Global Journal of Medicine & Public Health

Psychiatric morbidities among pulmonary tuberculosis patients at a tertiary care hospital in Tripura: A cross-sectional study

Bishnupada Saha[1], Bhubaneswar Roy[2], Siddhartha Debbarma[3], Anishim Rokham[4]*

ABSTRACT

Background

Tuberculosis patients are more likely to suffer from mental disorders such as depression and anxiety. So, this study aimed to assess the proportion of psychiatric morbidities among patients of pulmonary tuberculosis attending the DOTS center of Agartala Government Medical College and GB Pant (AGMC & GBP) Hospital, Tripura, India.

Materials & methods

We did this cross-sectional study between January 2020 to June 2021. All pulmonary tuberculosis patients aged ≥ 18 years attending for treatment were included. Drug-resistant tuberculosis, extra pulmonary tuberculosis without pulmonary tuberculosis, pulmonary tuberculosis with CNS involvement and patients with prior psychiatric illness were excluded. We used a two-part semi-structured questionnaire to collect the socio-demographic information and the Mini-International Neuropsychiatric Interview-Plus (MINI-Plus) to diagnose psychiatric morbidity. Qualitative data were presented as frequency and percentages, Quantitative data were presented as mean and standard deviation. Pearson's chi-square test/ Fisher's exact test were used to assess significant differences between groups and to find associations. P-value less than 0.05 was considered statistically significant.

Results

Out of 120 participants, the majority were male (52.5%, 63/120) and rest were females (47.5%57/120). The mean age was 32.6±8.5 years. Most (57.5%, 69/120) (N, %) of the participants belonged to the Bengali community and 54.2% (65/120) were from tribal/indigenous community. The mean duration of TB infection among study participants was 2.7±1.3 months. More than half (51.7%, 62/120) of the participants had any psychiatric disorder, according to MINI-Plus. Fifty-seven (48.3%) participants did not have any psychiatric diseases. Depression was the most prevalent (21.7%, 26/120), followed by generalized anxiety (16.7%, 20/120), panic disorder (8.3%, 10/120), somatization disorder (3.3%, 4/120) and brief psychiatric disorder (1.7%, 2/120). Patient's gender, age group, religion, community, socioeconomic status, employment, educational status, and duration of TB infection were significantly associated with psychiatric morbidity.

Conclusion

Our study showed a high prevalence of mental disorders among individuals suffering from pulmonary TB. Thus, the study findings emphasize the need to integrate mental health services in managing TB patients.

Key words: Generalized anxiety disorder, major depressive episode, panic disorder, psychiatric morbidity, pulmonary tuberculosis

GJMEDPH 2023; Vol. 12, issue 3 | OPEN ACCESS

***Corresponding author:** Bishnupada Saha, MD, Senior Resident , Department of Psychiatry, Tripura Medical College, Agartala, Tripura, India, sahabishnu999@gmail.com; 2. Bhubaneswar Roy, MD, Associate Professor , Department of Psychiatry, Agartala Government Medical College, Agartala, Tripura, India; 3. Siddhartha Debbarma, MD, Assistant Professor , Department of Psychiatry, Agartala Government Medical College, Agartala, Tripura, India; 4.Anishim Rokham, MD, Associate Professor, Department of Pulmonary Medicine, Agartala Government Medical College, Agartala, Tripura, India

Conflict of Interest—none | **Funding**—none

Ethical policy and Institutional Review board statement: Ethical clearance was taken from the Institutional Ethical Committee of Agartala Government Medical College, Agartala, Tripura.

INTRODUCTION

Tuberculosis (TB) remains a significant public health concern worldwide and still carries a high social stigma in many countries.[1] According to the Global TB Report 2020, India is the most significant contributor to the global increase of newly diagnosed TB cases.[2] Tuberculosis patients are more likely to suffer from mental disorders such as depression and anxiety.[3–9] On the other hand, the risk of developing TB may also be increased for people with psychiatric disorders.[10,11] The presence of psychiatric comorbidity in TB patients can also lead to poor treatment outcomes, disability, and treatment failure, as well as poor quality of life due to problems with adherence to medication.[3,12] Evidence also suggests addressing the mental health issues of tuberculosis patients can reduce their burden and improve their quality of life and TB outcomes.[13]

Though the link between tuberculosis and mental disorders is reported, most studies focused mainly on depression and anxiety. Furthermore, insufficient data is available on the prevalence of psychiatric morbidities in patients of pulmonary tuberculosis in North-Eastern India, particularly Tripura. So, this present study aimed to assess the proportion of psychiatric morbidities among patients of pulmonary tuberculosis attending the DOTS center of a tertiary care hospital in Tripura, India.

Materials & methods

Study design, population, and setting

We did this cross-sectional study between January 2020 to June 2021 among pulmonary tuberculosis patients attending the DOTS center of Agartala Government Medical College and GB Pant (AGMC & GBP) Hospital, Tripura, India. This centre caters the both urban and rural population of the West Tripura district, more over it is the only centre in this state for drug resistance TB cases.

Sample size and sampling

The sample size was calculated using the formula, $N = (Z^2.p.q)/d^2$, where p= 43.3[14] and d = 10%. At 95% confidence level, after adding 20% non-response/missing data, the sample size which comes to 114.2, rounded off to 120 as the final sample size. A total of 500 patients visited the DOTS centre during the study period, while 120 cases were included 380 cases were excluded. Non-probability sampling was done and patients were selected consecutively till the sample size was achieved.

Inclusion and exclusion criteria

All patients aged 18 years and above, suffering from pulmonary tuberculosis, attending the DOTS center of AGMC & GBP hospital for treatment were included after taking informed written consent. Whereas drug-resistant tuberculosis, extrapulmonary tuberculosis without pulmonary tuberculosis, pulmonary tuberculosis with CNS involvement and patients having prior psychiatric illness before the diagnosis of tuberculosis were excluded.

Study tool

We used a semi-structured questionnaire that had two sections. Section one contained questions regarding socio-demographic information of the participants including the duration of having TB, while section two was used to diagnose psychiatric morbidity using Mini International Neuropsychiatric Interview-Plus (MINI-Plus). The MINI-Plus was developed as a brief, structured diagnostic interview tool used to diagnose the most common psychiatric disorders and has demonstrated good psychometric properties.[15,16]

Data analysis

Data was entered in MS Excel and analysed using IBM Statistical Package for Social Sciences (SPSS) software (Version 26.0). Qualitative data were presented as percentages, while quantitative data were presented as a mean and standard deviation. Pearson's chi-square test/ Fisher's exact test were used to assess significant differences between groups and to find an association. P-value less than 0.05 was considered statistically significant.

Ethics clearance

Ethics clearance was obtained from the Institutional Ethics Committee for Clinical Studies, Agartala Government Medical College. In addition, written informed consent was obtained from all the participants.

Results

Basic characteristics of patients

Most participants were males (52.5%,63/120) and rest were females (47.5%57/120) and the mean age of patients was 32.6± 8.5 years, ranging from 18-49 years. Most of the participants were from the Bengali community (57.5%,69/120) and were from rural areas (54.2%,65/120). The mean duration of TB infection among our study participants was 2.7±1.3 months. Table 1 describes the characteristics of our study participants.

Table 1 Characteristics of participants (N=120)

Age (in years)	Frequency	Percentage
≤ 20	8	6.7%
21-40	88	73.3%
>40	24	20.0%
Sex	Frequency	Percentage
Male	63	52.5%
Female	57	47.5%
Religion	Frequency	Percentage
Hindu	87	72.5%
Muslim	24	20.0%
Christian	9	7.5%
Community	Frequency	Percentage
Bengali	69	57.5%
Tribal	51	42.5%
Marital status	Frequency	Percentage
Married	83	69.2%
Unmarried	37	30.8%
Locality	Frequency	Percentage
Rural	65	54.2%
Urban	55	45.8%
Socioeconomic status *(Modified BG Prasad 2020)*	Frequency	Percentage
Class I/ Upper	25	20.8%
Class II/ Upper middle	18	15.0%
Class III/ Middle	31	25.8%
Class IV/ Lower middle	25	20.8%
Class V/ Lower	21	17.5%
Employment status	Frequency	Percentage
Employed	47	39.1%
Unemployed	73	60.9%
Education	Frequency	Percentage
Illiterate	23	19.2%
Primary	33	27.5%
Secondary	38	31.7%
Higher Secondary	10	8.3%
Graduate and above	16	13.3%
Duration since TB diagnosis *(in months)*	Frequency	Percentage
<3 months	57	47.5%
≥3 months	63	52.5%

Psychiatric morbidity

Among our study participants, more than half (51.7%, 62/120) had any psychiatric disorder according to MINI-Plus, while 48.3% (58/120) didn't have any psychiatric diseases (Table 2). The major depressive episode (21.7%, 26/120) was the most prevalent, followed by generalized anxiety disorder (16.7%, 20/120), panic disorder (8.3%, 10/120), somatization disorder (3.3%, 4/120) and brief psychiatric disorder (1.7%, 2/120) (Figure 1).

Table 2 Prevalence of psychiatric morbidity in TB patients (N=120)

Psychiatric disorders	Frequency	Percentage
Present	62	51.7%
Absent	58	48.3%

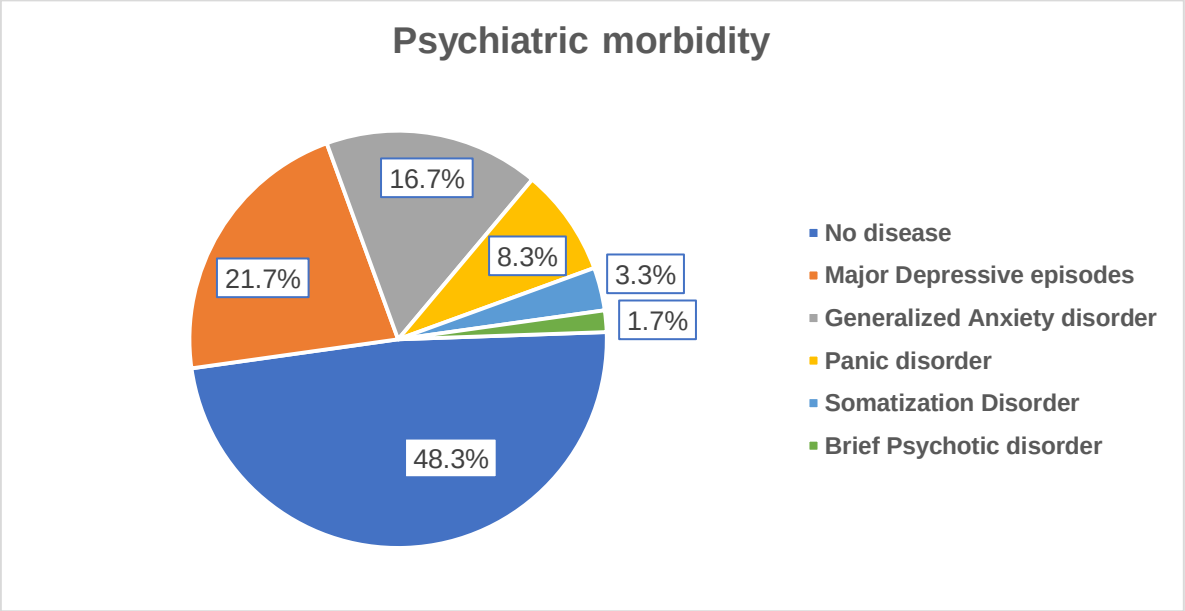

Figure 1 Proportion of different psychiatric disorders according to MINI-Plus (N=120)

Patient's gender, age group, religion, community, socioeconomic status, employment, educational status and duration of TB infection was significantly associated with psychiatric morbidity (table 3). The proportion of patients suffering from generalized anxiety disorder was higher (50%, 4/8) among participants aged below 20years of age and it was significantly significant (p-value=0.000). Prevalence of major depressive episode was higher (27.3%, 24/88) among the 20-40 years age group and it was statistically significant (p-value=0.042). Among the participants who had somatization disorder, all were above 40 years of age and it was statistically significant (p-value=0.003). Female patients were more likely to develop the panic disorder (p-value=.000) and somatization disorder (p-value=.048) than men. Though the prevalence of depression (male=15.9%,10/63 and female=28.1%,16/57; p-value=0.105) and brief psychotic disorder (male=0%, 0/63 and female=3.5%, 2/57; p-value=0.134) was higher among the female patients, it was not statistically significant. Likewise, a higher prevalence of anxiety disorder (male=17.4%,11/63 and female=15.7%,9/57) among male patients was not statistically significant (p-value=0.806). The percentage of patients suffering from any psychiatric disorder was significantly (p-value= 0.001) higher among Christian (100%,9/9) than Hindu (52.9%, 46/87) and Muslim (2.9%, 7/24). Higher prevalence of psychiatric illness was seen among the patients belonging to the Bengali community (60.9%,44/69) than among the indigenous/Tribal community (39.2%, 20/51), which was statistically significant (p-value=0.019). Among the different socioeconomic status, participants belonging from middle class (Class-III) had higher (80.6%,

25/31) prevalence of any psychiatric disorder than the rest of socioeconomic groups and it was statistically significant (p-value=0.000). Major depressive episodes were significantly (p-value=0.000) higher (54.8%, 17/31) among the participants belonging to middle socioeconomic class than the rest of socioeconomic groups. However, generalized anxiety disorder was significantly (p-value=0.013) higher (36.0%, 9/25) among the participants belonging to lower middle socioeconomic class, while panic disorder was significantly (p-value=0.001) higher (27.8%, 5/18) among the participants belonging to the upper middle socioeconomic class. The presence of psychiatric morbidity was significantly (p-value=0.001) higher (91.3%, 21/23) among the illiterate participants than the rest of educational group. The employment status of the patients was found to be significantly associated (p-value= 0.007) with presence of any psychiatric illness as it was higher (61.6%, 45/73) among unemployed participants. Presence of any psychiatric disorder was higher among the patients who were suffering from TB for more than three months (table. 3). Duration of TB infection was also significantly associated with generalized anxiety disorder (p-value=0.007) and panic disorder (p-value=0.001).

Table 3 Association of different variables with psychiatric disorder

Variables	Subcategory	Morbidity Absent	Morbidity Present	p-value
Age group (in years)	≤20	4 (50%)	4 (50%)	0.033*
	21-40	48 (54.5%)	40 (45.5%)	
	>40	6 (25%)	18 (75%)	
Gender	Female	16 (28.1%)	41 (71.9%)	0.000*
	Male	42 (66.7%)	21 (33.3%)	
Religion	Hindu	41 (47.1%)	46 (52.9%)	0.001*
	Muslim	17 (70.8%)	7 (2.9%)	
	Christian	0 (0%)	9 (100%)	
Community	Bengali	27 (39.1%)	42 (60.9%)	0.019*
	Tribal	31 (60.8%)	20 (39.2%)	
Marital status	Married	39 (46.9%)	44 (53.1%)	0.659
	Unmarried	19 (51.4%)	18 (48.6%)	
Locality	Rural	29 (42.3%)	38 (56.7%)	0.376
	Urban	29 (52.7%)	26 (47.3%)	
Socioeconomic class	Class I/ Upper	19 (76.05)	6 (24.0%)	0.000*
	Class II/ Upper middle	12 (66.7%)	6 (33.3%)	
	Class III/ Middle	6 (19.45%)	25 (80.6%)	
	Class IV/ Lower middle	12 (48.0%)	13 (52.05)	
	Class V/ Lower	9 (42.9%)	12 (57.1%)	
Employment status	Employed	30 (63.8%)	17 (36.2%)	0.007*
	Unemployed	28 (38.3%)	45 (61.6%)	
Education	Illiterate	2 (8.75%)	21 (91.3%)	0.001*
	Primary	11 (33.3%)	22 (66.7%)	
	Secondary	28 (73.7%)	10 (26.3%)	
	Higher Secondary	7 (70.0%)	3 (30.0%)	
	Graduate or above	10 (62.5%)	6 (37.5%)	
Duration of TB infection	<3 months	41 (71.9%)	16 (28.1%)	0.000*
	≥3 months	17 (28.8%)	42 (71.2%)	

DISCUSSION

This cross-sectional study assessed the psychiatric morbidity in pulmonary TB patients from a tertiary care centre of Tripura. We found more than half (51.7%, 62/120) of the patients had any psychiatric morbidity along with tuberculosis, where major depressive episode (21.7%,26/120) was the most prevalent, followed by generalized anxiety disorder (16.7%,20/120). The presence of any psychiatric disorder among pulmonary tuberculosis patients varied in the literature. For example, Singh et al. in their study reported that among the pulmonary tuberculosis patients, 24% had any psychiatric disease and Maikandaan et al. reported 38% of pulmonary TB patients had any psychiatric illness.[7,17] In contrast, Kumar et al. (74%) and Chandra et al. (76%) reported much higher levels of psychiatric illness.[8,18] The variation in prevalence in our study could be due to several factors, such as the assessment instrument used, different geographic locations and the study's time frame. For example, Kumar et al. assessed only the prevalence of anxiety and depression with General Health Questionnaire-12 (GHQ-12) in 2015 and Chandra et al. did the study in 2004.

Among our study participants, depression was the most common psychiatric disorder, followed by generalized anxiety, similar to other studies.[7,8,19,20] The high prevalence of depression and anxiety in pulmonary tuberculosis patients have been attributed to the various psychosocial stresses faced by the patient, such as social stigma attached to the illness, setbacks in occupation, social isolation with damaged status and helplessness caused by incapacity due to chronic disease.[21]Our study suggested a significant association between religion and psychiatric morbidity, which was the opposite of what Paradesi et al. reported as they did not find any association between religion and psychiatric morbidity.[14] In addition, the age group of patients was significantly associated with psychiatric disorders in our study, in contrast to the findings of Maikandaan et al., Paradesi et al. and Kumar et al.[8,14,17] Finally, we found a significant association between the patient's socioeconomic status and depression and anxiety. Similar findings have been reported by several other studies.[17,19,22]Duration of TB infection was significantly associated with psychiatric disorders, particularly generalized anxiety disorder and panic disorder, similar to the finding of Maikandaan et al.[17] Though a similar result of a high occurrence of psychiatric illness with the increased duration of TB status was reported by Singh et al., it was not significant.[7] To the best of our knowledge, this was the first study regarding psychiatric morbidity in TB patients from the North-eastern part of India. This study had the advantage of employing the MINI-Plus, a well-established structured diagnostic interview scale that covers a broader range of mental disorders. Despite these strengths, single institution-based study design and nonprobability sampling might affect the generalizability of our results. Secondly, due to the study's cross-sectional nature, we cannot draw any conclusions regarding the temporality between pulmonary tuberculosis and psychiatric morbidity.

CONCLUSIONS

Our study showed a high prevalence of mental disorders among individuals suffering from pulmonary TB. Thus, the study findings emphasize the need to integrate mental health services in managing TB patients, including screening all new TB patients. A longitudinal perspective community-based or multicentric study is also recommended for broader generalization of findings.

ACKNOWLEDGMENTS

The authors would like to thank all the participants for their participation in this research.

chromeThe authors would also like to thank Dr. Abhijit Das and Dr. Abhishek Paul Majumder for their contribution in finalizing the manuscripts

.

REFERENCES

1. World Health Organization. Global tuberculosis report 2019 [Internet]. Geneva: World Health Organization; 2019 [cited 2023 Jan 22]. Available from: https://apps.who.int/iris/handle/10665/329368
2. World Health Organization. Global tuberculosis report 2020 [Internet]. Geneva: World Health Organization; 2020 [cited 2023 Jan 22]. Available from: https://www.who.int/publications-detail-redirect/9789240013131
3. Pachi A, Bratis D, Moussas G, Tselebis A. Psychiatric Morbidity and Other Factors Affecting Treatment Adherence in Pulmonary Tuberculosis Patients. Tuberc Res Treat. 2013;2013:e489865.
4. Wang X, Li X, Zhang Q, Zhang J, Chen H, Xu W, et al. A Survey of Anxiety and Depressive Symptoms in Pulmonary Tuberculosis Patients With and Without Tracheobronchial Tuberculosis. Front Psychiatry. 2018;9:308.
5. Mason PH, Sweetland AC, Fox GJ, Halovic S, Nguyen TA, Marks GB. Tuberculosis and mental health in the Asia-Pacific. Australas Psychiatry. 2016;24(6):553–5.
6. Araújo GSd, Pereira SM, Santos DNd, Marinho JM, Rodrigues LC, Barreto ML. Common Mental Disorders Associated with Tuberculosis: A Matched Case-Control Study. PLOS ONE. 2014;9(6):e99551.
7. Singh L, Pardal P, Prakash J. Psychiatric morbidity in patients of pulmonary tuberculosis-an observational study. Ind Psychiatry J. 2015;24(2):168.
8. Kumar K, Kumar A, Chandra P, Kansal H. A study of prevalence of depression and anxiety in patients suffering from tuberculosis. J Family Med Prim Care. 2016;5(1):150.
9. Doherty AM, Kelly J, McDonald C, O'Dywer AM, Keane J, Cooney J. A review of the interplay between tuberculosis and mental health. Gen Hosp Psychiatry. 2013;35(4):398–406.
10. Hayward SE, Deal A, Rustage K, Nellums LB, Sweetland AC, Boccia D, et al. The relationship between mental health and risk of active tuberculosis: a systematic review. BMJ Open. 2022;12(1):e048945.
11. McQuistion HL, Colson P, Yankowitz R, Susser E. Tuberculosis infection among people with severe mental illness. Psychiatr Serv. 1997;48(6):833–5.
12. Sweetland AC, Kritski A, Oquendo MA, Sublette ME, Pala AN, Batista Silva LR, et al. Addressing the tuberculosis–depression syndemic to end the tuberculosis epidemic. Int J Tuberc Lung Dis. 2017;21(8):852–61.
13. Acha J, Sweetland A, Guerra D, Chalco K, Castillo H, Palacios E. Psychosocial support groups for patients with multidrug-resistant tuberculosis: five years of experience. Glob Public Health. 2007;2(4):404–17.
14. Paradesi RK, Ekramulla S, Kamuju NR, Nallapaneni NR, Srikanta S. Prevalence and Associated Factors of Major Depressive Disorder among Pulmonary Tuberculosis Patients. J Clin Diagn Res. 2020;14(7):VC01–4.
15. Sheehan DV, Lecrubier Y, Sheehan KH, Amorim P, Janavs J, Weiller E, et al. The Mini-International Neuropsychiatric Interview (M.I.N.I.): the development and validation of a structured diagnostic psychiatric interview for DSM-IV and ICD-10. J Clin Psychiatry. 1998;59 Suppl 20:22-33;quiz 34-57.
16. Lecrubier Y, Sheehan DV, Weiller E, Amorim P, Bonora I, Sheehan KH, et al. The Mini International Neuropsychiatric Interview (MINI). A short diagnostic structured interview: reliability and validity according to the CIDI. European Psychiatry. 1997 ed;12(5):224–31.
17. Maikandaan CJ, Rs PK, Kapil V, Zubaida Sultana S. A Study of Psychiatric Morbidity in Patients Suffering from Pulmonary Tuberculosis. Global J Research Analysis. 2016; 5(6).10-3.
18. Chandra P, Singh S, Singh BK. Study of Psychiatric co - morbidity in cases of tuberculosis patients undergoing treatment. Indian J Public Health Res Dev. 2011;2(2):111–3.
19. Kamble B, Dhaked S, Mahaur G, Prasad B, Kumar P, Dhaked GK. Depression Among Patients with Tuberculosis at a Directly Observed Treatment Short-Course (DOTS) Center in Rural Delhi. Cureus. 2022;14(10):e30827.
20. Duko B, Bedaso A, Ayano G. The prevalence of depression among patients with tuberculosis: a systematic review and meta-analysis. Ann Gen Psychiatry. 2020;19(1):30.
21. Lara-Espinosa JV, Hernández-Pando R. Psychiatric Problems in Pulmonary Tuberculosis: Depression and Anxiety. J Tuberc Res. 2021;9(1):31–50.
22. Salodia UP, Sethi S, Khokhar A. Depression among tuberculosis patients attending a DOTS centre in a rural area of Delhi: A cross-sectional study. Indian J of Public Health. 2019;63(1):39.