Depression in Hyperemesis Gravidarum: Determinants and Extent in Al-Nasiriyah, Across sectional study

Assist. Prof. Dr. Alaa Hussein Ali Al Nasir

Assist. Prof. Dr. Alaa Hussein Ali Al Nasir

(FICMS), Department of Obstetrics and Gynecology, College of Medicine – University of Thi-Qar, Iraq.

Correspondence
Alaa Hussein Ali Al Nasir
FICMS, Department of Obstetrics and Gynaecology, College of Medicine, University of Thi – Qar, Iraq

History
- Received: May 12, 2020
- Accepted: May 29, 2020
- Published: June 20, 2020

DOI : http://doi.org/10.5334/ejmcm.277

ABSTRACT

Background: at a global level and among child bearing age women, the first leading disease burden cause is the depression. Nationally, scarce published data was related to the depression prevalence among pregnant especially with hyperemesis gravidarum women.

Aim: to assess the depression extent among hyperemesis gravidarum pregnant Thi-Qarnian women.

Methodology: A cross sectional, hospital based, analytical study was carried out in two teaching hospitals (Bent Al Huda and Al Habobi teaching hospitals) in from first week of September /2015 to end of July 2016. All attendants sufferer pregnant from HG to the obstetric outpatients included in this study. Based on previous Iraqi study (37.2%) for of depressive symptoms prevalence in pregnant women sample size had been calculated such prevalence rate with precision of 5%, confidence level of 95%, and added extra sample of 10%, to reach to 322. Beck depression inventory-II (Arabic version) (BDI –II score of > 20 depression was considered) had been used as a specialized questionnaire designed for the achieve the aim of the study. SPSS version 23 had been used for data analysis, P<0.05 considered significant

Results: 37.1%.of the HG pregnant women was depressed, which was significantly affected by previous history of hyperemesis (P = 0.03), high socioeconomic status (P = 0.009), increased gravidity (P = 0.03),increased gestational age (P = 0.003)and unwanted pregnancy (P = 0.03).

Recommendation: re-inforce mental health care of pregnant women through the antenatal care services at primary health care level, with strengthening the mental and social rehabilitation methods that are used for diagnosed women with depression.

Key word: hyperemesis gravidarum, pregnant, Depression,prevalence , Thi-Qar.

INTRODUCTION

Nausea and vomiting are the earliest symptoms at the pregnancy first trimester , start as soon as at the 4th week of gestation with a peak at week 9 – 12 of pregnancy and fade within the end of 1st trimester (Edmonds,2007). It is varies in severity between pregnant women, being mild to moderate in approximately 80%of pregnant women and known as (morning sickness), and severe in 0.5% - 2% of them and known as hyperemesis gravidarum (HG),the remaining 18%have no symptoms of nausea and vomiting (McCarthy et al.,2014; Jueckstock et al.,2010). It may stay continue for whole pregnancy period in 20% of pregnant women.3 The nausea and vomiting in severe form (intractable) in the early pregnancy is known as hyperemesis gravidarum (Edmonds,2007).

Hyperemesis gravidarum, is still vague and not completely understood (Aksoy et al.,2015) It is believed that HG is a multi-factorial complex health event attributed to combination of different unrelated conditions such as genetic, environmental, hormonal and psychiatric conditions (Vikanes et al.,2010 ; Uguz et al.,2012).

Actually, different etiological theories of HG are suggested, but in fact only few of these theories are tested (Fejzo and Macgibbon ,2012; Vikanes,2010) Such theories include the role of infection with helicobacter pylori (HP), (Cardaropoli et al.,2014) pregnancy specific factors such as fetal gender, multiple pregnancy, and molar pregnancies, (Rashid et la.,2012)genetic factors, and ethnic factors, (Fejzo et al.,2008) immunological changes during pregnancy, (Yoneyama et al.,2005) and finally the hormonal changes in early pregnancy (Bajaj et al.,2013).

Different studies reported that HG is associated with different risk factors (Chhetry et al.,2016).

In early pregnancy, changes in maternal circulatory levels of reproductive hormones especially human chorionic-gonado-tropin (HCG) are considered as a triggering factor for development of HG. This is because the pattern of HCG secretion matches with the onset, peak and relief from hyperemesis gravidarum, and association of high HCG levels with multiple gestation and molar pregnancy that are associated with higher risk of hyperemesis gravidarum (Fejzo et al.,2012).

Epidemiologically, rates of HGare different from each other among different countries, being higher in Asian countries than European countries (Mahmoud et al.,2012).

HGis strongly associated with adverse outcomes on both fetal and maternal levels. As a long term outcomes, high rate of depression and serious neurological disorders were reported among HG sufferer women (Kuru et al.,2012;WHO,2016)

Depression, Globally, depression represents a public health importance due to its higher rate during pregnancy, its strong effects on development of postpartum depression, and its impact on the mother and fetus health (Bansil ET AL.,2010).

Females have double risk of experiencing depression than male, and at childbearing ages had higher tendency to develop depression than any other time in their lives (Assen ,2007). Different theories explain the pathophysiology of depression especially among pregnancy, including neurotransmitter theory and neuroendocrine system theory (Takahashi ,2010). Mental illness among pregnant women in the Arabic World is highly stigmatized health issue (Jabbour et al.,2012).

Nationally, scarce published information was related to the depression prevalence among pregnant especially with hyperemesis gravidarum women.

AIM

to assess the depression extent among hyperemesis gravidarum pregnant Thi-Qarnian women from Sep. 2015 to end of Jul. 2016

SUBJECTS & METHODS

Study design & settings

A cross sectional, hospital based, analytical study was carried out in two teaching hospitals (Bent Al Huda and Al Habobi teaching hospitals) from first week of September /2015 to end of July 2016.

Population of the study

It include any HG sufferer pregnant woman who attends the obstetric outpatients in these two hospitals. Most of those women have been admitted to hospital.

Inclusion criteria

All eligible pregnant women who were suffering from severe vomiting(> 3 times/day) without any other obvious underlying cause and were unable to maintain oral uptake with >3 Kg weight loss, and positive ketone urea, and who were attending the obstetric outpatient of the two hospitals were recruited for this study.3

Exclusion criteria

Pregnant women with evidence of antenatal bleeding, with mild to moderate nausea and vomiting(morning sickness), preexisting medical or psychiatric comorbid conditions, physical or psychological disabilities, patient refused to participate, and those using antibiotic, proton pump inhibitor, and H2 blocker at time of inclusion were excluded from the study.

Sample size calculation

An appropriate sample size , and according to national demographic figures of Thi-Qar province at 2015 which was supplied by the Ministry of Health , Thi-Qar population was nearly two millions (1979561), 4% (79182) represents the annual pregnancy target at 2015. Since incidence of HG is 2% worldwide(79182*0.02=1583.6~1584) , 2, 3,35 so it was estimated that 1584 of these pregnant women will suffer from hyperemesis gravidarum. The estimated sample size is adjusted for the estimated pregnant women who is expected to suffer from HG(N=1584) by using the following equation: N(adjusted) = (N*n) / (N+n) 36 , N= population size (1584)

n= sample size for infinite population

n(adjusted) = (1584*359)/(1584+359) = 292.6 ~ (293)

The researcher add extra 10% (29) of the sample to cover refusal or incomplete questionnaire and the final sample size is (322).

3.5.2.Sampling method

All HG sufferer pregnant who attend the obstetric outpatient clinic in the nominated hospitals were included depending on the inclusion and exclusion criteria.

Data collection

The data was collected by the researcher by direct interview and filling two special questionnaires forms. The objectives of the study were explained, and a verbal a verbal consents were obtained. The required ethics approvals were obtained. Data collected in groups of questionnaires. The 1st is the Arabic version of standard Beck depression inventory questionnaire- 37, and the 2nd is a special questionnaire. Beck Depression Inventory scale (BDI) screening instrument for detecting symptoms and severity of depression consists of (21) questions, with a scoring ranging from 0-3 for each question(and the total score range from 0 to 63).

Table 1: Beck Depression Inventory scale interpretation

	BDI score	Interpretation
1	1-10	Normal
2	11-16	Mild mood disturbance
3	17-20	Borderline clinical depression
4	21-30	Moderate depression
5	31-40	Severe depression
6	over 40	Extreme depression

*A score of more than 20 is considered as depression.

The 2nd questionnaire includes different variables that are suspected to associated with depression among enrolled participants. These variables are titled under three main categories: demographic variables, socio-economic(socio-economic scoring had been done according to Saadoon etal study) 38variables, and obstetric variables.

STATISTICAL ANALYSIS

A computerized statistical software; Statistical Package for Social Sciences (SPSS) version 23 was used. Descriptive statistics are presented as (mean ± standard deviation) and frequencies as percentages. Multiple contingency tables were obtained, appropriate statistical tests was performed, Chi-square and Fishers exact was used for categorical variables. t- test analysis was used to compare between means. In all statistical analysis the level of significance (p value) sets at ≤ 0.05 and the results are shown as tables. Statistical analysis of the study was done by a Community Medicine specialist.

RESULT

Mean BDI score of HG women was 20±12. Approximately(11.5%, 9.9% ,15.7% , 19.5% and 23%) of the participants suffered from extreme, severe , moderate depression, borderline clinical depression and mild mood disturbances respectively. Generally, depression prevalence among pregnant women with HG was 37.1%, as shown in figure 1 (A& B)

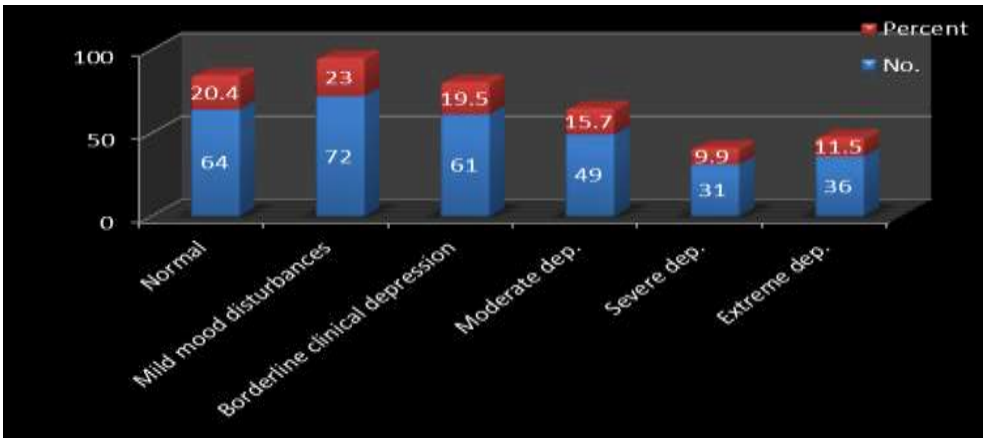

Figure I: Extent of depression in hyperemesis pregnant (A)

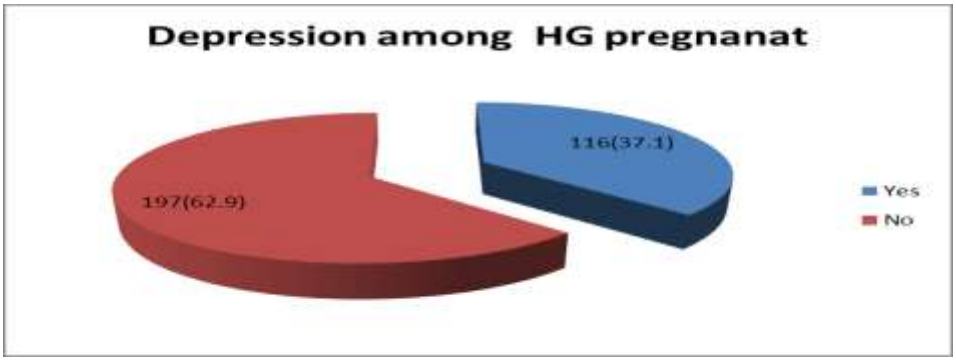

Figure I: Extent of depression in hyperemesis pregnant (B)

As shown in figure II, there was no significant statistical association ed between depression and sociodemographic characteristics of the studied women (p>0.05) except for socio-economic character (P value<0.005)

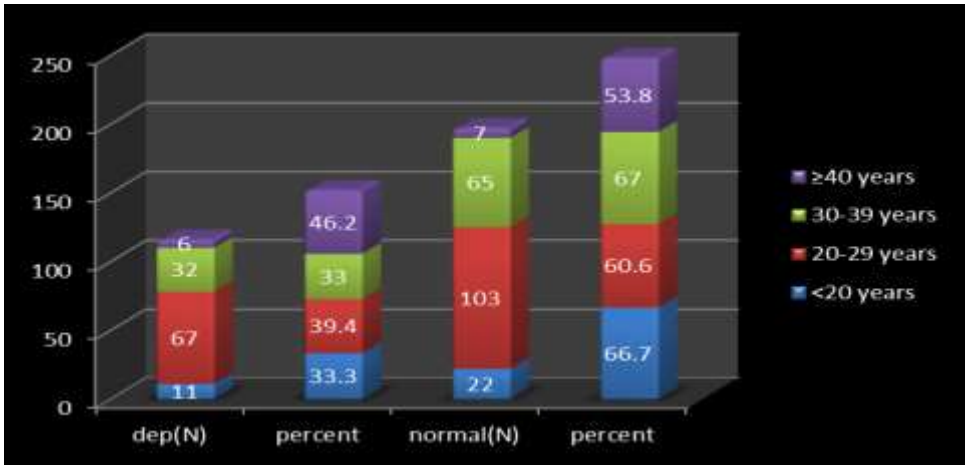

Figure II-A: Distribution of age characteristics of HG women according to depression status (P value=0.063)

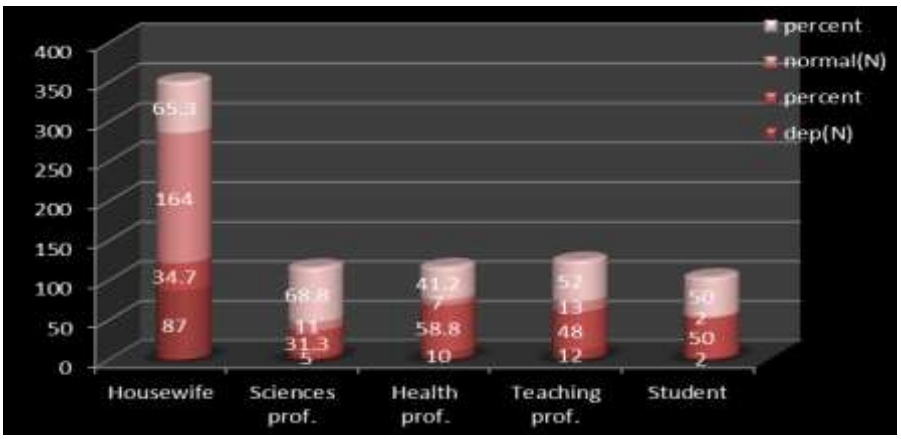

Figure II B: Distribution of age characteristics of HG women according to depression (P value=0.228 by F.E test)

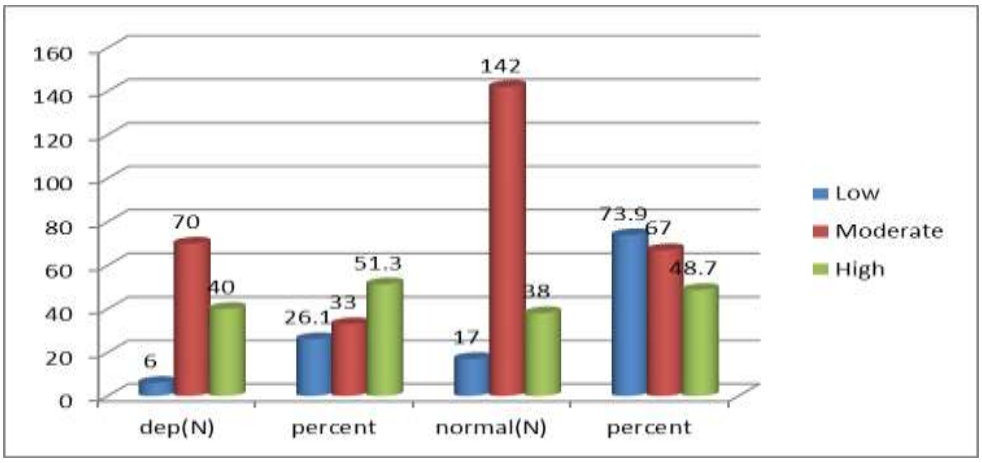

Figure II -C: Distribution of socioeconomic characteristics of HG women according to depression.

As it is shown in figure 2, HG women with high socioeconomic status had higher depression prevalence (p=0.009).

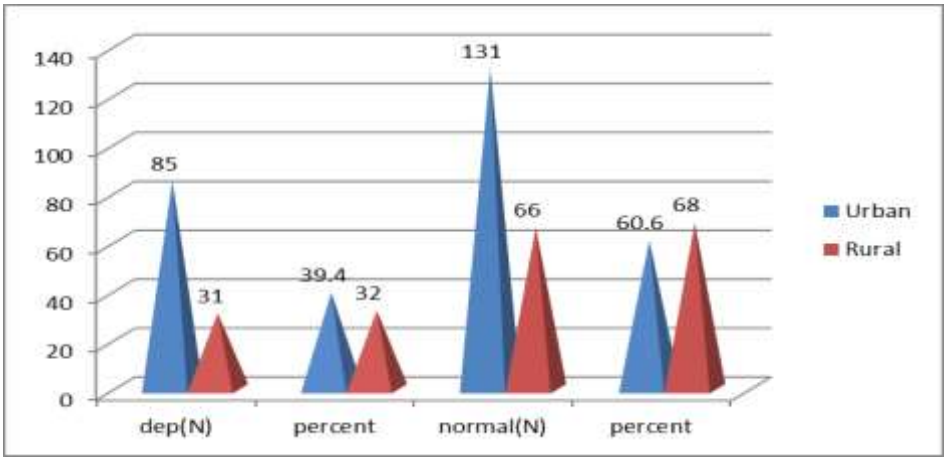

Figure II-D: Distribution of residence of HG women according to depression (P value=0.276)

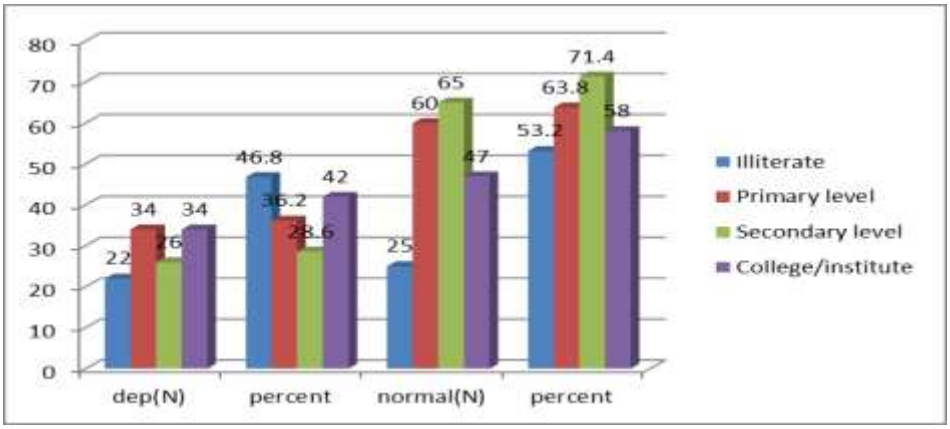

Figure II-E A: Distribution of occupations of HG according to depression (P value=0.189)

Table 2 show significant association was observed between previous history of HG and depression prevalence (p=0.03). No significant association was observed between depression and multiple pregnancy (p=0.8). Women with HG who did not want this pregnancy had significantly higher depression (p=0.03).

Table 2. Distribution of obstetric history of HGwomen according to depression status.

Variable	Depression		No depression		χ^2	P
	No.	%	No.	%		
History of HG					4.4	0.03
Yes	72	42.4	98	57.6		
No	44	30.8	99	69.2		
Multiple pregnancy					0.2	0.8
Yes	7	38.9	11	61.1		
No	109	36.9	186	63.1		
Wanted pregnancy					4.3	0.03
Yes	88	34.4	168	65.6		
No	28	49.1	29	50.9		

Table 3 show significant association was observed between increased gravida mean and depression (p=0.03). No significant differences were observed between depressed and non-depressed women regarding age, parity, miscarriage number, and GA at time of interview and at appearance of HG (p>0.05).

Table 3. Distribution of determinants means of HG according to depression

Variable	Depression	No depression	t-test	P
	Mean ±SD	Mean ±SD		

Gravida	3.6±2.4	3.1±1.7	2.08	0.038
Parity	2.2±2.05	1.8±1.6	1.8	0.07
GA at time of review	9.6±2.2	9.4±3.2	0.6	0.5
GA at appearance of HG	6.6±1.9	6.07±2.5	2.04	0.06
Miscarriage number	1±2	1±1	1.6	0.09

Performing logistic regression of these significantly associated variables revealed that only high Socioeconomic state(SES) , previous history of hyperemesis gravidarum, and unwanted current pregnancy were significantly associated with depression among pregnant women, as shown in Table No.4.

Table 4: Logistic regressing analysis.

Significance	Variable	B	p-value	Expected (B)	95%CI for expected (B)	
					Lower	Upper
Significant	High SES	1.158	0.031	3.182	1.112	9.103
	History of HG	0.499	0.043	1.647	1.016	2.672
	Unwanted this pregnancy	0.680	0.023	1.973	1.099	3.544
Insignificant	Moderate SES	0.432	0.394	1.540	0.571	4.156
	Gestational age at interview >8 weeks	0.477	0.168	1.612	0.966	2.688

DISCUSSION

Many authors indicate that HG(HG) is the main reason for increased maternal hospitalization (Veras and Mathias,2014). HG is reported in 0.3%–2% of all pregnancies .40 However, a few researches estimated the prevalence and explore relations of psychopathological factors which accompany pregnancy (Chung et al.,2001).

In this study, the depression prevalence among HG is 37.1%. This prevalence is lower than that reported by a previous study in Turkey 4 which found that 53.9% of those with HG had moderate to severe depression. depression prevalence which was reported by current study is higher than the estimated by Malaysian study (Tan et al.,2014) and an Omani study (Al-Azri et al.,2016) (19% and 24.3% respectively). These differences in depression prevalence among HG pregnant women might be attributed to discrepancies in lifestyle and cultural habits, socioeconomic status and general mental health in the community in addition to differences in study designs and depression scores among studies. Mean BDI score of HG in this study is 20±12. This finding is close to the results of Turkey study 44which stated that mean BDI score of the pregnant with HG was 20.9±10.4.

The present study showed that 19.5% of the pregnant women with HG had borderline depression, 15.7% of them had moderate depression ,and 21.4% of them had severe and extreme depression. These findings are relatively lower than those reported by a previous Iranian study (Bazarganipour et al.,2015) except for severe rank ,which revealed that 19% of HG pregnant women had mild depression, 46% of them had moderate depression and 7% of them had severe depression. This difference might be due to the use of BDI-SF (Beck Depression Inventory-Short Form) score by the Iranian study. Etiology of HGis still unknown, however many literatures demonstrate many mechanisms for HG like human chorionic gonadotropins effect, estrogen and progesterone effect, pregnancy thyrotoxicosis, H-pylori effect and other hormonal effects (Zhang et al.,2011).

Although this psychosomatic theory is considered a controversial topic, and it is dealt with by authors as the main cause of HG in early pregnancy which needs intensive mental health care. (Power et al.,2010). Many literatures from multiple countries (Pirimoglu et al.,2010;Bazarganipour et al.,2015; Al-Azri et al.,2016) document direct relationship between psychopathology of pregnant women and HG. A Previous study in USA (McCarthy et al.,2011), stated that even anxiety may be associated with onset of HG, depression, stress and behavior limitations which are more likely effects of HG symptoms. It is known that depression is a common mental disorder in pregnancy with prevalence range from 4% to 25% as it was found by many studies (Faisal-Cury and Menezes ,2007; Ryan et al.,2005). which also revealed that pregnant women in early pregnancy have depression prevalence of 15.5%, late pregnancy as 11.1% and in post-partum as 8.7%.

High socioeconomic level of the early pregnant women under investigation with HG was associated significantly with depression (p=0.009). This finding is inconsistent with many studies like the study in USA (Räisänen et al.,2014) and the study in Tanzania (Rwakarema et al.,2015), which revealed that low socioeconomic level of pregnant women in early pregnancy was an independent risk factor for depression. This inconsistency might be attributed to two explanations; the first was reported by previous Turkish study (Kamalak et al.,2013) which found a significant association between HGin early pregnancy and high socioeconomic status of pregnant women and clarified that those women with high socioeconomic status might be more sensitive and might complain more than low socioeconomic status women. The second explanation was

stated by Japanese study (Miyake et al.,2012) which reported that employed pregnant women had lower rate of depression in early pregnancy and showed the significance of social support in lowering depressive scores during pregnancy. In general in our community and our study most of women are unemployed especially those living in moderate to high socioeconomic status families. Some authors illustrate that HGis highly related to psychological problems that are present in multiple forms like neurosis, hysterical attacks, pregnancy rejection and depression, all of which are related to pregnant women poverty and marital conflicts (ACOG,2004). However, no remarkable definite psychogenic causes for HG were detected yet. A previous American a review of literature study (Munch,2002) revealed that sociocultural factors made the researchers thought that psychological disturbances are risk factors for HG while these psychological disturbances might be the results of HG.

Increased gestational age (more than eight weeks) of pregnant women with HG is associated significantly with depression (p=0.03). This finding is consistent with results of an Egyptian study (Sabri and Nabel,2015)which found that depression scores increased with gestational age increment and pregnant women with depression were significantly delivered at lower gestational age. Inconsistently, a previous study which was conducted in USA (Schetter and Tanner ,2012) stated that depression prevalence was higher among pregnant with younger gestational age. This inconsistency may be due to accumulated effect of HG that increase the psychological distress of those women after the second month of gestational age. Similarly, the present study reported a higher depressive mean scores among HG pregnant with history of multiple gravidity (p=0.03). This consistent with results of an Indian study (Ajinkya et al.,2013) which found that women with previous pregnancies had higher risk of developing depressive symptoms among pregnant women than nulliparous women. This finding might be due to numerous health, social and economic difficulties which face pregnant women at multiple gravidity ranking them at higher risk of depression. On the other hand, a previous Turkish study (Kamalak et al.,2013) showed that nulliparous that had significantly higher mean BDI scores than multiple gravidity history pregnant women. This difference might be due to a difference in the studying design and inclusion criteria of the pregnant women in addition to the effect of other studied risk factors like environmental factors and others.

The present study showed that the previous HG history of association significantly with depression in early pregnancy (p=0.03). This is similar to results of a Turkish study (Hizli et al.,2012) which revealed a highly significantly associated in between HG and depression, and that depression risk was 76 fold increment in patients with history of HG.

Pregnant women with HG who did not want pregnancy in present study had higher depression prevalence (p=0.03). This is consistent with results of the Turkish studies (Duman, 2012) and Finland (Räisänen et al.,2014). In many literatures, unwanted pregnancy was considered as a precursor of depression and HG, while in other studies it was considered as an outcome of depressive symptoms and HG in early pregnancy (Benute et al.,2010). However, it is for physicians to know that if depression is a risk factor for unwanted pregnancy, this needs high efforts before pregnancy for early detection of these cases and directing them to family planning, and if depression is an outcome for unwanted pregnancy, it needs a mental health intervention during antenatal care of pregnant women to early detect the depressive pregnant women and provide mental and social support (Dibaba et al.,2015).

LIMITATIONS OF THE STUDY

Temporal relationship cannot be assessed, Possibility of selection bias, & Limitation related to the method used for diagnosis of depression, the question were subjective.

CONCLUSIONS AND RECOMMENDATIONS

one-third of pregnant with HG had depression which was high on the provincial level .SES, history of HG and unwanted pregnancy was the main determinants. For that reason it is recommended to:

Implement mental health care programs targeting pregnant women through the antenatal care services provided at the primary health care level, The awareness of medical Personal about depression among pregnant women should be raised. The family Planning activities to mitigate unwanted Pregnancy must be reinforced

REFERENCES

1. Edmonds DK.(2007). Dewhurst's Textbook of Obstetrics & Gynaecology. Oxford, UK: Blackwell Publishing;P 1-717.
2. McCarthy FP, Lutomski JE, Greene RA.(2014). Hyperemesis gravidarum: current perspectives. Int J Women Health; 6:719–25.
3. Jueckstock J, Kaestner R, Mylonas I.(2010). Managing hyperemesis gravidarum: a multimodal challenge. BMC Med; 8(1):46. doi: 10.1186/1741-7015-8-46
4. Aksoy H, Aksoy Ü, Karadağ Öİ, Hacimusalar Y, Açmaz G, Aykut G, et al.(2015). Depression levels in patients with hyperemesis gravidarum: a prospective case–control study. Springerplus; 4:2–7.
5. Vikanes A, Skjaerven R, Grjibovski AM, Gunnes N, Vangen S, Magnus P.(2010). Recurrence of HGacross generations: population based cohort study. BMJ; 340:c2050.
6. Uguz F, Gezginc K, Kayhan F, Cicek E, Kantarci AH.(2012). Is HG associated with mood, anxiety and personality disorders: a case–control study.Gen Hosp Psychiatry 2012; 34:398-402
7. Fejzo MS, Macgibbon K .(2012). Hyperemesis gravidarum: it is time to put an end to the misguided theory of a psychiatric etiology. Gen Hosp Psychiatry; 34:699–700.
8. Vikanes AV.(2010). Causes of hyperemesis gravidarum. Thesis. University of Oslo;. Available

from: https://www.duo.uio.no/bitstream/handle/10852/27914/dravhandling-vikanes.pdf?sequence=3 . (Accessed 2016. August 28).

9. Cardaropoli S, Rolfo A, Todros T.(2014). Helicobacter pylori and pregnancy-related disorders. World J Gastroenterol; 20(3):654–64.
10. Rashid M, Rashid MH, Malik F, Herath RP.(2012). HGand fetal gender: a retrospective study. J Obstet Gynaecol; 32(5):475–8.
11. Schiff MA, Reed SD, Daling JR.(2004). The sex ratio of pregnancies complicated by hospitalization for hyperemesis gravidarum. BJOG; 111(1):27–30.
12. Basso O, Olsen J.(2001). Sex ratio and twinning in women with hyperemesis or pre-eclampsia. Epidemiology;12(6):747–9.
13. Irgens LM. (2000).The Medical Birth Registry of Norway; Epidemiological research and surveillance throughout 30 years. Acta Obstet Gynecol Scand. Jun;79(6):435–9.
14. Fejzo MS, Ingles SA, Wilson M, Wang W, MacGibbon K, Romero R, et al.(2008). High prevalence of severe nausea and vomiting of pregnancy and HGamong relatives of affected individuals. Eur J Obstet Gynecol Reprod Biol; 141(1):13–7.
15. Sekizawa A, Sugito Y, Iwasaki M, Watanabe A, Jimbo M, Hoshi S, et al.(2001). Cell-free fetal DNA is increased in plasma of women with hyperemesis gravidarum. Clin Chem. Dec; 47(12):2164-5.
16. Sugito Y, Sekizawa A, Farina A, Yukimoto Y, Saito H, Iwasaki M, et al.(2003). Relationship between severity of HGand fetal DNA concentration in maternal plasma. Clin Chem. Oct; 49(10):1667-9.
17. Yoneyama Y, Suzuki S, Sawa R, Araki T.(2005). Plasma adenosine concentrations increase in women with hyperemesis gravidarum. Clin Chim Acta; 352(1-2):75-9.
18. Bajaj S, Raiput R, Jacob JJ.(2013). Endocrine disorders during pregnancy. First edition. Jaypee brothers medical publishers;P. 67-71.
19. McCarthy FP, Khashan AS, North RA, Moss-Morris R, Baker PN, Dekker G, et al.(2011). A Prospective Cohort Study Investigating Associations between HGand Cognitive, Behavioural and Emotional Well-Being in Pregnancy. PLoS One.18;6(11):e27678.
20. Chhetry M, Thakur A, Uprety DK, Basnet P, Joshi R.(2016). HGin a tertiary care center in eastern Nepal: A prospective observational study. J Ayub Med Coll Abbottabad;28(1):18-21.
21. Fejzo MS, Ching C, Schoenberg FP, Macgibbon K, Romero R, Goodwin TM, et al.(2012). Change in paternity and recurrence of hyperemesis gravidarum. J Matern Neonatal Med. ;24;25(8):1241–5.
22. Goodwin TM.(2002). Nausea and vomiting of pregnancy: an obstetric syndrome. American Journal of Obstetrics and Gynecology; 186(Supplement): S184-S189.
23. Mahmoud GA.(2012). Prevalence and risk factors of HG among Egyptian pregnant woman at the woman's health center. Med J Cairo Univ;80(2):161–8.
24. Kuru O, Sen S, Akbayır O, Goksedef BPC, Özsürmeli M, Attar E, et al.(2012). Outcomes of pregnancies complicated by hyperemesis gravidarum. Arch Gynecol Obstet.Jun 24;285(6):1517–21.
25. WHO.(2016). The global burden of disease. Available from: http://www.ispnpsych. org/docs/4-00Global-Burden.pdf; (Accessed, 2016. August 28).
26. Wissart J, Parshad O, Kulkarni S.(2005). Prevalence of pre- and postpartum depression in Jamaican women. BMC Pregnancy Childbirth;5:15.
27. Bansil P, Kuklina E V, Meikle SF, Posner SF, Kourtis AP, Ellington SR, et al.(2010). Maternal and fetal outcomes among women with depression. J Women's Heal;19(2):329–34.
28. Bennett HA, Einarson A, Taddio A, Koren G, Einarson TR.(2004). Prevalence of depression during pregnancy: Systematic review. Obst. & Gyn;103(4):698-709.
29. FarisS.(2012)Depressionstatistics.28th,Retrievedfrom:www.Healthline.com/Health/Depression/Statistics.
30. Assen A.(2007). Handbook of Cognitive Hypnotherapy for Depression: An Evidence-based Approach. USA. Lippincott Williams & Wilkins Handbook.
31. Takahashi L.(2010). Neurobiology of schizophrenia, mood disorders, and anxiety disorders. In McCance K, Huether S, Brasher V, Rote N (Eds.). Pathophysiology: The biologic basis for disease in adults and children. 6thed. Maryland Heights, MO: Mosby Elsevier. pp. 646-664.
32. NIHCM.(2010).Foundation Issue Brief. Identifying and Treating Maternal Depression: Strategies & Considerations for HealthPlans.
33. Jabbour S, Giacaman R, Khawaja M, Nuwahid I.(2012). Public Health in the Arab World. First Edit. USA.Cambridge University Press,P: 258.
34. Eloul L, Ambusaidi A, Al-Adawi S.(2009). Silent Epidemic of Depression in Women in the Middle East and North Africa Region. Sultan Qaboos Univ Med J; 9(1): 5–15.
35. Roseboom TJ, Ravelli ACJ, van der Post JA, Painter RC.(2011). Maternal characteristics largely explain poor pregnancy outcome after hyperemesis gravidarum. Eur J Obstet Gynecol Reprod Biol; 156(1):56–9.
36. Epi-Tools epidemiological calculators. Sample size to estimate a single proportion. Retrieved from: http://epitools.ausvet.com.au/content.php?page=1Pro

portion&Proportion=0.372&Conf=0.95&Precision=0.05&Population=1584 . (2016; August 15).

37. Ghareeb AG.(2000). Manual of Arabic BDI-II. Alongo Press. Cairo Inventory: the author's twenty-five years of evaluation. Clin Psychol Rev. 2000;8:77–100.
38. Saadon AA, Al-Asadi JN.(2014).Prevalence and sociodemographic determinants of hypertension in Thi-Qar governorate: A household survey. American Journal of Advanced Drug Delivery; 2(6):802-15.
39. Veras TCS, Mathias TAF.(2014). Hospitalizations leading causes for maternal disorders. Rev Esc Enferm USP;48(3):401-3. http://www.scielo.br/pdf/reeusp/v48n3/0080-6234-reeusp-48-03-401.pdf
40. Ismail SK, Kenny L.(2007). Review on hyperemesis gravidarum. Best Pract Res Clin Gastroenterol; 21:755–69.
41. Chung TK, Lau TK, Yip AS, Chiu HF, Lee DT.(2001). Antepartum depressive symptomatology is associated with adverse obstetric and neonatal outcomes. Psychosomatic Medicine ; 63(5):830–4.
42. Tan PC, Zaidi SN, Azmi N, Omar SZ, Khong SY.(2014). Depression, Anxiety, Stress and Hyperemesis Gravidarum: Temporal and Case Controlled Correlates. PLoS ONE; 9(3):e92036.
43. Al-Azri M, Al-Lawati I, Al-Kiyumi M, Al-Rawahi A, Davidson R, Al-Maniri A.(2016). prevalence and risk factors of antenatal depression among Omani women in primary care setting. Sultan Qaboos Univ Med J;16(1):e35-e41.
44. Şimşek Y, Çelik Ö, Yılmaz E, Karaer A, Yıldırım E, Yoloğlu S.(2012). Assessment of anxiety and depression levels of pregnant women with HGin a case-control study. Journal of the Turkish German Gynecological Association; 13(1):32-6.
45. Bazarganipour F, Mahmoodi H, Shamsaee B, Taghavi SA.(2015).The frequency and severity of nausea and vomiting during pregnancy and its association with psychosocial health. J Midwifery Reprod Health.; 3(3): 401-7.
46. Zhang Y, Cantor RM, MacGibbon K, Romero R, Goodwin TM, Mullin PM, et al.(2011). Familial aggregation of hyperemesis gravidarum. American Journal of Obstetrics & Gynecology; 204(3): 230.e1-7.
47. Power Z, Thomson AM, Waterman H.(2010). Understanding the stigma of hyperemesis gravidarum: Qualitative findings from an action research study. Birth; 37(3): 237-44.
48. Pirimoglu ZM, Guzelmeric K, Alpay B, Balcik O, Unal O, Turan MC.(2010). Psychological factors of HGby using the SCL-90-R questionnaire. Clinical and Experimental Obstetrics & Gynecology; 37(1): 56-9.
49. Faisal-Cury A, Rossi Menezes P.(2007). Prevalence of anxiety and depression during pregnancy in a private setting sample. Arch Women Ment Health.; 10:25-32.
50. Ryan D, Milis L, Misri N.(2005). Depression during pregnancy. Can Fam Physician; 51:1087-93.
51. Rwakarema M, Premji SS, Nyanza EC, Riziki P, Palacios-Derflingher L.(2015). Antenatal depression is associated with pregnancy-related anxiety, partner relations, and wealth in women in Northern Tanzania: a cross-sectional study. BMC Women's Health; 15:68.
52. Kamalak Z, Köűş N, Köűş A, Hizli D, Ayrim A, Kurt G.(2013). Is there any effect of demographic features on development of HGin the Turkish population? Turk J Med Sci; 43: 995-9.
53. Miyake Y, Tanaka K, Arakawa M.(2012). Employment, income, and education and prevalence of depressive symptoms during pregnancy: the Kyushu Okinawa Maternal and Child Health Study. BMC Psychiatry; 12:117.
54. American College of Obstetricians and Gynecologists.(2004).Nausea and vomiting of pregnancy. Practice Bulletin 52. Obstet Gynecol; 110033: 803–14
55. Munch S.(2002). Chicken or the egg? The biological-psychological controversy surrounding hyperemesis gravidarum. Soc Sci Med. 2002; 55:1267–78.
56. Sabri Y, Nabel H.(2015). The impact of anxiety and depression during pregnancy on fetal growth and the birth outcome. Egyptian Journal of Psychiatry 2015; 36 (2): 95-100
57. Schetter DC, Tanner L.(2012). Anxiety, depression and stress in pregnancy: implications for mothers, children, research, and practice. Current opinion in psychiatry 2012; 25(2):141-8.
58. Ajinkya S, Jadhav PR, Srivastava NN.(2013). Depression during pregnancy: Prevalence and obstetric risk factors among pregnant women attending a tertiary care hospital in Navi Mumbai. Industrial Psychiatry Journal. 2013; 22(1):37-40.
59. Hizli, D., Kamalak, Z., Kosus, A., Kosus, N., & Akkurt, G.(2012). HG and depression in pregnancy: is there an association? Journal of Psychosomatic Obstetrics and Gynaecology;33(4): 171–5.
60. Duman NB.(2012).Sociodemographic and obstetric factors associated With depression during pregnancy in Turkey. American International Journal of Contemporary Research; 2 (11): 17-26.
61. Räisänen S, Lehto SM, Nielsen HS, Gissler M, Kramer MR, Heinonen S.(2014). Risk factors for and perinatal outcomes of major depression during pregnancy: a population-based analysis during 2002–2010 in Finland. *BMJ Open*. 2014; 4:e004883.

62. Benute GRG, Nomura RMY, Siracuza RJ, Fraguas Jr R, Lucia MCS, Zugaib M.(2010). Depression during pregnancy in women with a medical disorder: risk factors and perinatal outcomes. Clinics; 65(11):1127-31.

63. Dibaba, Y., Fantahun, M., & Hindin, M. J.(2015). The association of unwanted pregnancy and social support with depressive symptoms in pregnancy: evidence from rural Southwestern Ethiopia. BMC Pregnancy and Childbirth; 13(1): 135.

Cite this article: Alaa Hussein Ali Al – Naser. 2020. Depression in Hyperemesis Gravidarum: Determininants and Extent in Al – Nasiriyah, A Cross – Sectional Study. European Journal of Molecular & Clinical Medicine, 7(1), pp. 34 – 44, DOI: https://doi.org/10.5334/ejmcm.277