



A STUDY OF PATIENTS WITH PULMONARY TUBERCULOSIS AND ITS RELATIONSHIP WITH DIABETES AND OUTCOME OF TREATMENT IN THIS PATIENT

General Medicine

Dr. Sushil Kumar* M D (General Medicine) Assistant Professor, Dept. of Medicine, Anugrah Narayan Magadh Medical College Hospital, Gaya. *Corresponding Author

Dr. Pramod Kumar Sinha M D (General Medicine), FICP Associate Professor and Head Dept. of Medicine, Anugrah Narayan Magadh Medical College Hospital, Gaya.

ABSTRACT

Background: There is synergistic effect between diabetes mellitus and pulmonary tuberculosis. India has highest number of tuberculosis patient and India has also second highest number of patients with diabetes mellitus in world. The dual curse of these two diseases may have an impact on both side as outcome of treatment and poor glycaemic control. There were many studies have been done about relationship between diabetes and tuberculosis but still there is a large gap about its synergistic effect.

Methods: In this study we include 164 patients with pulmonary tuberculosis with age more than 18 years 72 out of 164 patients are diabetic and 92 patients are nondiabetic. Demographic details, physical and clinical examination, Blood sugar fasting and post prandial, HbA1c, x-rays chest, sputum for AFB and CBNAAT test have been done all patients then ATT given to patients and appropriate antidiabetic treatment given to diabetic patients. follow up done on to all patients on 2nd month and 6th months.

Results: In this study commonest age group for tuberculosis infection is 45-54 but in diabetic patients common age group for tuberculosis infection is 55-64. Patients of diabetic and tuberculosis commonly having elevated HbA1c and relatively poor treatment outcome reflected by sputum conversion rate 77.7%, 16.7% has failed treatment and also diabetic patients has 3+ sputum positivity.

Conclusions: In patients with tuberculosis screening of diabetes may improve treatment outcome and prevent complications by appropriate management of diabetes and tuberculosis.

KEYWORDS

Tuberculosis, Diabetes mellitus, Coinfection, HbA1c, CBNAAT

INTRODUCTION

India continues to highest TB burden country in the world Tuberculosis still continues to be one of the most common health hazards in India. Around one third on the world's population is estimated to be infected by Mycobacterium tuberculosis. India is experiencing escalating epidemic of diabetes mellitus. Available data suggest that estimated 11% of urban population and 3% of rural population above the age of 15 years have diabetes mellitus, about half of this rural population are unaware about diabetes mellitus. Most recent data suggest that people with diabetes mellitus is about 62 million with a further 77 million having impaired glucose tolerance.

India is said to be the diabetic capital of the world with the greatest number of cases. There is rising concern worldwide about the twin epidemics of these two chronic diseases, especially in low to middle-income countries such as India and China. The escalating epidemic of DM is also said to have a significant impact on global TB control.

Diabetes mellitus (DM) TB co-infection is associated with poor glycaemic control in DM patients. Reactive hyperglycaemia often accompanies chronic infections due to the associated pro-inflammatory state and release of counter-regulatory stress hormones such as epinephrine, cortisol and glucagon, all insulin antagonists.¹ The dual curse of these two diseases may have an impact on the outcome of treatment.

This study was performed to assess the prognosis in patients with diabetes mellitus and tuberculosis and its treatment outcome.

METHODS

This study has been performed in Department of Medicine in Anugrah Narayan Magadh Medical College Gaya in which 164 sputum positive pulmonary tuberculosis above the age of 18 years old patients included, 72 patients are diabetic and 92 are nondiabetic. At presentation Sputum examination was done for all the patients by Zeihl Neelson's method and CBNAAT also done. Detail clinical profile and physical examination were done and noted. only those who were sputum positive were included in this study. All these positive samples were graded as per the RNTCP guidelines. General demographic details were taken for all the patients including their height and weight and the Body Mass Index was calculated.

Chest X-rays were taken for all the patients for the presence and location of cavities, opacities, hilar enlargement, pleural effusion, fibrosis, pneumothorax etc. The x-rays were also graded as minimal,

moderately advanced and far advanced as per the national tuberculosis association guidelines: Minimal: -Slight to moderate density, no cavities, small part of one or both lungs, total extent not greater volume of lung one side of the space above 2nd chostochondral junctions and T4/T5; Moderately advanced: -Slight to moderate density lesions one\both lungs. Total extent; far advanced, more extensive than moderate and involved more than two lobe of lung.

All the patients with tuberculosis were treated with first line ATT. In patients with diabetes treated by appropriate antidiabetic and ATT. The patients were followed up after 2 months and 6 months and in each follow up, sputum smear, chest X-rays and other blood tests were performed. Sputum smear-positive patients were declared cured only if they had negative sputum results and complete symptomatic relief at the end of full course of anti-tubercular treatment.

Drug resistant patients, pregnant women, Patients who were sputum negative, without any of the classic symptoms for TB, HIV positive, patients with chronic renal or liver disease, chronic alcoholics, any connective tissue disorders were excluded from the study. Patients who were previously treated for tuberculosis were also excluded from the study.

RESULTS

In this study total number of patients were 164 in which 72 patients has tuberculosis and diabetes mellitus and 92 were nondiabetic tuberculosis. Male are more affected than female in both diabetic and nondiabetic group similarly BMI was low in both groups. Most patients in diabetic and nondiabetic group having addiction of alcohol or smoking or both. Most common age group in patients with tuberculosis is 45-54 years and in patients with diabetic age group is 55-64 years. Most patients of diabetic have poor glycaemic control revealed by high HbA1c which was most prominent in 35-64 years age group. Most patients with diabetes has 3+ sputum positivity but in nondiabetic patients were equally divided between 1+, 2+, and 3+ sputum positivity. Most of patients with nondiabetic tuberculosis were cured by treatment with six-month ATT. There was one case of failed treatment in nondiabetic tuberculosis patient, 29% completed treatment successfully with clinical improvement but required extended treatment due to nonadherence or missing the regular treatment. the sputum conversion from positive to negative in patients with nondiabetic tuberculosis is 93.5%. Sputum conversion rate in diabetic group is 77.7% and 16.7% patients have failed treatment, 2 patients died during treatment patient who died has poor glycaemic control 3+ sputum positivity. In patients with diabetic tuberculosis

11.1% has minimal x-ray severity and 54.2 has far advance severity. In patients with nondiabetic tuberculosis 47.8% has moderate severity.

DISCUSSION

In the present study, the number of diabetics was 43.9% of the total patients included. The prevalence of DM in TB patients in Kerala is reported to be 44% while it was reported to be 15.2% in a study in Tamil Nadu.²

The most common age group to be affected was 55-64 years among the diabetic group and 45-54 among the non-diabetic group in the present study. Similar findings were reported by Perez-Guzman et al who also found that the TB-DM patients to be older.³ HbA1c was elevated to >9% in the 45-54 age group although it was high even in the 35-44 and 55-64 age groups. Similar results were observed in studies by Adhami et al and Patel et al.^{4,5} We have also observed that 16.7% of the cases among the diabetic and only 1.1% case among the non-diabetics failed to convert from sputum positive to sputum negative. Compared to the non-diabetics, the conversion was poor in the diabetics. This was observed in few other studies. Alisjahbana et al study showed significant number of positive sputum culture results at the end of 6 months in DM group (22.2%), compared in patients without DM (9.6%) with P value of <0.05% diabetes remained a significant risk factor for sputum conversion.⁶ Among the Chest X-ray findings, far advanced severity was more common among the diabetics than the nondiabetics. Most of the diabetic patients were either having far advanced severity or moderately advanced severity with very only 11.1% showing minimally advanced stages. This was concurrent with studies by Chiang et al and Avuthu et al, where it was reported that multiple cavities and lesions in the lungs were more among the patients with poor glycaemic control than other wise.^{7,8}

Table 1: General characteristics of the pulmonary tuberculosis patients with and without diabetes.

	PTB with DM	PTB without DM
Sex (Male/Female)	51/21	69/23
Age group		
<35	1 (1.4%)	15 (16.3%)
35-44	6 (8.3%)	14 (15.2%)
45-54	17 (23.6%)	16 (17.4%)
55-64	19 (26.4%)	7 (7.6%)
65-74	16 (22.2%)	21 (22.8%)
>75	13 (18.1%)	19 (20.8%)
BMI	22.7 ± .2	18.3 ± 2.9
Hb	12.9 ± 1.2	12.5 ± 1.9
ESR	50.3 ± 19.7	59.3 ± 21.2
Smokers	33 (45.8%)	41 (44.6%)
Alcoholics	39 (54.2%)	45 (48.9%)

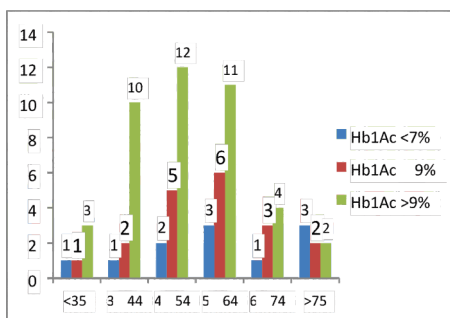


Figure 1 :Relation between Hb1Ac and age among the diabetic patients with PTB.

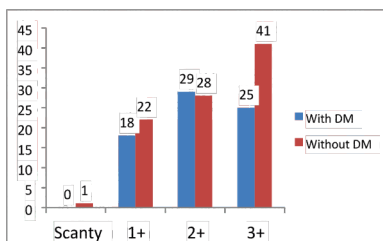


Figure 2 : Sputum positivity among the diabetic and nondiabetic.

Table 2: Outcome of treatment at the end of 6 months

	With DM	Without DM
Cured	24 (33.3%)	59 (64.1%)
Completed	32 (44.4%)	27 (29.%)
Failure	12 (16.7%)	1 (1.1%)
Default	2 (2.8%)	4 (4.3%)
Death	2 (2.8%)	1 (1.1%)

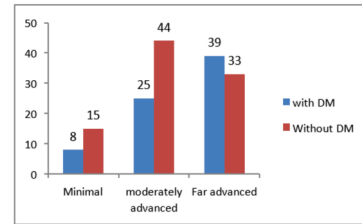


Figure 3: Chest X-ray severity among the patients.

CONCLUSIONS

Screening for DM in patients with TB could improve case detection, early treatment, and prevention of DM complications. Maintenance of blood sugar level at normal or near normal level, is one of the most primary goal in patient care. Tuberculosis worsens glycaemic control and makes the control of DM difficult.

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