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RESEARCH ARTICLE

EFFECT OF DEPRESSION ON GESTATIONAL DIABETES

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ABSTRACT

Objective: To examine depression level of women diagnosed with gestational diabetes mellitus (GDM) and to compare these with glucose-tolerant (GT) women at similar stages of pregnancy.

Research Design and Methods: Prospective longitudinal study conducted on 50 women with GDM and 50 NGDM women at 24 – 36 weeks of pregnancy. We are depended on Beck depression Scale the Arabic version.

Results: Women with GDM, compared with GT women, depression scales, older, with low income, illiterate, and high BMI.

Conclusions: higher level of depression scales, with low income, illiterate, and high BMI most causes of gestational diabetes.

INTRODUCTION

Depression is abnormal psychological state that is characterized by reduction of mood, interest, and energy. It can be consider as the opposite state of mania. Depressive disorders are a group of illnesses characterized by excessive or long-term depressed mood and loss of interest in activities that were used to be enjoyable. The symptoms can severely disrupt the person's life. Depression interferes with your daily life and routine and reduces your quality of life. About 6.7 percent of U.S. adults ages 18 and older have depression. (Ciaramella and Poli, 2001)

Not all people with depression have the same symptoms. Some people might only have a few and others a lot. How often symptoms occur, and how long they last, is different for each person. Symptoms of depression include:

- Feeling sad, anxious, or "empty"
- Feeling hopeless
- Loss of interest in hobbies and activities that you once enjoyed
- Decreased energy
- Difficulty staying focused, remembering, making decisions
- Sleeplessness, early morning awakening, or oversleeping and not wanting to get up
- No desire to eat and weight loss or eating to "feel better" and weight gain
- Easily annoyed, bothered, or angered. (Rush, 2006)

There are several forms of depressive disorders. The most common are major depressive disorder and dysthymic disorder. (Altshuler *et al.*, 1998)

- Major Depressive Disorder
- Psychotic Depression
- Postpartum Depression

Gestational diabetes is a significant problem in the United States, gestational diabetes has been found in up to 14% of all pregnancies (Jovanovic and Pettitt, 2001), Women with gestational diabetes were more likely to have a cesarean section (46%) compared to women without gestational diabetes (32%), Also, the hospital costs related to delivery of infants were 18% more expensive (about \$4,500) for women with gestational diabetes than for women without gestational diabetes. (Byrn, 2011)

Gestational diabetes mellitus (GDM) is any degree of glucose intolerance with its onset (or first diagnosis) during pregnancy and usually resolving shortly after delivery. Pregnancy hormones decrease fasting glucose levels, increase fat deposition, delay gastric emptying and increase appetite. However, over the course of pregnancy, postprandial glucose concentrations increase as insulin resistance increases. This is normally countered by an increased production of insulin but in women with GDM there is an insufficient compensatory rise. (Reece *et al.*, 2009) Human placental lactogen (hPL) increases up to 30-fold throughout pregnancy and induces insulin release from the pancreas in pregnancy and hPL can cause peripheral insulin resistance, also human placental growth hormone (hPGH) cause insulin resistance of pregnancy, both two hormones do that by increase release of adiponectin, TNF- α , interleukin 6. (Barbour *et al.*, 2007) NICE guidance suggests that the following risk factors for developing GDM are Increasing age (≥ 25 years old), Certain ethnic groups (Asian, African Americans, Hispanic/Latino Americans and Pima Indians), High BMI before pregnancy (BMI ≥ 30), Smoking

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doubles the risk of GDM, Change in weight between, Previous unexplained stillbirth, Previous macrosomia, Family history of type 2 diabetes. (Nohira *et al.*, 2006) Although there is sufficient information on (1) Depression during pregnancy and (2) depression and diabetes, there is little information about depression and gestational diabetes. Antenatal depression occurs in about 20% of all pregnancies and gestational diabetes occurs in up to 14% of all pregnancies Symptoms of depression are common during the antepartum period, thus assessment and educations regarding this disorder are important.

In addition, a history of depression may be a risk factor for the development of gestational diabetes mellitus (GDM) (Byrn and Penckofer, 2015). Both behavioral and biological theories exist to support the potential association between depression and GDM. Depression and depressive symptoms are associated with obesity and behaviors related to the development of GDM, such as excessive caloric intake, physical inactivity and smoking and depression can cause activation of the hypothalamic-pituitary-adrenal (HPA) axis, leading to enhanced and sustained cortisol secretion.

Table 1. Distribution of pregnant by Socio- Demographic Characteristics

Variable			SD	
Age (year)	Women with GDM (n = 50)	Women without GDM (n = 50)	Value	Sig.
15-20	1	4	6.8	0.018
21-25	11	13		
26-30	18	16		
31-40	20	17		
Total	50	50		
Income	Women with GDM (n = 50)	Women without GDM (n = 50)		
	600 \$ - 700 \$	850\$ - 1100\$		
Marital status	Women with GDM (n = 50)	Women without GDM (n = 50)	DS value	Sig.
Married	41	47	22.2	0.000353
Widowed	9	3		
Total	50	50		
Level of education	Women with GDM (n = 50)	Women without GDM (n = 50)	DS value	sig
illiterate	22	11	7.4	0.4
Primary	12	28		
Secondary	7	13		
academic	9	8		
Total	50	50		
residence	Women with GDM (n = 50)	Women without GDM (n = 50)	SD value	Sig.
Urban	27	31	5.16	0.24
Rural	23	19		
Total	50	50		
occupation	Women with GDM (n = 50)	Women without GDM (n = 50)		
employee	11	17		
Un employee	22	11		
Housewife	17	22		
Total	50	50		
occupation type	Women with GDM (n = 50)	Women without GDM (n = 50)		
Government employee	10	15		
Free works	1	2		
Total	11	17		

Table 2. Distribution of pregnant by Socio- Demographic Characteristics

	Women with GDM (n = 50)	Women without GDM (n = 50)
Weight (kg)	71.3 ± 20.2	70.0 ± 12.3
Height (m)	1.61 ± 0.07	1.66 ± 0.08
BMI (kg/m ²)	27.4 ± 7.2	24.6 ± 3.8
0-h fasting glucose level (mmol/l) (mg%)	5.4 ± 0.5 97.2 ± 9	4.4 ± 0.3 79.2 ± 5.4
2-h fasting glucose level (mmol/l) (mg%)	8.7 ± 1.0 156.6 ± 18	5.5 ± 1.1 99.0 ± 19.8
Family history of diabetes (%)	30	16
Living with partner (%)	96	90

Table 3. Distribution of depressed pregnant women according to their Level of Depression

Level of depression	Score of depression	Women with GDM (n = 50)	Women without GDM (n = 50)	SD	
				value	sig
No depression	0-11	2	8	7.65	0.17
Mild depression	12-19	5	13		
Moderate depression	20-27	17	12		
Severe depression	28-63	26	17		
Total	63	50	50		

Cortisol opposes the action of insulin, and can lead to visceral adiposity, insulin resistance and other risk precursors of diabetes. (Champaneri *et al.*, 2010) Important gonadal steroid levels modifications have been reported, with as much as a 100-fold variation in serum estrogen levels and a 1000-fold change in serum progesterone levels during pregnancy. These changes can exacerbate such emotional difficulties. (Anniverno, *et al.*, 2013)

Method and Data Collection

The data collected from 1ed July 2015 to 20th Augustus 2015. A structured interview were constructed with pregnant women who were attended primary center health / Babylon government to complete the questionnaire after the permission from Training and Development Center / Babel health government and the information are taken in patients room ,and it was selected purposively (each patient asked for their agreement before gathering the information).The average time required for each respondent of the pregnant women has taken approximately 15-20 minutes for full questionnaire about assessing depression and anxiety among pregnant women through the interview.

This study was performed in a small two primary health centers in Babylon government which are Al Baqer center and Al-Shomaly center. All pregnant women are offered a test for GDM using the American diabetic association criteria. Women are tested in the morning at the beginning of the third trimester using a 75-g glucose tolerance test (GTT) administered after an overnight fast. A diagnosis of GDM is made if the fasting glucose level is ≥ 5.1 mmol/l (95 mg%) and/or the 2-h glucose level is ≥ 8.0 mmol/l (140 mg%) (Crowther *et al.*, 2005). For patient convenience, a modified GTT is sometimes performed when the fasting glucose level is omitted (9). Prospective longitudinal study conducted on 50 women with GDM and 50 NGDM women at 24 – 36 weeks of pregnancy (Daniells *et al.*, 2003). Social support, education, and income were found to be significant factors relatedto perinatal depression (Byrn, 2009; Moore *et al.*, 1984). The incidence of mental health disorders subsequent to GDM was attenuated after adjustment for clinical and socioeconomic factors. (Walmer *et al.*, 2015) Measures administer includethe Depression (Moore *et al.*, 1984). As the following details of each Scale was used.

Sociodemographic

Characteristics of the sample include age, gender, and marital status, level of education, residence, occupation and occupation type[14].

Depression Scale

Depression Scale consists of 21 items of statements, each item presented one symptom of depression (sadness , pessimism, sense of failure, loss of pleasure, guilty feelings, punishment feelings, self-dislike, self-criticalness, suicidal thoughts or wishes, crying, agitation ,social withdrawal , indecisiveness, change body image and shape, tiredness or fatigue, changes in sleeping pattern, loss of energy, changes in appetite, decreased weight , loss of interest in sex and preoccupation with health) responses to each item were (not at all = 0 , a little = 1 , some = 2 , a lot = 3) the degrees of scale were ranging between 0-63 degrees, and divided the levels of depression, according to this scale to four levels.

1. Zero -11 no depression.
2. 12 -19 mild depressions.
3. 20 - 27 moderate depression.
4. 28 - 63 severe depression.

Statistical Analysis

The investigator used the appropriate statistical methods in the data of analysis by using SPSS version 20, which include the following statistical methods.

1. Stander deviation
2. significant

RESULTS

The results of the present study were analyzed through the application of statistical procedures, which were interpreted based on the sample responses to the self-reported questionnaires and semi self-structural, the researcher is present the results as following .

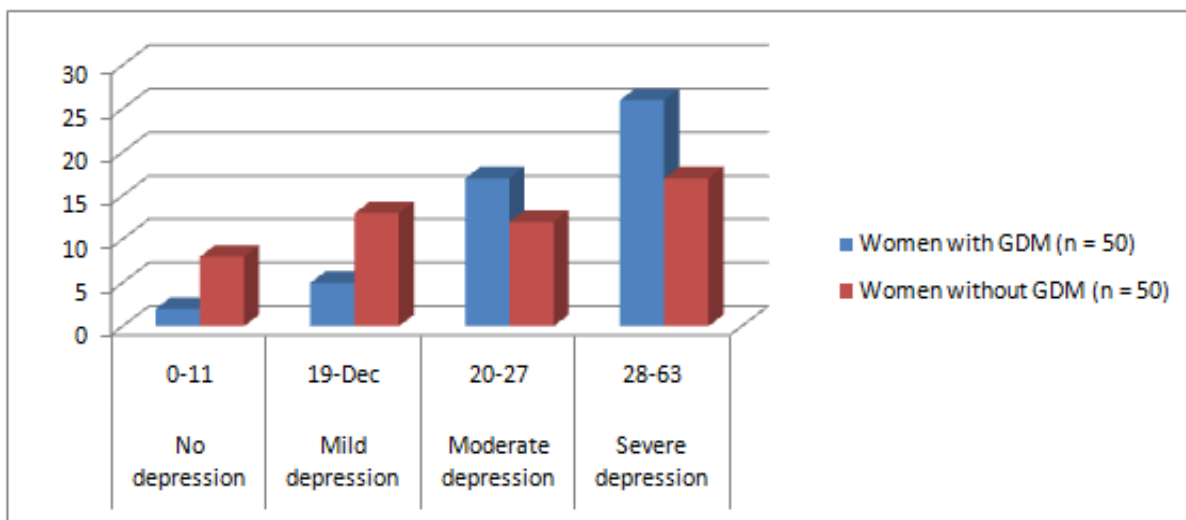


Figure 1. Distribution of patients sample according to depression level

Socio- Demographic Characterizes

The tables below shows that the highest percentages of pregnant women were (40%) (26-30) years old; illiterate (44%); (46%) Rural, (44%) Unemployed and (10 %) Government employee. The table below show the BMI, 0-h fasting blood glucose, 2-h fasting glucose level and history of diabetes for Women with GDM are more than Women without GDM

Depression scale

The table below shows that high level relative to depression items are sadness and guilty feelings, moderated level items are indecisiveness and agitation, low-level items are Social withdrawal and changes in appetite. We are found that (26) cases of Women with GDM have Severe level of depression as compare with 12 cases of Women without GDM of depression.

DISCUSSION

Prenatal depression and gestational diabetes are common complications during pregnancy. This study found that women with GDM had higher rates of depression as well as higher mean depression scores, it was determined that women with GDM were more likely to suffer from depression than women without GDM when controlling for age, marital status, and BMI.

Socio- Demographic Characterizes

The findings of the present study show that the majority of the studied patients in the age groups (31-40) years, this result is almost similar to that Ben-Haroush A, Yogeve Y, Hod M. 2004 findings indicate that majority of the studied subjects age were (30 -40) years (Ben-Haroush *et al.*, 2004). In addition Areefa SMAK *et al.*, 2014 found that age more than 35 years of the mother as one of the major correlation factors for developing GDM. Also Radhia Khan *et al.*, 2013 found that age of GDM were significantly higher at as compared to healthy pregnant women. (Khan *et al.*, 2013)

The findings of the present study show that the majority of the studied patients with low income as compare with high income and this result is almost similar to that Areefa SMAK *et al.*, 2014 found that the most GDM significant associated demographic factors with low income. This study found that the women with GDM had a higher BMI and this agreement with Buchanan, T.A. and A.H. Xiang 2005 who's found that with increase weight can increase rate of occur of GDM. In addition to Radhia Khan *et al.*, 2013 found that BMI of GDM were significantly higher at as compared to healthy pregnant women (Khan *et al.*, 2013). Also Yariv Yogeve 2007 found that found that with increase weight can increase rate of occur of GDM. (Yogeve and Langer, 2008)

Depression scale

The findings of the present study show that the women with GDM had high depression scale as compared with that without GDM. This agreement with Khurshid Natasha *et al.* 2013 whom found that Depression was higher in GDM subjects (25.92 %) compared to without-GDM subjects (10.38 %) (Natasha *et al.*, 2015).

In addition to Elina Engberg *et al.* 2015 where found that the women at high risk for GDM, 17% had high risk for depression compared to 11% of the pregnant women (Engberg *et al.*, 2015). Also Caroline *et al.*, 2005 found that women with GDM had high depression scale as compare with those without GDM (Crowther *et al.*, 2005). In addition, Mary Alice Byrn 2011 Found that women with GDM were found to have higher depression scores than these without GDM (Byrn, 2011).

Conclusion

1. Women with gestational diabetes have high BMI as compare with these without gestational diabetes one.
2. Women with gestational diabetes have high 0- fasting glucose level and 2- hr. glucose level as compare with these without gestational diabetes one.
3. history of diabetes Women with gestational diabetes have history of diabetes
4. Most Socio- Demographic Characterizes of the sample of gestational diabetes women were (31-40) years old, with low income, illiterate, and Unemployed.
5. Women with gestational diabetes have severe level of depression as compare with these without gestational diabetes one.
6. Educate all government institutions to conduct periodic tests for early detection of diabetes.
7. Conducting similar studies at the national level on the largest sample to assess anxiety and depression among gestational diabetes women.

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