

Determination the Risks Factors of Tuberculosis and Its Clinical Outcome during the Year (2022) in Al-Hilla City, Iraq

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Abstract

Background: Tuberculosis (TB) is an infectious disease caused by mycobacterium TB bacteria. Tuberculosis generally affects the lungs, but can also affect other parts of the body. The classic symptoms of active TB are a chronic cough with blood-containing mucus, fever, night sweats, and weight loss. **Objectives:** To determine the risks factors of tuberculosis and its clinical outcome in Hilla city and to determine the association between risks factors of tuberculosis and its clinical outcome. **Materials and Methods:** A descriptive study is conducted in Hilla City from periods September 1st 2021 to June 1st 2022. The sources of data are the TB patients' medical records. A non-probability "purposive sample" of ($N = 127$) patients diagnosed with tuberculosis. The data were obtained retrospectively by reference to these cards. The medical records are in the form of cards and the information contained in them include demographic data of the patients (age, gender, smoking status, history of chronic diseases, and residency). **Results:** The results of study indicate that age group (21-30) are have highest percentage between all age groups and men are more affected than women. **Conclusion:** The study concluded that the people who are male young adults and elderly, smoker and with chronic diseases are high risk factors for TB.

Keywords: Clinical outcome, risks factors, tuberculosis

INTRODUCTION

Tuberculosis (TB) is a serious public health issue around the world, with the World Health Organization (WHO) estimating that one-third of the world's population, or about 2 billion people, are infected with mycobacterium TB, the TB causative agent. In 2015, an estimated 10.4 million new incident cases of tuberculosis were reported worldwide, with an estimated 1.4 million TB fatalities.^[1]

Cases of TB are on the rise, especially in developing nations. TB is the leading cause of death worldwide. According to data, 8.6 million people were infected with HIV in 2012, and 8.6 million people died as a result of the disease, with around a quarter of those infected becoming HIV positive. Many of these fatalities may have been avoided if people had received treatment.^[2]

South East Asia ranks first with 29% of instances, followed by Africa (27%), and the Western Pacific areas (27%) (19%). India and China, the world's two most populous countries, both have high rates of tuberculosis

cases, with India accounting for 26% and China for 12%. In affluent countries, the number of cases of tuberculosis is substantially lower.^[3,4]

Because most active instances of TB occur in people aged 19-49, TB can have a negative impact on individuals' and nations' economic status. People are actively involved in their careers and contribute to a nation's Gross Domestic Product throughout this stage of their life.^[5]

MATERIALS AND METHODS

Study design

A descriptive study is conducted to explore risks factors of tuberculosis and its clinical outcome during the last

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year in Hilla City for the periods of September 1, 2021 to June 1, 2022.

Study sample

A non-probability “purposive sample” of ($N = 127$) patients diagnosed with tuberculosis and collected through the used medical records for the year of 2022.

Data collection

The medical records of TB patients are the data sources. The information was gathered retroactively using these cards as a guide. The medical records are found in form as patient’ chart or cards, and they contain information regarding the patients’ demographics such as age, gender, smoking status, history of chronic diseases, and residency as well as, the patients’ reactions and outcomes..

Approach of statistic

The data from the study were evaluated with the use of the “Statistical Package for the Social Sciences” (SPSS, IBM Inc., Chicago, Illinois, USA, version 20). The results of the investigation are analyzed and estimated using information from statistical analysis methodologies.

Ethical approval

The patients’ identities were not divulged in order to maintain research ethics, and the data were examined collectively.

RESULTS

According to the objective of the study, results are presented with Tables 1-5 and Figures 1, 2.

DISCUSSION

The major goal of this study was to see if there were any tuberculosis risk variables that were linked to clinical outcomes in Hilla City during the previous year. The demographic parameters of age, gender, smoking status, history of chronic diseases, and residency were chosen as risk factors for analysis. At a P value of 0.01, the patients’ age, gender, smoking status, and history of chronic diseases were all strongly linked to their clinical result. Furthermore, with a p value of >0.05 , the patient’s residency had no effect on their clinical result.

In relation to age, the findings illustrated the youngest (ages 21-30) and the elderly (61) made up around a quarter of the cases. Young adults, on the other hand, were more in the age group with the highest percentage. It was difficult to draw conclusions about babies and young children being more susceptible to tuberculosis because their immunity would not have fully developed, as indicated by the researchers.^[6]

Furthermore, among all age groups, the elderly had the lowest outcomes. This could be due to immunosuppressive

Table 1: Statistical relationship between patients’ age and their clinical outcome of TB

Rating		Clinical outcome of TB				Total
		Prolonged cough	Prolonged cough + sputum	Prolonged cough + bloody sputum	Cough + bloody sputum + weight loss	
Age	<10 years	0 (0.0%)	11 (8.7%)	1 (0.9%)	0 (0.0%)	12 (9.4%)
	10-20 years	6 (4.7%)	11 (8.7%)	8 (6.3%)	0 (0.0%)	25 (19.7)
	21-30 years	6 (4.7%)	11 (8.7%)	15 (11.8%)	0 (0.0%)	32 (25.3)
	31-40 years	0 (0.0%)	6 (4.7%)	0 (0.0%)	0 (0.0%)	6 (4.7%)
	40-50 years	0 (0.0%)	11 (8.7%)	8 (6.3%)	0 (0.0%)	19 (15%)
	51-60 years	6 (4.7%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	6 (4.7%)
	61 and older	13 (10.2%)	0 (0.0%)	7 (5.5%)	7 (5.5%)	27 (21.3%)
	Total	31 (24.3%)	50 (39.4)	39 (30.7%)	7 (5.5%)	127 (100%)

$$\chi^2 \text{ obs.} = 93.966; \text{ d.f.} = 18; \chi^2 \text{ obs.} = 28.869; P\text{-value} = 0.000 \rightarrow \text{HS}$$

χ^2 : Chi-square, Df: degree of freedom, P -value: probability value, HS: high significant

Table 2: Statistical relationship between patients gender and their clinical outcome of TB

Rating		Clinical outcome of TB				Total
		Prolonged cough	Prolonged cough + sputum	Prolonged cough + bloody sputum	Cough + bloody sputum + weight loss	
Gender	Male	25 (19.6%)	34 (26.8%)	9 (7.1%)	0 (0.0%)	68 (53.5%)
	Female	6 (4.7%)	16 (12.6%)	30 (23.6%)	7 (5.5%)	59 (46.5%)
	Total	31 (24.3%)	50 (39.4)	39 (30.7%)	7 (5.5%)	127 (100%)

$$\chi^2 \text{ obs.}: 35.976; \text{ d.f.} = 3; \chi^2 \text{ obs.}: 7.815; P\text{-value} = 0.000 \rightarrow \text{HS}$$

χ^2 : Chi-square, Df: degree of freedom, P -value: probability value, HS: high significant

Table 3: Statistical relationship between smoker patients status and their clinical outcome of TB

Rating		Clinical outcome of TB				Total
		Prolonged cough	Prolonged cough + sputum	Prolonged cough + bloody sputum	Cough + bloody sputum + weight loss	
Smoking status	Smokers	31 (24.3%)	33 (26%)	24 (18.9%)	7 (5.5%)	95 (74.8%)
	Non smokers	0 (0.0%)	17 (13.4%)	15 (11.8%)	0 (0.0%)	32 (25.2%)
	Total	31 (24.3%)	50 (39.4)	39 (30.7%)	7 (5.5%)	127 (100%)
χ^2 obs.: 18.497; d.f.: 3; χ^2 obs.: 7.815; P -value = 0.000 $\rightarrow$ HS						
χ^2 : Chi-square, Df: degree of freedom, P -value: probability value, HS: high significant						

Table 4: Statistical relationship between patients' history of chronic diseases and their clinical outcome of TB

Rating		Clinical outcome of TB				Total
		Prolonged cough	Prolonged cough + sputum	Prolonged cough + bloody sputum	cough + bloody sputum + weight loss	
History chronic diseases	Without D	12 (9.4%)	16 (12.6%)	9 (7.8%)	0 (0.0%)	37 (29.1%)
	DM	12 (9.4%)	6 (4.7%)	7 (5.5%)	7 (5.5%)	32 (25.2%)
	Respiratory D	7 (5.5%)	28 (22%)	23 (18.1%)	0 (0.0%)	58 (45.7%)
	Total	31 (24.3%)	50 (39.4)	39 (30.7%)	7 (5.5%)	127 (100%)
χ^2 obs.: 35.203; d.f.: 6; χ^2 obs.: 12.592; P -value = 0.000 $\rightarrow$ HS						
χ^2 : chi-square, Df: degree of freedom, P -value: probability value, HS: high significant						

Table 5: Statistical relationship between MDR of TB and clinical outcome of TB

Rating		MDR-TB		Total
		Positive responses	Negative responses	
Clinical outcome	Prolonged cough	29 (22.8)	2 (1.6)	31 (24.4)
	Prolonged cough + sputum	46 (36.3)	4 (3.1)	50 (39.4)
	Prolonged cough + bloody sputum	29 (22.8)	10 (7.9)	39 (30.7)
	Cough + bloody sputum + weight loss	6 (4.7)	1 (0.8)	7 (5.5)
	Total	110 (86.6)	17 (13.4)	127 (100)
χ^2 obs.: 7.594; d.f.: 18; χ^2 obs.: 7.815; P -value = 0.055 $\rightarrow$ S				
χ^2 : Chi-square, Df: degree of freedom, P -value: probability value, S: significant, MDR: multi-drugs resistance				

comorbidities or other age-related diseases being misclassified as tuberculosis, as many were smear-negative. Older people require more sensitive diagnostic techniques and better TB care.^[7]

In addition, our gender statistics show that males account for 53.5% of the population, implying that gender may be a risk factor for tuberculosis infection. However, it's possible that the lower number of women is related to a lesser number of notifications. Due to the shame associated with the condition, it has been discovered that women do not reveal their infection. This is comparable to the findings of a previous study.^[8]

Furthermore, the male gender is linked to a poorer 2-month sputum culture conversion rate (78.8% vs. 89.3%, $P = 0.002$) and greater on-treatment mortality (78.8% vs. 89.3%, $P = 0.002$).^[9]

Smoking appears to be the most important risk factor for getting tuberculosis among our findings in terms of patients' smoking status. Smokers are at a higher risk for tuberculosis

infection due to poor mucosal secretion clearance and diminished alveolar macrophage phagocytic activity. This is in line with the conclusions of a recent study.^[10,11]

Tobacco smoking is linked to a higher risk of advanced and more severe illness, as seen by lung cavitations, positive sputum smear and culture results, and slower smear and culture conversion following therapy commencement. In patients with pulmonary tuberculosis, smoking has a significant detrimental impact on treatment completion, cure rates, and relapse rates.^[12]

In the case of individuals with a history of chronic diseases, a weakened immune system, both natural and cell-mediated, has been listed as one of the causes of chronic disease, and has been identified as a risk factor, particularly in latent cases. HIV infection was found in one out of every eight TB patients, suggesting that the latter infection could be a risk factor. It has been discovered that latent patients have a lower level of immunity, rendering

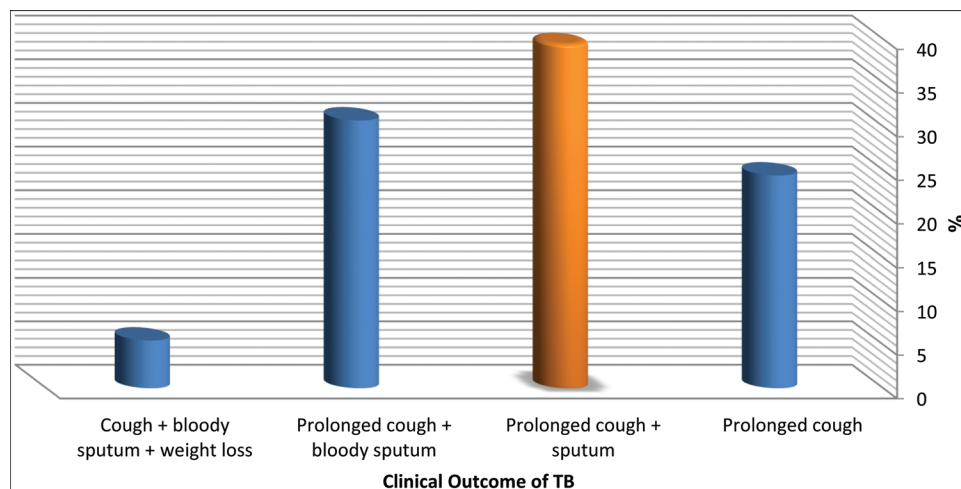


Figure 1: The clinical outcome of tuberculosis among patients

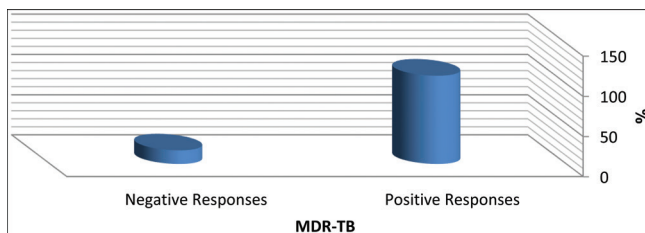


Figure 2: The multi-drugs resistance of tuberculosis

them more susceptible to tuberculosis infection. Similar findings were discovered by.^[13,14]

Diabetes mellitus appears to be a risk factor for tuberculosis infection in Malaysians as well. This observation is in line with.^[15,16] Diabetes inhibits both innate and adaptive immune responses to tuberculosis.

At a *P* value of 0.05, the relationship between multi-drugs resistance (MDR) of TB and clinical result of tuberculosis patients shows that there is a significant association between MDR of TB and clinical outcome of tuberculosis patients. One of the key challenges of the TB control effort is multidrug resistance in TB treatment clinics. MDR and defaulting from TB treatment rates were 13.4%, which is consistent with earlier research that found MDR and defaulting from TB treatment rates ranging from 2.8% to 30.8% in South West Nigeria.^[17-19] Better implementation tactics, such as a defaulter tracing system, supervision, and health education initiatives, could explain the significantly reduced MDR and defaulting rate.

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CONCLUSIONS

People who are young adults and elderly, people who are male, people who are smoking, people with chronic diseases are high risk factors.

It should be tested for tuberculosis to allow for early detection and intervention. People should be made aware of the consequences of smoking, drunkenness, and drug usage, including their vulnerability to tuberculosis, through educational initiatives. To lower the vulnerability of the elderly, young, and men to tuberculosis, a vigorous vaccination campaign should be implemented.

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Conflicts of interest

There are no conflicts of interest.

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