STUDY TO KNOW THE TUBERCULOSIS PREVALENCE AMONG PATIENTS OF DIABETES MELLITUS

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Abstract:

Tuberculosis (TB) is an endemic disease that produces high morbidity and mortality among humans in the world. Diabetes mellitus (DM) increases the risk of contracting TB from diabetes patients compared to the general population.

Objective: *The aim of this analysis was to know the prevalence of TB in patients receiving medication for DM.*

Study Design: *A cross-sectional study.*

Place and Duration: *In the Medicine unit ii of DHQ Hospital Rawalpindi for three months duration from March 2019 to May 2019.*

Methods: *The study included all patients aged 18-60 years with a diagnosis of DM who were admitted to the diabetes clinic currently under treatment. All patients were asked for symptoms of tuberculosis. If TB symptoms were positive, sputum analysis was performed. Three sputum samples (morning spot) were collected to observe AFB. Data were analysed with SPSS version 20.*

Results: *A total of 290 patients were included in the study. The mean age of the patients was 45.63 ± 10.33 years. Among these, 172 patients (59.3%) were women. In addition, 63 patients (21.7%) had type 1 DM and 227 patients (78.3%) had type 2 DM. When asked questions about tuberculosis symptoms, 32 patients (11.0%) were positive. The remaining 258 patients were negative (89%). However, an additional sputum analysis showed that TB was confirmed in only 12 patients (4.1%). After adjustment of the confounding factors, age, sex and type of DM did not appear to play an important role in the development of tuberculosis in these patients.*

Conclusion: *As in this study, we recommend that regular screening of all diabetic patients in our country should be considered endemic for this fatal disease in relation to the high prevalence of TB in diabetic patients.*

Keywords: *Diabetes Mellitus, prevalence, tuberculosis.*

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INTRODUCTION:

Diabetes mellitus (DM) is one of the major diseases in the world affecting approximately 235 million people, with a prevalence of 8.3% worldwide[1-2]. It caused 5.1 million deaths in 2013 worldwide. In addition, approximately 80% of patients with DM belong to low- and middle-income countries, including Pakistan[3]. Diabetic patients are more susceptible to infections. This can be explained on the basis of the increase in sugar levels, which provides a very favourable environment for the growth of invasive microorganisms[4]. Hyperglycaemia prevents many types of immune cells from functioning properly, causing infections[5]. Tuberculosis (TB) contributes to comorbidity in diabetic patients. Research has shown that most TB infections in diabetes are unnoticed because most symptoms, such as drowsiness, weight loss and anorexia, are shared by both conditions. In addition, diabetic patients are at 2-3 times greater risk of developing tuberculosis than non-diabetic patients[6-7]. In a study conducted in Ethiopia, the prevalence of TB in patients with DM was 6.2%. In a study from India, this prevalence was found to be 10%. In a meta-analysis by Chen et al., The prevalence of diabetes was 7.20% in patients with tuberculosis[8]. The reason for our study is that TB is primarily a disease of third world countries, including Pakistan, and there are few studies in the literature on the prevalence of TB in DM patients in the world and especially in Pakistan. Therefore, this study investigating the incidence of TB in patients with DM in our country. In addition, this study will produce real evidence of this prevalence in our country.

MATERIALS AND METHODS:

This cross-sectional study was held in the Medicine unit ii of DHQ Hospital Rawalpindi for three months duration from March 2019 to May 2019. This study began after obtaining the approval of the ethics review board of the hospital. The study included male and female patients aged 18-60 years with diabetes mellitus in the diabetes clinic and currently under treatment. Exclusion criteria include newly diagnosed DM patients; patients with immunosuppressive drugs / steroids; and patients with antibiotics for the last 15 days. All patients who met the inclusion and exclusion criteria were included in the study. Details of the study were explained and informed consent was obtained from all patients in the study. All patients were asked about the symptoms of TB symptoms. Based on these symptoms, patients were divided into positive TB and negative TB symptoms. For a patient to have TB positive symptoms, he / she must have at least 3 of the following symptoms :> continuous cough for 2 weeks; cough; Weight loss; Night sweats; and fatigue If a patient has 3 or more symptoms, he was accepted for sputum examination. Three sputum samples (morning spot) were collected by optical microscopy using Ziehl Neelson (ZN) staining to observe AFB. Positive TB was considered if a patient had the following two: Signs of positive TB and positive ZN staining in any of the samples. Negative TB was considered if a patient had any of the following symptoms: negative TB symptoms or negative ZN staining in all samples. The estimated sample size was 290 patients, estimated at a prevalence of 7.2%, estimated at a 5% error margin and a confidence interval of 99.9%. The collected data were entered and analysed using the statistical program SPSS 20. Study variables were analysed using simple descriptive statistics, and mean and standard deviation were calculated for numerical values such as age. Frequencies and percentages were calculated for qualitative variables such as gender, positive TB and negative TB. Data were classified to control modifiers including age, sex, and type of diabetes. Chi-square test was performed after stratification. P value was considered significant.

RESULTS:

A total of 290 patients were included in the study. The mean age of the patients was 45.63 ± 10.33 years. In addition, we found that most of the patients (41%) were in the 51-60 age group. All details regarding the age distribution of the patients in the study are summarized in Figure 1.

Fig 1. Age distribution of patients in this study
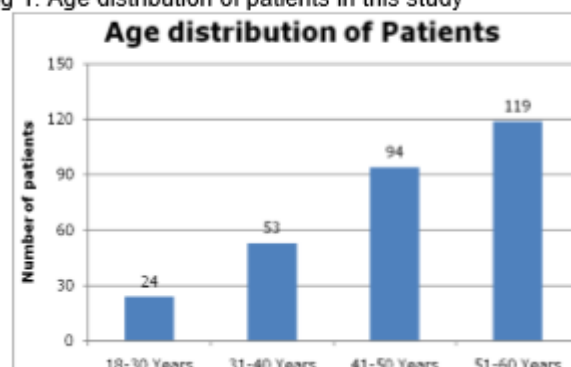
In this study, 172 patients (59.3%) were women (Figure 2).

Fig. 2: Distribution of patients according to gender
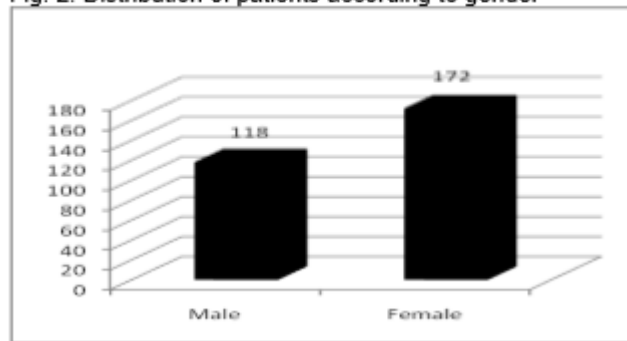
In this study, 63 patients (21.7%) had type 1 DM and 227 patients (78.3%) had type 2 DM. When asked for tuberculosis symptoms, 32 patients (11%) were found to be positive and the remaining 258 patients (89%) were negative. However, an additional sputum analysis showed that TB was confirmed in only 12 patients (4.1%). Data were classified according to age groups, gender and type of DM. It was found that none of these categories were significant (Table 1).

	Positive TB	Negative TB	P-Value
Age Groups			
18-30 Years	4 (16.66%)	20 (83.33%)	0.64
31-40 Years	7 (13.2%)	46 (86.7%)	
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 efforts by health care organizations, tuberculosis is one of the most common diseases and is believed to affect one third of the world's population[9]. In the early twentieth century, health professionals tried to find a relationship between TB and DM, but could not find unity if caused TB or as a result of DM[10-11]. Recently, some studies have been carried out on the subject and found a positive relationship between the two entities. Many researchers have created an increasing problem with the rapid increase in the burden of DM and TB, particularly in third world countries, including Pakistan and India. In this study, we found that the mean age of the patients was 45.63 ± 10.33 years. In addition, the majority of the patients in our study (73.4%) belonged to the 4th and 5th years of life. In a study conducted by Qayyum et al. In Pakistan, TB prevalence was highest in the 4th and 5th decade. In another Australian study, the authors found that the age of patients did not change the risk of TB among diabetics[12]. Similarly, in our study, it was not found to increase the risk of TB in patients with DM. In this study, the prevalence of TB symptoms was found to be 11% and TB in 4 diabetic patients. Another study from Pakistan found a prevalence of 9.5%. In a report from Ethiopia, this prevalence was 6.2% in India, 6% and 5.4% in Tanzania[13]. In another study from Korea, this prevalence was 2.12%. Otherwise, this difference between Pakistan and other countries may be due to the high prevalence of TB in the sub-continent[14]. According to WHO estimate in 2011, the prevalence of TB in the general population was 0.39%. As seen in our study, the high incidence of TB among diabetics explains the relationship between TB and DM. various human studies support this idea. The underlying pathophysiology is higher glycaemic indices and poor control leads to low immunity, which makes diabetic patients more susceptible to infections, including tuberculosis[15]. In a systematic review of

Christie et al., The prevalence of TB in diabetic patients was found to be significantly higher, and the authors confirmed the idea that DM increased the risk of TB.

CONCLUSION:
Based on this study, we suggest that TB burden is high in diabetic patients and that screening of diabetic patients on a regular basis, especially in our population.

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