ORIGINAL ARTICLE

SUBSTANCE ABUSE AMONG PULMONARY TUBERCULOSIS PATIENTS AT TERTIARY CARE HOSPITALS OF PESHAWAR, PAKISTAN

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ABSTRACT

OBJECTIVES: To determine the frequency of substance abuse among pulmonary tuberculosis (PTB) patients and to assess the association of socioeconomic factors associated with substance abuse among PTB attending tuberculosis clinics at tertiary hospitals in Peshawar, Pakistan.

METHODS: This descriptive cross-sectional study was conducted from 1st May 2019 to 31st October 2019 at three tertiary care hospitals (Lady Reading Hospital, Khyber Teaching Hospital and Hayatabad Medical Complex) in Peshawar, Pakistan. Sample size was calculated by using OpenEpi software, taking prevalence of substance abuse as 50%. PTB patients (n=423) aged 17-60 years were recruited through convenient sampling technique. Data was collected from tuberculosis patients through validated questionnaires: Alcohol, Smoking & Substance Involvement Screening Test & Poverty Score Card.

RESULTS: Out of 423 patients, 264 (62.4%) were males. Majority (n=331;78.3%) of the participants belonged to 'middle-income group. Mean age of the participants was 39.33±13.76 years. Frequency of substance abuse amongst sampled tuberculosis population was 54.9% (n=232/423). The most common substance abuse included tobacco products (22.7%), sleeping pills (6.6%), opioids (6.1%) and cannabis (5.7%). A significant association was detected between substance abuse and income of participants- low and high income group had higher reported substance abuse than middle income group (p<0.001). Our study found a statistically significant association between gender and substance abuse (p-value <0.01) with more females (63.63%) than males (50.38%) reported being involved in substance abuse.

CONCLUSION: More than half of PTB patients, substance abuses. Gender and socioeconomic factors have significant association with substance abuse.

KEYWORDS: Tuberculosis, Pulmonary (MeSH); Mycobacterium (MeSH); Mycobacterium Infections (MeSH); Tuberculosis (MeSH); Substance-Related Disorders (MeSH); Substance Abuse Detection (MeSH); Social Determinants of Health (MeSH); Socioeconomic Factors (MeSH).

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INTRODUCTION

Tuberculosis (TB) is caused by Mycobacterium tuberculosis and it is considered a public challenge around the world.[1] According to World Health Organization (WHO), globally 10 million people suffer from TB and it has caused approximately 1.6 million deaths in 2017 alone.[2] Pakistan is ranked fifth among high burden countries with 510,000 people developing TB each year.[2,3]

People who abuse substance have a greater risk to contract TB, because the substances damage the body and weaken the immunity to fight against diseases.[4] Several studies have indicated that substance abuse continue to be a group at high risk for TB patients. According to a study one in five TB patient in the United States reported abusing alcohol or using illicit drugs. Research reveals such patients appear more contagious and difficult to treat.[5] Similarly, according to another study conducted in Bostwana, Multiple Drug Resistance (MDR) patients have high rates of alcohol use compared to other TB patients.[6]

Substance abuse effects tuberculosis prognosis in many ways including delayed diagnosis. Individuals who abuse substances often have limited access to routine health care, which often leads to delayed diagnosis thereby making them more contagious.[7,8]

Furthermore, the medicines used for TB treatment are typically metabolized by the liver, the functioning of which is compromised by substance abuse.[5,9] Although factors associated with substance abuse have been frequently investigated, very little information is available regarding the demographic and socioeconomic features associated with illicit drug use amongst TB patients.[9,10]

There is scarcity of information on the prevalence of substance use in patients with TB and its effect on treatment compliance and disease prognosis especially in middle income countries. Screening TB patients for substance abuse, can provide good chance for advance intervention efforts to hamper its harmful effects. Increase attention to high risk group such as drug abusers can serve as an integral part of an overall treatment that can be contribute to decrease decline in TB patient ratio. This study was planned to determine the frequency of substance abuse among pulmonary tuberculosis patients and furthermore, to assess the association of socioeconomic factors associated with substance abuse among PTB attending TB clinics at tertiary care hospitals in Peshawar, Pakistan.

METHODS

This descriptive cross sectional study was conducted from 1st May 2019 to 31st October 2019 at three tertiary care hospitals (Lady Reading Hospital, Khyber Teaching Hospitals and Hayatabad Medical Complex) in district Peshawar, Pakistan. The sample size was calculated through OpenEpi with the following parameters: Margin of error 05%., confidence level 95%., and prevalence of substance abuse in tuberculosis patients: 50% Due to the paucity of research on the topic, the prevalence of substance abuse amongst pulmonary TB patients in Pakistan could not be established from previous research. Therefore 50% was taken as the anticipated prevalence of substance abuse amongst PT patients in Pakistan. The calculated sample size was 384. Adding 10% non-response rate, 423 PTB patients aged were recruited in this study.

All PTB patients aged 17 to 60 years, visiting the selected hospitals for PTB treatment were eligible for inclusion in the study. Patients who were not willing to participate were excluded. Approval of synopsis was taken from Advance Studies and Research Board (ASRB) DIR/KMU-AS&RB/SA/001039 at 29-08-2019 and Ethical committee of Khyber Medical University (KMU) DIR/KMU-EB/SA/000682 at 11-11-2019. Permission was obtained from the head of departments HODs of Tertiary Hospitals Peshawar LRH, KTH and HMC. Once approval was granted the process of data collection was initiated. Informed Consent was obtained from each participants before collecting data. The purpose of research study was explained to all participants in detail. Data was collected from tuberculosis patients via a validated questionnaire: Alcohol, Smoking & Substance Involvement Screening Test (ASSIST).[8] The questionnaire was translated from English language into Urdu language. Validation was done through the Urdu & English Departments of University of Peshawar. The translated questionnaire was pilot tested and reliability tested through SPSS software after data collection was performed. The calculated value of Cronbach's alpha for ASSIST Questionnaire was 0.853.

TABLE I: SOCIODEMOGRAPHIC PROFILES OF THE STUDY POPULATION (N=423)

Variables	Categories	Frequency (%)
Gender	Male	264 (62.4 %)
	Female	159 (37.6 %)
Marital Status	Single	163 (38.5 %)
	Married	235 (55.6 %)
	Divorced	10 (3.5 %)
	Widowed	15 (3.5 %)
Family Status	Single	243 (57.4 %)
	Joint	180 (42.6 %)
Education	Illiterate	99 (23.4 %)
	Primary	40 (9.5 %)
	Matric	80 (18.9 %)
	Intermediate	122 (28.8 %)
	Bachelor	78 (18.4 %)
	Master	4 (0.9 %)
Occupational Status	Jobless	125 (29.6 %)
	Employed	263 (62.2 %)
	Retired	35 (8.3 %)
Socioeconomic Status	Poor Income Group	22 (5.2 %)
	Middle Income Group	331 (78.3 %)
	High Income Group	70 (16.5 %)
Treatment Duration (months)	< 1	67 (15.6 %)
	1 - 3	107 (25.5 %)
	4 - 6	112 (26.5 %)
	> 6	137 (32.4 %)

Poverty score card and ASSIST Questionnaires were used for data collection. The first question asked about substance abuse was "In your life, which of the following substances have you ever used?" with categories, Yes and No. After the participants were asked about using illicit drugs ever during their life time. The next questions pertained to the number of time the products were used. Based upon the frequency of use, participants were categorized into abusers and non-abusers. Those who scored 4 and above were labelled substance abusers. Poverty Score Card contains 10 questions regarding socioeconomic status. It categorised in to following three groups: poor income group 0-35, middle income group 35-70 and high income group 71-100.

RESULTS

The mean of age of participants was 39.33±13.759 years. Out of 423 patients 264 (62.4%) were males. Majority (n=331; 78.3%) were from middle income group (Table 1).

Frequency of substance abuse, socioeconomic factors and of TB patients who have used illicit drugs ever during life time

In our study 232 (54.9%) respondents reported being involved in substance abuse whereas non-abusers were 191 (45.1%). The most common substance abuse included tobacco products (n=96; 22.7%), sleeping pills (n=28; 6.6%), opioids (n=26; 6.1%) and cannabis (n=24; 5.7%) [Table II].

Association of Substance Abuse with Gender and socioeconomic status of PTB patients:

The frequency of substance abuse was significantly higher in males (n-131) than in females (n-58). A significant positive association was found between gender and substance abuse amongst the responder's (Pearson Chi-square level 7.743a, df-2 n 2 tailed P-value=.005).

The frequency of substance abuse was significantly higher in low and high income groups whereas negligible difference was observed in the substance abuse status of TB patients belonging to middle income group. Pearson chi-square value 16.333a and df 2 on 2-tailed (p value <0.001) test which indicates a significant association between substance abuse and income status (Table III).

DISCUSSION

Substance abuse adversely influences pulmonary tuberculosis prognosis and treatment outcome. The socioeconomic status of TB patients' and of substance abusers is often low. Substance abusers tend to spend their meagre resources on illicit drugs as opposed to their health and wellbeing. This behaviour renders the abusers malnourished making them vulnerable to various diseases. Research suggests that individuals who abuse drugs are at high risk of developing tuberculosis. The current study shows alarming figures of substance abuse amongst pulmonary TB patients visiting tertiary hospitals of Peshawar, Pakistan.

The frequency of substance-abuse among TB patients according to this study was 54.9% and it was found to have a significant association with income and gender. A difference was

TABLE II: FREQUENCY OF SUBSTANCE ABUSER, SOCIOECONOMIC FACTORS AND OF TB PATIENTS WHO HAVE USED ILLICIT DRUGS EVER DURING LIFE TIME

Variables		Frequency (n=423)	Percentage
Substance Abuser	Abusers	232	54.9
	Non-Abusers	191	45.1
Tobacco Product's		96	22.7
Sleeping Pills		28	6.6
Opioids		26	6.1
Cannabis		24	5.7
Alcohol		11	2.6
Cocaine		11	2.6
Inhalants		11	2.6
Hallucinogens		10	2.4
Amphetamine Type Stimulants		8	1.9
Others (injection non-medically)		7	1.7

observed in the frequency of females who reported substance abuse with a higher number of female TB patients reporting to having being involved in substance abuse. A very slight difference was observed in the substance abuse status of the male TB patients. We did not determine if there was a difference in the products that were abused across the two genders and different income status. More than half (55.6%) of the respondents were married. While we did not ascertain the relation between marital status of the respondents and their status of substance abuse, our results echo the findings of previous research on tuberculosis which has shown that tuberculosis is more common in married people. Research suggests that married people are more prone to develop TB due to higher chances of exposure to TB disease due to overcrowding at home, stress which in turns leads to dependence on sleeping pills and opium which directly compromises the functioning of liver. These factors make married individuals

TABLE III: ASSOCIATION BETWEEN GENDER, SOCIOECONOMIC STATUS AND SUBSTANCE ABUSE

Variables		Substance Abuse		P Value
		Abuser (n=232)	Non-abuser (n=191)	
Gender	Male (n=264)	131 (49.62%)	133 (50.38%)	<0.01
	Female (n=159)	101 (63.53%)	58 (36.47%)	
Socioeconomic Status	Poor Income Group (n=22)	14 (63.63%)	8 (36.36%)	<0.001
	Middle Income Group (n=331)	165 (49.84%)	166 (50.16%)	
	High Income Group (n=70)	53 (75.71%)	17 (24.28%)	

more susceptible to developing diseases.[10] Another interesting finding of this study was that substance abuse was more common in unemployed respondents. The findings of several studies revealed that the abuse of substances such as alcohol and tobacco products is more common and prevalent in unemployed people.[11,12] These findings support the findings of our study which showed that a high proportion of drug abusers were unemployed. While we did not delve into the reasons of these findings in our study, research suggests that stress associated with unemployment makes individuals more susceptible to opioid misuse and substance abuse.[13]

Regarding the socioeconomic status of TB patients, the findings of our study are consistent with several studies conducted from different regions of the world including reports by WHO, all of which have consistently reported substance abuse being more common in low income groups. An interesting finding of this study was substance abuse being higher in high income group as well with no difference in the substance abuse status of patients belonging to middle income group.[14] While a few other surveys have reported similar findings in terms of socioeconomic status and substance abuse, many others as mentioned above reported that substance abuse is more common in low income groups. One possible explanation for this difference in the findings can be attributed to the scoring and categorization of the respondents into middle and low income groups.[15,16] Socioeconomic status is an important predictor in the prognosis of many health problems and its association with TB is well established. Low income status combined with drug abuse can play havoc with the lives of TB patients. Since most of the income is spent on drugs instead of health which in turn can compromise the overall well-being of the individuals and makes them negligent towards their health's needs. Drug abusers tend to prioritize buying drugs over availing health and this can lead to delayed diagnosis and poor prognosis of TB.[17,18]

Globally, tobacco smoking and alcohol use are known risk factors for TB infection.[19] Tobacco users are 3.3 times more at risk of Tb infection as compared to non-users. Similarly, alcohol abusers are 1.2 times more at risk of developing TB. Infection as compared to non-abusers. In 2018, 0.83 million new TB cases overall were alcohol abusers and 0.86 million were tobacco abuser as compared to current study results, the frequency of substance abuser amongst PTB were 54.9%.[12,20]

The findings of this current study revealed that 22.7% of our study population reported tobacco abuse and 2.6% consumed alcohol. These findings are different than the findings reported in a similar study conducted in Brazil which reported the frequency of tobacco use amongst TB patients as 73.4%.[21,22] This could be due to the overall low frequency of tobacco use in the general population in Pakistan as compared to Brazil.[18]

Another study conducted in USA revealed 10-50% prevalence of tobacco and alcohol amongst tuberculosis patients.[24] These findings are consistent with the results of our study. According to our study results approximately 1 in 4 patients with PTB abuse tobacco products, cannabis, consume alcohol beverages and sleeping pills or heroine as compared to the findings of the study conducted in US which showed that 1 in 3 tuberculosis patients use substance illegally.[24]

According to this descriptive cross-sectional study, substance abuse was significantly higher in men than women suggesting a significant association between gender and substance abuse. Tobacco products and cannabis use was common in intermediate students (n=42) and mostly women were addicted to sleeping pills (n=25), similarly a report from India revealed history of tobacco and sedative drugs observed in the females.[25,26] In the present study (n=55) participants who were employed were abusing substance, (n=135) participant were unemployed drugs and retired were (n=18). Similar findings with respect to employment status have been reported into the results of study by Gupta, et al., and Khan, et al.[27,28]

Additionally, according to the findings of the current study cocaine (crack and coke) use was (2.6%). No association was found between uses of cocaine with pulmonary tuberculosis disease. The use of hallucinogens (2.4%) and inhalants (2.6%) was significantly low in this study compared with other studies. Research suggests that the users of these substances constitute high risk group for tuberculosis in developing countries.[15,19]

RECOMMENDATIONS & LIMITATIONS

The knowledge generated by this study will have a positive impact on the phenomena under study. Substance abuse is considered taboo and TB patients are stigmatised as well in this culture. Therefore, there is a need to explore the topic of substance abuse explored by using qualitative methodologies. It will further breed in-depth understanding of the problem. Development of integrated treatment guidelines is a good way forward.

Given the stigma and taboo, attached to substance abuse, self-reporting nature of the substance abuse in this study was a limitation.

CONCLUSION

Substance abuse continue to be a group at high risk for TB and impacts TB prognosis. More than half the study population was involved in some kind of substance abuse. Majority of these belonged to middle income group. Socioeconomic factors and substance abuse have significant association with PTB. Substance abuse was significantly higher in men as compared to women and strong association between gender and substance abuse.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under:

MA: Acquisition, analysis and interpretation of data, drafting the manuscript, approval of the final version to be published

SR & KR: Conception & study design, critical review, approval of the final version to be published

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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