had mild and 6.4% had moderate depression. Results are in accordance with a recent study from Turkey which reported the prevalence of depression as 60.5% among pulmonary TB patients.[18] A prevalence of depression among TB patients was reported as 68% in South Africa,[7] 52.8% and 45.5% in older studies from Nigeria.[8,9] Results of severe depression among TB patients are not in agreement with studies reporting as low as 8% prevalence in India[10] while a high prevalence of 22.5% in Nigeria.[9]

In present study Knowledge about dosage and treatment, Infection contacts, personnel hygiene and general habits of patient and contact groups was also pursued and no much difference was observed. However, contact investigation was only done in 7.2% of respondents which is may be considered negligible moreover 69 (49.3%) patients had children <5 years of age off which only 2 (2.9%) were screened periodically. A study aimed to active case detection of TB patients from same settings has already reported 17 (2.5%) smear positive TB cases of which 4 (23%) were suffering from drug resistant TB.[19] Although programme management of Drug Resistant TB (PMDT) site is providing free home visit for sputum collection from symptomatic contacts [20] is admirable but the services could be extended to contacts of simple TB patients.

Around 34.4% patients had total approximate income of less than 10000 rupees and 42.8% had their income in range of 10001-20000. While 75% respondents had their family size between 4-9 persons while 17.8% had family size of more than 10 persons showing misery of study participants where minimum wage rate set by Government of Pakistan is 15000 rupees for a single unskilled worker in previous budget.[21] Recently achievements of National TB Contacts Program are reported to be successful in meeting variety of challenges including diagnosis and treatment of TB and drug resistant TB[22] even then a lot of work to do coping with socio-

economic issues of poor people and Government as well. Minimum wage rate set by Government in budget 2017-18 is rupees 15000/month for unskilled workers.

Physicians should be vigilant regarding mental health of patients during treatment which will improve the compliance of patients hence result in better treatment outcomes which will ultimately helpful for general patients to achieve better health. Further treatment outcome of normal and depressed patients is lacking in this study and open for future study.

It is concluded that despite the presence of similar factors like poverty, age, lower formal education and overcrowding among both patients and contacts groups; patients are significantly more prone to mental disorders like depression and anxiety etc. while psychosis was not observed in any case.

Acknowledgement

We acknowledge Pakistan Health Research Council for the funding of this project.

Conflict of interest: None declared.

References

1. National TB Control Program. Tuberculosis control in Pakistan, Module for MBBS students. (Accessed on 2nd May 2019) Available from URL: http://ntp.gov.pk/uploads/ntp_1369817904_CURRICULUM_FOR_MBBS_STUDENTS.pdf
2. Jassal MS, Bishai WR. Epidemiology and challenges to the elimination of global tuberculosis. CID 2010; 50(3): 156-64.
3. Marak B, Kaur P, Rao SR, Selvaraju S. Non-communicable disease comorbidities and risk factors among tuberculosis patients, Meghalaya, India. Indian J Tubercl 2016; 63(2): 123-5.
4. Biomed Central. Global depression statistics. (Accessed on 2nd May 2019) Available from URL: https://www.sciencedaily.com/releases/2011/07/110725202240.htm
5. Major depressive disorders. (Accessed on 2nd May 2019) Available from URL: http://www.allaboutdepression.com/dia_03.html
6. Kebede D, Alem A. Major Mental disorders in Addis Ababa, Ethiopia. II. Affective disorders. Acta Psychiatric Scand 1999; 100(397): 18–23.
7. Westaway MS, Wolmarans L. Depression and self-esteem: rapid screening for depression in black, low literacy, hospitalized TB patients. Soc Sci Med 1992;3 5(10): 1311-5.
8. Aghanwa HS, Erhabor GE. Demographic/ socioeconomic factors in mental disorders associated with TB in southwest Nigeria. J Psychosomatic Res 1998; 45(4): 353-60.
9. Ige OM, Lasebikan VO. Prevalence of depression in tuberculosis patients in comparison with non-tuberculosis family contacts visiting the DOTS clinic in Nigeria tertiary care hospital and its correlation with disease pattern. Ment Health Fam Med 2011; 8(4): 235-41.
10. Natani GD, Jain NK, Sharma TN, Gehlot PS; Agrawal SP; Koolwal S, et al. Depression in TB patients: correlation with duration of disease and response to anti-tuberculous chemotherapy. Indian J Tuberc 1985; 32(1): 195.
11. Trenton AJ, Currier GW. Treatment of comorbid tuberculosis and depression. Primary Care Companion J Clinl Psychiat 2001; 3(2): 236.
12. Moussas G, Tselebis A, Karkanias A, Stamouli D, Ilias I, Bratis D, et al. 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 Gen Psychiatry 2008; 7: 7.
13. Zulkefly NS, Baharuddin R. Using the 12-item General Health Questionnaire (GHQ-12) to Assess the Psychological Health of Malaysian College Students. Global J Health Sci 2010; 2(1): 73-80.
14. Hamilton M. Development of a rating scale; for primary depressive illness. Brit J Soc Clin Psychol 1967; 6(4): 278–96.
15. Montazeri A, Harirchi AM, Shariati M, Garmaroudi G, Ebadi M, Fateh A. The 12-item General Health Questionnaire (GHQ-12): translation and validation study of the Iranian version. Health and Quality of Life Outcomes 2003; 1(1): 66.
16. Tola HH, Shojaeizadeh D, Garmaroudi G, Tol A, Yekaninejad MS, Ejeta LT, et al. Psychological distress and its effect on tuberculosis treatment outcomes in Ethiopia. Glob Health Action 2015; 8(1): 29019.
17. Peltzer K, Naidoo P, Matseke G, Louw J, Mchunu G, Tutshana B. Prevalence of psychological distress and associated factors in tuberculosis patients in public primary care clinics in South Africa. BMC Psychiatry 2012; 12(1): 89.
18. Yilmaz A, Dedeli O. Assessment of anxiety, depression, loneliness and stigmatization in patients with tuberculosis. Acta Paulista de Enfermagem 2016; 29(5): 549-57.
19. Rehman S, Munir MK, Iqbal R, Salam AA, Saeed S, Masud F, et al. Active case detection among household contacts of multi drug resistant tuberculosis patients in a tertiary care setting. Pak J Med Res 2014; 53(3): 55-9.
20. Muhammad KM, Sana R, Rizwan I. A Need for Tuberculosis Infection Control Measures: A Case Series Study in Pakistan. Asian Journal of Medicine and Biomedicine. 2017; 1(1): 19-22.
21. Minimum Wages in Pakistan with effect from 01-07-2017 to 30-06-2018. (Accessed on 2nd May 2019) Available from URL:https://paycheck.pk/main/salary/minimum-wages
22. Munir MK, Rehman S, Iqbal R. Meeting the challenge, making a difference: Multidrug resistance tuberculosis in Pakistan. Pak J Med Res 2018; 57(1): 1-2.