Major Depression Among Patients with Type II Diabetes Mellitus In Mosul City

Dr. Rakan A. Hamid[1], Dr. Raghad A. Ibrahim[2],
Dr. Ramadhan M. Sultan[3]

[1]Family physician (F.I.C.M.S.F.M), Director Of Family Medicine, DOH, Mosul, IRAQ
[2]Family Physician (F.I.C.M.S.F.M), Mosul, IRAQ
[3]Family physician (F.I.C.M.S.F.M), Director Of Public Health Department, DOH, Mosul, IRAQ

ABSTRACT

The association of depression and diabetes has been acknowledging by many studies, and the validity of these findings between different cultures and communities remains obvious. To estimate the frequency and severity of depression among type 2 diabetic patients, and to describe several socioeconomic characters among diabetic' spatients with depression; A case series study design was adapted, a sample of 150 patients with type 2 DM were assessed for the presence of depression in Ibn-Sena and AL-Salam teaching Hospitals in Mosulcity. A sample was randomly collected during a period from the 1st of October 2013 to the 1st of April2014. The study revealed that depression is common among type 2 diabetic patients with frequency rate (34.67%), with mean age (53.93±7.91) for both female and male and female to male ratio was (2.25:1). Regarding the severity of depression and according to Beck depression inventory score (BDI) score; this study showed that 27 patients (18%) have mild depression(BDI score 10-18) ; 19 patients (12.66%) have moderate depression (BDI score 19-29) and 6 (4%) have severe depression (BDI score 30-63).moderate and severe depression are more frequent among female gender (68%) than male (32%) , this difference is statistically significant with P value=0.049. In conclusion depression is common among type II diabetic patients and its more common and sever in female than males.

Key words: Depression, Diabetes mellitus, Beck Depression Inventory (BDI).

INTRODUCTION

Depression is a part of normal experience to feel unhappy at time of adversity while " depressive disorders " are mental illness characterized by a profound and persistent feeling of sadness or despair and /or loss of interest in things that were once pleasurable.[1]

It interferes with daily life normal functioning (almost every aspect of the life can be affected, including the emotions, physical health, relationships and work) and causes pain for both the person with the disorder and those who care about him or her. [2]

A major depressive disorder – also known as clinical depression or unipolar depression – is not the same as a passing blue mood, It is not a sign of personal weakness or a condition that can be willed or wished away, It is a mood disorder characterizedby at least 2 weeks of depressed mood, a loss of interest or pleasure in usual activities, and a feeling ofhopelessness associated with other findings such assleep disturbances or loss of energy.[3]

Classification of Depressive Syndromes

Although no single classification system is universally accepted, the current standard of diagnosis in the United States is the American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders, fourth edition (DSM-IV): [4]

> - **Major Affective Disorders**
>   - Major Depression (unipolar depression)
>   - Bipolar Disorder (manic–depressive illness)

- ➢ **Chronic Affective Disorders**
  - o Dysthymic Disorder
  - o Cyclothymic Disorder

- ➢ **Organic Brain Syndrome**
  - o Organic Affective Disorder

- ➢ **Other Conditions**
  - o Adjustment Disorder with Depressed Mood
  - o Seasonal Affective Disorder
  - o Postpartum Depression

Major Depression (unipolar depression):

This is the DSM-IV term for serious depression that is accompanied by neurovegetative symptoms. Four or more of the major neurovegetative symptoms including appetite disturbance, sleep disturbance, psychomotor retardation or agitation, anhedonia, loss of energy, feelings of worthlessness or guilt, decreased concentration, and suicidal thoughts are dominating the clinical picture and are present for a minimum of 2 weeks.[4]

Onset is variable, Symptoms usually develop over weeks to months, but they may develop suddenly. At least half of patients have recurrent episodes. A family history of a major affective disorder (major depression or bipolar disorder) is common.[4]

Epidemiology
Depression is a major cause of morbidity worldwide. [5] Lifetime prevalence varies widely, from 3% in Japan to 17% in the US. In most countries the number of people who would suffer from depression during their lives falls within an 8–12% range. [6]

Population studies have consistently shown major depression to be about twice as common in women as in men..[7]

The risk of major depression is increased with chronic conditions (e.g., obesity, cardiovascular disease, diabetes, asthma. [8]

The Relationship between Diabetes And Depression.
Discussion of the relationship between glucose metabolism and psychiatric illness has occurred for at least three centuries. The eminent English physician Thomas Willis, M.D., first documented an interaction between psychiatric illness and diabetes mellitus (DM) in the late-17th century. However, it was not until the late 20th century that epidemiological studies started to discover the complexities of the interrelationship between these two conditions. [9]
Multiple investigators have studied the relationship between depression and DM. Anderson et al. (2001) completed a comprehensive meta-analysis of 42 studies demonstrating that the presence of diabetes consistently doubles the odds of comorbid depression. Furthermore, when depression and diabetes coexist, the severity of diabetes increases. [10]

Some authors have proposed that depression may stem from the psychosocial burden and/or biochemical changes related to diabetes and it is treatment. This hypothesis may help explain why depression is more prevalent in diabetics than in the general population .[9]

AIM OF THE STUDY

To estimate the frequency and severity of depression among type 2 diabetic patients , and to describe several socioeconomic characters among diabetics patients with depression.

PATIENTS AND METHODS

Administrative agreement
An official agreement was obtained from Ministry of health, directorate of health in Mosul city and from headquarter of Ibn-SenaTeaching Hospital and AL-Salam Teaching Hospital before conduction of the present study. A verbal consent was taken from the patients who included in the study.

Study Period
The study was conducted over a period of six months extending from the 1st of October 2013 to the 1st of April 2014.

Study Design
A clinical study – case series study was adopted in order to achieve the objectives of the present study.

Study sample
The study sample consists of (150) patients who attending the medical outpatient clinics at Ibn-Sena and AL-Salam Teaching Hospital in Mosul city. The participants have to be diagnose as type 2 D.M by different specialists in order to be included in this study.A systematic random sample (every 3rd person) was selected to choose the participant who meet inclusion criteria.

Case Definition
The patients attending out patients consultation clinic at Ibn-Sena Teaching Hospital and AL-Salam Teaching Hospital and diagnosed by Internal medicine specialists as having type 2 DM according to WHO criteria.

- Fasting plasma glucose $\geq$ 7.0 mmol/L (126 mg/dL).
- Random plasma glucose $\geq$ 11.1 mmol/L (200 mg/dL).
- Tow post prandial glucose $\geq$ 11.1 mmol/L (200 mg/dL) after a 75 gramoral glucose load.[11]

One abnormal laboratory test is diagnostic in symptomatic individual and two abnormal laboratory test is diagnostic in a symptomatic individual.

Inclusion criteria
Every patienthas type 2 D.M who aged 20 years or older.

Exclusion criteria
1. Patient with type 1 DM.
2. patient with Gestational DM.
3. Diabetic patient who have had history of depression or psychiatric illness before his diabetic illness .
4. Patient who is uncooperative
5. Age younger than 20 years.

Data Collection Tools
Three documents were determined:
1- A socio-demographic questionnaire to capture socio-demographic variable such as age, sex, marital, employment, education state, socioeconomic status(income state estimated according to the social class)[12] and disease related data questionnaire like duration of D.M, smoking, BMI. [13]
2- The participants were subject to International Neuropsychiatric interview (M.I.N.I) version 5.0.0. [14] and to be more specific to the Arabic copy module [15] which concerned in diagnosis of major depression disorder in respect to both DMS -IV and ICD-10. M.I.N.I has acceptably high validation and reliability scores.
3- Beck Depression Inventory (BDI).[16] BDI was used to assess the severity of depression. BDI (Appendix 2) questionnaire consist of 21 items, each item has a score range of (0-3).

Minimum total score of 10 is require to identified subject with significant symptoms.
5-9These ups and downs are considered normal
10-18 indicates mild depression
19-29indicates moderate depression
30-63 indicates severe depression .
Higher total scores indicate more severe depressive symptoms.
Below 4 = Possible denial of depression.[16]

Statistical Analysis of Data:
Data was entered manually into a database. The Statistical Package for the Social Science (SPSS) version 7 software and mini-tab 14 was used for descriptive analysis. Items that were not answered by respondents were considered as missing.

Statistical analysis was performing :

Descriptive statistics: to evaluate the frequencies and percentages of socio-demographic variable and disease related data questionnaire.

Chi square (x2) test[17]**:** was used to find the statistical association between socio-demographic variable and disease related data with 95% confidence limit interval (CI) for the result which is calculated by using the following equation:
%95CI of the OR = OR1±1.96 √X2.
Odds ratio was calculated by using the following equation

OR = (a×d)/(b×c)

P value < 0.05 used as a significance statistical association.

RESULTS

Table 1: The socio demographic characteristics of study population

| Age group(years)	DM+Dep. (n=52)		DM (n=98)		Total	
	no	%	no	%	No	%
20 - 29	1	1.9	3	3.1	4	26.7
30 - 39	6	11.5	21	21.4	27	18.0
40 - 49	16	30.8	31	31.6	47	31.3
50 - 59	22	42.3	29	29.6	51	34.0
≥ 60	7	13.5	14	14.3	21	14.0
Gender						
Female	36	69.2	48	48.9	84	56.0
Male	16	30.8	50	51.1	66	44.0
Residency						
Urban	45	86.5	61	62.2	106	70.7
Rural	7	13.5	37	37.8	44	29.3
Marital status						
Single	28	53.8	7	62.2	35	23.3
Married	24	46.2	91	37.8	115	76.7
Occupation						
Non- employed	23	44.2	27	27.6	50	33.3
private	11	21.2	17	17.3	28	18.7
Retired	13	25.0	34	34.7	47	31.3
Employed	5	9.6	20	20.4	25	16.7
Level of education						
Illiterate	24	46.2	23	23.5	47	31.3
Primary	12	23.1	21	21.4	33	22.0
Secondary	7	13.4	24	24.5	31	20.7
University	9	17.3	30	30.6	39	26.0
Socio-economic status						
Low	43	82.7	37	37.8	80	53.3
High	9	17.3	61	62.2	70	46.7
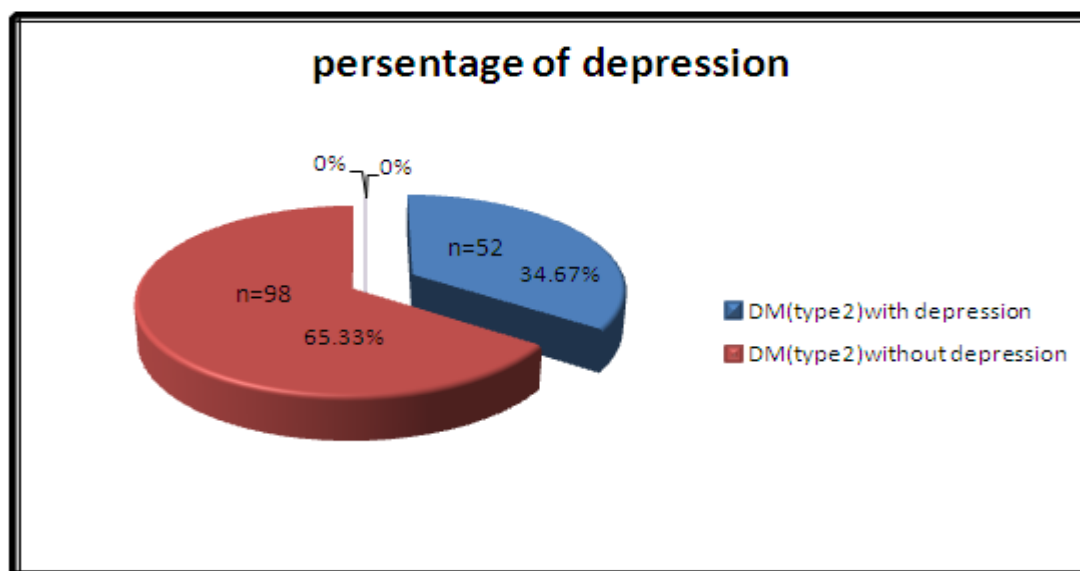
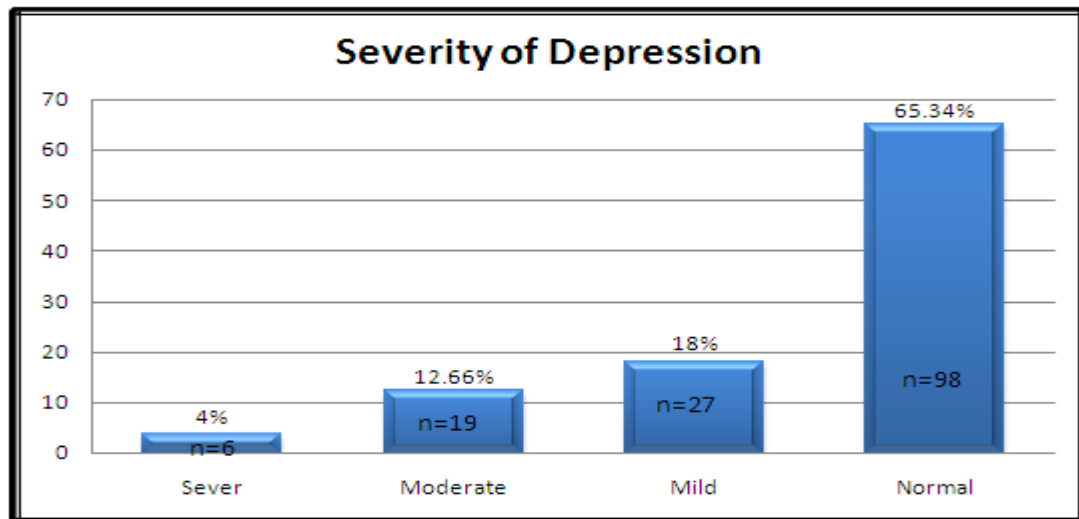**Fig. 1: Percentage of depression among study sample, Mosul 2014.**

Fig. 2: Distribution of study sample according to Beck Depression Inventory (BDI) score, Mosul 2014.

Table 2: Distribution of study population according to Gender

Gender	DM +Dep.		DM		Total		P*-Value
	No.	%	No.	%	No.	%	
Female	36	69.24	48	48.9	84	56.0	0.017
Male	16	30.76	50	51.1	66	44.0	
Total	52	100	98	100	150	100	

* x2-test was used

Table 3: The relationship between Gender and severity of depression among study population, Mosul 201

Gender	Moderate + severe dep.		Mild dep.		Total		P*-Value
	No.	%	No.	%	No.	%	
Female	17	68	11	40.7	28	53.8	0.049
Male	8	32	16	59.3	24	46.2	
Total	25	100	27	100	52	100	

* x2-test was used

Table 4: Distribution of study population according to age groups Mosul 2014.

Age groups	DM+ Dep.		DM		Total		P*-Value
	No.	%	No.	%	No.	%	
20 - 29	1	1.9	3	3.1	4	2.7	0.610
30 - 39	6	11.5	21	21.4	27	18.0	0.133
40 - 49	16	30.8	31	31.6	47	31.3	0.914
50 – 59	22	42.3	29	29.6	51	34.0	0.168
≥ 60	7	13.5	14	14.3	21	14.0	0.890
Total	52	100	98	100	150	100	
Mean ± SD	53.93±7.91		55.63±8.17				

Table 5: The relationship between diabetic duration and depression among study population, Mosul 2014

Duration Of DM	DM +Dep.		DM		Total		P*-Value
	No.	%	No.	%	No.	%	
< 5 years	5	9.6	16	21.4	21	14.0	0.260
5 – 10 years	15	28.9	36	36.7	51	34.0	0.332
≥10 years	32	61.5	46	41.9	78	52.0	0.022
Total	52	100	98	100	150	100	

*x2-test was use

DISCUSSION

Depression is a common mental disorder with high prevalence worldwide. Approximately 340 million people worldwide suffer from depression at any given time including 18 million in the United States [18]. According to the World Health Organization (WHO), depression is responsible for the greatest proportion of burden associated with non-fatal health outcomes accounting for approximately 12% total years lived with disability [19].

In this study depression was found in (34.67%) among type 2 DM patients. This result is consistent with the result of Jameel N. et al, study in Kingdom of Bahrain at 2009 which found that 33.3% of study sample had depression. [20] But not consistent with the result of Hamid H. et al at 2004 in Jordan who found that (19.7%) of study sample had depression. [21] This difference between two studies could attributed to the difference in study sample (649 sample size), low rate of conflict and stable security state in Jordan.

Female patients have highest percentage (69.24%) of depression when compare to male percentage (30.76 %). This difference is statistically significant with (p value = 0.017), Female to male ratio was (2.25:1). This finding is similar to the general trend of gender distribution of depression in the general population worldwide. [1] [12] It also consistent with a meta-analytic review of the literatures (42 eligible studies) by Anderson et al. [10] which reported depression was significantly higher in diabetic women (28%) than in diabetic men (18%).This could be attributable to gender- specific issue like menstrual period, premenopausal, and menopause. [22] More so, many women also face additional stresses such as responsibilities both at work and at home, single parenthood, caring for children which could all lead to depression. On the other hand, no significant difference in the frequency of depression regarding gender among study sample was found in a cross sectional study was done in India at 2010 by Raval et al. [23] This difference may attributed to study design , study sample size, social and cultural factors .

According to BDI score for severity of depression this study showed that moderate and severe depressive symptoms were found to be more frequent among women with DM (68%) than men (32%). This result is consistent with a cross sectional study was done in Iran by Shahrakivahed Aziz, et al. at 2012, [24]who found (62.12%) of moderate and severe depressive symptoms were among women compare to (37.88%) among men . On the other hand a significant relationship between depression and time since Diabetes diagnosis (p value = 0.022) with highest percentage (61.5%) of depression among diabetic patients with diabetic duration more than 10 years , and this is consistent consist with a study done in AL-Kuwait at 2011 by Hany et al. which found highest frequency rate (79.3%) among those with duration since Diabetes diagnosis > 10 years and p- value = 0.001. [25] However it is inconsistent with the result of Kaur et al., study in Malaysia at 2013 which found that, depression was more frequent among diabetic patient with lower duration of diabetes with frequency rate 67.7% (duration <10). [26]

Because the incidence of diabetes complications increases with increased illness duration as found in a study in Jordon by Ajlouni et al., at 2008, one could expect greater depression risk in those who have been ill for a longer time.[27]

CONCLUSION

1. One third of type 2 diabetic patients in study population have depression and majority of them are female.

2. Two third of type 2 diabetic patients with depression were in the age group of (40-59) years.

3. The frequency of moderate and severe depression (high BDI score) were high female than males .

4. long duration of diabetes patients (≥ 10years old) showed high frequency of depression.

RECOMMENDATIONS

1. Administration of a brief and regular depression screening tool in PHC, out patients clinic and or diabetic Clinic for early recognition of depression among diabetic patients, as early treatment of depression could have beneficial.
2. Health education programs for all population especially those with chronic disease like DM for self-assessment and early diagnosis and treatment.

REFERENCES

[1]. Gelder M, Harrison P, Cowen P. Shorter Oxford textbook of Psychiatry,5th-ed.-UK:Oxford-University-Press;-2006.-P.218.
[2]. Fundukian LJ, Wilson JE. The Gale encyclopedia of mental health2thed.-USA:The-Gale-group;-2008.
[3]. Martin S. Lipsky, Mitchell S. King. Blueprint family medicine.3rd ed.Philadelphia:-Lippincott-Williams-&-Wilkins;-2011.
[4]. John J, Scott L. Approach to the Patient with Depression, in: Allan H.Goroll, Albert -G.Mulley .Primary -care_ Medicine .6thed.Philadelphia: Lippincott Williams & Wilkins; 2009.P.1454-1440.
[5]. World Health Organization. The world health report – Mental Health:New Understanding, New Hope. 2001.
[6]. Kessler RC, Berglund P, Demler O. The epidemiology of majordepressive disorder : Results from the National Comorbidity SurveyReplication (NCS-R) . JAMA 2003 ; 289 (203) : 3095 –105.
[7]. Gender differences in unipolar depression: Anupdate ofepidemiological findings and possible explanations. Acta PsychiatricaScandinavica . 2008 ; 108 (3): 163–74.
[8]. Chapman DP, Perry GS, Strine TW. The vital link between chronicdisease and depressive disorders. Prev Chronic Dis 2005 ; 2:A14.
[9]. Nouwen A, Winkley K, Twisk J, Lloyd CE, Peyrot M, Ismail K, et al.European Depression in Diabetes (EDID) Research Consortium: type 2diabetes mellitus as a risk factor for the onset of depression: a systematicreview and meta analysis. Diabetologia 2010;53(12):2480–6.
[10]. Anderson RJ, Freedland KE, Clouse RE, Lustman PJ, The prevelanceof comorbid depression in adults with diabetes: a meta-analyticreview of the literature . Diabetes Care 2001; 24(6):1069-1078.
[11]. World Health Organisation. Definition, Diagnosis and Classification ofDiabetes Mellitus and its Complications 1999. Availableat:http://en.wikipedia.org/wiki/Diabetes_mellitus.
[12]. David R.H. lectures notes on medical sociology.1.st edition. London:Blackwell publication; 1984:45-51.
[13]. World Health Organization. BMI Classification. Global database onBody Mass Index. W HO, Geneva 2006. Retrieved July 27 2012.Avialable at :http: //http://en.wikipedia.org/wiki/Body mass index
[14]. Sheehan DV, Lecrubier Y, Sheehan KH, Janavs J, Baker R, Knapp E,Sheehan M. Weiller E, Hergueta T, Amorim P, Bonora LI, Lepine JP.The Mini international neuropsychiatric interview (M.I.N.I) : Thedevelopment and validation of structured diagnostic psychiatric interviewfor DSM-IV and ICD-10. J Clin Psychiatry. 1998;59 suppl 20:22-33PMID 9881538.
[15]. Ghanim M. The Arabic version of the Mini InternationalNeuropsychiatric Interview (M.I.N.I): Reliability, Validity, Egypt J ofpsychiatr. 2002; 21
[16]. Beck AT, Steer RA, Garbin MG J (1988). Psychometric properties ofthe Beck Depression Inventory Twenty-five years of evaluation . Clin.Psych. Review 8: 77–100.
[17]. Indrayan A, Sarmukaddam SB. Medical biostatistics. New York:Mrcel Dekker, INC; 2001: 343, 364-367.85 - J.F. Greden, Physical symptoms of depression: unmet needs, J. Clin.Psychiatry 2003;64 (7) :5–11.
[18]. J.F. Greden, Physical symptoms of depression: unmet needs, J. Clin.Psychiatry 2003;64 (7) :5–11.
[19]. World Health Organization, Revised global burden of disease (GBD) 2002qestimates. Availablenfromb: http:/www.who.int/healthinfo/bodgbd20 02revised/en/index.html. 2005.
[20]. Jameel N, Fatima H, Majeda H, Najah K. Prevalence of Depressionamong People with Diabetes Attending Diabetes Clinics at PrimaryHealth Settings. Bahrain Medical Bulletin 2009 September; 31(3) .
[21]. Hamid H, Abu-Hijleh NS, Sharif SL, Raqab ZM, Maṡad D, Abbas A.A primary care study of the correlates of depressive symptoms amongJordanian women. Transcult Psychiatry 2004;41:487-96.
[22]. Sadock, Benjamin James; Sadock, Virginia Alcott. Kaplan & Sadock'sSynopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry, 10th ed.Philadelphia:-Lippincott-Williams-&-Wilkins;-2007.
[23]. Raval A, Dhanaraj E, Bhansali A, Grover S, Tiwari P.Prevalence &determinants of depression in type 2 diabetes patients in a tertiary carecenter. Indian J Med Res 2010, 132:195–200.
[24]. Shahrakivahed A, Moushtagh Z, Firozkohi M, Jahantigh Mozhgan.Frequency and severity of depression in diabetic patients referred todiabetes center of Zabol. Interdisciplinary Journal of contemporaryresearch in business . May 2012; 4(1).
[25]. Hany M, AL-ABBASI A, Hussein H, Rima A. Prevalence ofDepressive Disorder in Diabetic Patients in Kuwait Oil Company (Al-Ahmadi Hospital) . Med. J. Cairo Univ. 2011 March; 79 (1):67-72.
[26]. Gurpreet Kaur, Guat HT, Suthahar A , Ambigga S K, Karuthan C.Depression, anxiety and stress symptoms among diabetics in Malaysia:a cross sectional study in an urban primary care setting. BMCFamilyPractice 2013;14:69.
[27]. Ajlouni K, Khader, YS, Batieha A. An increase in prevalence ofdiabetes mellitus in Jordan over 10 years. Journal of Diabetes and ItsComplications 2008;22:317–324.