The Professional Medical Journal
www.theprofesional.com

ORIGINAL PROF-3127

DOI: 10.17957/TPMJ/16.3127

TUBERCULOUS PATIENTS;
DIAGNOSTIC SIGNIFICANCE OF FASTING BLOOD GLUCOSE (AFB)

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Article received on:
14/10/2015
Accepted for publication:
03/12/2015
Received after proof reading:
13/01/2016

ABSTRACT: The objective of present study was to screen out the diabetes mellitus by fasting blood glucose (FBG) in patients with pulmonary tuberculosis. **Background:** Diabetes mellitus and Tuberculosis has strong co-relation and complicates each other. Diabetes increases the risk of infections including tuberculosis particularly pulmonary TB, Therefore making anti-tuberculous drugs ineffective. Similarly M. tuberculous infection predisposes to diabetes mellitus and complicates it further. Patients simultaneously having, both diabetes mellitus and tuberculosis, the chances of multiple systems involvement becomes high. The delayed or ineffective response to anti tuberculous chemotherapy raises suspicion of underlying diabetes mellitus .There for such patients should be screen out by fasting blood glucose (FBG) levels so as to treat the treat the diabetes as well. **Objectives:** The objective of this study was to screen out diabetes in pulmonary TB patients by fasting blood glucose level (FBG) especially where the treatment response of anti-tuberculous drug is delayed or poor. **Study Design:** This was prospective observational study. **Place and Duration of Study:** This study was conducted at DHQ-teaching hospital Mirpur Azad Kashmir from February 2013 to December 2014 .This included both in and outdoor patients. **Inclusion criteria:** 1. Age range of tuberculous patients between 20-40 years. 2. Pulmonary tuberculous patients. **Exclusion criteria:** 1. Pulmonary TB patients with co-existent diabetes mellitus. 2. TB patients with renal failure, autoimmune diseases like rheumatoid arthritis, SLE, immunosuppressant drugs and steroid were excluded. **Material and Methods:** Ninety-five diagnosed patients of pulmonary TB were selected. The questionnaire form was designed according to objective of study. This Included with patients having pulmonary TB with but still not screened out for diabetes .The questionnaire contained history, general physical and systemic examination, especially respiratory system. Risk factors like family history of diabetes and TB were evaluated. The socio–economic status of patients was carefully assessed. Routine investigations like complete blood count, ESR, fasting and random blood glucose were done. Three morning sputum specimens and fasting blood glucose (FBG) were main tools of diagnosis of TB. The data thus obtained, was subjected to SPSS verssion-20 for statistical analysis. **Results:** A total of 95 patients with pulmonary tuberculosis were selected including in and outdoor patients. Out of them, 65 patients were males, and 30 were females. Age group mainly ranging between 20-40 of years. Screening of diabetes in 95 tuberculous patients was done by fasting blood glucose. Seventeen patients (17), twelve (12) male and five (05) female were screened out to be diabetic. **Conclusion:** Screening by fasting blood glucose is an effective tool in diagnosis of diabetes mellitus in tuberculous patients.

Key words: Pulmonary Tuberculosis, Diabetes Mellitus, Fasting Blood Glucose, Sputum for AFB, Chest X-Ray, Blood CP and ESR.

Article Citation: Naeem A. Tuberculous patients; diagnostic significance of fasting blood glucose (AFB). Professional Med J 2016;23(1):045-049. **DOI:** 10.17957/TPMJ/16.3127

INTRODUCTION

Tuberculosis (TB) and diabetes mellitus (DM) are most important systemic diseases prevalent throughout in the world and are posing serious health hazarded. A bidirectional studies has been conducted by many reach workers. The association of diabetes and tuberculosis is well recognized globally. Both disease complicates each other and make the treatment of both diseases difficult. It is essential to treat the both disease for better outcome. Pulmonary tuberculosis has become increasing burden in developing countries particularly in diabetic patients. Diabetic patients are at increased risk

to develop pulmonary TB.[1] Non-insulin diabetes mellitus (NIDDM) are increasing in number than insulin dependent diabetes mellitus because of changing life style and lack of awareness of its consequences.[2] Poorly controlled diabetes leads to multiple complications including cardiovascular, neuropathy and increased susceptibility to infections. Diabetic patients are predispose to M. Tuberculosis by mechanism of hyperglycemia and by indirect effect on macrophages and lymphocytic functions leadings to diminished ability to kills the organisms.[3] Diabetes affects both humeral and cellular immunity of patients and predispose to many infections, (Bacterial viral, fungal) particularly tuberculosis. About 87% of patients with tuberculosis (TB) and 67% of patients with diabetes mellitus (DM) lives in developing countries. Tuberculosis has emerged as epidemic form in developing countries because of rising population, poor living standard and lack of resources.[7]

Tuberculosis can predispose to development of diabetes mellitus by weight loss and malnutrition .Many studied have shown that oral glucose intolerance is high in tuberculous patients.[10]

Screening for diabetes in patients with tuberculosis will not only ensure early case detection but also better management of tuberculous patients.[15]

We reviewed available literature on risk of diabetes among TB patients. Glucose intolerance was reported among 12.5% to 41% of patients with active TB. This study aims to screen out DM with fasting blood glucose among the patients with pulmonary TB.[18]

MATERIAL AND METHODS

We conducted this study on 95 patients with TB patients at DHQ Teaching Hospital Mirpur (AK) from February 2013 to December 2014. This included both in and outdoor patients. After informed consent, the demographic characteristics were recorded.

All TB cases more than 20 >years of age, sputum positive and sputum negative cases, were included in the study.

All of these were screened for diabetes using the diagnostic criteria of a fasting plasma glucose level of ≥ 126 mg/dl.

The purpose of the study was explained to the patient and informed written consent was obtained.

The questionnaire, contained questions to assess risk factors of diabetes and TB namely age, sex, social status, family history of diabetes, TB and smoking. Details about the age wise distribution, sputum examination, screening of non-diabetic and diabetic patients among the tuberculous patients was entered in TB centre established at DHQ Mirpur (AK).

RESULT

A total of 95 patients with tuberculosis were admitted during the study period. Out of them, 65 patients were males, and 30 females. 78(74.1%) Non-diabetic were diagnosed i.e.55 (55.25%) were male and 23(21.85 %) female. We found that 17 (16.75%) among tuberculosis patients i.e. 12 (11.4%) male and 05(4.75%) female were having fasting blood glucose >126 mg/dl. Age range of patients was 20-40 years.

The distribution of certain characteristics of the patients is given in following tables.

DISCUSSION

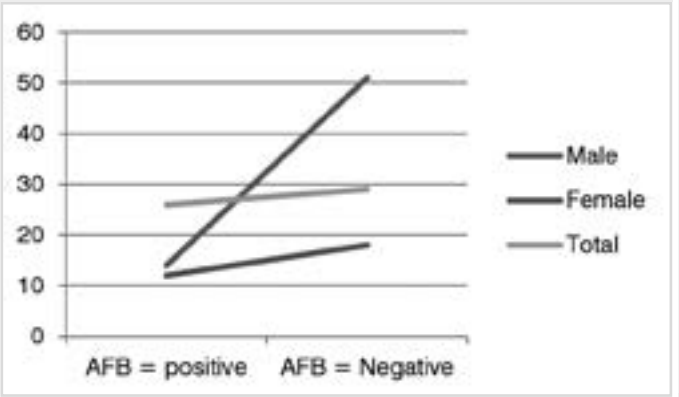
TB and DM are common diseases in developing countries, particularly Pakistan and India. The incidence of both diseases is rising and they frequently co-exit. Patients with DM are more susceptible to infections and the risk of developing TB is as high as three times in diabetic as compared to non-diabetics. Conversely TB deteriorate diabetes mellitus complications, and glucose intolerance is found high in tuberculous patients. Several recent reports indicate the need to consider the increasing trend in prevalence of diabetes in countries like Pakistan and India. Considering the growing trend in prevalence of diabetes and huge burden of latent TB infection

Total No. of patients=95							
Age range [in years]	Male	% age	Female	% age	Mean age [in years]	Total No.	% age
20 -40	N-65	61.75	N-30	95.5	30	N-95	90.75

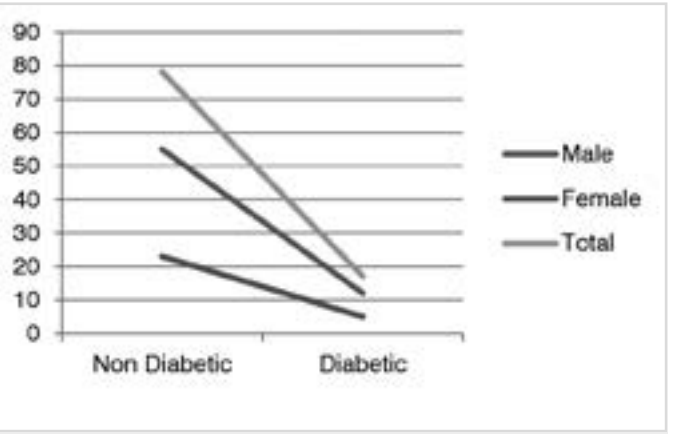
Table-I. Age wise-distribution of patients.

Total No. of patients=95						
Smear Examination	Male patients= 65	% age	Female patients = 30	% age	Total no= 95	%age
AFB= positive	N - 14	9.1	12	3.6	26	24.7
AFB= negative	N - 51	33.15	18	5.4	69	65.55

Table-II. Smear examination of TB patients.



Smear examination of TB patients



Diabetic and Non-diabetic

Total NO. Of patients=95 A- Non-diabetic					
Male patients	% age	Female patients	% age	Total no	% age
55	55.25	23	21.85	78	74.1

Table-III (a). TB patients screening by fasting blood level (AFG).

B- Diabetic Total No. of patients=95					
Male patients	% age	Female patients	% age	Total No.	% age
12	11.4	5	4.75	17	16.75

Table-III (b). TB patients screening by fasting blood level (AFG).

amongst Pakistani population, it is necessary to focus on diagnosis of latent TB infection and screening for DM and ensuring good metabolic control amongst those diagnosed with DM. The role of possible chemoprophylaxis for subjects with DM and latent TB needs to be carefully considered and evaluated, given the magnitude of the burden.

There is strong association between TB and DM patients. Diabetes should be considered in patients with poor clinical response to anti tuberculosis treatment and similarly the suspicion of TB should be considered in patients with uncontrolled diabetes. Pulmonary TB may adversely affect the glyceamic control and has been shown to produce glucose intolerance that improve or normalizes after anti-Tb treatment.

The present study showed that the prevalence rate of diabetes in TB patients was (16.75%). Diabetes was more common in men than women (11.4 versus4.75). It is mandatory to screen out tuberculous patients by fasting blood glucose for better management of TB patients.

CONCLUSION

Screening by fasting blood glucose is an effective tool in diagnosis of diabetes mellitus in tuberculous patients.

SUGESSIONS

1. Screening of all TB patients for diabetes with fasting blood glucose especially where TB chemotherapy response is delayed.
2. All tuberculous patients screened out to be diabetic, should be council for diabetic control by dietary or anti-diabetic drug treatment.
3. TB patients should be encouraged for family member screening for TB and DM.

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AUTHORSHIP AND CONTRIBUTION DECLARATION

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