

ORIGINAL RESEARCH

A Cross Sectional Study of Depression in Type II Diabetes Mellitus patients and its socio-demographic determinants

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ABSTRACT

Background: Depression is one of the common psychiatric disorders and associated with significant disability. Several factors predispose patient for the development of depression. Chronic physical illnesses increase the stress level and psychological problems. There is an epidemic of diabetes and depression is common in diabetic patients. Considering these factors this study aims at measuring the prevalence of depression in diabetic patients attending tertiary care centre in India. Also, this study tries to find out any risk factors for depression in diabetic patients. **Methods:** This study was carried out at a tertiary care centre in India. This is a cross sectional study. We enrolled sixty-one consecutive cases fulfilling inclusion and exclusion criteria and taking consent. Diagnosis of diabetes was done by physician. Patients were assessed by psychiatrist for the presence of depression. Statistical analysis was carried out to find out any factors associated with depression in diabetic patients. **Results:** The prevalence of depression in diabetic patients in this study was 18.03 percent. This study found that depression was more common in patients with higher education and urban backgrounds. **Conclusion:** Patients with diabetes mellitus are vulnerable for depression. Various psychological and physiological changes are responsible for it. This high prevalence of depression necessitates routine screening of diabetic patients for depression. Early detection and treatment of depression can lead to better prognosis in diabetic patients.

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INTRODUCTION

Diabetes mellitus (DM) refers to a group of common metabolic disorders that share the phenotype of hyperglycaemia. It is a chronic disease that causes short- and long-term complications. (Ramachandran et al., 2001) It is well documented that the prevalence of depression among patient with diabetes is higher than among the general population. Depression may have special clinical relevance in diabetes since the two illnesses may affect each other. (Anderson et al., 2001a).

Depression is associated with increased levels of glucocorticoids, catecholamines, and growth hormone; changes in glucose transport function; and secretion of inflammatory cytokines, which could lead to insulin resistance and be causal factors in the development of diabetes as

well as complications of diabetes (Gold, 2015) (Lustman et al., 2000). The second hypothesis is that depression in patients with both type 1 and type II diabetes results from chronic psychosocial stressors of having a chronic medical condition as well as psychosocial demands imposed by diabetes (Gois et al., 2012).

Diabetic patients with comorbid depression have poor adherence to medications (Silverman et al., 2015). Nonadherence rate to oral hypoglycaemics was 19.5 percent in a large health maintenance organisation (Lin et al., 2004). They have unhealthy lifestyle. They do not follow dietary advice and exercise. All these factors lead to poor glycaemic control, more diabetes related complications (Wu et al., 2020). Thus, there is bidirectional relationship between diabetes and depression. In this study we want to assess the prevalence of depression in patients with diabetes mellitus and to find out factors associated with depression in diabetic patients.

METHODS

This is across sectional descriptive study. This study was conducted at tertiary care hospital. Patients with type II diabetes attending outpatient and inpatient department and fulfilling the criteria were included in the study. Patients aged 18-60 years and with adequate cognitive functions to perform the interview and without any psychotic disorders or substance-related disorders were included in the study. Patients with any other concomitant disorders that could affect the function of nervous system or taking drugs were excluded from the study. Eligible patients were included in the study only after written and informed consent. Those patients who did not give consent to participate in the study were excluded from the study.

After diagnosis of type 2 diabetes mellitus made by physician patients who met the study criteria were recruited and informed consent was taken. Data was collected by using a semi-structured interview in one sitting (data like income, family support, nuclear or joint family, urban or rural, educational status of caregiver etc) and Patients were assessed for depressive symptoms by using Hamilton Depression rating scale (HAM-D). Ham-D has seventeen questions for scoring. Each question is scored separately, and sum is calculated. A total score of 7 or less is considered as normal. A total score more than seven is considered as depressed. Analysis was carried out to see any effect of sociodemographic or clinical variables on depression in type II diabetes patients.

The data analysis was done with the help of statistician. For continuous data student t test was applied and for discrete data chi square test was used.

RESULTS

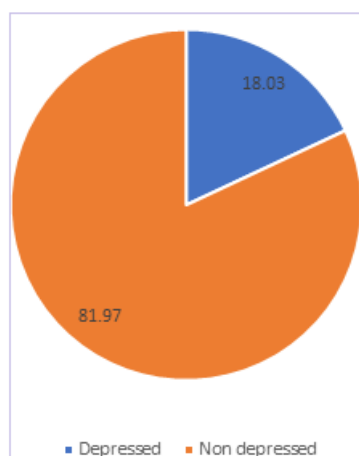


Diagram 1: Percentage of depressed patients in study sample

Among the study subjects 18% of subjects have depression (HAM-D score more than 7)

Table 1: Sociodemographic characteristics

Sociodemographic variables		
Age		55.62± 5.687
Education	Uneducated and less than 12 th standard	52 (85.2%)
	Degree or higher	9 (14.8%)
Occupation	Unskilled/semiskilled	46 (75.4%)
	skilled	15 (24.6%)
Sex	Male	27 (44.3%)
	Female	34 (55.7%)

Table 2: Clinical Parameters of the subjects

Clinical Variables		
	Mean	SD
weight	67.15±	13.111
height	159.02±	8.857
BMI	25.90±	4.245
PR	78.80±	5.759
bslF	158.28±	58.765
bslPP	254.43±	86.210
HbA1c	8.90±	1.874
HamD	4.07±	4.980

Table 3: Sociodemographic variables and depression

Variables		Depressed (n=11) Mean ± SD		Non depressed (n=50) Mean ± SD		P value
		Number	Percentage	Number	Percentage	
Sex	Male	5	14.70	29	85.30	0.514
	Female	6	20.68	21	79.32	
Education	Uneducated/ Primary school/ High school	7	13.46	45	86.54	0.047*
	Degree	4	44.44	5	55.56	
Occupation	Unskilled/Semiskilled	7	15.55	39	84.45	0.538
	Skilled	4	26.66	11	73.34	
Residence	Rural	1	4.00	24	96	0.02*
	Urban	10	27.77	26	72.23	

Table 4: Clinical variables and depression

Variables	Depressed (n=11) Mean \pm SD	Non depressed (n=50) Mean \pm SD	P value
Age	56.64 \pm 4.965	55.40 \pm 5.855	0.518
weight	65.09 \pm 12.494	67.60 \pm 13.322	0.570
height	158.00 \pm 8.786	159.24 \pm 8.946	0.678
BMI	25.35 \pm 4.485	26.02 \pm 4.228	0.640
PR	80.91 \pm 4.505	78.34 \pm 5.937	0.183
bslF	177.91 \pm 55.926	153.96 \pm 59.031	0.224
bslPP	282.45 \pm 102.376	248.26 \pm 82.137	0.237
HbA1c	9.05 \pm 1.628	8.87 \pm 1.938	0.773

We have recruited sixty-one subjects out of which 18.03 percent were depressed (Diagram 1). Fifty-two (85.2%) were educated upto 12th standard while Nine (14.8%) had higher education i.e., degree or more. Subjects with skilled work were 15 (24.6%) and unskilled / semiskilled were 46 (75.4%). Twenty-seven (44.3%) were males and 34 (55.7%) were females. The mean Weight and height were 67.15 \pm 13.11 and 159 \pm 8.857 and Body mass index was 25.90 \pm 4.24. Fasting blood sugar level was 158.28 \pm 58.76 and post prandial blood sugar level was 254.4 \pm 86.2, while mean HbA1c 8.90 \pm 1.87. Prevalence of depression was 14.7% in males compared to 20.68% in females, though it was not significant. Higher Education was associated with the higher prevalence of depression 44.44% compared to lower education 13.46% (P value 0.047). Depression was present in 4% of rural and 27% of urban areas (P value 0.02). There was significant no difference between skilled (15.6%) and semiskilled/unskilled (26.7%) (P value 0.538).

The mean age was similar between depressed and non-depressed diabetic patients viz. 56.64 \pm 4.965 and 55.40 \pm 5.855 (P value 0.518). The mean weight, height and Body mass index was 65.09 \pm 12.494, 158.00 \pm 8.786 and 25.35 \pm 4.485 in depressed patients and 67.60 \pm 13.322, 159.24 \pm 8.946 and 26.02 \pm 4.228. This was not statistically significant. Pulse rate was similar between the depressed (80.91 \pm 4.505) and non-depressed patients (78.34 \pm 5.937) (P value 0.183). Fasting blood sugar, post prandial blood sugar and HbA1c values were 177.91 \pm 55.926, 282.45 \pm 102.376 and 9.05 \pm 1.628 in depressed and 153.96 \pm 59.031, 248.26 \pm 82.137 and 8.87 \pm 1.938 in non-depressed patients. And it was non-significant.

DISCUSSION

Diabetes mellitus is a chronic debilitating condition. Previous studies have found higher prevalence of depression in patients with diabetes mellitus. The prevalence of depression was 18% in this study. This is similar to the findings of study of 703 individuals using becks depression inventory (Hein et al., 2018). The studies which used self-rated scales found higher prevalence. The range of depression prevalence among diabetic patients was 8 to 44% in India (Rajan et al., 2022). This wide variation in the prevalence may be explained by sociodemographic factors, methods of assessing depression, difference in the design of the study, severity of diabetes etc. Self-rated interviews for assessment of depression yields higher prevalence than investigator administered scale (Anderson et al., 2001b). There are multiple factors that can predispose the diabetic patients for development of depression.

Sociodemographic factors which were identified as risk factors for depression in diabetic patients include female, poor glycaemic control (Anderson et al., 2001b). The present study found that 14% males and 20% of females with diabetes have depression. Though this difference was not statistically significant. This could be due to small sample size. Also, this study could not find any relation between glycaemic control as measured by HbA1c, fasting blood sugar and post prandial blood sugar level and depression. This contrasts with previous

studies. This could be explained by the fact that sample was collected from tertiary care centre. Most of the patients had poor glycaemic control. A metanalytic review found that depression was more in patients with poor glycaemic control (Lustman et al., 2000).

There was considerable influence of the residence on prevalence of depression in diabetes. The prevalence of depression in diabetic patients from rural background was only 4 percent. This is same as general population. However, patients from urban backgrounds had significantly higher prevalence of depression (27.7%). Also, depression was more in highly educated patients (44.44%) than patients with lower education (13.46%). Diabetic patients from urban background have more sedentary lifestyle and less socialization. Most of the patients from urban background have higher education. People with higher education may have more perceived stress about being diabetic. Another study from India found that depression was more in literate patients (Hussain et al., 2020). This study confirms this finding.

A cross sectional study from Kuwait found that higher body mass index was associated with higher rates of depression among diabetic patients (Al-Ozairi et al., 2020). This study did not find such association. There was no effect of body mass index, pulse rate or blood pressure on the prevalence of depression in diabetic patients.

Small sample size is one of the limitations for this study. This study did not include patients from community as this was hospital-based study. We cannot generalize these findings due to above mentioned limitations. However, the present study gives a good idea about depression in moderate to severe diabetic patients. It adds more information related to the topic in Indian settings.

Future studies with larger sample, including community patients can give better clarity. Also, a prospective design can give better information about depression and diabetes.

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