ORIGINAL ARTICLE

PREVALENCE OF CO-MORBID DEPRESSION IN DIABETIC POPULATION

Khizran Mir, Kinza Mir*, Irsa Malik, Quratulain, Anum Shehzadi

Department of Pharmacy, Hazara University, Mansehra, *Department of Psychology, Women Institute of Learning, Abbottabad-Pakistan

Background: Depression is common among diabetic patients and is linked with worse outcomes. This study was conducted to investigate the prevalence and determinants of depression in patients with established type 2 diabetes (T2DM). **Methods:** In this cross sectional study, patients with established T2DM were examined consecutively for depression by administering the nine-item PHQ-9. A sample of 112 participants was purposively selected. Differences in characteristics between participants were tested with independent t-test at 5% significance level. **Results:** One hundred-twelve patients were evaluated, including 41 (36.6%) males, 71 females (63.4%). The mean age of participants was 49.5±12.1 years, with the mean duration of diabetes 8.6±7.3years. Mean PHQ-9 score was 11.9±6.9, with 67 cases (59.8%) achieving the diagnosis of clinically significant depression. Depression was found to be more in females (13.14±6.73) as compared to males (9.97±6.92, p=0.02*). A positive correlation was observed between depression and duration of diabetes, whereas a weak positive correlation was noticed between depression and age. However, no significant relationship was observed between depression and type of medication (p=0.094).**Conclusions**: The study showed high prevalence of depression in patients with T2DM, with higher occurrence in females as compared to males. The risk factors of depression were age and duration of diabetes.

Keywords: Diabetes, depression, insulin, PHQ-9

J Ayub Med Coll Abbottabad 2015;27(1):99–101

INTRODUCTION

Diabetes is the most prevalent, non-communicable and chronic disease found globally. International Diabetes Federation (IDF) reports that the prevalence of diabetes mellitus has reached epidemic levels worldwide. Approximately 340 million people are suffering from diabetes mellitus. Estimates for 2010 indicate that in 7 regions of IDF, 285 million had diabetes. These numbers represent an increase of 39 million from 2007 and an expected continued increased to 439 million in 2030.[1] Prevalence of diabetes is high in Pakistan ranging from 7.6 to 11%.[2,3] Reports from National Diabetes Survey and National Health Survey differ both in observations regarding prevalence of diabetes and in relative burden in various provinces and among males and females, in Pakistan.

Depression is the most common psychological disorder.[4] Diabetes is associated with an increased risk of depression, which is linked with worse outcomes.[5,6] Patients with depression and diabetes have been shown to have poor self management and poor compliance to anti-diabetic, lipid-lowering and antihypertensive treatment. It has been suggested that 1 in 3 diabetic patients suffers from depression leading to loss of function and reduced quality of life.[7,8] In some diabetics depression is thought to be a psychological reaction to the severe pain caused by neuropathy.[9] Another study suggested that visual impairment following retinopathy, multiple hospital admissions and sexual dysfunction may also contribute to depression.[10] Studies also have shown association between cerebral vascular involvement and depression in diabetics, even in the absence of hypoglycaemic episodes.[11,12]

This study aimed to know the frequency of depression among diabetics in our setup and association between depression and risk factors.

MATERIAL AND METHODS

This cross-sectional study was carried out from May 2013 to June 2013. Patients visiting OPD's and those admitted in wards of Ayub Teaching Hospital and District Headquarter Hospital, Abbottabad were purposively selected and evaluated. Patients with established T2DM were examined consecutively for depression by PHQ-9 (a subset of the patient health questionnaire), demographic variables were also recorded.

Depression was assessed by administering nine items PHQ-9. Each item of PHQ-9 consists of a polychotomous (4 options for each question) format. It is based directly on the diagnostic criteria for major depressive disorder in Diagnostic and Statistical Manual (DSM), 4th edition. The reported over all accuracy of PHQ-9 is 85%, with sensitivity of 75% and specificity of 90%.[13] The PHQ-9 is a dual instrument that is used to establish a provisional depressive disorder and it also provides a severity score. For the diagnosis of depression, we selected clinically significant depression as, a PHQ-9 score of 10 as moderate, a PHQ-9 score of 15 as moderately severe and a score of 20 as major depression.

Data was collected after obtaining written informed consent. Demographic form and PHQ-9 questionnaire were completed by the investigator. SPSS version 16.00 was used for data analysis reported as mean±standard deviation or percentages. Differences in characteristics between participants were determined using independent samples *t*-test in the case of continuous variables and Chi-square test in the case of categorical variables at 5% level of significance. Regression lines are shown to present correlation between variables of interest.

RESULTS

A total of 112 patients (41 males, 71 females) were included in the study. Data is given in Table-1 in this regard. Table-2 shows mean depression score of participants with statistically significant difference by gender. Figure 2 shows that there is a positive correlation between duration of diabetes and depression score, i.e., with an increase in the duration of diabetes there would be an increase in the depression of the person. The same trend was observed in both male and female participants. Table-3 shows percentages of intensity of depression of male and female diabetic patients with respect to their medication with statistically no significant difference (p=0.94).

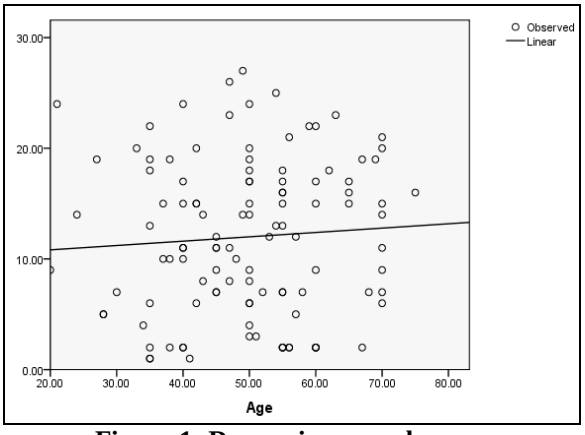

Figure-1: Depression score by age.

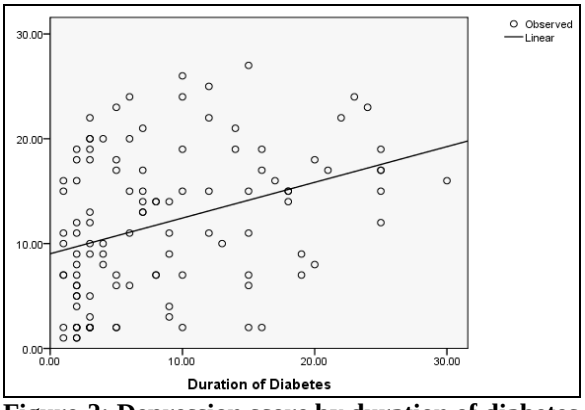

Figure-2: Depression score by duration of diabetes

Table-1: Participants by gender, age and other variables.

Gender	**Frequency**	**Percentage**
Male	41	36.6
Female	71	63.4
Total	112	100.0
Age		
Age (Years)	**Frequency**	**Percentage**
20–40	30	26.8
41–60	64	57.1
61–80	18	16.1
Total	112	100.0
Depression Score		
Depression Score Groups	**Frequency**	**Percentage**
Minimal	20	17.9
Mild	25	22.3
Moderate	21	18.8
Moderately Severe	33	29.5
Severe	13	11.6
Total	112	100.0
Duration of Diabetes		
Duration of Diabetes (Years)	**Frequency**	**Percentage**
1–10 Years	78	69.6
11–20 Years	24	21.4
21–30 Years	10	8.9
Total	112	100.0
Medication		
Type of Medication	**Frequency**	**Percentage**
Oral	62	54.4
Insulin	27	24.1
Both	23	20.5
Total	112	100.0

Table-2: Depression score by gender

Gender	**N**	**Minimum**	**Maximum**	**Mean**	**SD**	***p*-value**
Male	41	1.00	24.00	9.97	6.92	0.02*
Female	71	1.00	27.00	13.14	6.74	

*Statistically significant at 5%

Table -3: Intensity of depression by type of medication for diabetes mellitus

	Minimal	**Mild**	**Moderate**	**Moderately Severe**	**Severe**	**Total**	***p***
Oral	15 (24.2%)	17 (27.4%)	9 (14.5%)	15 (24.2%)	6 (9.7%)	62 (100.0%)	0.094
Insulin	3 (11.1%)	5 (18.5%)	6 (22.2%)	7 (25.9%)	6 (22.2%)	27 (100/0%)	
Both	2 (8.7%)	3 (13.0%)	6 (26.1%)	11 (47.8%)	1 (4.3%)	23 (100.0%)	
Total	20 (17.9%)	25 (22.3%)	21 (18.8%)	33 (29.5%)	13 (11.6%)	112 (100.0%)	

DISCUSSION

Depression in diabetes mellitus is a disorder having multiple factors which may arise from biological and psychological factors. The prevalence of depression among diabetes has been studied in different surveys.[14,15] Our study showed an association between depression and diabetes mellitus that is, more than half of the patients surveyed were ailing from moderate to severe depression. The prevalence of depression in diabetics in our study is 59.8%. The data regarding the prevalence of depression in patients with diabetes from

the USA and the UK reports the prevalence of about 30-83%.[16,17] A small study from Iran[18] reported 55% prevalence of depression in diabetics. Similarly, a meta-analysis by Anderson *et al*[19] identify the prevalence of depression in diabetics ranging from 8–61%.

Our study showed that females are more depressed than males having a mean depression score of 13.4+6.73 as compared to males having mean depression score of 9.97+6.92 (*p*-0.02). Studies from the West also suggest higher prevalence of depression in women as compared to men.[20,21] The higher prevalence in women may be due to adverse experiences, socio-cultural roles, psychological attributes, biological factors including hormones and poor social support. Our study showed a positive correlation between age and depression. Advancing age is usually associated with depression as has been shown in previous studies[17] and more in patients with diabetes mellitus. Some studies, however, failed to find any relationship between age and depression due to diabetes.[10,22]

Our study showed that there is a positive relation between duration of diabetes and depression score i.e., with an increase in the duration of diabetes, an increase in the depression of the person was observed. The same trend was seen in both male and female participants. There were conflicting reports regarding the association between duration of diabetes and depression. In the present study, diabetes was associated with type of medication taken for diabetes mellitus. However, no significant difference was observed in the intensity of depression in patients taking oral hypoglycaemic agents, insulin or for patients taking both (oral and insulin). Studies from the USA have suggested a high prevalence of depression in patients on insulin.[19] Limitations of our study could be the small sample size but its strength is that data was collected rigorously by one investigator only.

CONCLUSION

Our study showed high prevalence of depression in patients with T2DM, with higher occurrence in women as compared to men. The risk factors of depression were age and duration of diabetes. No significant relation was observed between depression and type of medication for diabetes mellitus. The diabetes may predispose a diabetic patient to clinically significant depression therefore; proper treatment should be initiated for depression along with anti-diabetic medication.

REFERENCES

1. Prevalence estimate of diabetes mellitus (DM), 2010- MENA. IDF Diabetes Atlas, 2010. International Diabetes Federation. Available at: http://www.idf.org/content/mena-data
2. Shera AS, Jawad F, Maqsood A. Prevalence of diabetes in Pakistan. Diabetes Res Clin Pract 2007;76(2):219–22.
3. Jafar FH, Levey AS, White FM, Gul A, Jessani S, Khan AQ, *et al*. Ethnic differences and determinants of diabetes and central obesity among South Asians of Pakistan. Diabet Med 2004;21(17):716–23.
4. Lustman PJ, Griffith LS, Clouse RE, Freedland KE, Eisen SA, Rubin EH, *et al*. Effects of nortriptyline on depression and glycemic control in diabetes: results of a double-blind, placebo-controlled trial.. Psychosom Med 1997;59(3):241–50.
5. Gavard JA, Lustman PJ, Clouse RE. Prevalence of depression in adults with diabetes. An epidemiological evaluation. Diabetes Care 1993;16(8):1167–78.
6. Lustman PJ, Anderson RJ, Freedland KE, de Groot M, Carney RM, Clouse RE. Depression and poor glycemic control: a meta-analytic review of the literature. Diabetes Care 2000;23(7):934–42.
7. Jacobson AM, de Groot M, Samson JA. The effects of psychiatric disorders and symptoms on quality of life in patients with type type I and II diabetes mellitus. Qual Life Res 1997;6:11–20.
8. Judd LL, Rapaport MH, Paulus MP, Brown JL. Subsyndromal symptomatic depression: a new mood disorder? J Clin Psychiatry 1995;55:18–28.
9. Koracs M, Mukerji P, Iyengar S, Drash A. Psychiatric Disorder and metabolic control among youths with IDDM. A Lingitudinal study. Diabetic care 1996;19:318–23.
10. Alwyns LW. Organic Psychiatry. London: Wiley-Blackwell;1998.
11. D'Mello DA, Rooker GM. Refractory Depression, cardiovascular risk factors and leukoariosis. J Clin Psychiatry 1997;58(6):274.
12. Fleming GA, Jhee S, Coniff R, Riordan H, Murphy M, Kurtz N, *et al*. In Optimizing Therapeutic Development in Diabetes. London Greenwich Medica Media, 1999;pp 47–60.
13. Kroenke K, Spitzer RL, Williams JB. The PHQ-9: validity of a brief depression severity measure. J Gen Intern Med 2001;16(9):606–13.
14. Lustman PJ, Griffith LS, Clouse RE, Cryer PE. Psychiatric illness in diabetes mellitus: relationship to symptoms and glucose control. J Nerv Ment Dis 1986;174(12):736–42.
15. Lustman PJ, Griffith LS, Clouse RE. Depression in adults with diabetes: results of a 5-year follow-up study. Diabetes Care 1988;11(8):605–12.
16. Li C, Ford ES, Strine TW, Mokdad AH. Prevalence of depression among U.S. adults with diabetes: findings from the 2006 behavioral risk factor surveillance system. Diabetes Care 2008;31(1):105–7.
17. Kendrick T, Dowrick C, McBride A, Howe A, Clarke P, Maisey S, *et al*. Management of depression in UK general practice in relation to scores on depression severity questionnaires: analysis of medical record data. BMJ 2009;338:b750.
18. Khamseh ME, Baradaran HR, Rajabali H. Depression and diabetes in Iranian patients: a comparative study. Int J Psychiatry Med 2007;37(1):81–6.
19. Anderso n RJ, Freedland KE, Clouse RE, Lustman PJ. The prevalence of comorbid depression in adults with diabetes: a meta-analysis. Diabetes Care 2001;24(6):1069–78.
20. Culbertson FM. Depression and gender. An international review. Am Psychol 1997;52(1):25–31.
21. Ali S, Stone MA, Peters JL, Davies MJ, Khunti K. The prevalence of co-morbid depression in adults with type 2 diabetes: a systematic review and meta-analysis. Diabet Med 2006;23(11):1165–73.
22. Blazer DG, Moody-Ayers S, Craft-Morgan J, Burchett B. Depression in diabetes and obesity: racial/ethnic/gender issues in older adults. J Psychosom Res 2002;53(4):913–6.

Address for Correspondence:

Khizran Mir, Department of Pharmacy, Hazara University, Mansehra-Pakistan.
Email: khizranmir@gmail.com