

ORIGINAL RESEARCH

Incidence of different types of tuberculous lesion in association with diabetes mellitus

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ABSTRACT

Background: One of the top 10 infectious diseases in the world and a major cause of death is tuberculosis (TB). The present study was to assess incidence of different types of tuberculous lesion in association with diabetes mellitus. **Methods:** 88 patients with history of diabetes mellitus and having complaints of cough with productive sputum for more than four weeks, loss of weight, loss of appetite, low grade fever, haemoptysis etc. of both genders were selected. All were evaluated for fasting, random blood glucose level. **Results:** Out of 88 patients, 54 were males and 34 females. Types of tuberculosis was pulmonary tuberculosis in 10 and extra pulmonary tuberculosis in 7 cases. Incidence of diabetes among tuberculosis patients was type 1 diabetes mellitus in 3, type 2 diabetes mellitus in 14. Socio-economic status was low in 8, middle in 5 and high in 4. Clinical features were cough with or without expectoration in 67, fever in 54, weakness & malaise in 32, loss of weight in 17, breathlessness in 53, chest pain in 26, distention of abdomen in 15, and swelling of gland in 7 cases. Types of lesions was pleurisy with effusion in 6, fibrocavitary lesion in 2, fibroinfiltrative lesions in 3, abdominal & intestinal TB in 3, tuberculous meningitis in 2 and miliary tuberculosis in 1 case. **Conclusion:** Incidence of tuberculous infection in diabetes mellitus is gradually increasing. Pulmonary types of tuberculosis are more in diabetic patients.

Keywords: diabetes mellitus, tuberculosis, glucose

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INTRODUCTION

One of the top 10 infectious diseases in the world and a major cause of death is tuberculosis (TB). Mycobacterium tuberculosis, the bacillus that causes tuberculosis, is dispersed into the air by sick individuals.¹ Although extrapulmonary TB can sometimes affect other places, the illness usually affects the lungs (pulmonary TB). An estimated 10.0 million (8.9–11.0 million) individuals worldwide contracted tuberculosis in 2019, and 1.4 million (1.3–1.6 million) of those cases resulted in death. Thailand was one of the 30 nations with the highest TB burden in 2019 with 105,000 incident cases and 11,500 TB-related deaths.²

The prevalence of diabetes has surged globally due to factors such as population aging, urbanization, dietary modifications, and decreased physical activity, which has led to a rise in obesity.³ Over the next 30 years, it is anticipated that the prevalence of DM would increase most sharply in areas with high TB incidence. Approximately 80% of the 415 million estimated DM cases worldwide come from low- and middle-income countries.^{4,5} Thirteen observational studies were included in a comprehensive analysis,

which revealed that DM triples the risk of tuberculosis. These results show considerable variance between studies, with risk ratios ranging from 0.99 to 7.83, despite the fact that this is the most well-characterized element of the connection between TB and DM.⁶ The present study was to assess incidence of different types of tuberculous lesion in association with diabetes mellitus.

MATERIALS & METHODS

The study was carried out 88 patients with history of diabetes mellitus and having complaints of cough with productive sputum for more than four weeks, loss of weight, loss of appetite, low grade fever, haemoptysis etc. of both genders. All gave their written consent to participate in the study.

Data such as name, age, gender etc. was recorded. All were evaluated for fasting, random blood glucose level. As per ADA criteria fasting plasma glucose is more or equal to 126 mg./dl. or random plasma glucose more or equal to 200 mg/dl. is diagnostic of diabetes mellitus. Urine sugar examination and routine examination of urine was carried out using Benedict's Test. Appearance of yellow or red deposit

indicates presence of reducing substance (i.e. sugar) in urine. Sputum examination for A.F.B, sputum culture examination, Skiagram of the chest PA view, tuberculin skin test, ELISA, biochemical, cytological examination and culture of ascitic, pleural, pericardial and cerebrospinal fluid was also carried out. Others investigations were complete blood examination,

ESR,USG of abdomen, echocardiography, C.T. Scan of Brain, Spine, Abdomen etc. and tissue biopsy – by fine needle aspiration of affected side was taken and cultured.Results thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Total- 88		
Gender	Males	Females
Number	54	34

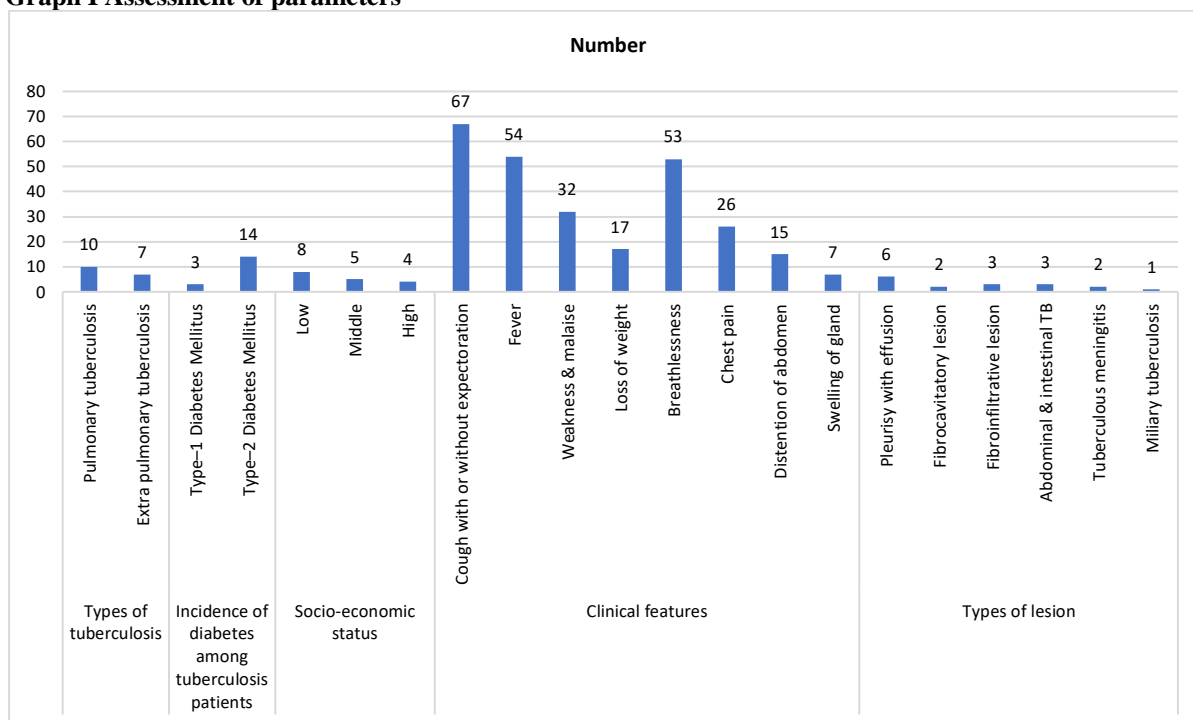
Table I shows that out of 88 patients, 54 were males and 34 females.

Table II Assessment of parameters

Parameters	Variables	Number	P value
Types of tuberculosis	Pulmonary tuberculosis	10	0.84
	Extra pulmonary tuberculosis	7	
Incidence of diabetes among tuberculosis patients	Type-1 Diabetes Mellitus	3	0.01
	Type-2 Diabetes Mellitus	14	
Socio-economic status	Low	8	0.17
	Middle	5	
	High	4	
Clinical features	Cough with or without expectoration	67	0.84
	Fever	54	
	Weakness & malaise	32	
	Loss of weight	17	
	Breathlessness	53	
	Chest pain	26	
	Distention of abdomen	15	
	Swelling of gland	7	
Types of lesion	Pleurisy with effusion	6	0.75
	Fibrocavitary lesion	2	
	Fibroinfiltrative lesion	3	
	Abdominal & intestinal TB	3	
	Tuberculous meningitis	2	
	Miliary tuberculosis	1	

Table II, graph I shows that types of tuberculosis was pulmonary tuberculosis in 10 and extra pulmonary tuberculosis in 7 cases. Incidence of diabetes among tuberculosis patients was type1 diabetes mellitus in 3, type 2diabetes mellitus in 14. Socio-economic status was low in 8, middle in 5 and high in 4. Clinical features were cough with or without expectoration in 67, fever in 54, weakness & malaise in 32, loss of

weight in 17, breathlessness in 53, chest pain in 26, distention of abdomen in 15, and swelling of gland in 7 cases. Types of lesions was pleurisy with effusion in 6, fibrocavitary lesion in 2, fibroinfiltrative lesions in 3, abdominal &intestinal TB in 3, tuberculous meningitis in 2 and miliary tuberculosis in 1 case. The difference was significant (P< 0.05).

Graph I Assessment of parameters**DISCUSSION**

DM triples the risk of developing active TB among infected patients. The association between DM and TB is supported by the fact that patients with DM have impaired cell-mediated immunity, renal failure, micronutrient deficiency, and pulmonary microangiopathy.^{7,8} In addition, DM and inadequate glycemic control significantly reduce the likelihood of a favorable outcome, increase TB drug resistance, and death among patients with TB.⁹ The present study was to assess incidence of different types of tuberculous lesion in association with diabetes mellitus.

We found that out of 88 patients, 54 were males and 34 females. Buasroung P et al¹⁰ in their study patients diagnosed with TB were enrolled and tested for fasting plasma glucose (FPG) and hemoglobin A1c (HbA1c) within 3 months after TB diagnosis. A total of 216 patients with TB were included. Median (IQR) age was 60 years (53-73), and 57% were male. The prevalence of DM was 42.6%. Patients with TB with DM were more likely to have other comorbidities (76% vs 52%, $p < 0.001$), a higher proportion of positive sputum acid-fast bacilli (AFB) (27% vs 11%, $p = 0.001$), and a positive culture for Mycobacterium tuberculosis in bronchoalveolar lavage (10% vs 3%, $p = 0.045$) compared to those without DM. Patients with TB with DM had a lower cure rate at 6 months (30% vs 57%, $p = 0.001$), a higher death rate at 6 months (14% vs 3%, $p = 0.016$), and a higher proportion of treatment complications (22% vs 10%, $p = 0.014$) than those without DM. Having pre-existing underlying impaired fasting glucose (odds ratio [OR] 8.03, $p < 0.001$) and positive sputum AFB (OR 7.41, $p < 0.001$) were associated with newly diagnosed DM cases among patients with TB.

types of tuberculosis was pulmonary tuberculosis in 10 and extra pulmonary tuberculosis in 7 cases. Incidence of diabetes among tuberculosis patients was type 1 diabetes mellitus in 3, type 2 diabetes mellitus in 14. Socio-economic status was low in 8, middle in 5 and high in 4. Clinical features were cough with or without expectoration in 67, fever in 54, weakness & malaise in 32, loss of weight in 17, breathlessness in 53, chest pain in 26, distention of abdomen in 15, and swelling of gland in 7 cases. Types of lesions was pleurisy with effusion in 6, fibrocavitary lesion in 2, fibroinfiltrative lesions in 3, abdominal & intestinal TB in 3, tuberculous meningitis in 2 and miliary tuberculosis in 1 case. Soma Oraon et al¹¹ found out the incidence of different types of tuberculosis in patients suffering from diabetes mellitus; to prevent early mortality and morbidity caused by tuberculosis and early diagnosis and treatment of diabetes mellitus in patients of tuberculosis and vice-versa. In the present work a total number of 100 (hundred) patient were selected in which patients had history of diabetes mellitus and having complaints of cough with productive sputum for more than four weeks. Of these patients, 20 were found with tuberculous lesion. In 20 diabetic tuberculosis patients, 11 were male and 9 were female. In these patients, 16 were belonging to rural area and 4 were from urban area. Extra pulmonary tuberculosis was found in 14 patients and pulmonary tuberculosis in 6 patients. The incidence of tuberculous infection is associated with more in type 2 diabetes mellitus than type 1 diabetes mellitus, 17 & 3 cases respectively. The most common clinical feature was cough with or without expectoration, than fever and weakness. Pleural effusion is the most common extra pulmonary tuberculous lesion. Most of the

tuberculous lesions are diagnosed by Chest X-Ray PA-view. In diabetic pulmonary tuberculous lesion, 45% cases are found in advanced stage.

The shortcoming of this study is small sample size.

CONCLUSION

Authors found that incidence of tuberculous infection in diabetes mellitus is gradually increasing. Pulmonary types of tuberculosis are more in diabetic patients.

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