

A study of comorbidity of depression, anxiety and diabetes mellitus

Gul D¹, Bali K²

¹Dr Deepali Gul
MD, Assistant Professor
Department of Psychiatry

²Dr Kusum Bali
MD, Associate Professor
Department of Medicine
kusumbali96@gmail.com

^{1,2}Punjab Institute of Medical Sciences,
Jalandhar, Punjab, India

Received: 10-05-2017

Revised: 30-05-2017

Accepted: 05-06-2017

Correspondence to:

Dr Deepali Gul
deepaligul@rediffmail.com
9815628887

ABSTRACT

Background: The prevalence of depression and anxiety in diabetes is considerably higher than normal population and found to have a negative impact on diabetes.

Objective: The present study aimed at assessing the prevalence of anxiety and depression among outpatients receiving treatment for diabetes.

Materials and Methods: Ours was a cross-sectional study where data was collected from 100 consecutive patients receiving treatment from the outpatient department of a teaching hospital for diabetes mellitus. The socio-demographic details were collected with the help of a self-structured questionnaire. Hamilton Rating Scale for Depression (H.D.R.S.) and Amritsar Depressive Inventory (A.D.I.) and Hamilton Anxiety Rating Scale (H.A.R.S.) were used to assess the presence and severity of depression and anxiety. The details regarding the diabetes included the duration of the condition, family history of diabetes, if any, and Body Mass Index (BMI).

Results: The study sample consisted of 34 male and 66 female patients and their average age was 54.2 years. Most of the patients had mild depression, as indicated by an A.D.I. score of 8 to 13. Significant anxiety symptoms were seen in 30% of the patients. Most of the patients were having mild to moderate anxiety. Depression and anxiety was more prevalent in Type 2 diabetic patients in comparison to Type 1 diabetic patients.

Conclusion: The comorbidity of depression, anxiety and diabetes mellitus is frequent. Depression and anxiety are more commonly associated with Type-2 Diabetes Mellitus. These findings underscore the need to screen all diabetic patients for the presence of psychiatric disorders.

Key Words: Depression, anxiety, diabetes mellitus, prevalence, symptoms

Introduction

Although the prevalence of a mental disorder, in general, in patients with diabetes mellitus is regarded to be comparable to the general population, an increased prevalence of depressive disorders, often co-morbid with anxiety, has been reported in patients with diabetes mellitus. ^[1] The prevalence of depression and anxiety in diabetes is considerably higher than normal population and ranges between 12 and 28%. ^[2-4] Both diabetes and anxiety/depression are independently associated with increased morbidity and mortality. Co-occurrence of these conditions adds to the cost, morbidity, and mortality. ^[5] Both depression and anxiety have been found to be associated with a negative impact on diabetes. ^[6] Depression is associated with non-adherence to diabetes self-care including following dietary restrictions, medication compliance, and blood glucose monitoring resulting in worse overall clinical outcomes. ^[7]

The present study aimed at assessing the prevalence of anxiety and depression among



outpatients receiving treatment for diabetes. It also explored the correlation between different parameters of diabetes and the extent of anxiety and/or depression.

Materials and Methods

The study was conducted in the Medicine and Psychiatry outpatient departments of a teaching hospital. Making use of a cross-sectional study design, data was collected from 100 consecutive patients receiving treatment from the outpatient department for diabetes mellitus. Only those subjects who gave valid informed consent were included in the study. Patients of both the sexes having diabetes with absence of depression or anxiety before the diagnosis of Diabetes Mellitus were included in the study. Patients with severe cognitive impairment, already on any psychotropic drug, past history of a psychiatric disorder, on associated drug or alcohol dependence were excluded from the study. Patients having any serious organic illness, major psychiatric illness, like Schizophrenia and mental

retardation were also excluded. The patients who were included in the study sample were administered a semi-structured questionnaire to collect the socio-demographic profile and the details regarding diabetes and its treatment. The details regarding the diabetes included the duration of the condition, family history of diabetes, if any, and Body Mass Index (BMI). The level of diabetes control was assessed with the help of HbA1c levels. Hamilton Rating Scale for Depression (H.D.R.S.) and Amritsar Depressive Inventory (A.D.I.) were used to assess the presence and severity of depression. Hamilton Anxiety Rating Scale (H.A.R.S.) was used to assess the extent and severity of anxiety among the study subjects. The data was analyzed with the help of chi-square tests, Cramer’s test and the variables were compared by carrying out multiple t-tests.

Results

Ours was a cross-sectional study with the study sample consisting of 100 consecutive patients diagnosed as having Diabetes Mellitus. The study sample consisted of 34 male and 66 female patients. The average age of the sample was 54.2 years. The average age of the male patients was higher than that of the female patients (59.9 versus 52.6 years). The age range of the study sample was 17 years to 85 years. As many as 57% patients belonged to the age group of 47 to 66 years. 85% of the patients were married. 56% of the patients were Sikh by religion. 53% resided in urban areas. 35% patients were educated upto matriculation while another 26% were educated upto secondary level. 48% of the patients were housewives. Of the others, majority were government employees or farmers. (Table: 1) Clinical depression as indicated by an A.D.I. score of 8 or more, was found in 43% of the study sample. Most of the patients had mild depression, as indicated by an A.D.I. score of 8 to 13. Significantly greater number of female patients had mild to moderate depression as compared to the male patients (30% versus 9%). (Fig.1) 35% patients had Diabetes for 6 to 10 years. Another 30% patients had Diabetes Mellitus for the last one to five years. (Fig.2)

Table: 1 Socio-demographic variables (N=100)

MARITAL STATUS	
Unmarried	7
Married	85
Divorced	2
Widow/Widower	6
RELIGION	
Hindu	43
Sikh	56
Others	1
PLACE OF RESIDENCE	
Rural	47
Urban	53
EDUCATIONAL ATTAINMENT	
Illiterate	1
Upto Primary	16
Upto Matric	35
Upto Secondary	26
Graduate	19
Post-graduate	3
OCCUPATION	
Farmer	17
Student	6
Govt Employee	19
Self-employed	10
Housewife	48

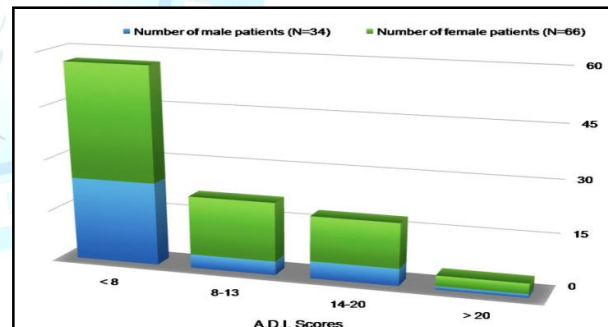


Fig.1 Distribution of ADI scores

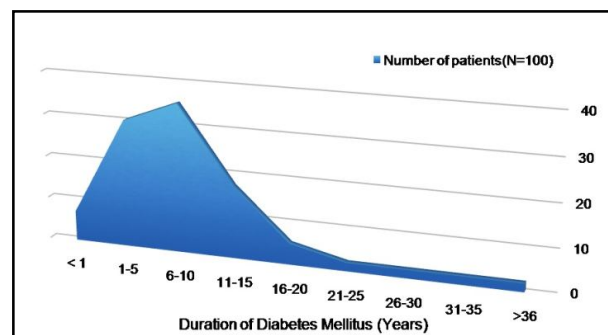


Fig.2 Distribution with respect to duration of diabetes mellitus

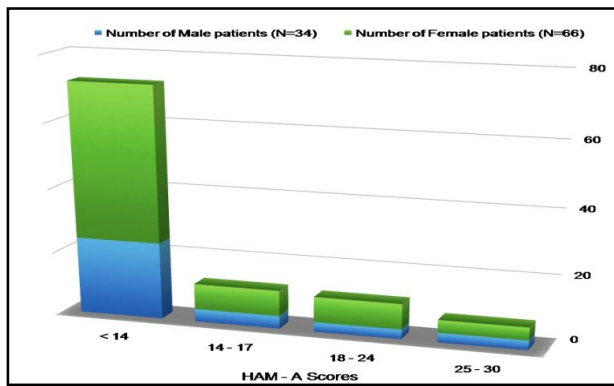


Fig. 3 Distribution of HAM-A scores

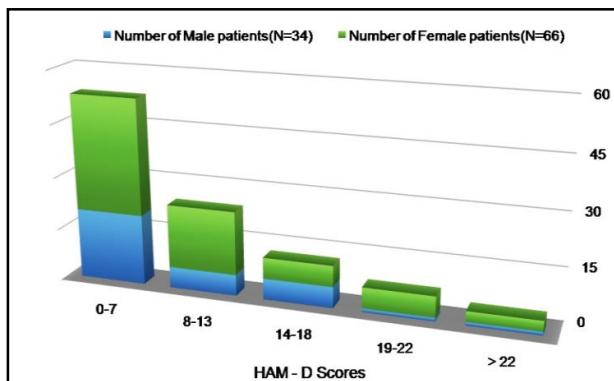


Fig. 4 Distribution of HAM-D scores

Of the 47% patients having Clinical depression, majority had mild depression. The number of female patients with mild depression was significantly greater as compared to the number of male patients (18% versus 6%). (Fig.4) Significant anxiety symptoms were seen in 30% of the patients. Most of the patients were having mild to moderate anxiety. 11.76% of the male patients and 12.12% of the female patients had mild anxiety. Another 8.82% of the males and 12.12% of the females had moderate levels of anxiety. (Fig. 3) 64% of the patients in the study sample had Type 1 Diabetes Mellitus while the remaining 36% had Type 2 Diabetes Mellitus. The association between the two types of diabetes and prevalence of depression based on the scores obtained on the A.D.I. showed that 70.3% of type 1 diabetic patients were depression free, 15.6% were mildly depressed, 10.9% were moderately depressed and 3.1% were severely depressed. Among type 2 patients, 33.3% did not have clinically significant depression, 30.6% were mildly depressed, 30.6% were moderately

depressed and 5.6% were severely depressed. Hence depression was more prevalent in Type 2 diabetic patients in comparison to Type 1 diabetic patients when measured through A.D.I. The chi-square results showed significant value ($p=0.004$) which was less than the alpha value 0.05. Hence the two variables i.e. Type of Diabetes and Depression were significantly associated and the size of this effect was 0.364 which was significant at 0.05 level. (Table: 2) The association between the two variables i.e. the type of diabetes and depression among patients as per the H.D.R.S. scores, 68.8% of Type 1 diabetic patients fall in the category of 0-7, 18.8% fall in category of 8-13, 4.7% were in 14-18 category, 4.7% were in 19-22 category and 3.1% were severely depressed. Among Type 2 patients 25% were normal, 33.3% were in the category of 8-13, 25% were 14-18 depression range, 11.1% were in 19-22 category and 5.6% were severely depressed. Depression was more prevalent in Type 2 diabetic patients in comparison to Type 1 diabetic patients when measured through H.D.R.S. The chi-square results showed significant value ($p=0.0001$) which was less than the alpha value 0.05. Hence the two variables i.e. Type of Diabetes and Depression were significantly associated and the size of this effect was 0.447 which was also significant at 0.05 level. (Table: 3) The association between the two variables i.e. the type of diabetes and anxiety among patients as per the H.A.R.S. scores showed 78.1% of Type 1 diabetic patients had clinically insignificant anxiety level, 9.4% fall in the category of 14-17, 6.3% were in 18-24 category, and 6.3% were high on anxiety level. Among Type 2 patients 55.6% were normal, 16.7% were in the category of 14-17, 19.4% were 18-24 anxiety range, and 8.3% fall in severe anxiety range. Anxiety was more prevalent in Type 2 diabetic patients in comparison to Type 1 diabetic patients when measured through H.A.R.S. The chi-square results showed that the significance value (p) was 0.098 which was greater than the alpha value which was 0.05. Hence the two variables i.e. Type of Diabetes and Depression were not significantly associated.

Table 2: Distribution of ADI scores with respect to the type of diabetes

TYPE OF DIABETES	A.D.I. Scores				TOTAL
	LESS THAN 8	8-13 (MILD)	14-20 (MOD)	GREATER THAN 20 (SEVERE)	
Type 1 Count	45	10	7	2	64
Type 1 % within type 1	70.3	15.6	10.9	3.1	100.0
Type 2 Count	12	11	11	2	36
Type 2 % within type 2	33.3	30.6	30.6	5.6	100.0

$\chi^2=13.240$; $p=0.004$

Table 3: Distribution of HDRS scores with respect to the type of diabetes

TYPE OF DIABETES	HDRS Scores					TOTAL
	0-7	8-13	14-18	19-22	GREATER THAN 22	
Type 1 Count	44	12	3	3	2	64
Type 1 % within type 1	68.8	18.8	4.7	4.7	3.1	100.0
Type 2 Count	9	12	9	4	2	36
Type 2 % within type 2	25.0	33.3	25.0	11.1	5.6	100.0

$\chi^2=19.983$; $p=0.001$

Table 4: Distribution of HARS scores with respect to the type of diabetes

TYPE OF DIABETES	HARS Scores				TOTAL
	< 14	14-17	18-24	25-30	
Type 1 Count	50	6	4	4	64
Type 1 % within type 1	78.1	9.4	6.3	6.3	100.0
Type 2 Count	20	6	7	3	36
Type 2 % within type 2	55.6	16.7	19.4	8.3	100.0

$\chi^2=6.487$; $p=0.090$

Discussion

Ours was a cross-sectional study of 100 consecutive patients presenting to the Outpatient Department of Medicine with a diagnosis of Diabetes Mellitus. The patients were assessed for the presence and severity of depression with the help of a self-report questionnaire (A.D.I.) and a clinician rated scale (Hamilton rating Scale for Depression). The prevalence of depression was found out to be 43% according to the A.D.I. scores while this figure was found out to be 47% as per the scores obtained on the Hamilton Rating Scale of Depression. Our findings are in agreement to the prevalence of co-morbid depression found in earlier studies though the figure varies widely from 5.8% to 84%.^(8, 9) The wide variation reported in the literature is probable because of the differing scales used to measure extent of depression in different studies. The prevalence of depression was found out to be higher in females (50% versus 41.1%). This is in

agreement with the earlier studies.^(2, 9, 10, 11) More females reported mild depression while more males reported moderate to severe depression. 51.5% of the female depressed patients had only mild depression while 60% of the male depressed patients had moderate to severe depression in our study. This is in agreement with the findings of the earlier studies.^(2, 12) The prevalence of anxiety was found out to be in 30% of the patients in our study with majority having only mild to moderate anxiety (76.6%). This is in agreement with the findings of the earlier studies where the prevalence rates have ranged from 32% to 81.8%.^(9, 13) Equal percentage of male and female patients had moderate to severe anxiety in our study. This is not in agreement with the findings of earlier studies which have consistently reported women as more frequently having moderate to severe anxiety.^(2, 9, 12) The prevalence of depression in

patients of Type 2 Diabetes Mellitus was significantly higher than that found in patients of Type 1 Diabetes (66.6% versus 29.7% as per A.D.I. scores; 75% versus 31.2% as per H.D.R.S. scores). The prevalence of depression and anxiety has been consistently reported to be higher in Type 2 diabetics as compared to Type 1 diabetics although the figures are far lower than those found in our study.^(2,13) A detailed study focusing on this area is needed.

Ours was a mono-centric study conducted in a teaching hospital located in the urban area with a small sample size. We collected the data relating to depression and anxiety. A more widespread assessment of the patients is likely to give more useful information.

References

1. E Andreoulakis, T Hyphantis, D Kandylis, A Iacovides. Depression in diabetes mellitus: a comprehensive review. *Hippokratia* 2012;16(3):205–14.
2. Ali S, Stone MA, Peters JL, Davies MJ, Khunti K. The prevalence of co-morbid depression in adults with Type-II diabetes: A systemic review and meta-analysis. *Diabet Med* 2006;23:1165–73.
3. Hermanns N, Scheff C, Kulzer B, Weyers P, Pauli P, Kubiak T, et al. Association of glucose levels and glucose variability with mood in Type 1 diabetic patients. *Diabetologia* 2007;50:930-5
4. Shaban MC, Fosbury J, Kerr D, Cavan DA. The prevalence of depression and anxiety in adults with Type 1 diabetes. *Diabet Med* 2006;23:1381–4.
5. Lin EH, Rutter CM, Katon W, Heckbert SR, Ciechanowski P, Oliver MM, et al. Depression and advanced complications of diabetes: A prospective cohort study. *Diabetes Care* 2010;33:264–9.
6. Prisciandaro JJ, Gebregziabher M, Grubaugh AL, Gilbert GE, Echols C, Egede LE. Impact of psychiatric comorbidity on mortality in veterans with type 2 diabetes. *Diabetes Technol Ther* 2011;13:73–8.
7. Balhara YPS, Sagar R. Correlates of anxiety and depression among patients with type 2 diabetes mellitus *Indian J Endocrinol Metab* 2011 Jul;15(Suppl1): S50–4.
8. Roy T, Lloyd CE. Epidemiology of Depression and Diabetes: A systematic Review. *J Affect Disord* 2012; 142: S8 – 21.
9. Chaudhry R, Mishra P, Mishra J, Singh P, Mishra BP. Psychiatric morbidity among diabetic patients: A hospital-based study. *Ind Psychiatry J* 2010 Jan-Jun;19(1):47–9.
10. Islam SM, Rawal LB, Niessen LW. Prevalence of depression and its associated factors in patients with type 2 diabetes: A cross-sectional study in Dhaka, Bangladesh. *Asian J Psychiatr* 2015 Oct;17:36-41.
11. Anderson RJ, Freedland KE, Clouse RE, Lustman PJ. The prevalence of co-morbid depression in adults with Type 2 diabetes: A systematic review and meta-analysis. *Diabet Med* 2001;24:1069–78.
12. Lloyd CE, Dyert PH, Barnett AH. Prevalence of symptoms of depression and anxiety in diabetics clinical population. *Diabet Med* 2000;17:198–202.
13. Collins MM, Corcoran P, Perry IJ. Anxiety and depression symptoms in patients with diabetes. *Diabet Med* 2009 Feb;26(2):153-61.

Cite this article as: Gul D, Bali K. A study of comorbidity of depression, anxiety and diabetes mellitus. *Int J Med and Dent Sci* 2017;6(2):1513-1517.

Source of Support: Nil
Conflict of Interest: No