Assessment of the Prevalence of Depression among Type II Diabetic Patients at a Tertiary Centre in Eastern India

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Abstract:

Background: Diabetes mellitus, commonly referred to as diabetes, is a chronic metabolic disorder characterised by elevated blood sugar levels. The present study was conducted to assess the prevalence of depression among diabetics.

Materials and Methods: 98 type II diabetics of both genders were enrolled. The body mass index (BMI) was recorded. Postprandial blood glucose, fasting blood glucose, and HbA1c values were used to measure the degree of diabetes control. The Beck Depression Inventory (BDS-II) assessed depression.

Results: Out of 98 patients, males were 50 and females were 48. Body mass index <25 kg/m2 was seen in 35 subjects, 25–30 kg/m2 in 24 subjects, and >30 kg/m2 in 29 subjects. Fasting blood sugar <110 mg/dl was seen in 21, 110–125 mg/dl in 30, and >125 mg/dl in 47 subjects. The difference was non-significant ($P > 0.05$). The duration of diabetes was <5 years in 20; 5–10 years in 24; and >10 years in 34. It was found that the risk of depression among type 2 diabetic patients increased significantly with the increase in the duration of disease ($P = 0.002$). The duration of treatment was <5 years in 13, 5–10 years in 36, and >10 years in 49 subjects. The difference was non-significant ($P > 0.05$).

Conclusion: The prevalence of depression among diabetics was high. The risk factors for depression were age and central obesity.

Keywords: Diabetes Mellitus, Beck Depression Inventory, Blood Sugar.

Introduction

Diabetes mellitus, commonly referred to as diabetes, is a chronic metabolic disorder characterised by elevated blood sugar (glucose) levels. Type 1, type 2, and gestational diabetes are the three main types of diabetes [1].

Insulin resistance, a condition in which the body's cells do not react to insulin as well, is a characteristic of type 2 diabetes. Over time, the pancreas may also fail to produce enough insulin. Although it often manifests in adults, children and adolescents are increasingly receiving diagnoses for it. Obesity, sedentary lifestyle, genetic factors, and age are among the risk factors [2].

An estimated 350 million individuals worldwide suffer from depression, making it a widespread ailment. Depression can develop into a dangerous medical disease, particularly if it persists for a long time and is moderately or severely intense. The impacted individual may experience severe distress and perform poorly at work, school, and in the family. Diabetics with diabetes mellitus frequently experience depression [3]. Diabetes and depression are often co-occurring conditions that are linked to worse glycemic control, higher complications, and less adherence to medication and healthy lifestyle practices. It is possible to consider depression as a modifiable independent risk factor for the onset of type 2 diabetes and the advancement of its complications [4]. The identification and management of this connection may significantly impact the prevention and treatment of various conditions [5]. Roughly 80% of individuals with type 2 diabetes live in low- and middle-income nations (LMICs). However, a large portion of the study on depression in individuals with diabetes has been carried out in high-income countries (HICs) [6].

Aims and Objective: The present study was conducted to assess the prevalence of depression among diabetics.

Materials & Methods

The present cross-sectional study included 98 type II diabetic patients of both genders attending the General Medicine OPD at the Department of General Medicine in collaboration with the Department of preventive and social medicine at Government Medical College, Bettiah, and Jan Nayak Karpuri Thakur Medical College & Hospital (JNKTMCH), Madhepura, Bihar, India. The study was approved by the institutional ethical and research committees. The study was carried out between September 2020 and August 2021.

An informed and written consent was obtained from all the participants prior to the commencement of the study. The study was a community-based, cross-sectional questionnaire-based study. Keeping power (1-beta error) at 80% and confidence interval (1-alpha error) at 95%, the minimum sample size required was 60 patients; anticipating non-response and incomplete data collection, therefore, the sample size has been kept at 98 (more than the minimum required number of cases) patients in the present study.

Inclusion Criteria: Type 2 DM patients aged between 20 and 70 years of any gender with a diagnosed type 2 DM were included in the present study.

Exclusion Criteria: Type 2 DM patients aged <20 and >70 years, pregnant, or past history of any Psychiatric disorders or comorbidities of any chronic condition other than type 2 DM were excluded from this study. In order to take part in the study, all participants gave written consent. Data such as name, age, gender, etc. was recorded. The length of the illness, the course of treatment, the kind of care being given, any complications brought on by diabetes, any family history of the disease, and the body mass index (BMI) were recorded. Postprandial blood glucose, fasting blood glucose, and HbA1c values were used to measure the degree of diabetes control. The Beck Depression Inventory (BDS-II) was used to assess depression, and the Morisky Medicine Adherence Scale (MMAS-8) was utilised to gauge patients' adherence to their prescribed medicine. The data was collected through a personal interview with the participants using a predesigned questionnaire, which included two sections. The first section inquires about socio-demographic data. The second section is the Beck Depression Inventory (BDS-II) to assess depression.

The data thus obtained were subjected to statistical analysis using the statistical package for social sciences (SPSS) version 22.0.The qualitative data was presented using percentages and frequencies. A chi-square test for independence was used to detect relationships between depression and its risk factors. A P value < 0.05 was considered significant.

Results

In the present study, the mean age of patients was 46.95±8.50 years. 51.02% were males and 48.98% were females. Further, it was found that patients with less than secondary education were twice as likely to have depression as those with secondary education and above (P = 0.001). Low family income was also associated with a significant increase in the risk of depression (P <0.001). Other socio-demographic actors were not significantly related to depression (Table I).

Table 1: Depression among type II diabetic patients (n = 98) in relation to their socio-demographic characteristics.

Variable	Category	Frequency (n=98)	Percentage	P value
Age (years)	20-30	3	3.06	0.62
	31-40	8	8.16	0.40
	41-50	39	39.80	0.25
	>50	48	48.98	0.72
Gender	Male	50	51.02	0.30
	Female	48	48.98	
Marital status	Un married	9	9.18	0.28
	Married	64	65.31	0.21
	widow /divorced	25	25.51	0.08
Educational level	< secondary	39	39.80	0.001
	≥ secondary	59	60.20	
Income	Not enough	5	5.10	<0.001
	Enough	68	69.39	
	Enough+ saving	25	25.51	
Smoking	yes	24	24.49	0.81
	No	74	75.51	
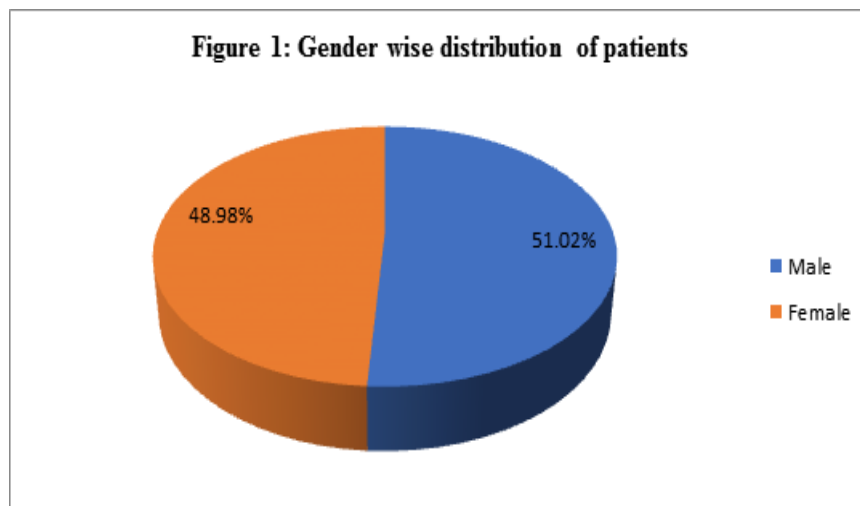
Figure 1: Gender wise distribution of patients

Table 2: Assessment of parameters

Parameters	Variables	Number	P value
Body mass index (kg/m2)	<25	35	0.12
	25-30	24	
	>30	29	
Fasting blood sugar (mg/dl)	<110	21	0.32
	110-125	30	
	>125	47	
Duration of diabetes (years)	<5	20	0.002
	5-10	24	
	>10	34	
Duration of treatment (years)	<5	13	0.61
	5-10	36	
	>10	49	

Table II and graph I show that a body mass index <25 kg/m2 was seen in 35 subjects, 25–30 kg/m2 in 24 subjects, and >30 kg/m2 in 29 subjects. Fasting blood sugar <110 mg/dl was seen in 21, 110–125 mg/dl in 30, and >125 mg/dl in 47 subjects. The difference was non-significant (P > 0.05). The duration of diabetes was <5 years in 20; 5–10 years in 24; and >10 years in 34. It was found that the risk of depression among type 2 diabetic patients increased significantly with the increase in the duration of disease (P = 0.002). The duration of treatment was <5 years in 13, 5–10 years in 36, and >10 years in 49 subjects. The difference was non-significant (P > 0.05).
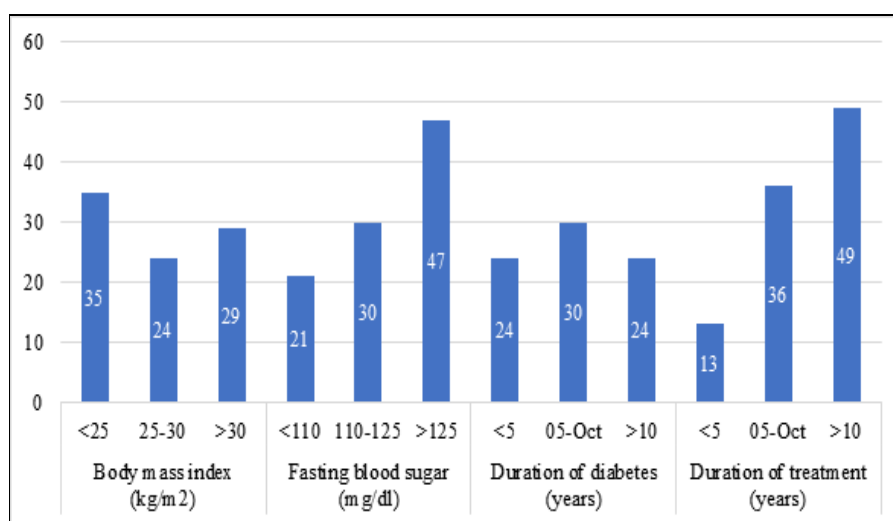

Figure 2: Assessment of parameters

Table 3: Assessment of degree of depression according to Beck's Depression Inventory II.

Beck's Depression Inventory	Number of patients (n=98)	Percentage	P value
Minimal	24	24.49	
Mild	16	16.33	
Moderate	32	32.65	0.63
Severe	26	26.53	

Table III shows that among the present participants, depression was seen in 75.51%. 16 subjects had mild, 32 had moderate, and 26 had severe depression. The difference was non-significant (P > 0.05).
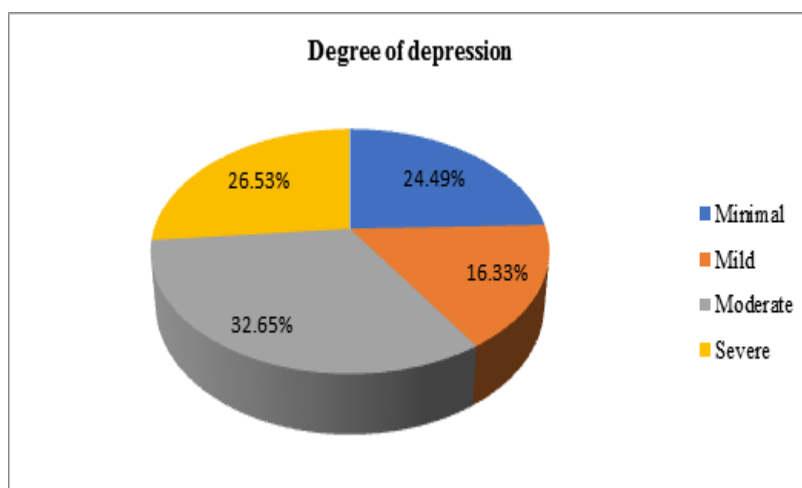
Figure 3: Assessment of the degree of depression

Discussion

Poor adherence to diet and medication regimens for diabetes is also linked to depression. Patients with diabetes and depression also exhibit decreased levels of physical activity, a lower quality of life, and higher health care costs [7]. Depressive symptoms may be a result of the burden of diabetes, as evidenced by the higher prevalence of depressive symptoms among individuals with a DM2 diagnosis [8]. A portion of the correlation between DM2 and depressive symptoms appears to be explained by the prevalence of chronic illnesses [9,10]. The present study was conducted to assess the prevalence of depression among diabetics.

We found that out of 98 patients, males were 50 and females were 48. Kumar et al. [11] studied the prevalence of depression among patients with diabetes mellitus type 2. The majority of the potential cases of depression (33%) were in the age group of 51–60 years. 62% of the patients were male. The majority of the patients (40%) were in the age group of 51–60 years. 73.4% of the married patients were potential cases of depression. 78% of the patients had a family history of type 2 diabetes mellitus. The majority of the patients (72%) were overweight or obese (BMI > 25 kg/m2).

We found that a body mass index <25 kg/m2 was seen in 35 subjects, 25–30 kg/m2 in 24 subjects, and >30 kg/m2 in 29 subjects. Fasting blood sugar <110 mg/dl was seen in 21, 110–125 mg/dl in 30, and >125 mg/dl in 47 subjects. The duration of diabetes

was <5 years in 24, 5–10 years in 30, and >10 years in 24. The duration of treatment was <5 years in 13, 5–10 years in 36, and >10 years in 49 subjects. Raval et al. [12] found that in their study, patients with T2DM (n = 300) were evaluated [147 (49%) male and 153 (51%) female]. The median duration of diabetes (IQ) was 8 (4–13) years. 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 years (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, and pill burden (>4). However, the likelihood of depression was not significant with the duration of diabetes or insulin use.

Besides, the present study found that the risk of depression among diabetic patients increases significantly with low education, low income, or low social support. These findings are consistent with those of studies [13,14].

The study also revealed an increased risk of depression among diabetics with an increased duration of DM. This finding is similar to that reported by other studies [15]. This may be explained by the increased risk of complications

with a longer duration of disease, which in turn increases the risk of depression.

We found that depression was seen in 75.51% of 16 subjects had mild, 32 had moderate, and 26 had severe depression. Raj Kumar et al. [16] found that the prevalence of geriatric depression (ICD-10) was 12.7%. Low income, experiencing hunger, history of cardiac illnesses, transient ischemic attack, past head injury, and diabetes increased the risk for geriatric depression after adjusting for other determinants using conditional logistic regression. Having more confidants was the most significant protective factor. Age, female gender, cognitive impairment, and disability status were not significantly associated with geriatric depression. The DSM-IV-IVagnosis of major depression was significantly correlated with experiencing hunger, diabetes, transient ischemic attack, past head injury, more disability, and less nourishment; having more friends was protective.

The current study found that the prevalence of depression among diabetic patients is 49.01%. This result is comparable to the results of studies conducted in Qatar by A. Bener [17] at 52.5%, in Ethiopia by T. D. Habtewold et al. [18] at 47%, and in Mexico by C. Tovilla-Zárate et al. [19] at 48.27%.

However, studies were conducted by O. B. Albasheer et al. [20], which reported a prevalence of depression among diabetic patients of 37.6%, and by Anderson RJ et al. [21], which indicated a lower prevalence of depression among diabetics.

Limitation of the Study: The limitation of the study is the small sample size.

Conclusion

The authors found that the prevalence of depression among diabetics was high. Diabetic patients with low education, poor income, and a long duration of diabetes mellitus were found to be at higher risk of depression. More than three-fourths of type II diabetic patients had depression.

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