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STUDY ON PREVALENCE OF DIABETIC MELLITUS AMONG TUBERCULAR PATIENT IN TERITIARY CARE HOSPITAL

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ABSTRACT

Tuberculosis is an infectious disease which may be caused by a variety of strains of Mycobacteria, but usually Mycobacterium tuberculosis. Poor adherence to drug treatment therefore poses a serious risk to the community and contributes to failure in eradicating the disease globally. The present study aims at improving the patient's knowledge towards their disease and medication and also to assess the medication adherence, by means of structured counselling and providing specially designed patient information leaflet. **Keywords:** TB**,** DM, Prevelance, Risk, Screening.

Objectives

- To study the prevalence of diabetes mellitus in pulmonary tuberculosis.
- To know the association between TB and risk of diabetes.

Materials and Methods: This was a prospective observational study which was carried out for a period of six months at RNTCP centre of Basaveshwara Medical College Hospital & research centre, Chitradurga. **Results:** A total of 119 patients were randomly selected. Among the 119 TB patients who participated in screening for DM, 27(22.7%) were found to have diabetes were found with Random blood sugar 304.95mg/dl and Fasting blood sugar 159.15mg/dl. Out of those who had diabetes 77(64.7%) were males and 42(35.3%) were females. Tuberculosis patients aged 50years and above there is no association between age group and TB. Odd ratio of 0.86 suggests negatives association between social history and TB, and odd ratio of 3.86 reveals that there is a high association between sputum and TB. **Conclusion**: In this study, we found the high prevalence of diabetes

among the TB patients compare to general population suggest that screening of diabetes among TB is necessary and should be performed during the diagnosis of TB. Prevalence of diabetes among TB was found higher among male compare to female and age of the patients having diabetes was found to be in patients of TB.

KEYWORDS: TB**,** DM, Prevelance, Risk, Screening.

1. INTRODUCTION

Tuberculosis is an infectious disease which may be caused by a variety of strains of Mycobacteria, but usually Mycobacterium tuberculosis. Tuberculosis usually affects the lungs, but it can also affect other parts of the body, such as the brain, the kidneys, or the spine.[1] The symptoms of pulmonary tuberculosis include, cough with sputum or blood, night sweat, chest pain, weight loss, fever and weakness.[2] Diabetes is classed as a metabolism disorder. It is a group of diseases characterized by high levels of blood glucose resulting from defects in insulin production, insulin action and both, and is associated with serious complications and premature death. It is a leading cause of illness and death across the world which is associated with continuing damage, dysfunction and failure of various organs including lungs.[35]

Criteria for diagnosis of diabetes is fasting blood sugar level should be >125 mg/dl and 2 h post-glucose load should be >200 mg/dl. There are some reasons or can say associated factors that may lead to development of TB among diabetes patients that are people with diabetes have a weak immune system as a result of chronic disease so they are of higher risk of development of disease from latent infection. The risk is 2-3 times higher than people without diabetes[2]. Diabetes leads to the faster progression of latent TB, infection (LTBI) to active TB disease and poor TB treatment outcomes such as death during treatment, relapses and delayed sputum smear conversion. Early detection can help improve care and control of both diabetes and tuberculosis.[10]

Nearly one-third of world's population is infected with Mycobacterium tuberculosis and about 10% of them are at risk of developing active form of the disease in their lifetime depending upon the interaction of the epidemiological triad. Screening for DM in TB patients could improve DM case detection and early treatment and indirectly lead to better TB specific treatment outcomes. Many research questions regarding association between diabetes and TB remain unanswered because of lack of well-designed studies. This study was planned

to determine the prevalence of diabetes and prediabetes amongst a cohort of TB patients registered in selected Tuberculosis Units (TUs) of Revised National Tuberculosis Control Program (RNTCP) and understand the pattern of diabetes management availed by the known diabetes cases.[11] If diabetes is a risk factor for TB in this part of the world, this will have important consequences for TB control and patient care, as diabetes co-morbidity is related to a higher TB case fatality rate.[37]

2. MATERIALS AND METHODS

A prospective observational study was approved by the Institutional Ethics Committee, of SJM College of pharmacy, Chitradurga, karnataka. The study was conducted at RNTCP Centre of Basaweshwara Medical College Hospital & Research Centre, Chitradurga.

- Patients of either sex who are diagnosed with Tuberculosis (Pulmonary/ Extrapulmonary tuberculosis).
- The Tuberculosis Patients visiting Revised National Tuberculosis Control Program, General Medicine and Orthopaedic department.
- The patient who avail themselves during datacollection.
- Who gave informed consent was included.

Patients with caused TB presented in-patient department of RNTCP are selected for the study. Informed consent form (Annexure-II) is issued and explained to the patient or patient representatives in the local language (kannada). Demographic details of the enrolled patients are collected which are necessary for the study. The details include name, age, sex, medical history, medication history, lab data and treatment chart.

2.1 Statistical Analysis: The data was entered in Microsoft Excel-2010 version and the results are analysed using Statistical Package for Social Services (SPSS 19.0). Chi square test was applied to determine any significant difference between quantitative variable.

3. RESULTS

1 Prevalence of Diabetes mellitus among Tuberculosis patients across different groups.

Among the 119 TB patients who participated in screening for DM, 27(22.7%) were found to have diabetes. Out of those who had diabetes 20(74%) were male and 7(24%) were female.Prevalence and pattern of DM among TB patients across different groups represented in table-8.

Table 1: Prevalence of DM among TB patients across different groups.

	Categories	No of TB patients with Diabetes	Percentage	P value
Age groups(in years)	<30	0	0.0	0.000(sig)
	31-40	2	7.4	
	41-50	6	22.2	
	51-60	6	22.2	
	61-70	8	29.7	
	>70	5	18.5	
Genders	Male	20	74	0.6 (not sig)
	Female	7	26	
Types of TB	Pulmonary	18	66.7	0.9 (not sig)
	Extrapulmunory	9	33.3	

Association between Tb and risk factor of diabetes

Odd ratio of 1.0 which is not indicates the association between age groups and TB (TB can occurs at any age). Odd ratio of 0.86 suggests negatives association between social history and TB, and odd ratio of 3.86 reveals that there is a high association between sputum and TB.

Table 2: Association between Tb and risk factor of diabetes.

	Variables	DM with TB	Only TB	OR (95% CI)
Age groups (in years)	40-50	8	33	1.0
	>50	19	59	
Social history	Smoking	15	55	0.86
	Alcohol	12	37	
Types of TB	Sputam positive pulmunory	18	33	3.81
	Sputam negative extrapulmunory	9	63	

DISCUSSION

India is the second most population country in the world. India account for 26% of all new cases of TB in the world annually. At the same time, India dealing with the highest burden of TB in the world. In this hospital based observational study the prevalence of DM was higher among patients with active Pulmonary TB.[2] The wide range of prevalence of DM in different studies might be due to the difference in socio-demographic characteristics of source populations in the localities studied. The increased prevalence among male study subjects might be due to risk factors like smoking, drinking and other sociodemographic charecters. The mechanism behind the association between TB and DM is not fully understood but studies suggest that DM depresses the immune response through effects on macrophage and

lymphocyte function, which in turn facilitates active TB disease.[30] Moreover, diabetes may impair treatment outcome with reduced TB drug bioavailability, delayed sputum conversion, multidrug-resistant TB, TB relapse and, more importantly, TB mortality.[26]

A study conducted in Mexican-American and Europeans revealed higher prevalence among younger people with incidence of TB background. Usually incidence of DM increases with age; but from there finding the have seen how much TB increases the chance of developing DM even at early ages. So this increased prevalence of TB-DM in the younger people will negatively affect TB control program and will become another burden to health service systems.

119 patients among which the below 30 years were found to have incidence of TB, High prevalence of DM was found amongst younger TB patients and smear positive cases, A similar study conducted by **Damtew E** *et al*., A study on Prevalence of Diabetes Mellitus among Active Pulmonary Tuberculosis Patients at St. Peter Specialized Hospital, Addis Ababa, Ethiopia, which reveals that age group between 25- 44 years found to be the major age groups having Dm with TB.[2] **Thapa B** *et al.,* Conducted a study prevalence of diabetes among tuberculosis patients and associated risk factors in kathmandu valley. Patients results showed that out of 114 patients were males 21 (56.8%) and 16(43.2%) were females. In my study out of 119 Patients 77(64.4%) patients were Males and 42 (35.3%) patients were Females. This study showed that male patients were more prone to get TB than females. This may be because of working environment, and social habits like drinking alcohol and smoking.[3]

CONCLUSION

TB is an airborne disease caused by the bacterium Mycobacterium tuberculosis. India accounts for nearly 20% of the global burden of Tuberculosis (T.B), with global TB ranking of ‘one’. It is the leading cause of death in patient with infectious diseases in India.

- The prevalence of DM in patients with TB in our series was 22.7%. About half of the TB‑DM patients in our study were diagnosed for the first time during this study.
- Out of 119 patients 77(64.7%) were males and 42(35.3%) were females.
- Among 119 patients 99(83.1%) patients were pulmonary and 20(16.9%) were extrapulmonary.

In this study, we found the high prevalence of diabetes among the TB patients compare to general population suggest that screening of diabetes among TB is necessary and should be performed during the diagnosis of TB. Smoking as a risk factor among diabetes with TB patients compare to smoking in TB was found to be statistically insignificant. However, when we have taken drinking as a risk factor for diabetes with TB patients compare to drinking among TB patients, it was found to be significant.

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