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Pulmonary Tuberculosis and Smoking: A cross-sectional study at a Tertiary Care Facility

Fasih Ullah[1], Wisal Ahmad[1], Hussain Ahmad[2], Saadia Ashraf[2], Zahid Hussain[3], Raza Ullah[1]✉

[1]Department of Pulmonology, Hayat Abad Medical Complex, Peshawar - Pakistan [2]Department of Pulmonology, Khyber Teaching Hospital, Peshawar - Pakistan [3]Department of Pulmonology, Farooq Teaching Hospital, Islamabad - Pakistan

Corresponding author:
Raza Ullah
Department of pulmonology,
Hayat Abad Medical Complex,
Peshawar - Pakistan
Email: dr.raza127@gmail.com

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A B S T R A C T

Background: Mycobacterium tuberculosis is the cause of pulmonary tuberculosis (TB), a highly morbid disease that is linked to a number of co-morbid illnesses. Similar to other lung conditions, smoking is regarded as a major risk factor for tuberculosis in the lungs.

Objective: To find out how common smoking is among pulmonary tuberculosis patients at Khyber Teaching Hospital's pulmonology department.

Methodology: A cross-sectional study was conducted in the pulmonology department of the Khyber Teaching Hospital in Peshawar between March 17 and September 16, 2022. A non-probability consecutive sampling method was utilized to include in the study 157 patients, aged 15 to 70, who had pneumonia brought on by tuberculosis, regardless of gender. The trial was approved by the hospital ethical committee, and the patients who took part provided written informed permission. Each patient's information was entered into a well-organized proforma. The frequency of smoking among the patients was noted. Data was entered using SPSS 23.

Results: 60.5% of the total 157 patients were men and 39.5% were women. An average age was 37.13 +/- 16. 3.3±1.1 weeks was the mean duration of tuberculosis. The average time spent smoking was 59.9 +/- 3.1 months. In 38.2% and 28% of the patients, accordingly, there was diabetes and hypertension. Among all patients, smokers made up 30.6%.

Conclusion: Patients with pulmonary tuberculosis frequently smoke; of those with the disease, 30.6% are reported smokers. This highlights the necessity of smoking reduction initiatives as a component of tuberculosis treatment to enhance results. Comprehensive care also necessitates treating co-morbid illnesses such as diabetes and hypertension.

Keywords: Tuberculosis; Smoking; Risk Factors

Introduction

The tuberculosis bacillus (MTB) is the infectious agent that causes tuberculosis, an infectious disease. Although every organ in the body might be affected, the lungs are most frequently affected, which can result in pulmonary tuberculosis (PTB). Tuberculosis (TB) continues to be a major cause of morbidity and mortality worldwide. Based on data from the World Health Organization (WHO), 10.6 million individuals worldwide were affected by tuberculosis (TB) in 2022, and about 1.3 million people died from the disease.[1] The disease still poses a serious threat to public health despite tremendous advancements in TB control strategies, especially in poor nations with scarce healthcare resources and high rates of poverty and malnutrition. Out of 22 high-burden nations, Pakistan came in fifth place in terms of the total number of TB cases. All kinds of tuberculosis were estimated to have an incidence and prevalence rate of 231 and 364 per 100,000 people, respectively.[2] These concerning figures demonstrate how urgently ongoing efforts to control tuberculosis (TB) in high-burden areas are required. Overcoming other infectious diseases like HIV/AIDS and malaria, tuberculosis continues to be the deadliest disease produced by a single infectious agent. The COVID-19 pandemic that broke out in 2020 has hindered efforts to control tuberculosis (TB) and caused a major setback in the disease's progress. An estimated 867,000 people died from tuberculosis (TB) in just the first half of 2020, in part due to the pandemic's detrimental effects, which included disrupting healthcare systems and delaying TB diagnosis and treatment.[3] Additionally, it's estimated that about 25% of people on the planet have subclinical, non-infectious tuberculosis (TB), which acts as a reservoir for newly diagnosed active instances of the disease. The fact that people with latent TB infection (LTBI) can develop active TB at any moment, particularly when risk factors including smoking, malnourishment, and immunosuppression are present, presents another obstacle to TB control efforts.

One of the characterizing obsessive elements of TB is the arrangement of caseating granulomas, which are viewed as the sign of the illness.[4] These granulomas structure as the body's safe reaction to contain the bacillus, yet their breakdown prompts the improvement of pits in the lungs, a typical element of cutting edge pneumonic TB.[5] The disintegration of granulomas into the bronchi works with the spread of the microorganisms and the improvement of irresistible cavities, which assume a key part in TB transmission. A few gamble factors, both organic and natural, add to the movement from idle to dynamic TB. Financial factors, for example, hunger, liquor misuse, and cigarette smoking have for quite some time been perceived as critical gamble factors for the advancement of dynamic TB. Smoking, specifically, has arisen as a significant supporter of TB-related horribleness and mortality.

Tobacco smoking and tuberculosis are two interconnected worldwide wellbeing dangers, each worsening the other. As indicated by WHO gauges, tobacco smoking causes around 6 million passings yearly, and infections connected with smoking case a larger number of lives than HIV, jungle fever, and TB consolidated.[6] Smoking is related with a higher gamble of creating TB and more unfortunate treatment results for people with the infection. Research has shown that smokers are at expanded hazard of both procuring TB disease and creating dynamic TB. A case-control study evaluating smoking and mortality in India uncovered that TB was the main source of overabundance passings among smokers contrasted with non-smokers. The review showed a portion reaction relationship, where the gamble of mortality because of TB expanded with the power and span of smoking. This features areas of strength for the among smoking and TB, especially in nations with high TB troubles.

A case-control study examining the association between smoking and mortality among public delegate mortality data in India found that the primary cause of smokers' disproportionately high death rate compared to non-smokers across all demographic groups was tuberculosis. There was a clear portion response association between smoking and male tuberculosis mortality.[7] According to a review, the recurrence of current smoking was found in 62.4 and 82.4% of male patients in their 20s to 60s and 27.5% of male patients in their 70s who had pneumonic TB with a positive sputum smear in Osaka. In female patients, the recurrence of current smoking was higher than the public norm, with 46.2% of women in their 20s and 45.5% of women in their 30s reporting current smoking,[8] highlighting the main advantages of smoking over pneumonic tuberculosis. Smoking weakens the body's defense mechanisms by impairing mucociliary freedom and mucosal resistance, which makes it easier for bacteria like Mycobacterium tuberculosis to spread infection. However, smoking causes mucociliary leeway to decrease, mucosal surface resistance to be reduced, and contaminations to advance due to mucociliary brokenness. This leads to increased adhesion, durability, and decreased freedom of microscopic organisms, such as tuberculous bacteria.[9] Considering the close connection between smoking and tuberculosis, assessing the smoking burden among patients with pneumonic TB is essential for guiding interventions for general well-being. Comprehending the smoking recurrence in aspiratory TB cases with a positive smear would provide crucial insights into the role of tobacco use in the transmission and movement of tuberculosis. The purpose of this study is to determine the prevalence of smoking among patients with pneumonic tuberculosis (TB) in order to shed light on policies and interventions that focus on smoking cessation as a component of TB control programs. By tending to smoking as a modifiable gamble factor,

Table 1. Demographic characteristics studied cases

Mean Age	37.13 ± 16 years
Gender	
Males	60.5% (95)
Females	39.5% (62)
Duration of Tuberculosis	3.3 ± 1.1 weeks
Diabetes	38.2%
Hypertension	28%

medical services frameworks can go to prudent lengths to decrease TB-related dismalness and mortality and further develop therapy results for impacted people.

Objective

To decide the recurrence of smokers among patients with pneumonic tuberculosis in the pulmonology division of Khyber Teaching Hospital (KTH) Peshawar.

Methodology

This was a cross-sectional review did at the Branch of Pulmonology Khyber Teaching Medical clinic Peshawar from Spring seventeenth, 2022, to September sixteenth, 2022. The example size was determined utilizing the WHO test size number cruncher, keeping a 95% certainty stretch, 7% outright accuracy and 27.5% recurrence of smoking in pneumonic TB came to be 157.[8]

Patients with analyzed pneumonic TB, matured between 15 to 70 years and of either orientation were remembered for the review utilizing a non-likelihood successive examining method. Every one of those with extra-aspiratory and multi-drug-safe TB cases were rejected from the review.

After endorsement from the clinic Moral Audit Panel and informed assent from each of the 157 patients. A total history was taken, and an actual assessment was performed. Kind of smoking will be noted including cigarette, huqa, sheesha, and E-cigarette. All the necessary data including age, orientation, and length of TB, term of smoking, Diabetes, and Hypertension was recorded on an organized proforma. Classification of information was guaranteed by covering the names of patients. Patients were guided to quit smoking.

Information will be broke down utilizing SPSS v 23. Quantitative factors like age, span of TB and term of smoking were introduced as mean and standard deviation. Subjective factors like orientation, diabetes, hypertension, and smoking were introduced as recurrence and rates. Information definition will be done concerning age, gender, diabetes, and hypertension to control the effect modifier. Post-stratification chi-square was applied and p-value ≤0.05 was taken significant.

Results

157 patients 60.5% (95) were guys and 39.5% (62) female. The mean age was 37.13±16 years. The mean term of TB and smoking was 3.3±1.1 weeks and 59.9±3.1 months individually. Diabetes and Hypertension were available in 38.2% and 28% of patients separately Table 1.

Smoking was present in 30.6% of patients. Smoking was more common in males (p-value 0.014), diabetics (p-value <0.001) and hypertensive patients (p-value <0.001) (Table 2).

Discussion

Tobacco and tuberculosis (TB) are two major dangers to wellbeing overall and are common in some low-and center pay nations. In 2022, TB impacted around 10.6 million individuals overall and caused practically 1.5 million deaths.10 The biggest number of TB cases were accounted for in South-East Asia (44%), and Pakistan represents 6% of the assessed worldwide occurrence.[11]

Around 1.3 billion individuals smoke tobacco around the world, 80% of which dwell in Low-and center pay nations like Pakistan, where the weight of TB is additionally high.[12]

The pervasiveness of day-to-day smoking (the people who as of now smoke tobacco everyday) in everybody as per the latest Worldwide Grown-up Tobacco Review (GATS) 2014 reports is 11.5% (20.6% of guys and 2% of females) in Pakistan.[13]

Smoking is a gamble factor for TB contamination, improvement of TB illness, and adversely affects TB results. It is anticipated to cause 18 million extra instances

Table 2. Frequency of side effects experience during study time

		Frequency	Percentage	P-value
Smoking	Yes	48	30.6	0.032
	No	109	69.4	
	Total	157	100.0	

of TB by 2050.[14,-16] Additionally, proceeding to smoke tobacco subsequent to being determined to have TB is related with more unfortunate TB results. Smoking intensifies its side effects, adversely influences therapy results and prescription adherence, higher gamble of TB backslide/repeat, advancement of medication opposition tuberculosis, expanded TB transmission, and TB related passings.[17-21] It additionally causes roughly 15-20% of TB related deaths.[22] Because of the unfavorable effect that smoking tobacco might have on TB control and focuses to end TB, the World Wellbeing Association (WHO) suggests that tobacco smoking is handled inside the structure of TB the board and care.[23]

In a concentrate in Osaka, Japan, the recurrence of current smoking' among male patients with sputum smear-positive pneumonic TB was 62.4%, higher than the public normal. For female patients, the recurrence of current smoking was 46.2%.[8] In our review, the commonness of smoking in TB patients was 30.6% which is lower than the concentrate in Japan.

In one more ongoing review distributed in 2020, the predominance of smoking in the screened TB patient populace in Bangladesh was 8% (RR=1.49; 95% CI: 7.1-8.9; p<0.01 and the screened TB patient populace in Pakistan was 8.3% (RR=1.24; 95% CI: 7.3-9.4; p<0.01) higher than smoking in everybody

Population.[24] Contrasted with this review, the commonness is very high in our review. This might be a direct result of the review populace, orientation dispersion and social contrasts even inside a similar country.

In India, among recently analyzed TB patients, smoking commonness was 31.9% in guys.[25] In a review led in South Africa, the commonness of smoking in TB suspects was 57% (63% for guys and 44% for females).[26] A further report in China detailed a smoking commonness of 54.6% in TB cases27. These examinations concur with the consequences of our review where predominance is 30.6%.

The unfriendly connection among TB and tobacco is a worldwide concern and knowing the predominance of smoking in TB patients, especially in high weight TB countries is in this manner significant. The evaluations for smoking commonness in everyone are accessible for nations with a high TB trouble. Our review will assist specialists with planning huge scope studies/overviews to decide smoking pervasiveness in this populace and plan a few preventive measures.

Conclusion

The commonness of smoking among pneumonic TB patients in nations like Pakistan represents a huge danger to their wellbeing and prosperity. This hazardous blend can prompt extreme results, yet convenient mediations and smoking end endeavors can incredibly relieve these dangers and further develop treatment results, at last helping a huge piece of this weak population.

Limitation

The study has several limitations that need to be acknowledged. First, it is a single-center study, which may limit the generalizability of the findings to other settings or populations. Second, the sample size is relatively small, which could reduce the statistical power of the results and may not fully capture the variability in the population studied. Additionally, confounding factors, such as variations in patient characteristics or environmental influences, were not rigorously addressed, which may have influenced the outcomes and introduced bias. These limitations suggest that further multi-center studies with larger sample sizes and more comprehensive control of confounding variables are necessary to validate and expand upon the findings of this research.

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