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Study of Psychological Morbidity in Hyperemesis Gravidarum

Jayashree S[1], Sushila Bhuriya[1], Shivanand Manohar[1,2], Vidya CS[3]

[1]Department of Obstetrics and Gynecology, JSS Medical College, JSS Academy of Higher Education & Research, Mysuru
[2]Department of Psychiatry, JSS Medical College, JSS Academy of Higher Education & Research, Mysuru
[3]Department of Anatomy, JSS Medical College, JSS Academy of Higher Education & Research, Mysuru

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ABSTRACT

Introduction: hyperemesis gravidarum (HG) is one of the most common causes of repeated antenatal admissions in first trimester giving rise to both physical symptoms as well as psychological problems. Unfortunately, psychological problems are not identified and addressed appropriately. The objective of this study is to determine the severity of anxiety and depression in women with HG.

Method: this was a cross-sectional study. A total of 51 cases admitted in antenatal ward, JSS Hospital, Mysore with HG for the first time were screened for depression using Beck's Depression Inventory (BDI) Scale and anxiety using Hamilton Anxiety Scale (HAM-A). The data obtained was analyzed statistically using Microsoft Excel and SPSS Microsoft version 21.

Results: of the total number of cases, majority (60.8%) of the study subjects were primigravida, 9 (17.7%) were suffering from mild to moderate anxiety disorder, 3 (3.9%) were suffering from moderate to severe anxiety disorder, 6 (11.8%) were suffering from borderline depression, 18 (35.3%) were having mild depression,9 (17.6%) had moderate depression and 2 (3.9%) had severe depression. Moderate to severe anxiety was found only in women aged less than 24 years. The severity of anxiety was found to be more between 13 and 16 weeks of gestation. Prevalence of depression was more in women with history of HG in the previous pregnancy.

Conclusion: anxiety was found in 1/4th of pregnant women with hyperemesis gravidarum. Depression was found in 2/3rd of women with hyperemesis gravidarum. However less than 5% of women had severe anxiety or depression.

Keywords: Hyperemesis gravidarum(HG); Anxiety; Depression; HAM-A Score; BDI Score.

Introduction

Pregnancy, although a physiological process, is often associated with minimal to severe risk factors. These risks are usually seen in all groups of people irrespective of the socioeconomic class and the setting and might affect the physical as well as mental health of the pregnant woman. Special care towards mental health and well-being during pregnancy is available in developed countries but women in the developing and underdeveloped countries are often deprived of this. Hence a vast majority of women in these countries even though physically healthy are found to suffer from one or the other type of mental disorders like anxiety, depression, mood disorders and many more[1].

About 90% of women experience nausea and vomiting during pregnancy[2]. Hyperemesis gravidarum, reported to affect 0.5-2% of pregnant women, is a severe form of nausea and vomiting where women cannot tolerate anything orally. It is the most common reason for hospitalization in early pregnancy. "It generally begins around 4-7 weeks of gestation, peaks at 11-13 weeks and resolves in most cases by 12-14 weeks. About 10% of women continue to suffer throughout the pregnancy"[3,4,5,6]. The most common cause of nausea and vomiting during pregnancy is increased blood levels of HCG (human chorionic gonadotropin) hormone which is secreted from the placenta. Persistent vomiting may result in weight loss, nutritional deficiencies, dehydration, ketosis and electrolyte and acid-base imbalance[7].

Psychological problems are more common with this disorder of pregnancy. Hence these problems should be identified and addressed appropriately[8]. Along with major depression and generalized anxiety disorder, other psychiatry problems like avoidant personality disorder and obsessive-compulsive personality disorders are also higher in women with hyperemesis gravidarum. "Even though psychosomatic symptoms are more common in hyperemesis gravidarum, the psychological components of the disease arenot fully understood yet".

There are many factors that may put a woman at an increased risk for developing antenatal depression or anxiety, including but not limited to: the amount of emotional support she receives, past history of depression and/or anxiety and financial issues[9]. Antenatal depression is the presence of a major depressive disorder (MDD) during pregnancy[10]. Incidence of depression usually increases during pregnancy as compared with other times in their lives, which could be because of their altered hormone level. Incidence is between 10% and 19%.

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The prevalence of anxiety during pregnancy also varies. A study by Teixeira *et al.*[11] found that the prevalence of anxiety fluctuates according to trimester. A total of 270 participants were recruited to complete the State Anxiety Inventory (STAI-S) by Spielberger[12] in first, second, and third trimesters of pregnancy. STAI-S is used to measure the anxiety a person experiences in a particular state or situation (i.e., pregnancy). They found that 15.0% of the participants had anxiety in their first trimester, 12.3% in second trimester and 18.2% in third trimester. The prevalence of anxiety peaked in the third trimester.

Research also shows that the prevalence of anxiety can be substantially higher during pregnancy compared to depression.

Because of limited studies from tertiary care hospital about prevalence of psychological morbidity in pregnant women, our study was conducted.

Materials and Methods

All the patients with hyperemesis gravidarum admitted in the antenatal ward of JSS Hospital, Mysore during the study period from October 2017 to July 2019 were included in the study. Only women who were hospitalized for the first time in the current pregnancy for the treatment of hyperemesis gravidarum were included in the study. Confirmation of pregnancy was done with ultrasound or a positive urine pregnancy test, if ultrasound was uninformative due to very early pregnancy.

Women with multiple pregnancy, thyroid disease, gestational trophoblastic disease and established psychiatric illness or any other acute illness that could cause nausea and vomiting which may confound the diagnosis of hyperemesis gravidarum were excluded from the study.

Sample size was calculated using the formula $S=Z^2pq/d^2=1.96x1.96x0.02x0.98/.05x.05=30$. Hence a minimum of 30 patients with hyperemesis gravidarum were considered for the study. But during the study period a total of 51 cases of hyperemesis gravidarum were admitted in the department of OBG at JSS Medical College and Hospital, Mysuru and all of them were included in the study. Ethical clearance was obtained from Ethical Committee of JSSAHER, Mysore.

The study subjects were counseled regarding the nature of the study. Patient who gave informed consent was included in the study. The socio-demographic data, history of present pregnancy, obstetric history and past and family history of hyperemesis gravidarum was collected in a pretested, semi structured questionnaire method by interview technique. Translation was done in local language by an interpreter for those who did not know English. The level of anxiety and depression was measured using Hamilton Anxiety Rating Scale (HAM-A) for anxiety and Beck's depression inventory (BDI) for depression. The completed questionnaires were collected, and data was analyzed using Microsoft Excel and SPSS Microsoft version 21. Categorical data was represented in the form of frequencies and proportions. Chi-square test was used as the test of significance for qualitative data. Continuous data was represented as mean and standard deviation. P value of <0.05 was considered as statistically significant.

Results

The mean age of the study group was 23.65 $\pm$ 3.48 years in our study with nearly 60 % of them aged less than 24 years and 31 (60.8 %) of the study participants were primigravida. Majority (45.1%) of the study subjects were between 9 and 12 weeks, 14 (27.5%) were between 6 and 8 weeks of gestation and 12 (23.5%) were between 13 and 16 weeks. Only 2 (3.9%) women presented with hyperemesis gravidarum after 16 weeks of gestation.

Out of the 20 multigravida in our study, 10 (50%) had history of hyperemesis gravidarum in the previous pregnancy. Only 3.9% of the study subjects reported family history of hyperemesis gravidarum.

When we analyzed the Hamilton Anxiety Rating Scale (HAM-A) questionnaire, it was found that 9 (17.6%) of the study subjects were suffering from mild to moderate anxiety disorder and 2 (3.9%) of them were suffering from moderate to severe anxiety disorder. (Table 1)

Beck's depression inventory questionnaire analysis revealed that 6(11.8%) of the subjects were suffering from borderline depression, 18 (35.3%) were having mild depression, 9 (17.6%) had moderate depression and 2 (3.9%) had severe depression following hyperemesis gravidarum. (Table 2)

When the subjects were divided into different age groups and then analyzed for severity of anxiety, it was found that moderate to severe anxiety was found only

Table 1. Classification of anxiety disorder among the study subjects.

		Frequency (n=51)	Percentage
Anxiety (HAM-A)	Mild to Moderate	9	17.7%
	Moderate to Severe	2	3.9%
	NO	40	78.4%

Table 2. Classification of depression disorder among the study subjects.

		Frequency (n=51)	Percentage
Depression (BDI)	Borderline	6	11.8%
	Mild	18	35.3%
	Moderate	9	17.6%
	Severe	2	3.9%
	NO	16	31.4%

in women aged less than 24 years. Mild to moderate anxiety was found in women of all age groups. The difference was statistically significant. (Table 3) There was no statistically significant difference in the occurrence of depression in different age groups.

When the association between anxiety and period of gestation was analyzed, the severity of anxiety was found to be more between 13 and 16 weeks of gestation. Majority of the study subjects suffered from anxiety during the end of the first trimester and the start of second trimester. (Table 4) The association between depression and the period of gestation is shown in table 5. There was no statistically significant difference with respect to the same.

In spite of similar experience in the past,among the study subjects who had a history of hyperemesis gravidarum during previous pregnancy nearly half had an episode of anxiety ranging from mild to severe and 90 % were suffering from depression even in the present pregnancy.

Only 2 women with hyperemesis gravidarum had a positive family history of hyperemesis gravidarum and both of them were suffering from anxiety as well as depression in present pregnancy.

Discussion

Mild to severe nausea and vomiting in pregnancy usually affects approximately 50-60% of the pregnant women and 0.2-2.5% of them may progress into hyperemesis gravidarum. Hyperemesis gravidarum is more common in women of younger age group. In the studies done by Wikins *et al.*[13] and Aksoy *et al.*[14] the mean age was 25.6 years and 25.19 years respectively which is almost similar to the present study. However, in the studies done by Helena Kames K *et al.*[15] and B Poursharif *et al.*[16], the mean age was 30.2 years and 30.9 years which is much higher.

Table 3. Association between anxiety and the age group of study subjects.

		Age Group							
		Between 18 and 21 Years		Between 22 and 24 Years		Between 25 and 27 Years		Between 28 and 37 Years	
		Frequency	%	Frequency	%	Frequency	%	Frequency	%
Anxiety (HAM-A)	Mild to Moderate	2	13.3	0	0.0	4	36.4	3	60.0
	Moderate to Severe	1	6.7	1	5.0	0	0.0	0	0.0
	NO	12	80.0	19	95.0	7	63.6	2	40.0

Chi square = 13.882 p = 0.031*

Table 4. Association between anxiety and the period of gestation of study subjects.

		Period of gestation							
		Between 6 and 8 Weeks		Between 9 and 12 Weeks		Between 13 and 16 Weeks		Between 16 and 27 Weeks	
		Frequency	%	Frequency	%	Frequency	%	Frequency	%
Anxiety (HAM-A)	Mild to Moderate	2	14.3	1	4.3	5	41.7	1	50.0
	Moderate to Severe	0	0.0	0	0.0	2	16.7	0	0.0
	NO	12	85.7	22	95.7	5	41.7	1	50.0

Chi square= 17.24 p= 0.008*

Table 5. Association between depression and the period of gestation.

		Period of gestation							
		Between 6 and 8 Weeks		Between 9 and 12 Weeks		Between 13 and 16 Weeks		Between 16 and 27 Weeks	
		Frequency	%	Frequency	%	Frequency	%	Frequency	%
Depression (BDI)	Borderline	2	14.3	2	8.7	1	8.3	1	50.0
	Mild	6	42.9	9	39.1	3	25.0	0	0.0
	Moderate	3	21.4	2	8.7	4	33.3	0	0.0
	Severe	0	0.0	0	0.0	2	16.7	0	0.0
	NO	3	21.4	10	43.5	2	16.7	1	50.0

Chi square = 16.50, p= 0.169

The experience of a pregnant lady during her first pregnancy is different when compared to subsequent pregnancies. Hence, most of the signs and symptoms are more common among primigravida when compared with multiparous women. Similar to the findings of our study, parity predominance was seen in many other studies done by Depue R H *et al.*[17], H K Kieldgaard *et al.*[18]and GemechuKejela *et al.*[19].

Hyperemesis gravidarum is more common in the first trimester, i.e, before 12 weeks of pregnancy and the same was noted in our study (72% of women were in first trimester). Similar results were seen in the studies done byGemechuKejela *et al.*[19] and Magtira A *et al.*[20].

It is reported in numerous studies that the severity of depression and anxiety could be more in pregnant cases with hyperemesis gravidarum than it is in the healthy pregnant cases[21]. In the study by Uguz *et al.*[22] the prevalence of mood disorders such as major depression and anxiety disorders was detected to be higher in pregnant cases with hyperemesis gravidarum than it is in healthy control group." It has been suggested that "psychiatric diseases co morbid to hyperemesis gravidarum, could be the consequence of trauma and stress of a physical illness"[23].

Mitchell Jones *et al.*[24] demonstrated association between anxiety and hyperemesis gravidarum in their meta-analysis. In studies done by Yavuz Simsek *et al.*[25] and ErginbasKender *et al.*[26] using Beck's Anxiety Inventory scale, patients with hyperemesis gravidarum had significantly higher anxiety score and the association was also found to be statistically significant. In our study, Hamilton Anxiety Scale was used and the study subjects were further classified into mild, moderate, severe and no anxiety depending upon the score obtained by the individual subject. This scale was used based on previous research studies and operational feasibility in the ward with respect to time spent in data collection and quicker responses. Lee *et al.*[27] in their study found that anxiety was seen in 26.6% of women with hyperemesis gravidarum which is almost similar to findings of present study (21.57%). In the study done by Jennifer Kramer[28] nearly 14.2 % of pregnant women suffered from anxiety which is lesser than our study.

Depression component of the pregnant mothers with hyperemesis gravidarum was assessed and evaluated using Beck's depression inventory scale and study subjects were classified from borderline to severe depression. Simsek Y *et al.*[25] and ErginbasKender E *et al.*[26] concluded that patients with hyperemesis gravidarum had significantly higher depression score as per the Beck's Depression Inventory score and found the difference to be statistically significant. In the study done by PengChoing Tan *et al.*[29] also, depression was found to be significantly associated with hyperemesis gravidarum.

In the study done by Jennifer Kramer *et al.*[28], 12% had mild and 10 % had major depression while in study by Lee *et al.*[27], 11% had mild and 29% had major depression based upon EPDS scores among the pregnant women with hyperemesis gravidarum. Mitchell Jones *et al.*[24] also demonstrated association between depression and hyperemesis gravidarum in their study.

In a study done by Bazarganipour F *et al.*[30], 27.5% of the pregnant women were suffering from mild, 11% from moderate and 2.5% from severe type of depression which is almost similar to our study finding. In the study done by PengChoing Tan *et al.*[29] also, depression was found to be significantly associated with hyperemesis gravidarum. In the study done by Huseyin Aksoy *et al.*[31] 33.3% had mild, 38.5% had moderate and 15.4% had severe depression which was statistically significant. Scores of mild depression were similar to our study findings whereas moderate and severe depression was found to be much more when compared to other studies.

When our study result was compared with other epidemiological data, patients with hyperemesis gravidarum were found to have higher levels of depression disorders compared to women without hyperemesis gravidarum[32,33]. In contrast to our findings, Bozzo *et al.*[34] and Jahangiri *et al.*[35] found no association between depressive disorders and hyperemesis gravidarum.

One of the reasons for the variation in the prevalence of various degrees of severity of depression in different studies could be the use of different scores for quantifying depression. According to some studies BDI depression scale shows more depression when compared to Edinburgh Depression Scale, because it has more questions related to the somatic symptoms of depression which might lead to misdiagnosis of depression. This discrepancy in result might also be due to differences in sample size and period of gestation "because the incidence and severity of nausea and vomiting in hyperemesis gravidarum varies according to the gestational week".

Conclusion

Anxiety was found in 1/4th of pregnant women with hyperemesis gravidarum. Depression was found in 2/3rd of women with hyperemesis gravidarum. However less than 5% of women had severe anxiety and depression. Hence clinical assessment of the emotional problems and creating awareness will positively impact to the pregnant women. More research in women mental health that looks at psychological co morbidities are needed in Indian population.

Limitations

The study was carried out in tertiary care general hospital on small sample size and hence cannot be generalized. Questionnaire method was used at

certain phase of pregnancy and hence subjective parameters of study may vary. Depressive symptoms and severity can be assessed using different rating scales, such scales may affect the interpretation & impact of hyperemesis gravidarum, hence more Indian studies are needed.

References

1. Lu Mc, Halfo N. Racial and Ethnic disparities in birth outcomes. A life-course Perspective .Maternity child health Journal.2003.7 (1):13-30.
2. Gupta. N. Maternal Mortality: magnitude causes and concerns. Journal of obstetrics &Gynaec today. 2004; 9: 555-8.
3. Eliakin R, Abulafia O, &Sherer D.M. "Hyperemesis gravidarum: Current review". American journal of perinatology.2000; 17 (4): 207 – 218.
4. N K Kuşcu, F Koyuncu, Hyperemesis gravidarum: current concepts and management, Postgraduate Medical Journal. 2002;78:7679 -7680.
5. Dodds L, Fell DB, Joseph KS, Allen VM, Butler B. Outcomes of pregnancies complicated by hyperemesis gravidarum. Obstet.Gynecol 2006;107:285-92.
6. Godsey RK, Newman RB. Hyperemesis gravidarum. A comparison of single and multiple admissions. J Reprod Med.1991;36:287-90.
7. Susan Renee Wilcox, Pregnancy, Hyperemesis Gravidarum, Updated: Jan 13. 2010. Available from the URL http://emedicine.medscape.com/article/796564-overview.
8. Ebrahimi N, Maltepe C, Einarson A, Optimal management of nausea and vomiting of pregnancy, International Journal for Womens Health. 2010; 4(2):241-8.
9. Senturk V, Abas M, Berksun O, Stewart R. Social support and antenatal depression in extended and nuclear family environments in Turkey: A cross-sectional survey. BMC Psychiatry .2011;11:48-51.
10. Bowen A, Muhajarine N. Antenatal Depression. Can Nurse 2006 November;102 (9):27-30.
11. Teixeira C, Figueiredo B, Conde A, Pacheco A, Costa A. Anxiety and depression during pregnancy in women and men. J Affect Disord.2009;119:142-8.
12. Spielberger CD, Gorsuch RL, Lushene RE. STAI Manual for the State-Trait anxiety Inventory. Palo Alto, Calif.: Consulting Psychologists Press, Inc, 1970.
13. Wilkins, R. W.Journal Michigan Medical Society –Vomiting of Pregnancy .1931;30:669-672.
14. HüseyinAksoy, ÜlküAksoy , Özge İdem Karadağ, YunusHacimusalar , GökhanAçmaz , GülsümAykut. Depression levels in patients with hyperemesis gravidarum: a prospective case–control study. SpringerPlus .2015; 43(4):1-6.
15. Helena Kames Kjeldgaard, MalinEberhard-Gran, JūratėŠaltytėBenth, HedvigNordeng ,ÅseVigdisVikanes. History of depression and risk of hyperemesis gravidarum: a population-based cohort study. Arch WomensMent Health .2017; 20:397–404.
16. Poursharif B, Korst LM, Fejzo MS, Macgibbon KW, Romero R, Goodwin TM. The psychosocial burden of hyperemesis gravidarum. J Perinatol. 2008;28:176-81.
17. Depue R H, Bernstein L, Ross RK, Judd HL, Henderson BE. Hyperemesis gravidarum in relation to estradiol levels, pregnancy outcome, and other maternal factors: a sero epidemiologic study. Am J ObstetGynecol.1987;156(5):1137-41.
18. Helena Kames Kjeldgaard, MalinEberhard-Gran, JūratėŠaltytėBenth ,HedvigNordeng, ÅseVigdisVikanes. History of depression and risk of hyperemesis gravidarum: a population-based cohort study. Arch WomensMent Health .2017; 20:397–404.
19. Kejela G, Getu S, Gebretsdik T, Wendimagegn T .Prevalence of Hyperemesis Gravidarum and Associated Factors in Arba Minch General Hospital, GamoGofa Zone, Southern Ethiopia. Clinics Mother Child Health.2008; 15(1):1-5.
20. Magtira A, Schoenberg FP, MacGibbon K, Tabsh K, Fejzo MS. Psychiatric factors do not affect recurrence risk of hyperemesis gravidarum. J ObstetGynaecol Res. 2015;41(4):512-6.
21. McCarthy FP, Khashan AS, North RA, Moss-Morris R, Baker PN, *et al*. A Prospective Cohort Study Investigating Associations between Hyperemesis Gravidarum and Cognitive, Behavioural and Emotional Well-Being in Pregnancy. PLoS ONE.2011; 6(11): e27678.
22. Uguz F, Gezginc K, Kayhan F, Cicek E, Kantarci AH.Is hyperemesis gravidarum associated with mood, anxiety and personality disorders: a case-control study.GenHosp Psychiatry. 2012;34(4):398-402
23. Simpson SW, Goodwin TM, Robins SB, Rizzo AA, Howes RA, Buckwalter DK, Buckwalter JG. Psychological factors and hyperemesis gravidarum. J Womens Health Gend Based Med. 2001; 10:471-477.
24. Mitchell-Jones N, Gallos I, Farren J, Tobias A, Bottomley C, Bourne T Psychological morbidity associated with hyperemesis gravidarum; a systematic review and meta-analysis. BJOG. 2016;124(1):20-30.
25. Yavuzsimsek , onderÇelik, ErcanYılmaz, Abdullah Karaer1, EnginYıldırım, SaimYoloğlu. Assessment of anxiety and depression levels of pregnant women with hyperemesis gravidarum in a case-control study. J Turkish-German Gynecol Assoc. 2012; 13: 32-6
26. EbruErginbasKender, GoksenYuksel, Can Ger, UrunOzer. Eating Attitudes, Depression and Anxiety Levels of Patients with Hyperemesis Gravidarum Hospitalized in an Obstetrics and Gynecology Clinic,Düşünen Adam. The Journal of Psychiatry and Neurological Sciences .2015;28:119-126.
27. Lee AM, Lam SK, Lau SMSL. Prevalence, course, and risk factors for antenatal anxiety and depression. ObstetGynecol 2007;110(5):1102-12.
28. Kramer J, Bowen A, Stewart N, Muhajarine N. Nausea and vomiting of pregnancy: prevalence, severity and relation to psychosocial health. MCN Am J Matern Child Nurs.2013;38(1):21-7.
29. Tan PC, Zaidi SN, Azmi N, Omar SZ, Khong S Y. Depression, Anxiety, Stress and Hyperemesis Gravidarum: Temporal and Case Controlled Correlates. PLoS ONE.2014; 9(3): e92036.
30. Bazarganipour F, Mahmoodi H, Shamsaee B, TaghaviSA.The Frequency and Severity of Nausea and Vomiting during Pregnancy and its Association with Psychosocial Health. Journal of Midwifery and Reproductive Health. 2015; 3(3): 401-407
31. HüseyinAksoy, ÜlküAksoy , Özge İdem Karadağ, YunusHacimusalar, GökhanAçmaz , GülsümAykut. Depression levels in patients with hyperemesis gravidarum: a prospective case–control study. SpringerPlus .2015; 43(4):1-6.
32. Bennett H A, Einarson A, Taddio A, Koren G. Prevalence of depression during pregancy: Systematic review. ObstetGynecol .2004;103:698-703.
33. Gavin AR1, Melville JL, Rue T, Guo Y, Dina KT, Katon WJ. Racial differences in the prevalence of antenatal depression. Gen Hosp Psychiatry.2011;33(2):87-93.
34. Bozzo P, Einarson TR, Koren G, *et al*. Nausea and vomiting of pregnancy (NVP) and depression: cause or effect?. Clin Invest Med. 2011;34:245–248.
35. Jahangiri F, Hirshfeld-Cytron J, Goldman K, Pavone ME, Gerber S, Klock SC. Correlation between depression, anxiety, and nausea and vomiting during pregnancy in an in vitro fertilization population: a pilot study. J PsychosomObstetGynaecol. 2011;32:113–118.

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Corresponding author
Vidya CS
E-mail: vidyacs@jssuni.edu.in