ORIGINAL RESEARCH

Prevalence of depressionin Patients withtype II diabetes mellitus and associated risk factors

[1]Dr. Sakib Mo Yusuf Bombe, [2]Dr. Neha Singla

[1]Associate Professor, Department of General Medicine, Rama Medical College Hospital and Research Centre, Hapur, Uttar Pradesh, India
[2]Associate Professor, Department of Psychiatry,Narayan Medical College and Hospital,Jamuhar, Rohtas, Bihar, India

Corresponding author: Dr. Neha Singla
Associate Professor, Department of Psychiatry,Narayan Medical College and Hospital,Jamuhar, Rohtas, Bihar, India

Received: 9 December, 2021 Accepted: 10January, 2022

ABSTRACT

Background: Globally, diabetes mellitus (DM) is a significant public health concern. Recent estimates indicate that 7.3% of Indians suffer with DM. Individuals with diabetes mellitus are more likely to experience mental health issues. The present study was conducted to assess prevalence of depression in T2DM and associated risk factors.**Materials & Methods:**150 type II diabetes mellitus patients of both genders were selected. Post-Prandial Plasma Glucose (PPG), and glycatedhaemoglobin (HbA1c) were performed. The severity of depression was determined using Hamilton Depression Rating Scale (HAM-D).**Results:**Out of 150 patients, 86 were males and 64 were females. Type of family was joint: nuclear seen I 32:13 in patients with depression and 73:32 in patients without depression. Smoking was seen in 9 and 29, alcoholism in 3 and 11, duration of DM was 10.2 years and 11.3 years, family history of T2DM was seen in 5 and 16 and insulin therapy was seen in 12 and 18 respectively. The difference was significant (P< 0.05). The mean FPG (mg/dL) was 218.4 and 194.2, PPG (mg/dL) was 284.2 and 215.3, HbA1c % was 9.5 and 8.6 and haemoglobin (gm/dL) was 10.5 and 11.4 in patients with depression and without depression. The difference was significant (P< 0.05).**Conclusion:** Most of the patients had depression. Risk factors were smoking, alcoholism and family history of DM.

Keywords: Diabetes mellitus, depression, Smoking

INTRODUCTION

Globally, diabetes mellitus (DM) is a significant public health concern. Recent estimates indicate that 7.3% of Indians suffer with DM. Individuals with diabetes mellitus are more likely to experience mental health issues. Patients with diabetes mellitus are twice as likely to experience depression as the overall population.[1] It's interesting to note that depression and diabetes have a special two-way relationship.Due to (i) a lower quality of life; (ii) the financial strain of managing a chronic progressive illness; (iii) disabilities resulting from micro and macrovascular diabetic complications; and (iv) diabetes-related neurohormonal and neurotransmitter changes in the brain, diabetes may increase a person's risk of developing depression.[2]

However, information from prospective research suggests that depression raises the chance of developing diabetes.[3] Depression is linked to elevated blood glucose levels in persons with established diabetes mellitus. Reduced desire and self-care behaviors, decreased physical activity,

poor adherence to medical therapy, and hormonal changes can all make it harder for patients with depression to maintain glycaemic control. Additionally, depression is linked to a higher risk of complications and death from diabetes.[4] Depression may therefore be a barrier to the full management of diabetes mellitus.According to Indian studies, the prevalence of depression in T2DM patients ranges from 8 to 84%. Furthermore, there has been a great deal of variance in this research about the risk factors for depression in T2DM participants.[5]

AIM AND OBJECTIVES

The present study was conducted to assess prevalence of depression in T2DM and associated risk factors.

MATERIALS & METHODS

The study was carried out on 150 type II diabetes mellitus patients of both gendersin the Department of General Medicine, Rama Medical College Hospital and Research Centre, Hapur, Uttarpradesh, India in collaboration with Department of Psychiatry,Narayan Medical College and Hospital,Jamuhar, Rohtas, Bihar, India. The duration of study was from April2021 to November 2021.The Institutional Ethics Committee gave the study its approval.Data such as name, age, gender etc. was recorded.All gave their written consent to participate in the study. Presence of depression was assessed using Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) criteria. Data such as name, age, gender etc. was recorded.

Inclusion criteria

- Inpatients and outpatients with type 2 diabetes, age more than 18 years.

Exclusion criteria

- Individuals having a history of major mental illness or antidepressant use;
- patients with altered sensorium or patients in critical condition;
- pregnant women; and
- patients with a diagnosis of HIV infection, TB, chronic liver disease, or cancer.

Post-Prandial Plasma Glucose (PPG), glycated haemoglobin (HbA1c), serum creatinine and qualitative urine protein tests were performed. The severity of depression was determined using Hamilton Depression Rating Scale (HAM-D). Each of the 17 items in the HAM-D had a score between 0 and 2 (for the 8 items) or 0 and 4 (for the 9 items). The following categories were used to group study participants with depression based on their overall HAM-D score: (i) 8–13 is mild depression; (ii) 14–18 is moderate depression; (iii) 19–22 is severe depression; and (iv) ≥23 is extremely severe depression.

Statistical Analysis

The data obtained was subjected to statistical analysis using a Microsoft Excel spreadsheet and analysed using software Statistical Package for the Social Sciences (SPSS) 22.0 version. The data were represented in tables and graphs. Categorical variables were summarised in frequency and percent distribution, and a chi-square test was performed by a statistician. P value less than 0.05 was considered significant.

RESULTS

Table I:Gender wise distribution of patients

Total- 150		
Gender	**Male**	**Female**
Number	86 (57.33%)	64 (42.67%)

Figure 1: Percentage wise distribution of the patients

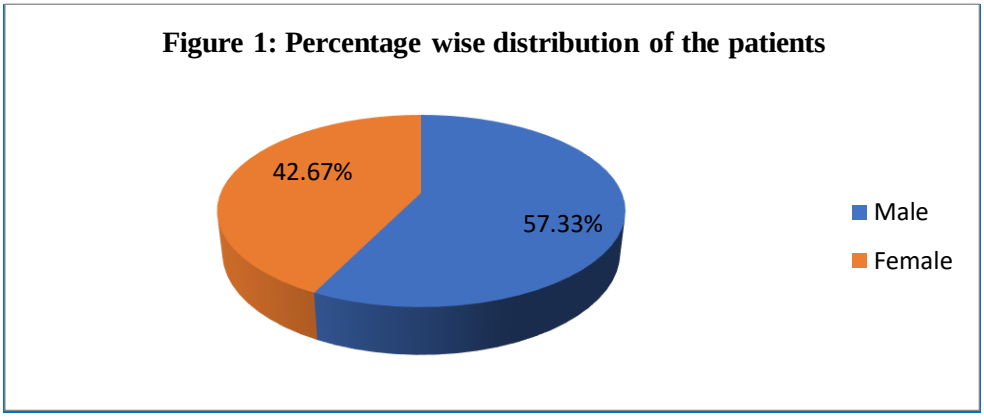


Table I, Figure 1 shows that out of 150 patients, 86 were males and 64 were females.

Table II: Socio-demographic variables of study patients

Parameters	Depression (45)	Without depression (105)	P value
Type of family (Joint: Nuclear)	32:13	73:32	0.81
Smoking	9	29	0.05
Alcohol consumption	3	11	0.03
Duration of DM (years)	10.2	11.3	0.49
Family history of T2DM	5	16	0.04
Insulin therapy	12	18	0.28

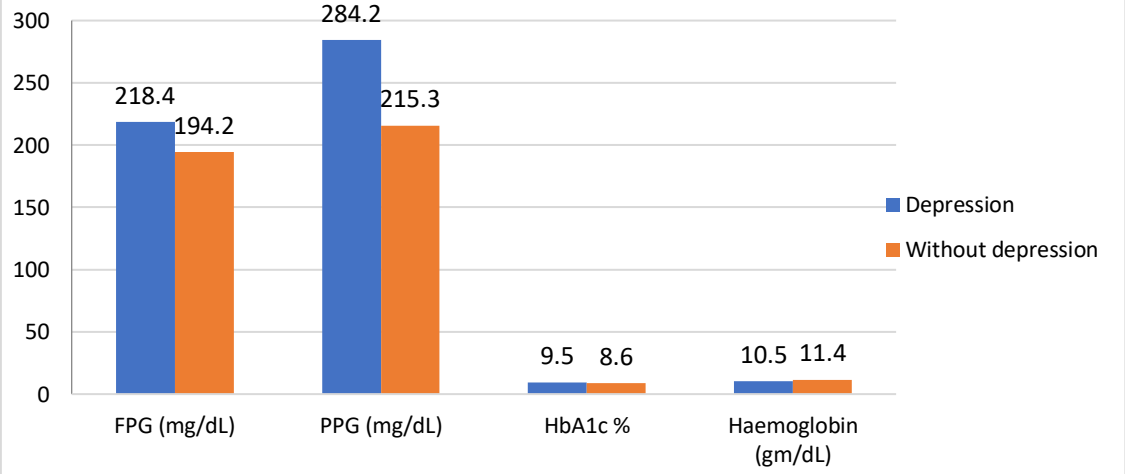
Table II, shows that type of family was joint: nuclear seen 32:13 in patients with depression and 73:32 in patients without depression. Smoking was seen in 9 and 29, alcoholism in 3 and 11, duration of DM was 10.2 years and 11.3 years, family history of T2DM was seen in 5 and 16 and insulin therapy was seen in 12 and 18 respectively. The difference was significant (P< 0.05).

Table III:Comparison of clinical parameters

Parameters	Depression	Without depression	P value
FPG (mg/dL)	218.4	194.2	0.05
PPG (mg/dL)	284.2	215.3	0.29
HbA1c %	9.5	8.6	0.13
Haemoglobin (gm/dL)	10.5	11.4	0.02

Table III, figure 2 shows that mean FPG (mg/dL) was 218.4 and 194.2, PPG (mg/dL) was 284.2 and 215.3, HbA1c % was 9.5 and 8.6 and hemoglobin (gm/dL) was 10.5 and 11.4 in patients with depression and without depression. The difference was significant (P< 0.05).

Figure 2: Comparison of clinical parameters



DISCUSSION

One of the most prevalent chronic diseases worldwide is diabetes. The past 20 years have seen a sharp increase in the prevalence of diabetes mellitus (DM) worldwide due to rising obesity and declining levels of physical exercise.[6] The country with the highest number of diabetics worldwide is India, where 69.9 million people are predicted to have the disease by 2025.[7] Both major depressive disorder (MDD) and type 2 diabetes (T2DM) are chronic conditions that can worsen for years before being diagnosed. Diabetes has been linked to an increased risk of depression, according to studies.[8,9] Additionally, depression increases the risk of type 2 diabetes. In addition to being common in the diabetic community, anxiety is often linked to depression. Diabetes, anxiety, and depression co-occurring.[10]The present study was

conducted to assess prevalence of depression in T2DM and associated risk factors.

We found that out of 150 patients, 86 were males and 64 were females. Rajput et al[11] studied the prevalence and predictors of depression and anxiety in patients of Type 2 diabetes mellitus (T2DM). Four hundred ten consecutive patients having T2DM and 410 healthy controls matched for age and sex attending the endocrine out-patient department of a tertiary care center of Northern India were included in the study. Sociodemographic and relevant clinical variables were collected. They were evaluated for depression and anxiety using Hamilton Depression Rating Scale and Hamilton Anxiety Rating Scale respectively. It was found that a significantly larger proportion of diabetic patients had depression (26.3% vs. 11.2%, P = 0.001), anxiety (27.6% vs. 12.7%, P = 0.001) and comorbid depression and anxiety (21.0% vs. 7.3%, P = 0.001) as compared to healthy controls. Diabetic women had higher depression (17.1% vs. 9.3%) and anxiety (17.6% vs. 10.0%) than men. The major predictors for a severe form of depression and anxiety among T2DM cases were age, female sex, insulin therapy, retinopathy, nephropathy, and ischemic heart disease.

We observed that type of family was joint: nuclear seen I 32:13 in patients with depression and 73:32 in patients without depression. Smoking was seen in 9 and 29, alcoholism in 3 and 11, duration of DM was 10.2 years and 11.3 years, family history of T2DM was seen in 5 and 16 and insulin therapy was seen in 12 and 18 respectively. Balharaet al[12] assessed the prevalence of anxiety/depression among outpatients receiving treatment for type 2 diabetes. There was a significant correlation between the HADS-Anxiety scale and Body Mass Index (BMI) with a correlation coefficient of 0.34 (P = 0.008). Also, a significant correlation existed between HADS-Depression scale and BMI (correlation coefficient, 0.36; P = 0.004). Significant correlation were observed between the duration of daily physical exercise and HADS-Anxiety (coefficient of correlation, -0.25; P = 0.04) scores. HADS-Anxiety scores were found to be related to HbA1c levels (correlation-coefficient, 0.41; P = 0.03) and postprandial blood glucose levels (correlation-coefficient, 0.51; P = 0.02).

We found that mean FPG (mg/dL) was 218.4 and 194.2, PPG (mg/dL) was 284.2 and 215.3, HbA1c % was 9.5 and 8.6 and haemoglobin (gm/dL) was 10.5 and 11.4 in patients with depression and without depression. Ravalet al[13] investigated the prevalence and determinants of depression in patients with established type 2 diabetes (T2DM). Patients with established T2DM were evaluated for depression by administering the nine-item PHQ-9 (Hindi version). Binary logistic regression model was used to examine association between predictor variables and risk of depression. Patients with T2DM (n=300) were evaluated [147(49%) male and 153(51%) female]. The median duration of diabetes (IQ) was 8(4-13) yrs. Of the study patients, 68 (23%) met the criteria for major depression, 54 (18%) for moderate depression and the remaining 178 (59%) had no clinically significant depression. Depression was strongly associated with age >54 yr (OR 1.26, 95% CI 1.02-1.67; P<0.05), central obesity (OR 1.34, 95% CI 1.04-1.64; P<0.001), neuropathy (OR 1.94, 95% CI 1.03-3.66; P=0.002), nephropathy (OR 1.81, 95% CI 1.02-3.21; P=0.041), peripheral vascular disease (OR 6.08, 95% CI 1.07-34.6; P=0.042), diabetic foot disease (OR 2.32, 95% CI 1.06-5.86; P<0.001) and pill burden (>4) (OR 1.27, 95%CI 1.01-1.44; P=0.035). However, the likelihood of depression was not significant with duration of diabetes and insulin use.

LIMITATION OF THE STUDY: The shortcoming of the study is small sample size.

CONCLUSION

Authors found that most of the patients had depression. Risk factors were smoking, alcoholism and family history of DM.

REFERENCES

1. Anjana RM, Deepa M, Pradeepa R, Mahanta J, Narain K, Das HK, et al. Prevalence of diabetes and prediabetes in 15 states of India: Results from the ICMR-INDIAB population-based cross-sectional study. Lancet Diabetes Endocrinol. 2017;5(8):585-96.
2. Anderson RJ, Freedland KE, Clouse RE, Lustman PJ. The prevalence of comorbid depression in adults with diabetes: A meta-analysis. Diabetes Care. 2001;24(6):1069-78.
3. Eaton WW, Armenian H, Gallo J, Pratt L, Ford DE. Depression and risk for onset of type II diabetes. A prospective population-based study. Diabetes Care. 1996;19(10):1097-102.
4. Kawakami N, Takatsuka N, Shimizu H, Ishibashi H. Depressive symptoms and occurrence of type 2 diabetes among

Japanese men. Diabetes Care. 1999;22(7):1071-76.
5. Lustman PJ, Anderson RJ, Freedland KE, de Groot M, Carney RM, Clouse RE. Depression and poor glycemic control: A meta-analytic review of the literature. Diabetes Care. 2000;23(7):934-42.
6. Young EA, Haskett RF, Murphy-Weinberg V, Watson SJ, Akil H. Loss of glucocorticoid fast feedback in depression. Arch Gen Psychiatry. 1991;48(8):693-99.
7. de Groot M, Anderson R, Freedland KE, Clouse RE, Lustman PJ. Association of depression and diabetes complications: A meta-analysis. Psychosom Med. 2001;63(4):619-30.
8. Katon WJ, Rutter C, Simon G, Lin EH, Ludman E, Ciechanowski P, et al. The association of comorbid depression with mortality in patients with type 2 diabetes. Diabetes Care. 2005;28(11):2668-72.
9. Lorant V, Deliège D, Eaton W, Robert A, Philippot P, Ansseau M. Socioeconomic inequalities in depression: A meta-analysis. Am J Epidemiol. 2003;157(2):98-112.
10. DiMatteo MR, Lepper HS, Croghan TW. Depression is a risk factor for noncompliance with medical treatment: meta-analysis of the effects of anxiety and depression on patient adherence. Arch Intern Med. 2000;160(14):2101-07
11. Rajput R, Gehlawat P, Gehlan D, Gupta R, Rajput M. Prevalence and predictors of depression and anxiety in patients of diabetes mellitus in a tertiary care center. Indian J EndocrinolMetab. 2016;20(6):746-51.
12. Balhara YP, Sagar R. Correlates of anxiety and depression among patients with type 2 diabetes mellitus. Indian J EndocrinolMetab. 2011;15(Suppl 1):S50-54.
13. Raval A, Dhanaraj E, Bhansali A, Grover S, Tiwari P. Prevalence and determinants of depression in type 2 diabetes patients in a tertiary care centre. Indian J Med Res. 2010;132:195–200.