ORIGINAL ARTICLE

CLINICAL PROFILE OF SPUTUM POSITIVE PULMONARY TUBERCULOSIS PATIENTS WITH DIABETES MELLITUS IN A TEACHING HOSPITAL AT JAMNAGAR, GUJARAT

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ABSTRACT

Background: Diabetes mellitus (DM) is a known risk factor for tuberculosis (TB). Presently, little is known about the effect of DM on the clinical presentation of TB. The aim of the study was to evaluate the clinical features of pulmonary TB in diabetics in our region.

Methods: The present prospective observational study was carried out on all consecutive smear-positive pulmonary TB patients with DM admitted in department of pulmonary medicine, Guru Gobind Sing Hospital & Shree M. P. Shah Medical College, Jamnagar, between October 2005 to September 2006.

Results: Total 38 cases were included in study. The male: female ratio was 2.8:1. The mean (± standard deviation) age of was 50.5 (± 13.5) years. The majority of patients were between 51-60 years. The incidence was started to rise from the age of 30 years and declined from the age 61 years. Elderly patients (age >50 years) had less incidence of fever, chest pain, haemoptysis and higher incidence of dyspnoea as compared to young adults (age < 50 years).

Conclusion: A diagnosis of TB should be considered in diabetics with an abnormal chest radiograph, in the presence or absence of specific clinical symptoms, in endemic regions. Level of blood sugar and age doesn't affect much in bacteriological and radiological presentation of pulmonary TB except the cavities which is more common in patients with uncontrolled diabetes. Insulin requirement to control the blood sugar in patients with pulmonary TB doesn't depend on the bacteriological and radiological extent of disease.

Keywords: clinical profile, diabetes, sputum positive, pulmonary tuberculosis

INTRODUCTION

DM is a metabolic disorder that weakens the immune system. The frequency and enhanced severity of infections in uncontrolled diabetes were well known before and after the discovery of insulin. The availability of antibiotics has made a great difference, but infection is probably a more serious threat to life in a diabetic than in the non-diabetic. DM is a well-known risk factor for TB in the past.[1,2] Pulmonary TB represents an important worldwide public health problem. Globally there is increase in cases of type 2 DM and greatest increase in cases will occur in developing countries, where TB is highly endemic.[3] Pulmonary TB has remained a public health problem in India since long. The incidence of pulmonary TB has been reported to be higher in diabetics than non-diabetics.[4,5] The higher incidence of TB amongst diabetics in India has also been reported by various workers.[6,7,8] DM is known to modify the clinical and radiological manifestations of pulmonary TB but had conflicting results. In this study, we aimed to evaluate the demographic, clinical and radiological presentation of PTB patients.

METHODS

This prospective observational study was carried out on patients admitted in department of pulmonary medicine, Shree M. P. Shah Medical College & Guru Gobind Sing Hospital, Jamnagar from July 2004 to November 2006. After a detailed history and thorough examinations all patients were subjected to sputum smear for AFB examination, X-ray chest PA view and hematological investigations. We included only sputum smear positive pulmonary TB patients with or without extra pulmonary TB. Sputum negative pulmonary TB, and HIV sero-positive patients were excluded from the study to allow better data analysis. Patients were

considered to have a diagnosis of DM if they were receiving insulin or an oral hypoglycemic agent at the time of hospital admission or were found to have two or more fasting blood glucose levels greater than 140 mg/dl. Sputum smear examination was graded in scanty, +, ++ or +++ according to Revised National Tuberculosis Control Programme (RNTCP) guideline.[9] All chest x-rays were reviewed by one of the pulmonologists participating in the study for presence or absence of cavities, involvement of zones and extent of disease. Extent of lesion was again divided in three, minimal lesion: disease with a combined area of less than that of the right upper lobe, moderate: disease with a combined area of less than that of the right lung but more than that of the right upper lobe and advanced: disease with a combined area of more than that of the right lung.

RESULTS

A total 38 sputum-positive PTB patients with DM were included in the study. Male patients outnumbered female patients. Of the 38 cases, 28 were males and 10 were females. The male: female ratio was 2.8:1. The mean (± standard deviation) age of was 50.5 (± 13.5) years. The majority of patients were between 51-60 years of age followed by 41-50. The numbers starts to rise from the age of 30 years and decline from the age 61 years.

The proportions of patients with different symptoms are compared in Table 1. Cough was most common symptoms in all the patients. Prevalence of fever, chest pain and haemoptysis was higher in young adults (age < 50 years) while prevalence of dyspnoea were found significantly higher (p value < 0.05) in elderly patients (age >50 years).

Table 1: Incidence of various symptoms in young adults and elderly patients

Symptoms	Age <50 yrs (n=20) (%)	Age >50 yrs (n=18) (%)	Total (n=38) (%)	Significance*
Cough	20 (100)	18 (100)	38 (100)	Not significant
Chest pain	5 (25)	3 (16.67)	8 (21.05)	Not significant
Fever	18 (90)	12 (66.67)	30 (78.95)	Not significant
Dyspnoea	6 (30)	11 (61.11)	17 (44.74)	**Significant**
Haemoptysis	3 (15)	1 (5.56)	4 (10.53)	Not significant

***at 95% confidence level**

Table 2: Radiological findings in controlled and uncontrolled diabetics

Radiological Findings	Sugar control		Signi-ficance*
	Uncontrolled (n=29) (%)	Controlled (n=9) (%)	
Type			
Cavity	15 (51.72)	1 (11.11)	Significant
Non-cavity	14 (48.28)	8 (88.89)	
Extension			
Mild	7 (24.14)	2 (22.22)	Not
Moderate	19 (65.52)	5 (55.56)	significant
Advance	3 (10.34)	2 (22.22)	
Zone			
Upper zone	9 (31.03)	2 (22.22)	Not
Mid zone	3 (10.34)	0	significant
Lower zone	14 (48.28)	5 (55.56)	
Multiple	3 (10.34)	2 (22.22)	

***at 95% confidence level**

The radiological features were compared in patients with controlled and uncontrolled diabetes (Table 2) as well as in patients with age < 50 & ≥ 50 years (Table 3). Over all non-cavitary lesion was more common (57.89%) as compared to caitary lesion. Cavitary lesion was significantly (p value < 0.05) higher in patients with uncontrolled diabetes while non-cavitary lesion in patients with controlled diabetes. Lower zone or multiple zone involvement with advance disease was more common in patient with controlled diabetes as compare to patients with uncontrolled diabetes. Middle zone or multiple zone involvement with non-cavitary and moderate or advance disease was more common in patient with > 50 years of age as compare to patients with < 50 years of age.

Table 3: Radiological finding in young adults and elderly patients

Radiological Findings	< 50 yrs (n=20) (%)	> 50 yrs (n=18) (%)	Signi-ficance*
Type			
Cavity	10 (50)	6 (33.33)	Not
Non-cavitary	10 (50)	12 (66.67)	significant
Extension			
Mild	6 (30)	3 (16.67)	Not
Moderate	12 (60)	12 (66.67)	significant
Advance	2 (10)	3 (16.67)	
Zone			
Upper zone	3 (15)	2 (11.11)	Not
Mid zone	4 (20)	6 (33.33)	significant
Lower zone	11 (55)	8 (44.44)	
Multiple	2 (10)	3 (16.67)	

***at 95% confidence level**

Sputum AFB positivity was compared in patients with controlled and uncontrolled diabetes (Table 6) as well as in patients with age < 50 & ≥ 50 years (Table 5). Over all scanty or 1+ positive sputum was more common in patient with diabetes and pulmonary TB

than 2+ or 3+. In our study 33.33% of the patients with controlled diabetes had numerous AFB on sputum smear examination compared to 24.14% of the patients with uncontrolled diabetes. Elderly patients (aged > 50 years) had more AFB on sputum smear examination as compared to younger patients (aged < 50 years).

Total insulin requirement to control blood sugar was compared in patients with low (scanty or 1+) and high (2+ or 3+) sputum positivity (Table 6). Patients with higher sputum positivity had required less insulin (<20 units) or OHA to control sugar while with lower sputum positivity had required more insulin (>20 units).

Table 4: Sputum AFB positivity in controlled and uncontrolled diabetics

Sputum for AFB	Sugar control		**Signi-ficance***
	Uncontrolled (n=29) (%)	Controlled (n=9) (%)	
Scanty or 1+	22 (75.86)	6 (66.67)	Not
2+ or 3+	7 (24.14)	3 (33.33)	significant

***at 95% confidence level**

Table 5: Sputum positivity in young adults and elderly patients

Sputum for AFB	**< 50 yrs (n=20) (%)**	**> 50 yrs (n=18) (%)**	**Signi-ficance***
Scanty or 1+	16 (80)	12 (66.67)	Not
2+ or 3+	4 (20)	6 (33.33)	significant

***at 95% confidence level**

Table 6: Insulin requirement to control sugar in relation to sputum positivity

Sputum for AFB	Insulin (%)		**Signi-ficance***
	OHA or < 20 units (n=19)	> 20 units (n=19)	
Scanty or 1+	13 (68.42)	15 (78.95)	Not
2+ or 3+	6 (31.58)	4 (21.05)	significant

***at 95% confidence level**

Table 7: Insulin requirement to control sugar in relation to extent of disease

Severity	Insulin (%)		**Signi-ficance***
	OHA or < 20 units (n=19)	> 20 units (n=19	
Mild	4 (21.05)	5 (16.67)	Not
Moderate	12 (63.16)	12 (75)	significant
Advance	3 (15.79)	2 (8.33)	

***at 95% confidence level**

Total insulin requirement to control blood sugar was also compared in patients with mild, moderate and advance disease (Table 7). Insulin requirement was more in patient with mild radiological disease as compared to patients with advanced disease who had required less insulin or OHA to control their blood sugar.

DISCUSSION

The association between DM and TB has long been acknowledged. Diabetes usually occurs in the middle age, but TB is a disease of young adults and our graph (Figure 1) shows the incidence rising from 30 years and highest in 51-60 years age group. So there must be an association between TB and diabetes. This male predominance may be that in most countries young men usually have more social and labour activities than women thus favouring the transmission of the disease and/or to a higher frequency of under-diagnosis in women primarily resulting from fewer opportunities among women of obtaining medical services.

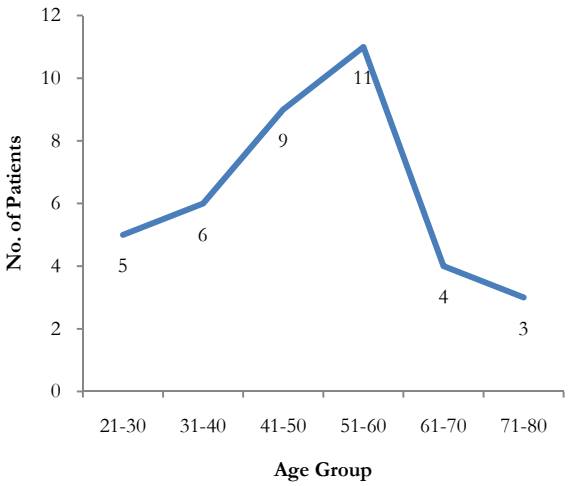

Fig: 1: Age group wise distribution of Patients

Cough and fever were the most common symptoms in our study which was comparable with the study by Singla et al.[10] A number of studies[11,12,13] have reported no difference in the symptomatology between diabetic and nondiabetic patients but a recent large study has reported a higher rate of fever and hemoptysis among diabetic patients.[14] Our data suggest that symptoms like hemoptysis and chest pain were more frequent in young adults whereas dyspnoea were significantly higher in elderly patients. The similar results were also found in patients of pulmonary TB without DM.[15,16,17] It has been found that DM is associated with a numerous AFB on sputum smear examination[10] but in our study higher number of patients had less numerous AFB.

We found higher frequency of lower zone lesions, as mentioned by other authors.[10,18,19] Lesions confined to the lower lung field only can lead to the consideration of diagnostic possibilities other than TB, with consequent delay in diagnosis and institution of proper treatment. Similar to previous studies, we found a

higher frequency of "atypical" images with fewer cavities in patients with DM[19,20] although other researchers have reported a higher frequency of pulmonary cavities in patients with DM.[10,14,18] Multilobar involvement has been reported to be more frequent[20] but it in our study it was less frequent. In the present study, multiple zone involvement, advanced lesion and less frequent cavitations were observed in the elderly patients than young adults. This type of findings is also common in patients of pulmonary TB without DM.[15]

Discrepancies in the literature regarding various features of patients with both DM and TB are bound to be partly due to differences in the degree to which glucose control has been achieved in these patients. DM is a known risk factor for TB in endemic area, and this risk increases with age. In general, TB is a disease that should be considered in diabetic patients with an atypical clinical and radiological presentation.

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