Original Article

Identification And Prevalence Rate Of Tuberculosis Among Patient With Diabetes Mellitus At PIMS Hospital Islamabad Pakistan

Marifat shah[1], Habiba Inayat[2], iram Yousaf Malik3, Muhammad imran4, Fawad Khalid[5], Javeria Riaz Masood[6],Amir Muhammad[7], Saleem jan[8], Yar Muhammad Khan[9], Mohibullah Khan[8], Zamarud Shah[10], Hikmat ullah khan[11*]

1. Associate professor, department of medicine, JMC, Peshawar.
2. TMO in Medical B ward HMC Peshawar Pakistan
3. Assistant Professor Microbiology Mbbs, M.Phil microbiology Central park Medical College,Lahore
4. Institute microbiology and molecular genetics University of the Punjab, Lahore Pakistan
5. TMO Internal Medicine Medical C Ward SGTH Swat kp Pakistan
6. TMO Surgical B ward SGTH Swat kp Pakistan
7. Medical officer at Cardiac Surgery ICU, Luqman International Hospital swat
8. Department of Chemistry University of Science and Technology Bannu Kp Pakistan
9. Department of Biotechnology University of Science and Technology Bannu Kp Pakistan
10. Department of Biotechnology Abdul Wali Khan University Mardan.
11. Department of Biotechnology and Genetic Engineering Hazara University Mansehra KP Pakistan

Corresponding Author: Hikmat ullah khan[9*]

CO-Corresponding Author: , Fawad Khalid[3*]

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Abstract

The worldwide study suggested that Tuberculosis (TB) is one of the most common endemic ailments having the great causing factor of mortality and morbidity. As compare to general population the Diabetes Mellitus (DM patient has high risk factor for getting Tuberculosis (TB).The main purpose of the current research is to investigate the frequency rate of Tuberculosis among Patient with Diabetes Mellitus at PIMS Hospital Islamabad Pakistan from April, 2021 to July, 2021.in the current study the patient was examined from the age of 20 to 60 which is already treated for Diabetes Mellitus as well. The patient was asking for the sign and symptoms of Tuberculosis (TB). When the Tuberculosis (TB) sign and symptoms found positive than after that Sputum analysis were done. There are three Sputum sample (morning-spot) were collected to examine AFB. For Statiscal Data analysis we Used SPSS version 20. A total of 412 patients were included in the study. The mean age of the patients was found as 45.63 ± 10.33 years. Among these, 240 patients (59.3%) were female. Also 112 patients (21.7%) had type 1 DM while 247 (78.3%) had type 2 DM. When asked about the TB symptoms, they were positive in 51 patients (11.0%) while negative in remaining 381 patients (89%). However, further sputum analysis showed confirmed TB in 22 patients (4.1%) only. After adjustment of confounding factors, age, gender and type of DM were not found having significant role for development of TB among these patients. From the current research we conclude that there is high prevalence rate in Tuberculosis (TB) among diabetics Patient which is the main causing factor of mortality and morbidity in Pakistan and globally as well .

Keywords: Tuberculosis; Prevalence; Diabetes Mellitus; Diabetics

INTRODUCTION

Diabetes mellitus (DM) is one of the major diseases in the world affecting approximately 235 million people with a global prevalence of 8.3% (1). It has caused 5.1 million deaths in 2013 in whole of the world. Also about 80% of DM patients belong to low and middle-income countries including Pakistan (2). Diabetic patients are more susceptible to infections. This can be explained on the basis of increased sugar levels that provide a very favorable environment for

the invading microorganisms to grow. Hyperglycemia decreases the ability of many types of immune cells to function properly which leads to infections in these patients (3). Tuberculosis (TB) contributes to co-morbidity in diabetic patients. Studies have shown that most of the TB infections in diabetics go unnoticed as many of the symptoms such as lethargy, weight loss, and anorexia are shared by both these conditions (4). Moreover, patients with diabetes are at a 2-3 times higher risk of contracting tuberculosis than those without diabetes (5).In a study in Ethiopia, the prevalence of TB in patients with DM was found to be 6.2% (6). In a study from India, this prevalence was found to be 10% (7).The combined prevalence rate of diabetes among patients with tuberculosis was 7.20% in a meta-analysis by Chen et al (8). The rationale of our study is that TB is mainly disease of third world countries including Pakistan and there are minimal studies in the literature available on the prevalence rate of TB among DM patients in our area of the world, particularly Pakistan, therefore I want to do this study to look for prevalence rate of TB among DM patients in our country. Also this study will generate an authentic piece of evidence of this prevalence from our country

MATERIAL AND METHODS

This cross-sectional study was conducted at PIMS Hospital Islamabad, over a period of 3 months from April, 2021 to July, 2021. This study was started after taking consent from Ethical review board of the hospital. Both male and female patients with age of 18-60 years with diagnosis of DM presenting in Diabetes clinic, already taking treatment for it were included in the study. Our exclusion criteria included newly diagnosed patients of DM; patients on immunosuppressive drugs/steroids; and patients on antibiotics for the past 15 days. All patients fulfilling the inclusion and exclusion criteria were enrolled in the study. They were explained about details of the study and informed consent was taken from all patients in the study. All patients were asked about the symptoms of TB symptoms. Based on these symptoms patients were segregated into TB positive and TB negative symptoms. For a patient to have TB positive symptoms he/she should have at least 3 of the following symptoms: Persistent cough for > 2 weeks coughing of blood, Fever; Loss of weight, Night sweats, and tiredness. If a patient has 3 or more symptoms, he was considered for Sputum analysis. Three sputum samples (morning-spot) were collected to observe AFB by light microscopy using Ziehl Neelson (ZN) staining. TB positive were considered if a patient has both of the following: TB symptoms positive and Positive ZN staining in any of samples. TB negative were considered if a patient has any of the following: Negative TB symptoms or Negative ZN staining in all of samples. Taking estimated population of AJ&K as 10000000, a margin of error of 5% and confidence interval of 99.9%, with estimated prevalence of TB as 7.2%8, the sample size calculated was 290 patents. The collected data were entered and analyzed accordingly using SPSS version 20 through its statistical program. The study variables were analyzed using simple descriptive statistics, calculating mean and standard deviation for numerical values like age. Frequencies and percentages were calculated for qualitative variables like gender, TB positive and TB negative. Data were stratified to control effect modifiers including age and gender and type of diabetes. Post-stratification chi Table 1: Stratification of Patients to rule out effect modifiers square test was applied. P-value ≤ 0.05 were considered as significant.

RESULTS

A total of 412 patients were included in the study. The mean age of the patients was found as 45.63 ± 10.33 years. Among these, 240 patients (59.3%) were female. Also 112 patients (21.7%) had type 1 DM while 247 (78.3%) had type 2 DM. When asked about the TB symptoms, they were positive in 51 patients (11.0%) while negative in remaining 381 patients (89%). However, further sputum analysis showed confirmed TB in 22 patients (4.1%) only. After adjustment of confounding factors, age, gender and type of DM were not found having significant role for development of TB among these patients. Stratification of data was done according to age groups, gender and type of DM. It was found not significant in any of these categories (Table 1).

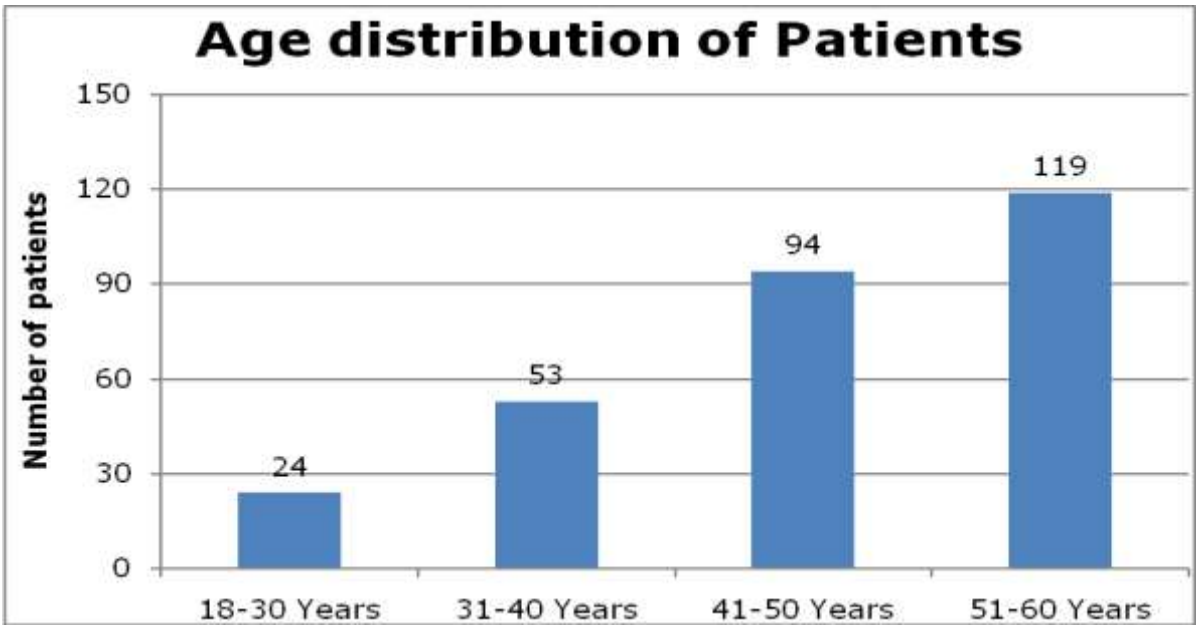

Fig 1. Age distribution of patients in this study

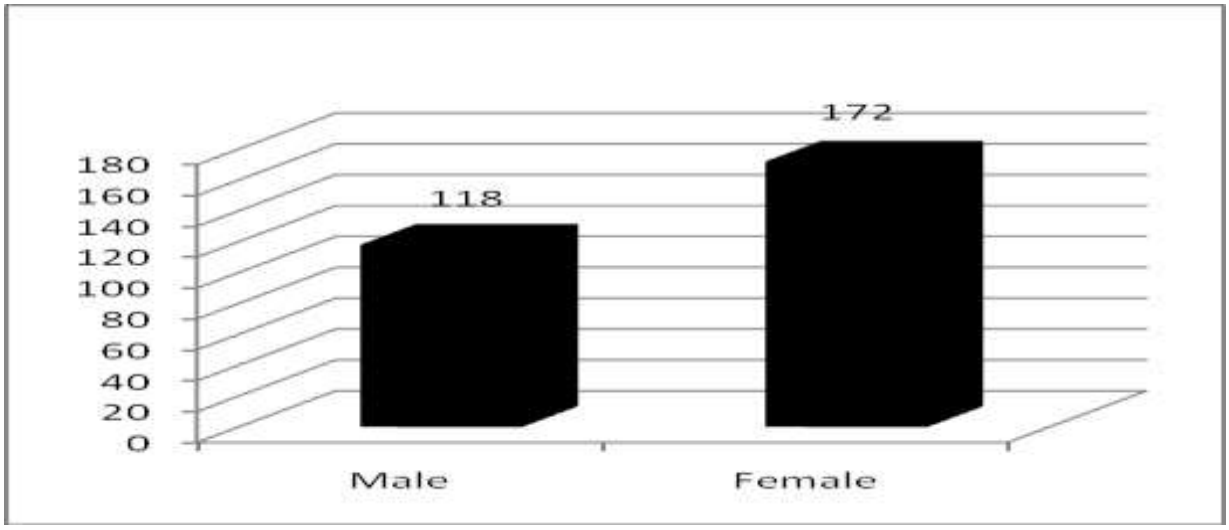

Fig. 2: Distribution of patients according to gender

Table Show the Positive and Negative Result of the Patient

	Positive TB	Negative TB	P-Value
Age Groups			
18-30 Years	4 (16.66%)	20 (83.33%)	

31-40 Years	7 (13.2%)	46 (86.7%)	0.64
41-50 Years	8 (8.5%)	86 (91.4%)	
51-60 Years	13 (10.9%)	106 (89.1%)	
Gender			
Male	11 (9.3%)	107 (90.6%)	0.44
Female	21 (12.2%)	151 (87.7%)	
Type of DM			
Type 1 DM	7 (11.1%)	56 (88.9%)	0.982
Type 2 DM	25 (11%)	202 (89%)	

Discussion

Despite all the efforts by health organizations, TB is one of the most prevalent diseases and is thought to be infecting one third of the world's populations (9). In early 20th century, health care professionals tried to find association between TB and DM although they couldn't find the association whether TB occurs as a result of DM or DM leads to TB (10).Recently some more studies had been conducted on the topic and have identified a positive relation between twoentities. Many investigators have raised an issue about the increasing prevalence of DM and TB, particularly third world countries including Pakistan, India and China that are having fastest raise in DM and TB burden (11).In this study, we have found the mean age of patients as 45.63±10.33 years. Also majority of patients (73.4%) in our study belonged to 4th and 5th decade of their lives. In a study by Qayyum et al fromPakistan, the highest prevalence of TB was found maximum in 4th and 5th decade (12). In another study from Australia, authors found that age of the patients did not modify risk of TB among diabetics (13). Similarly in our study, age was not found increasing risk of TB among patients with DM. In this study, the prevalence of TB symptoms was found 11% and confirmed TB in 4.among Diabetics (14).In another study from Pakistan, prevalencewas found as 9.5% (15) In a report from Ethiopia, this prevalence was 6.2% (15), 6% from India and 5.4% from Tanzania (16,17). In another study from Korea, this prevalence was found as 2.12% (18) This differenceamong Pakistan and other countries may be due to high prevalence of TB in Subcontinent otherwise. According to WHO estimation in 2011, the prevalence of TB in general population was found to be 0.39% (18). The high incidence of TB amongdiabetics, as shown in our study, sows relationship between TB and DM. Multiple studies form animals as well as humans support this idea (19). The pathophysiology behind is higher glycemic indicesand poor control leads to low immunity which makes diabetic patients more susceptible to infections including TB. In a systematic review by Christie et al.,prevalence of TB among Diabetics was found significantly high and authors confirmed the idea that DM increase risk for TB (20).

CONCLUSION

On the basis of this study, we conclude that the burden of TB is high in Diabetic patients and werecommend regular screening of diabetic patients for TB,

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