Research Article

Diabetes and depression: Impact of depression on self-care among patients with type 2 diabetes

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Abstract

Background: Diabetes is one of the many chronic medical conditions, which is adversely affected by comorbid depression. Research so far suggests an association between clinically significant levels of depression and a range of poorer self-care behaviors such as nonadherence to diet, exercise, and prescribed medications.

Objective: (1) To study the prevalence of depression among type 2 diabetic patients; (2) to study the impact of depression on self-care among type 2 diabetic patients.

Materials and Methods: A hospital-based cross-sectional study carried out in Urban Health Center, Raichur, Karnataka, India. Totally, 166 patients with established type 2 diabetes mellitus attending the Urban Health Center were interviewed using a predesigned questionnaire based on Summary of Diabetes Self-Care Activities and Patient Health Questionnaire to assess depression. Data were entered in Microsoft Excel and analyzed using Epi Info 7.

Results: The mean age of the study subjects was 54.8 years, and the mean duration of diabetes was 7.5 years. Only 18.7% of diabetic patients had done HbA1c test; 77.7% of diabetics were on oral hypoglycemic agents. Depression was found in 28.3% of participants. Nonadherence to treatment, smoking, and decreased physical activity was significantly associated to having depression ($P < 0.05$).

Conclusion: This study showed high prevalence of depression in patients with type 2 diabetes mellitus. Physicians caring diabetic patients must recognize and manage comorbid depression.

KEY WORDS: Type 2 diabetes**,** depression, self-care

Introduction

There is a global increase in the burden of diabetes, especially in developing countries. About 347 million people worldwide are affected by diabetes. In 2004, an estimated 3.4 million people died from complications of diabetes and 80% of these deaths occur in low- and middle-income countries. By the year 2030, diabetes is expected to become the seventh leading cause of death in the world. Type 2 diabetes accounts for 90% of the all the diabetes world-wide and can be prevented.[1] Self-care is the cornerstone of diabetes management. Healthy diet, physical activity, and adherence to medical regimens can slow the disease progression and reduce the morbidity and mortality associated with diabetic complications.[2]

Another condition that has high prevalence worldwide is depression. Patients with Type 2 Diabetes Mellitus experience depression twice higher than the general population, and diabetic patients with depression show greater difficulty with self-care.[2,3] The presence of depression in diabetic

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people is found to be associated with decreased adherence to treatment, poor metabolic control, higher complication rates, decreased quality of life, increased disability, and increased risk of death.[4] There are very limited data regarding the prevalence of depression among patients with type 2 diabetes mellitus. Hence, this study intends to find the prevalence of depression and the impact of depression on self-care among patients with type 2 diabetes.

Objectives

1. To study the prevalence of depression among type 2 diabetic patients.
2. To study the impact of depression on self-care among type 2 diabetic patients.

Materials and Methods

Design and Sampling

This is a hospital-based cross-sectional study undertaken at the Urban Health Center, Raichur, Karnataka, India, from January to February 2012. The research protocol was approved by the Institutional Ethical Committee. The study subjects comprised patients with established type 2 diabetes as per American Diabetic Association (ADA)[5] criteria. Patients who were extremely ill were not included in the study. In the 2-month study duration, a total of 166 type 2 diabetic patients aged older than 18 years attending the Urban Heath Center were interviewed after obtaining consent from them.

Questionnaire

Data were collected using a predesigned questionnaire based on Summary of Diabetes Self-Care Activities (SDSCA)[6] to assess self-care and Patient Health Questionnaire (PHQ-9)[7] to assess depression. The patients were enquired about their adherence to self-care activities over the previous 1 week. The self-care activities considered were adherence to diabetic diet, recommended diabetic medications, foot care, and physical activity of at least 30 min duration daily. The patients were also enquired about their smoking habit in the previous 1 week.

PHQ-9 was used to assess depression among the patients. The patients were asked about the depressive symptoms experienced over the last 2 weeks. Scoring of the symptoms was done, and the score was interpreted as follows: 0–4, no depression; 5–9, mild depression; 10–14, moderate depression; 15–19, moderately severe depression, and 20–27, severe depression.

Statistical Analysis

Data were entered in Microsoft Excel, and analysis was done using Epi Info 7.0. The χ^2 test was applied to find association between two variables. A *P* value of <0.05 was considered as statistically significant.

Table 1: Sociodemographic profile of the study subjects (*n* = 166)

	Frequency	Percentage
Age in years		
30–40	25	15.1
41–50	34	20.5
51–60	59	35.5
61–70	39	23.5
>71	9	5.4
Gender		
Male	96	57.8
Female	70	42.2
Education		
Illiterate	30	18.1
Primary	18	10.8
Secondary	28	16.9
Intermediate	18	10.8
Graduate and above	72	43.4
Socioeconomic status		
Class I	22	13.3
Class II	91	54.8
Class III	37	22.3
Class IV	16	9.6
Marital status		
Single	6	3.6
Married	160	96.4

Results

Of the 166 type 2 diabetic patients who participated in the study, 57.8% were men and 42.2% women. The mean age of study subjects was 54.8 years. About 43.4% of the study subjects were graduates. Majority of the study subjects belonged to class II socioeconomic status (54.8%) as per Modified B.G. Prasad's classification. About 96.4% of the study subjects were married Tables and figures.

In our study, the mean duration of Type 2 DM among the study subjects was found to be 7.5 years. As seen in Table 2, the majority of the study subjects (77.7%) were taking oral hypoglycemic agents, 15.1% were taking insulin, 6% were taking both oral hypoglycemic agents and insulin, and 1.2% of the study subjects were not taking any medications. Majority of the study subjects (81.3%) did not suffer from any complication as a consequence of diabetes. When enquired about when the last blood glucose examination was carried out, about 37.3% of the study subjects said they got their blood glucose tested 1 week before the study. Only 18.7% of the patients had got their glycosylated hemoglobin (Hb A1c) tested.

When questioned about their self-care behavior over the last 1 week, about 53.6% of the patients said that they adhered to the diabetic diet on all the days of the week, 36.7% of the patients said they followed the diabetic diet only few days of the week, and 9.6% of the patients said they did not follow the diabetic diet on any day of the week. Majority of

Table 2: Self-care behavior and complications (n = 166)

	Frequency	Percentage
Medications		
No medications	2	1.2
Oral hypoglycemic agents (OHAs)	129	77.7
Insulin	25	15.1
OHA + Insulin	10	6.0
Blood glucose examination		
Within week	62	37.3
A month back	47	28.3
2 months back	27	16.3
Between 3 and 6 months back	26	15.7
More than 6 months back	4	2.4
Adherence to diet		
All days	89	53.6
Some days	61	36.7
None of the days	16	9.6
Nonadherence to medications		
Missed all doses	11	6.6
Missed some doses	9	5.4
Not missed any dose	146	88.0
Foot care		
All days	74	44.6
Some days	25	15.0
None of the days	67	40.4
Physical activity		
All days	61	36.7
Some days	25	15.1
No activity	80	48.2
Smoking[a]		
No	76	79.2
Yes	20	20.8
Complications		
Nil	135	81.3
Retinopathy	6	3.6
Nephropathy	7	4.2
Neuropathy	9	5.4
Diabetic foot	9	5.4

[a]Only men were considered.

the patients (88%) had not missed any dose of their diabetic medications, while 6.6% of the patients said they missed all the doses. When enquired about foot care, only 44.6% of the patients were practicing foot care on all days of the week, 15% of the patients followed it on some days of the week, and 40.4% did not follow it even for a single day. When questioned about the physical activity, about 48.2% of the patients were sedentary, 15.1% of the patients were engaged in physical activity for some days of the week, and only 36.7% of the patients were engaged in physical activity on all the days of the week [Table 2].

The male patients were enquired about smoking over the last 1 week. Majority of the patients (79.2%) did not smoke, while 20.8% of the patients said they smoked.

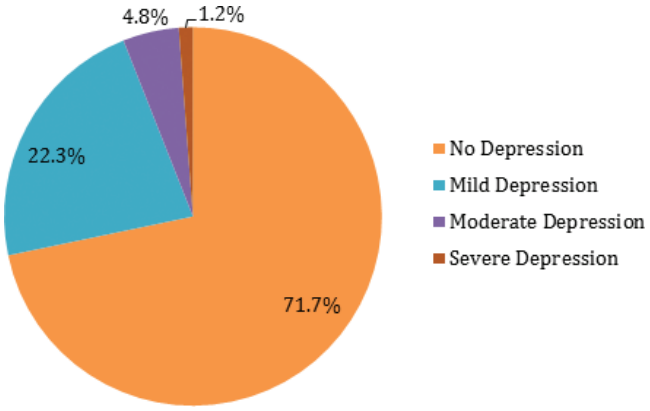

Figure 1: Prevalence of depression among patients with type 2 diabetes mellitus.

To assess the depression among the patients, PHQ-9 questionnaire was used. As seen in Figure 1, majority of the patients (71.7%) showed no depression, 22.3% mild depression, 4.8% moderate depression, and 1.2% severe depression. As shown in Table 3, type 2 diabetic patients with depression were less likely to adhere to diabetic diet (20.2%) on all the days of the week when compared with patients without depression (79.8%); this association was found to be highly statistically significant ($P < 0.01$). Adherence to medications was also found to be less among diabetic patients with depression ($P < 0.05$). Only 24.7% of the diabetic patients with depression said that they did not miss any dose of their medication, while 75.3% of the diabetic patients without depression did not miss any dose of their diabetic medications. Majority of the diabetics without depression (79.7%) followed foot care on all the days of the week, while only 20.3% of diabetic patients with depression followed foot care daily ($P < 0.05$). Only 18% of the diabetic patients with depression were engaged in physical activity on all days of the week as compared with 82% of the patients without depression ($P > 0.05$).

The male patients (n = 96) were enquired whether they smoked in the last 1 week. Of the 20 patients who gave history of smoking in the last 1 week, 60% showed depression.

Discussion

The results of this hospital-based study showed that the prevalence of depression among patients with type 2 diabetes was 28.3%. About 71.7% of the patients showed no depression, 22.3% mild depression, 4.8% moderate depression, and 1.2% severe depression. In a study carried out by Raval et al. in Chandigarh, the prevalence of depression among type 2 diabetic patients was found to be 41%. Of the patients assessed, 23% patients showed severe depression, 18% moderate depression, and 59% no clinically significant depression, and the increased prevalence of depression

Table 3: Association between self-care behavior and depression

Variable	No Depression (*n* = 119), *n* (%)	Depression (*n* = 47), *n* (%)	χ^2	*P*
Adherence to diet				
All days	71 (79.8)	18 (20.2)	9.623	<0.01†
Some days	41 (67.2)	20 (32.8)		
None of the days	7 (43.7)	9 (56.3)		
Adherence to medications				
Missed all dose	5 (45.5)	6 (54.5)	7.981	<0.05*
Missed some dose	4 (44.4)	5 (55.6)		
Not missed any dose	110 (75.3)	36 (24.7)		
Foot care				
All days	59 (79.7)	15 (20.3)	7.952	<0.05*
Some days	20 (80)	5 (20)		
None of the days	40 (59.7)	27 (40.3)		
Physical activity				
All days	50 (82)	11 (18)	5.66	>0.05
Some days	18 (72)	7 (28)		
No activity	51 (63.7)	29 (36.3)		
Smoking[a]				
No	63 (82.9)	13 (17.1)	15.13	<0.01†
Yes	8 (40)	12 (60.0)		

[a]Only men were considered.
*Significant; †highly significant.

was found among those with diabetic complications.[8] The increased prevalence of depression in the study by Raval et al. might be explained by the larger number of patients with diabetic complications when compared with our study. A study by Das et al. in Burdwan showed the prevalence of depression to be 4.15%. Among those with depression, 32.2% were mildly depressed, 36.7% moderately depressed, 14.4% severely depressed, and 16.7% very severely depressed.[9] A study carried out by Rahman et al.[10] in Dhaka, Bangladesh, showed the proportion of depression among patients with type 2 diabetes as 34.8%. These findings are comparatively higher than our study. However, Mosaku et al.[11] reported the prevalence of depression among diabetic patients as 20%, which is comparatively less than our study. These differences in the prevalence of depression might be because of difference in the scales used to assess depression. As these questionnaires rely upon self-reporting of the symptoms, there might be overestimation or underestimation of prevalence.

As shown in Table 3, adherence to diabetic diet and medications on all days of the week among type 2 diabetic patients with depression was found to be 20.2% and 24.7%, respectively, which is very less. Only 20.3% of diabetic patients with depression said they followed foot care daily ($P < 0.05$). Only 18% of the diabetic patients with depression were engaged in physical activity on all days of the week when compared with 82% of the patients without depression ($P > 0.05$). About 60% of the diabetic patients who said they smoked in the last 1 week showed depression ($P < 0.01$). Depression adversely affects the highest-order capacities of the individual such as motivation, energy, concentration, and self-confidence, subsequently worsening their quality of life.[12] This explains the lack of adherence to self-care activities, lack of physical activity, and increased smoking among diabetics with depression. Lifestyle changes such as increase in physical activity, healthy nutrition, and refraining from smoking require motivation, will power, confidence, and persistent effort, which are the exact attributes that depressed people lack.

Similar to the findings of our study, a study carried out by Lin et al. showed that coexisting major depression among diabetic patients was associated with smoking, lack of exercise, and reduced adherence to diet and medications.[13,14] The study by Gonzalez et al.[15] suggested that there is a continuous relationship between symptoms of depression and nonadherence to self-care for diabetes, and among patients with type 2 diabetes, even mild symptoms of depression are associated with important decrements in self-care.

Hence, our study showed that coexisting depression among patients with diabetes is associated with poor adherence to diet, medication, foot care, reduced physical activity, and increased smoking.

Conclusion

This study showed a high prevalence of depression among patients with type 2 diabetes. Our study showed that self-care, being the cornerstone of diabetes management, is often compromised in type 2 diabetes patients with depression. Patients with depression often do not speak about it and seek help in time; hence, physicians treating the diabetic patients should make an effort to recognize the depressive symptoms early

and manage comorbid depression. Effective management of depression can help bring diabetes under control.

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