

ORIGINAL RESEARCH

Analysis of Prevalence of Diabetes Mellitus among Tuberculosis Patients at a Tertiary Care Hospital in Central India

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ABSTRACT

Background: About 95% of patients with tuberculosis (TB) and 70% of patients with diabetes mellitus (DM) live in the low- and middle-income countries. Diabetes and tuberculosis may complicate each other at many levels. This study was conducted to assess the prevalence of diabetes mellitus among tuberculosis patients. **Materials and Methods:** 100 subjects having TB were enrolled. In order to diagnose diabetes mellitus in tuberculosis subjects, fasting blood sugar levels had been measured. Statistical analysis was conducted using SPSS software. **Results:** In this study, there were 75 males and 25 females. Out of 100 tuberculosis patients, diabetes mellitus was present in 37 subjects and was absent in 63 subjects. **Conclusion:** prevalence of diabetes mellitus in tuberculosis patients in this study was 37%.

Keywords: Diabetes Mellitus, Tuberculosis, Prevalence.

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INTRODUCTION

About 95% of patients with tuberculosis (TB) and 70% of patients with diabetes mellitus (DM) live in the low and middle income countries.^{1,2} The epidemic growth of DM has occurred in developing countries where TB is highly endemic. As a result, DM and TB are increasingly present together, and this calls for renewed interest in this topic.³ India is facing the dual problem of being the highest TB-burden country having a large number of people with diabetes posing a serious challenge for the health system.^{4,5} Systematic reviews have shown scientific evidence of the linkages between the two diseases. Diabetes and tuberculosis may complicate each other at many levels. Among those with active TB, diabetes may adversely affect TB treatment outcomes by delaying the time for microbiological response, reducing the likelihood of favourable outcome and increasing the risk of relapse, death and drug resistance.^{6,7} This study was conducted to assess the prevalence of diabetes mellitus among tuberculosis patients.

MATERIALS AND METHODS

In this study, there were 100 subjects aged from 25-50 years with mean age of 32.6 years. The subjects had been informed about the procedure and were asked for consent.

The subjects who gave consent and those who were willing to participate in the study had been included while those who did not give consent had been excluded from the study.

In order to diagnose diabetes mellitus in tuberculosis subjects, fasting blood sugar levels had been measured. Statistical analysis was conducted using SPSS software.

RESULTS

In this study, there were 75 males and 25 females. Out of 100 tuberculosis patients, diabetes mellitus was present in 37 subjects and was absent in 63 subjects. Obesity, dyslipidaemia, positive family history of diabetes and sedentary lifestyle were positive risk factors for occurrence of diabetes among TB patients.

Table 1: Gender-wise distribution of subjects.

Gender	Number of subjects	Percentage
Males	75	75%
Females	25	25%
Total	100	100%

Table 2: Prevalence of diabetes mellitus in tuberculosis patients.

Prevalence	Number of subjects	Percentage
Present	37	37%
Absent	63	63%
Total	100	100%

Table 3: Risk factors of diabetes among TB patients

Risk factors	Diabetes present	Diabetes absent
Obesity	12	21
Dyslipidaemia	10	18
Positive family history of diabetes	15	19
Sedentary lifestyle	13	20

DISCUSSION

Tuberculosis (TB) is a major contagious disease that is one of the top 10 causes of death worldwide.⁸ TB is caused by the bacillus *Mycobacterium tuberculosis*, which is spread when people who are infected with TB expel the bacteria into the air. The disease typically affects the lungs (pulmonary TB) but can also affect other sites. Globally, in 2019, there were an estimated 10.0 million (8.9-11.0 million) people infected with TB, and 1.4 million (1.3-1.6 million) people died of TB.⁹ In 2019, Thailand was ranked among one of the 30 highest TB burden countries with 105,000 incident cases of TB and 11,500 deaths from TB. Cell-mediated immunity is a crucial component in the host defence against *M. tuberculosis* that is weakened, resulting in an increased risk in the reactivation of TB.⁶⁻¹⁰ This study was conducted to assess the prevalence of diabetes mellitus among tuberculosis patients. In this study, there were 75 males and 25 females. Out of 100 tuberculosis patients, diabetes mellitus was present in 37 subjects and was absent in 63 subjects. Obesity, dyslipidaemia, positive family history of diabetes and sedentary lifestyle were positive risk factors for occurrence of diabetes among TB patients. Raghuraman S et al (2014)⁹ assessed the prevalence of diabetes in tuberculosis patients currently on treatment. This facility-based cross-sectional study was undertaken in four randomly selected peripheral health institutions providing directly observed treatment short-course, treatment for tuberculosis patients. All cases of tuberculosis, more than 18 years of age were screened for diabetes. Risk factors like age, sex, family history of diabetes, alcohol, smoking and obesity were assessed. The prevalence of diabetes in tuberculosis patients was found to be 29% (known diabetics - 20.7%, new Diabetes cases - 8.3%). Diabetes was significantly associated with older age, family history of diabetes, consumption of alcohol and sputum positivity. Screening patients with Tuberculosis for fasting blood

sugar estimation will help in early detection of diabetes. The study was conducted by Kottarath MD et al (2015)¹⁰ to know the prevalence of diabetes mellitus in tuberculosis patients diagnosed from the hospital. This was a hospital based descriptive study conducted in Department of Respiratory medicine, Academy of Medical Sciences, Northern Kerala in association with DOTS centre during a one-year period from August 2014 to July 2015. All patients diagnosed as a case of tuberculosis from their institution were included for the study. All patients were screened for diabetes mellitus using Fasting Plasma Glucose value. Additional information regarding age, body mass index (BMI), sputum smear positivity and treatment category of tuberculosis were collected. There was a higher prevalence of diabetes in tuberculosis patients than in general population and the rate was found to be 19.6%. There was a statistically significant association of diabetes with older age, higher BMI and sputum positivity. Routine screening for diabetes needs to be intensified in the community and more importantly in Tuberculosis patients.

CONCLUSION

The prevalence of diabetes mellitus in tuberculosis patients in this study was 37%.

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