ORIGINAL RESEARCH ARTICLE

A Cross Sectional Study on Prevalence of Depression in Type 2 Diabetes Mellitus Patients in Rural Field Practice Area of S Nijalingappa Medical College, Bagalkot, Karnataka

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Abstract:

Background: Diabetes and depression are highly prevalent chronic conditions that have significant impact on health outcomes. Patients with depression and diabetes have been shown to have poorer self-management and adherence to anti-diabetic, treatment when compared with diabetic patient's alone.

Objectives: To find out, the prevalence and determinants of depression in patients with established type II Diabetes Mellitus(T2DM)

Materials and Methods: This Cross-sectional descriptive study was undertaken in rural field practice area (Shirur) of department of community Medicine, S N Medical College, Bagalkot. A total of 150 Patients with established T2DM were evaluated for depression by administering the 21 item Beck Depression Inventory (BDI) Scale. Results: A total of 150 diabetes patients were assessed for depression, out of which 51% were male and 49% were females. 40.6% of the participants belonged to age group of 61-70 years .31.3% of the subjects had diabetes for last 6-10 years. According to becks depression scale ,44%of the subjects were not depressed, 29% of them suffered from mild depression, 16% had moderate and 11% had severe depression. 31.2% of 41-50 years' age group were severely depressed. Majority of the severely depressed subjects belonged to class 3 Socioeconomic class according to modified B G Prasad classification which was statistically significant. 56.2% of patients on insulin and OHA s were severely depressed, 56.2% of severely depressed patients had diabetes for 10-15 years, 75% of overweight or obese patients were severely depressed. 48% of the depressed patients had some form of co morbidities, patients with co morbities were likely to be more depressed than those without co morbidities with odds ratio of 3.18.38.6% of the depressed patients had suicidal thoughts. Subjects with depression were more likely to think about suicide, with odds ratio of 3.90.

Keywords: *Depression, Diabetes, Rural, Becks Depression Inventory*

INTRODUCTION

Diabetes is a chronic disease which affects all organs of the human body. According to World Health Organization 300 million people will be affected from Diabetes by 2025. In the world, India has the largest diabetic patients and it is expected to be 69.9 million by 2025[1].The prevalence of type 2 diabetes mellitus is steadily increasing in India [2].

Depression has been defined as wide range of emotional lows, from mere sadness to a pathological suicidal state[3]. Depression is another chronic manifestation which causes great proportion of burden associated with non-fatal health outcomes and account for 12% of total years lived with disability[4].Among diabetes patients, the prevalence of depression is common[5].

Patients suffering from diabetes mellitus are also at a higher risk of being diagnosed with depression compared to normal population[6]. The prevalence of depression is more among them who have long term complications. of diabetes[7].

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Patients with depression and diabetes have been shown to have poorer self-management and adherence to anti-diabetic treatment when compared with diabetic patient's alone[8]. They are more likely to have higher cardiovascular risk factors such as smoking, obesity, sedentary lifestyle, and uncontrolled hyperglycaemia[9]. For effective diabetes management, depression may be an important barrier. Patients with both depression and diabetes are more likely to have higher macrovascular and microvascular complications[7].

Depression is still largely unrecognized by physicians managing patients with diabetes mellitus[10]. It is estimated that only one-third of people with both Diabetes Mellitus and major depression are recognized and appropriately treated for both disorders[11].

Recognising and addressing this association can have profound implications for prevention and treatment of these disorders.[12]

The data available on the prevalence of depression in diabetes from India is limited. It has special relevance for India, being a middle-income country and also India has high prevalence of both these disorders. Hence the study has been undertaken[13-14].

MATERIALS AND METHODS

This Cross-sectional descriptive study was undertaken in rural field practice area (Shirur) of department of community Medicine, S N Medical College, Bagalkot. The population of rural health centre area is 19,197

with 14 Anganawadi centres. The study was conducted for a period of 6 months from June to November 2015.The investigators were trained to conduct interview using becks depression inventory scale.

Inclusion criteria:

Patients with established type 2 diabetes mellitus since last 1 year (Fasting glucose level more than or equal to 126mg/dl and post prandial, more than or equal to 200mg/dl) were considered for the study.

Exclusion criteria:

The patients who were not willing to participate in the study, those with pre-existing psychiatric illness or those who are currently on anti-depressants, pregnant women and seriously ill patients were excluded from the study.

Consent:

Informed and written consent was obtained from all the study participants

Data Collection:

A house to house survey was done to find out the diagnosed type 2 Diabetes Mellitus patients, by confirming with their medical records. The objectives of the study were explained to the study participants before initiating the study and the confidentiality of information was assured. A pre-designed and pre-tested questionnaire was used to elicit the information about socio-demographic factors. The family history of Depression was assessed based upon the earlier diagnosis in first and second degree relatives) and clinical variables such as duration of diabetes, modality of treatment, presence of co-morbidities or complications due to Diabetes

Mellitus was assessed by interviewing the patient and supplemented by patient records. The questionnaire was translated into the local Kannada language for better understanding.

Assessment of prevalence of Depression

The prevalence of depression was assessed by Beck Depression Inventory (BDI) Scale[15]. It is a mood-measuring device originally developed by Dr. Aaron T Beck. It is a subject wise scale and is used for screening purpose. It is one of the most widely used screening instruments for detecting symptoms of depression. It was designed to document a variety of depressive symptoms the individual experienced over the preceding week. This scale has been tested and validated.

It is a 21 item instrument to assess the existence and severity of symptoms of depression. Responses to the 21 items are made on a 4-point scale, ranging from 0 to 3 and the total score being 63. Each of the 21 items corresponding to a symptom of depression was summed to give a single score for the BDI scale. A score of 0-13 is considered as normal, 14-19 border line clinical depression or mild depression, 20-28 moderate depression, and 29-63 as severe depression.

Sample size:

The sample size was estimated using the formula $n = 4pq/L^2$. The prevalence of depression, "p" among type 2 Diabetes Mellitus patients is taken as 41% which is reported by previous study by Amit Raval et al[16] and taking the confidence interval as 95%. with relative precision of

20%. By applying these values in the formula the sample size is calculated as 145 and it was rounded off to 150.

Statistical analysis:

Data was entered in excel spread sheet. Data was expressed in terms of proportion or percentages. The association of each of the variables with depression was assessed by using Fishers exact and Chi-square test. Variables showing statistical significant association with the outcome variable (P<0.005) was considered as potential determining factors.

RESULTS

In the present study the total participants were150, in which 51% were female and 49% were male participants. Most of the

Table 1: Distribution of Study Subjects with Depression as Per Socio Demo-Graphic Profile

	NORMAL	MILD	MOD.	SEVERE	TOTAL	Chi/Fisher exact Value	p
	n(%)	n(%)	n(%)	n(%)	n(%)		
Age (Years)							
30-40	12(18.2%)	5(11.4%)	2(8.3%)	1(6.2%)	20		
41-50	16(24.2%)	4(9.1%)	2(8.3%)	5(31.2%)	27		
51-60	15(22.7%)	7(15.9%)	8(33.3%)	3(18.8%)	33	28.989	0 .016
61-70	20(30.3%)	14(31.8%)	11(45.8%)	4(25%)	49		
71-80	2(3.0%)	11(25.0%)	1(4.2%)	2(12.5%)	16		
81-90	1(1.5%)	3(6.8%)	0	1(6.2%)	5		
Socio- Economic Class							
I	13(19.7%)	7(15.9%)	0(0.0%)	2(12.5%)	22		
II	28(42.4%)	17(38.6%)	10(41.7%)	4(25.0%)	59		
III	21(31.8%)	13(29.5%)	8(33.3%)	10(62.5%)	54		0.042
IV	3(4.5%)	6(13.6%)	6(25.0%)	0(0.0%)	15		
V	1(1.5%)	1(2.3%)	0(0.0%)	0(0.0%)	2		
Treatment							
OHD	65(98.5%)	33(75%)	13(54.2%)	7(43.8%)	118		
Insulin	0(0.0%)	2(4.5%)	0(0.0%)	0(0.0%)	2	34.074	<.0001*
Insulin + OHD	1(1.5%)	9(20.5%)	11(45.8%)	9(56.2%)	30		
Duration of DM in years							
0-5	30(45.5%)	2(4.5%)	5(20.8%)	0(0.0%)	37		
06-10	21(31.8%)	18(40.9%)	2(8.3%)	1(6.2%)	42		
10-15	13(19.7%)	16(36.4%)	9(37.5%)	9(56.2%)	47	38.7	<0.001
15-20	2(3.0%)	7(15.9%)	7(29.2%)	5(31.2%)	21		
≥20	0(0.0%)	1(2.3%)	1(4.2%)	1(6.2%)	3		
BMI							
Underweight	1(1.5%)	0(0.0%)	0(0.0%)	0(0.0%)	1		
Normal	32(48.5%)	20(45.5%)	7(29.2%)	4(25.0%)	63		
Overweight	32(48.5%)	14(31.8%)	13(54.2%)	5(31.2%)	64	34.074	<.0001*
Obese class 1	1(1.5%)	10(22.7%)	4(16.7%)	5(31.2%)	20		
Obese class 2	0(0.0%)	0(0.0%)	0(0.0%)	1(6.2%)	1		
Morbid obesity	0(0.0%)	0(0.0%)	0(0.0%)	1(6.2%)	1		
Total	**66**	**44**	**24**	**16**	**150**		

study participants i.e. about 40.6% belonged to the age group of 61-70 years followed by 28% in 41-50 years. majority of the subjects i.e. 31.3% of the study participants had history of diabetes for last 6-10 years and 28.6% had history of 11-15 years.

79% of the study subjects were on oral hypoglycaemic agents(OHA) and 20% on both insulin and OHAs and only 1%on insulin alone. Most of the study participants i.e. 39.33% belonged to class II socioeconomic status ,34.66% belonged to class III, only 1.33% belonged to class V according to modified BG Prasad classification. In the present study 44% of the participants scored below 13 on becks depression inventory and were not depressed. Whereas 29% of the participants scored between 14-19 and had mild depression ,16% were moderately depressed who scored between 20-28 and 11% scored between 29-63 and were severely depressed.

Majority of the subjects belonging to age group of 61-70 years were moderately depressed, 31.2% of 41-50 years' age group were severely depressed. Majority of the severely depressed subjects belonged to

class III Socioeconomic class, which was statistically significant with p value of 0.04. Majority of the patients (98.5 %) on OHA were not depressed, where as 56.2% of patients on insulin and OHA s were severely depressed, this was statistically significant with p value of <0.001.

56.2% of severely depressed patients had diabetes for 10-15 years , whereas 37.5% of moderately depressed patients had diabetes for 10-15 years,40.4% of mildly depressed patients had diabetes for 6-10 years, 45.5% of patients had diabetes for 0-5 years, this was statistically significant with p value of < 0.001.Majority of the severely depressed patients i.e. 75% belonged to the category of overweight and obese, majority of moderately depressed patients belonged to overweight category i.e. 54.2%, 48.5% of the non-depressed patients belonged to normal weight category. This was statistically significant with p value 0f <0.001.

48% of the depressed patients had some form of co morbidities, there was association between depression and presence of co morbidities and

this was statistically significant with p value of 0.005,patients with co morbities were likely to be more depressed than those without co morbidities with odds ratio of 3.18(1.44-7.24).38.6% of the depressed patients had suicidal thoughts, , there was association between depression and presence of suicidal thoughts ,this was statistically significant with p value of 0.001, subjects with depression were more likely to think about suicide , with odds ratio of 3.90(1.96-7.76).

DISCUSSION

Proportion of overall depression:

In the present study the prevalence of depression was 56%. In a study done by in a Ranjan Das et al in urban areas of Kolkata,46.15% met criteria for depression, among the depressed group, 32.2% were mildly depressed, 36.7% were moderately depressed, 14.4% had severe depression, and 16.7% had very severe depression.[17] In study done by Amit Thour et al. The prevalence of depression was 41%. Severe depression was present in 4% subjects, moderate depression

Table 2: Distribution of depression in study subjects according to co morbidities

Distribution of depression in study subjects according to co morbidities						
Co Morbid conditions	Depression present	Depression absent	Total	Odds Ratio	χ^2	p
Present	72 (48%)	43 (28.6%)	115	3.18 (1.44,7.24)	7.62	0.005*
Absent	12 (8%)	23 (15.3%)	35			
	84	66	150			
Distribution of patients according to presence of suicidal thoughts						
Thoughts Of Suicide	Depression Present	Depression Absent	Total	Odds Ratio	χ^2	p
Present	58 (38.6%)	24 (16%)	82	3.9 (1.96,7.76)	14.64	0.001*
Absent	26 (17.33%)	42 (28%)	68			
	84	66	150			

in 10% subjects, and mild depression was present in 27% of subjects.[18] This was in agreement with our study.

Subramani et al in urban study Chennai found that prevalence of depression was 15.1%, which was less compared to our study[19]. Factors like lower socioeconomic class, lower levels of education, lack of social support might have played role in increased prevalence of depression in rural population in the present study.

Prevalence of depression and gender:

In the present study, depression was found more in females (30.66%)than in males (25.33%). Prevalence of depression is more in women compared to men both in general population and in diabetes, both globally and in India according to previous studies[20-23].

Asghar et al., found evidence of depressive symptoms in 29% of males and 30.5% of females with newly diagnosed diabetes in rural Bangladesh[24].

According to Subramani et al in urban study found that prevalence of depression among females to be 16.3% and males to be 13.9%, which was significantly higher compared to their male participants[19]. This was lower in comparison to our study, this may be because urban women are better informed and have better health care facilities

According to Katon W et al , female diabetic patients were associated with a significantly higher likelihood of meeting criteria for major depression[25]. According to Tattersall et al., diabetes can have considerable consequences on the quality of everyday life, with possible limitations in physical activity social life, family relations, and leisure activities[26].

Women in general have multiple roles to play, middle aged women may face additional emotional stress from dealing with adolescents, onset of a major illness, caring for an aging parent, divorce or widowhood[27]. This may be the reason for increased depression in women compared to men.

Depression and Body mass index:

In present study, majority of the severely depressed patients i.e. 75% belonged to the category of overweight and obese. In study done by Sacco W P et al indicated that BMI contributed to depression indirectly, via their effects on self-efficacy and diabetes-related medical symptoms[28].William P et al found out that higher BMI contributes to depression in adults with diabetes .[29]

According to Lin E H et al, Major depression was associated with less physical activity, unhealthy diet, which may contribute to increased BMI[30].According to Katon W et al higher BMI increased likelihood of depression[31].

Depression and type of treatment:

In this study, majority of the patients (98.5 %) on OHA were not depressed, where as 56.2% of patients on insulin and OHA s were severely depressed

According to study by Al-Amer RM et al found that patients who are on insulin treatment had a significant association with depression[32]

According to Katon W et al, Independent factors that were associated with a significantly higher likelihood of meeting criteria for major depression included treatment with insulin[31],

Similar results were obtained in study by Kessler et al [33] and Nock M K et al[34]. This may be due to repeated painful injections and its interference in everyday life. Diabetics find it difficult to use insulin when they are travelling or when they are working. This could have contributed to the depression.

Depression in patients with Co morbidities:

48 % of the patients with co morbidities were depressed in the present study. According to Katon W et al, presence of co morbidities had significant likely hood of depression[31].Anderson RJ et found that The prevalence of co morbid depression was 20 % in community based study[35] it is much less compared to our study. Wane J et al found out that The course of depression in patients with diabetes and other co morbid conditions is chronic and severe[36]. This may be due to the multiple drug intake and frequent visits to health facilities. The quality of life is decreased due to co morbidities.

Depression and suicidal thoughts:

In present study 38.6% of depressed patients had suicidal thoughts. According to Subramani et al [19] the percentage of subjects with suicidal thoughts is 12.4% and it was 3.1 % in study by Kessler et al[33] and it was 9.2% according to Nock M K et al [34]. According to study by Siddharth Sarkar et al suicidal ideas and attempts are more frequent in patients with diabetes

mellitus than healthy or medically ill controls, Psychological morbidity, including depression, precedes suicidal ideas and attempts[37]. Patients with diabetes showed greater hopelessness and suicide ideation than internal-medicine outpatients[38].

CONCLUSION

Regular assessment of Diabetics for presence/ development of depression is required for wellbeing of diabetic patients. Integrated approach by physician and psychiatrists for effective management of diabetes patients and those suffering from Depression and Diabetes. Counseling of all Diabetes Mellitus patients will help in preventing the depression and associated co morbid conditions.

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