

Diabetes Mellitus among Newly Diagnosed Tuberculosis Patients during COVID-19 Pandemic Period in a Secondary Health Institution

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ABSTRACT

Introduction: Tuberculosis is one of the major public health problems worldwide and it is a major cause of morbidity and mortality. The risk of TB infection not only rises in diabetes patients, but is also associated with a higher risk of an increased number of diabetes complications. This study was conducted to determine the prevalence of Diabetes Mellitus (DM) among patients with newly diagnosed TB in Civil hospital Dehra, district Kangra (HP) a secondary health institute.

AIM: To study the prevalence of DM in newly diagnosed pulmonary tuberculosis patients.

Materials and Methods: Total 40 newly diagnosed patients with pulmonary tuberculosis (TB) who came in medicine OPD, Civil hospital Dehra from August 2020 to April 2021 during COVID -19 pandemic period were enrolled in the study. Their fasting blood glucose (FBG) was done. Screening and diagnosis of DM was done according to American diabetes association (ADA) guidelines.

Results: The prevalence of DM and impaired fasting glucose (IFG) in newly diagnosed tubercular patients was 10% and 12.5% respectively in our study.

Conclusion: The prevalence of FBS was found to be higher in patients with TB than the general population. Hence it is very important to screen these patients timely to prevent further complications.

Keywords: Tuberculosis (TB), diabetes mellitus (DM), impaired fasting glucose (IFG), fasting blood glucose (FBG).

INTRODUCTION

Tuberculosis (TB) is one of the major public health problems worldwide and it is a major cause of morbidity and mortality. Tuberculosis has been identified as one of the top 10 causes of death globally¹. According to the World Health Organization (WHO), there were 10.4 million cases of TB in 2017, and 1.8 million deaths¹. India accounts for 24% of the global TB burden and 29% of deaths².

The incidence of DM is also increasing worldwide. In 2016, there were an estimated 61 million DM patients in India³. The prevalence of DM is increasing worldwide, with the global prevalence expected to double by 2030⁴. While the national prevalence of DM is estimated to be 7.3% in India, in urban regions it is higher at 11.2%⁵. Previous studies have indicated that the risk of TB amongst DM patients is three times higher than those without DM⁶. With the prevalence of DM projected to increase by 67% by 2035, the co-burden of TB-DM in India may lead to a major public health crisis⁷. The WHO as well as the Revised National Tuberculosis Program (RNTCP) in India, has recommended routine testing of diabetes amongst TB patients, particularly in high TB burden settings⁸.

The risk of TB infection not only rises in diabetes patients, but is also associated with a higher risk of an increased number of diabetes complications⁹.

Diabetics not only require longer treatment, but are also more likely to develop multi-drug resistant TB¹⁰. TB treatment results are influenced by DM, mainly by delaying sputum culture conversion, increasing patient fatality and treatment failure and increasing the risk of recurrent TB after completion of anti-TB treatment^{11,12}.

This study was conducted to determine the prevalence of DM among patients with newly diagnosed TB in Civil hospital Dehra, district Kangra (HP) during COVID-19 pandemic.

MATERIALS AND METHODS

This study was carried out in Civil hospital Dehra, Distt-Kangra (HP) which is designated TB microscopic centre from August 2020 to April 2021. Study participants included patients voluntarily attending OPD with symptoms of fever, cough, haemoptysis and loss of appetite. Total 40 patients were included in the study.

INCLUSION CRITERIA

Adult patients age >18 years who were diagnosed first time with pulmonary TB by sputum microscopy

EXCLUSION CRITERIA

- 1) Patients had past history of PTB or extra-pulmonary TB.
- 2) Patients with RT-PCR COVID-19 positive test.

All patients who were diagnosed positive for pulmonary TB were further screened for diabetes mellitus. FBG estimation was done after 8 hours of fasting using Glucose Oxidase method. All patients were assessed for clinical characteristics such as cough, haemoptysis, weight loss, fever, night sweats, loss of appetite, shortness of breath from the history and clinical examination. Sputum smear microscopy using Ziehl- Neelsen stain was done after two samples (one spot sample and other morning sample) of sputum were collected as per RNTCP guidelines. Presence of Acid fast bacilli as per RNTCP

guidelines was denoted as AFB positive. Screening and diagnosis of DM was done following national guidelines as recommended by American Diabetes Association (ADA); FBG >126mg/dl indicates DM; FBG 100-125mg/dl indicates impaired fasting glucose. FBG <125mg/dl were considered normal.

RESULTS

Total 40 patients which were newly diagnosed sputum positive pulmonary tuberculosis included in the study. Mean age of the patients was 50.12 years. Among them 26 were male patients and 14 were female patients. 4 patients (10%) had FBS >126mg/dl, means they had diabetes mellitus. 5 patients (12.5%) had fasting blood glucose between 100-125mg/dl, means impaired fasting glucose. The older age group had a significantly higher prevalence of diabetes as compared to younger group. In our study no significant association was found between gender and diabetes.

Table1: showing age distribution in patients with TB and patients with TB DM/IFG

AGE	Patients with TB only (%)	Patients with TB and DM (%)	Patients with TB and IFG (%)
<50years	18(45)	0	1(2.5)
>50 years	22(55)	4(10)	4(10)
TOTAL	40(100)	4(10)	5(12.5)

Table 2: showing sex distribution in patients with TB and patients with DM/IFG

GENDER	Patients with TB only (%)	Patients with TB and DM (%)	Patients with TB and IFG (%)
MALE	26(65)	3(7.5)	2(5)
FEMALE	14(35)	1(2.5)	3(7.5)
TOTAL	40	4(10)	5(12.5)

DISCUSSION

Our study found a prevalence of DM among TB patients of 10 % which is higher than that of the general population of India. This can be due to fact that all the patients were registered and investigated properly in the hospital. A study conducted by Manjareeka M et al, 13.9% prevalence of DM was found in patients with TB in tribal population Odisha¹³. We found that 12.5% prevalence of impaired fasting glucose was

found in patients with TB in our study. TB is a chronic infection with compromised immunity, so blood glucose level can be impaired may be responsible for stress induced hyperglycaemia and can lead to false positive diagnosis of DM. This impaired blood sugar also reflects the future risk of diabetes mellitus.

In this study patient with DM and PTB were older than that of patient with TB only which can be due to fact that with growing age the prevalence of DM also increases. No gender predilection was found in our study.

LIMITATION

- 1) The sample size was very small and limited to only one part of district.
- 2) Post prandial blood sugar and glycated haemoglobin could not be done.

CONCLUSION

The prevalence of FBS was found to be higher in patients with TB than the general population. Hence it is very important to screen these patients timely to prevent further complications.

Declaration of patient consent:

The authors certify that we have obtained all appropriate patient consent on forms regarding clinical information to be reported in the journal.

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Conflict of Interest: There are no conflicts of interest.

Ethical Approval: Approved

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