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Research Article

**STUDY TO KNOW THE ASSOCIATION OF PULMONARY  
TUBERCULOSIS WITH DIABETIC AND NON DIABETIC  
PATIENTS**<sup>1</sup>Dr.Maryum Tahir, <sup>2</sup>Dr.Afzaal Majeed, <sup>3</sup>Dr.Ayesha syed<sup>1</sup>King Edward Medical University Lahore<sup>2</sup>BHU Sheikh Chogani ,Gujrat<sup>3</sup>Foundation University Medical College Islamabad**Abstract:**

**Objective:** To evaluate diabetes mellitus effects on clinical diagnostic methods and to know the association of Pulmonary Tuberculosis with diabetic and non-diabetic patients.

**Study Design:** A cross-sectional retrospective.

**Place and Duration:** In the Pulmonology and Endocrinology Department of Mayo Hospital, Lahore for 2 years duration from 2015-2017.

**Methodology:** Clinical trials of patients with pulmonary TB proven diagnosis were reviewed. Clinical, diagnostic methods, Demographic data and findings on radiology were studied. High-resolution pulmonary computerized tomography (HRCT) and Radiologic data were performed by two different radiologists. After data entry on SPSS-16, the chi-square test and Fischer exact test were used for two groups comparison (TB without DM and TB). P value less than 0.05 was taken significant.

**Findings:** 200 total patients with pulmonary TB, 80 (% 40) had TB and synchronous DM (PTDM group). The mean age of the two groups was not different significantly. The incidence of DM and TB in women was higher significantly (P value <0.01). Between the two groups, there was a significant difference in terms of dyspnoea, fever, hemoptysis and weight loss. The most common diagnostic method used for diagnosis in both groups was Positive sputum smear (PT, PTDM) and there was no difference significantly (P value > 0.05). Multi-lobal cavities were significantly more recorded in diabetics (p value = 0.015). There was no statistically difference between the two groups.

**Conclusion:** Tuberculosis in diabetic patients may be more invasive, in women especially, so more measures should be taken on it.

**Keywords:** Tuberculosis, Diabetes mellitus, radiological findings.

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**INTRODUCTION:**

Diabetes mellitus (DM) patients are at an increased risk of developing some infectious diseases such as tuberculosis (TB) due to inadequate host defense. This can change the treatment style in all current situations. The high tuberculosis (TB) incidence in diabetes mellitus (DM) patients has been a major concern for many years. This may be more evident in Pakistan which is a developing country, especially in an endemic region for tuberculosis (Middle East). In Pakistan, the prevalence of tuberculosis in the 2011-13 period is 13.4 per 100,000 people; This rate is reported to be 44.8 per 100,000 in general in Pakistan. National studies show a incidence of 2.5% for men in DM and 3.58% for women. Although, it is believed that about 6% of Pakistan general population has DM (10 million). The most common comorbid disease in patients with pulmonary tuberculosis (24.3%) is Diabetes Mellitus. According to high incidence tuberculosis in this area, this study was performed to determine the clinical and diagnostic methods of pulmonary tuberculosis and its effect on radiological characteristics when DM is compared with patients with non-diabetic pulmonary tuberculosis.

**MATERIALS AND METHODS:**

This cross-sectional retrospective study was held in the Pulmonology and Endocrinology Department of Mayo Hospital, Lahore for 2 years duration from 2015-2017. Clinical records, Demographic data, radiological findings and diagnostic methods were obtained from the medical records of the patients. Fasting plasma glucose (FPG) > 126 mg / dL or Random plasma glucose > 200 mg / dL was repeated twice in new cases of diabetes mellitus. In some

patients, the diabetes mellitus diagnosis was recorded in previous medical records and glucose-lowering agents were used. According to the World Health Organization (WHO) classification Pulmonary tuberculosis was explained. Exclusion criteria included militant tuberculosis, pure pleural involvement, corticosteroid therapy or collagen diagnosis, positive HIV test and malignancy diseases. From Chest-X-ray reports Radiological data were obtained reported by two specialist radiologists and high-resolution lung computerized tomography (HRCT). Ethical approval was obtained from the local ethics committee. The patients selected for the study were divided into 2 groups:

1. DM with Pulmonary TB (PTDM) or Study group.
2. Control group or Pulmonary TB (PT).

Statistical analysis: Statistical analysis was done with SPSS Version 15 was used for data analysis. Chi-square test and Fischer exact test were used for two groups comparison. P value less than 0.05 was taken significant.

**RESULTS:**

Of the 200 patients with TB Lungs, TB and DM simultaneously occurs in 80 (40%) (PTDM group). Table-I shows the two groups demographic characteristics. Between the 2 groups, average age was not different significantly (P value > 0.05). The incidence of DM and TB in women was higher significantly (P value less than 0.02). In the PT group, the ratio of women in the PTDM group to men was 0.37: 1, while this ratio was 1.96: 1. Opioid dependence was higher in diabetic patients, but no obvious correlation was observed (P value > 0.05). In the PT group, Smoking was higher significantly (0.003 P value). Table I.

**Table-I: Demographic data of the Tuberculosis patients.**

<i>Variable</i>	<i>PT N=120 (60%)</i>	<i>PTMD N= 80 (40%)</i>	<i>P-value</i>
Age mean±SD (range)	49± 108 (14-80)	53± 2.4 (16-84)	> 0.05
<i>Sex:</i>			
Female	33(27.5%)	53 (66.3%)	
Male	87(72.5%)	27(33.8%)	< 0.01
Opium addiction	27 (22.5%)	41(51.9%)	> 0.05
Cigarette Smoker	58 (48.7%)	22(27.5%)	0.003

In Table II Clinical charts of the patients are given. There was a major difference between the two groups in terms of shortness of breath, fever, hemoptysis and weight loss. In both groups the most common diagnostic method used for diagnosis was Positive sputum smear, but there was no difference significantly in diagnostic methods between two groups (P value > 0.05).

**Table-II: Clinical manifestations of Tuberculosis cases.**

Symptoms	PT = n(%)	PTDM=n(%)	P-Value
	120 (60)	80 (40)	
Fever	106 (88.3)	43 (53.8)	< 0.01
Cough	109 (91.6)	65 (85)	> 0.05
Dyspnea	87 (72.5)	71 (89.9)	0.003
Night sweating	73 (60.8)	47 (59.5)	>0.05
Weight loss	56 (46.7)	49 (61.3)	0.043
Hemoptysis	26 (21.8)	33 (41.8)	0.003

Radiological findings are presented in Table IV. Lower lobe involvement, Parenchymal infiltration and cavil lesions in diabetic patients were higher (P value > 0.05).

**Table-IV: Radiological findings in PT and PTDM group.**

Finding	Parenchymal infiltration				Cavity			Nodular pattern	Pleural effusion				
	no	Upper lobe	Lower lobe	Multi lobar	no	Upper lobe	Lower lobe		Multi lobar	no	RT side	LT side	Bilateral
PT N(%)	10(58.3)	19(15.8)	9(7.5)	22 (18.3)	57(47.5)	19(15.8)	26(21.7)	18(15)	43(35.8)	52(43.3)	37(30.8)	19(15.8)	12(10)
PTDM N(%)	49(61.3)	5(6.3)	11(13.8)	15(18.8)	23(28.8)	16(20)	16(20)	25(31.3)	23(28.8)	37(46.3)	14(17.5)	15(18.8)	14(17.5)
P-value		<0.05				<0.05		0.014	>0.05			>0.05	

In non-diabetic patients, multilobar spaces were reported more frequently than non-diabetic patients (p = 0.014).

**Table-III: Diagnostic methods of pulmonary TB.**

Method	PT n (%)	PTDM n (%)	P - Value
Positive smear	68 (56.6)	38 (47.5)	> 0.05
Positive smear and culture	27 (22.7)	16 (20)	>0.05
Clinical and radiological findings plus response to treatment	25 (21)	26 (32.5)	> 0.05

However, no statistical difference was observed between parenchymal infiltration, pleural effusion, or the frequency or location of the nodal pattern between the two groups Table III..

### DISCUSSION:

Concurrent diabetes mellitus and tuberculosis are known as one of the most common diseases. Current results show that 40% of patients with BD are DM at the same time. Tuberculosis Saudi Arabia met by chance, these figures, respectively 15 immigrants and native Iran and Saudi patients in two studies in Turkey, 22.6% and 36.3%, in one study, and DM 23.4% and 30% respectively of patients' u. 2.16 The mean age of our study was higher in the PT group (49 ± 1.8 years) than in the PT group (53 ± 2.4 years), but

a significant relationship (p < 0.05) was observed. This information was supported by other studies. This means that older people live more with DM and TB; the age of decline based on the immune system and the cumulative effects of DM. Women were significantly different in the PTDM group (P value < 0.01) when the two groups studied were compared. Some studies have reported a higher prevalence of DM in women and men than in TB. On the contrary, some studies have shown that men in the PTDM group are older men. Our data show that PTDM

group and cigarette opiate dependence in the PT group is more frequent in the first group (P value = 0.003), statistically significant. This information is not yet defined in other studies and may require more attention. In this study, cough (100%), shortness of breath (79.4%), fever (74.5%), night sweats (60.3%). The most common clinical findings were hemoptysis (52.8%) and hemoptysis (29.8%). The frequency of the symptoms mentioned was similar in other studies. We found that Mycobacterium tuberculosis is the most common diagnostic method for positive sputum smear in both groups. Non-diabetic patients had more positive sputum smear, but the difference was not significant (P value > 0.05). Many studies have similarly shown positive spread of sputum as the most common diagnostic method. There was no significant difference between the two groups. Several studies have found a significantly higher sputum smear frequency in diabetic patients with pulmonary TB. Cavitory lesions and upper lobule involvement are well known radiological patterns of pulmonary tuberculosis. The interest in the middle or lower lung was defined as an atypical place. This model is frequently reported in diabetic patients. In our study, multiple lobe cavities were found significantly in diabetic patients (P value = 0.0124). This is due to an insufficient immune system in diabetic patients. Many studies have shown frequent cavitory lesions in diabetic patients with pulmonary tuberculosis. Other studies reported the same pulmonary vacuum in PT and PTDM patients. In non-diabetic subjects, diabetic patients had a higher incidence of upper lobe (6.3% versus 15.8%) and lower incidence (13.8% versus 13.8%, p < 0 value) in the lower lobe. 05). Similar results have been shown by others. Other imaging findings such as parenchymal infiltration, frequency and location of nodular and pleural fluid were similar in both groups; This information is supported by other studies.

### CONCLUSION:

Diabetic patients, especially women, are more susceptible to pulmonary tuberculosis with dyspnoea, weight loss, hemoptysis and multilobar cavitory lesions than non-diabetic patients. This means that TB may be more invasive in diabetic patients. Atypical pulmonary involvement is more frequently reported in diabetic patients with pulmonary tuberculosis. This means that the possibility of more pulmonary tuberculosis in diabetic patients needs to be considered, and in these cases there may be sputum smear or primary tests such as culture and pulmonary radiography or pulmonary HRT due to the possibility of more invasive tuberculosis. It is useful in previous diagnoses and, of course, better results. It can be concluded that there is an association between

pulmonary tuberculosis and a relatively suppressed immune system such as diabetes mellitus and underlying conditions.

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