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Association Between Hyperemesis Gravidarum and Postpartum Depression: A Case–Control Study

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ABSTRACT

This study aimed to evaluate postpartum depressive symptoms in pregnant women diagnosed with hyperemesis gravidarum (HEG) and to identify clinical predictors associated with increased depression risk.

This retrospective case–control study included 80 pregnant women diagnosed with HEG and 80 healthy pregnant women matched for maternal age and gestational age. Sociodemographic characteristics, obstetric outcomes, laboratory parameters, and Edinburgh Postnatal Depression Scale (EPDS) scores were recorded. An EPDS score ≥13 was considered indicative of postpartum depression (PPD). Correlation analyses and both univariable and multivariable logistic regression analyses were performed to identify independent predictors of PPD.

Median EPDS scores were significantly higher in the HEG group compared with controls ($p < 0.001$). PPD was present in 20% of the HEG group and 7.5% of controls ($p = 0.022$). In the entire cohort, HEG was identified as an independent predictor of PPD (aOR: 3.319, 95% CI: 1.167–9.446, $p = 0.025$). Within the HEG group, BMI was found to be an independent predictor of PPD (aOR: 1.101, 95% CI: 1.012–1.198, $p = 0.026$). Gestational age at delivery and birth weight were also lower in the HEG group ($p < 0.05$).

Pregnant women with HEG have a significantly higher risk of postpartum depression. Routine psychological screening, particularly with EPDS, may facilitate early detection and improve maternal mental health outcomes.

Keywords: Hyperemesis gravidarum, postpartum depression, EPDS, maternal mental health

Introduction

Nausea and vomiting are common during pregnancy, affecting approximately 90% of all pregnancies, mostly during the first trimester (1). Hyperemesis gravidarum (HEG) is a severe nausea and vomiting syndrome that occurs before the 22nd week of pregnancy and is often accompanied by metabolic disorders, although it can also develop without these disorders. This clinical condition is associated with dehydration, malnutrition, weight loss, and imbalances in electrolytes and acid-base balance (2) and is defined by ketonuria and weight loss (more than 5% of body weight) with more than three episodes of vomiting per day (3). The incidence of HEG is reported to be approximately 0.3–3% of pregnancies (4). It is the most common cause of hospitalisation in early pregnancy and the second most common cause throughout the entire pregnancy (5).

Although the aetiopathogenesis of hyperemesis gravidarum is not fully understood, genetic, hormonal (hCG, oestrogen, and thyroid), gastrointestinal, and psychosocial factors are thought to play a role. Some studies have reported an increased risk of HEG in women with a history of depression (6), while others have reported that depressive symptoms are more common in pregnant women with HEG who have no history of psychiatric illness (7,8). Prolonged episodes of nausea and vomiting negatively affect maternal daily activities, social relationships, and adaptation to pregnancy, paving the way for the emergence of anxiety and depressive symptoms. Mood disorders are the most common psychiatric complications, with a reported depression rate of approximately 50% (9). A UK-based study found that 26% of women with HEG reported occasional suicidal

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thoughts, 7% reported regular suicidal thoughts, more than 50% of cases considered terminating the pregnancy, and 5% actually did so (10).

The Edinburgh Postnatal Depression Scale (EPDS) is a widely used, highly valid and reliable self-report scale for screening depressive symptoms during pregnancy and the postpartum period (11). In recent years, it has been shown that using this scale during the antenatal period contributes to the early detection of depression risk. In this context, evaluating the EPDS score in pregnant women diagnosed with HEG is important in revealing not only the somatic but also the psychological burden of the disease.

The aim of this study is to determine whether pregnancies complicated by hyperemesis gravidarum carry an increased risk of developing depression. Accordingly, pregnant women diagnosed with hyperemesis gravidarum and a control group of healthy pregnant women were compared in terms of the development of depressive symptoms in the postpartum period using the EPDS.

Materials and Methods

Study Setting and Design: This retrospective observational case–control study included patients between October 2022 and July 2024.

Partipiciants: The study group consisted of 80 pregnant women who were diagnosed with HEG during the first or second trimester of pregnancy (between 6 and 19 weeks), were hospitalised or monitored as outpatients, and gave birth at our hospital. The control group included 80 healthy pregnant women who attended the antenatal clinic during the same period, had no systemic or psychiatric illness, and gave birth at our hospital. The diagnosis of HEG was based on the presence of persistent nausea and vomiting, along with at least a 5% loss in body weight, ketonuria, and/or electrolyte imbalance.

Cases with multiple pregnancies, thyroid dysfunction, gestational diabetes or pregestational diabetes diagnosis, hypertension, chronic systemic diseases including kidney or liver diseases were excluded from the study. Furthermore, patients with a known history of psychiatric illness or those using psychotropic drugs were also excluded from the study. These criteria aim to enable a more reliable assessment of psychosocial variables related to the pregnancy process. Women with singleton pregnancies aged 18 years and older without foetal malformations were matched in both groups to have a similar distribution in terms of age and gestational week.

Data Collection: Sociodemographic, obstetric, psychometric, and laboratory data for the study were recorded using a standardised data collection form. Participants' demographic characteristics, such as age, number of pregnancies, number of births, nulliparity status, and body mass index (BMI), were obtained from medical records at the time of application. Information on weight loss, hospital admission, and length of stay in the HEG group was determined from follow-up notes in the electronic record system. Ultrasound measurements taken in the early period were used to determine the gestational age, while the amount of weight gained during pregnancy was recorded based on the patient's own report when she presented to the hospital for delivery.

Obstetric outcomes such as gestational age, birth weight, and mode of delivery were obtained from our hospital's electronic record system. Information regarding the newborn's Apgar scores, presence of foetal distress, and admission to the neonatal intensive care unit (NICU) was assessed based on delivery and neonatal follow-up records.

Additionally, haematological and biochemical parameters for the entire study period were analysed for all participants. Complete blood count components (haemoglobin, leukocyte and platelet levels) along with liver function tests (AST, ALT), kidney function indicators (BUN and creatinine), serum electrolytes (Na^+, K^+, Cl, Ca^{+2}, Mg^{+2}, P), and urine pH and urine specific gravity were recorded via the hospital laboratory information system. Urine samples were assessed using the dipstick method, and ketonuria was graded as negative, +1, +2, or +3. Measurements were performed under the same laboratory conditions, using the same equipment and standard methods.

Edinburgh Postnatal Depression Scale Application: The EPDS was administered to all participants who attended our outpatient clinic for routine postnatal check-ups in a confidential setting using a face-to-face interview methodat postpartum 10-14 days. The scale consists of 10 items that assess the level of depressive symptoms. Each item is graded on a scale of 0–3 points, with a total score ranging from 0 to 30. High scores indicate increased levels of depressive symptoms. In the analyses, consistent with the literature, an EPDS score ≥9 was considered indicative of possible depression risk, while an EPDS score ≥13 was considered indicative of a

high likelihood of Postpartum Depression (PPD). Cases identified during the application as requiring psychological support were referred to the relevant clinics. The EPDS is routinely administered as part of standard postpartum outpatient follow-up at 10–14 days after delivery; the present study is based on a retrospective analysis of these routinely recorded clinical data. This timing was selected because the 10–14-day postpartum period corresponds to routine postpartum follow-up in our institution and has been shown in previous studies to be an appropriate early screening window for identifying women at increased risk of postpartum depressive symptoms.

Sample Size Calculation: The sample size for this study was determined based on the findings of a previous study with a similar design by Senturk et al., titled "The relationship between hyperemesis gravidarum and maternal psychiatric well-being during and after pregnancy: a controlled study." (12). Using the reported difference in postpartum depressive symptoms rates between groups, the effect size was calculated as w = 0.366. A priori power analysis was performed using G*Power version 3.1.9.7 for a chi-square test of independence, with a significance level of $\alpha = 0.05$ and power $(1-\beta) = 0.95$. The analysis indicated that a minimum of 97 participants would be required to detect the expected effect size. The effect size (w = 0.366) was calculated based on the difference in postpartum depressive symptom rates between groups reported in the reference study by Senturk et al., in accordance with Cohen's criteria for chi-square tests. The statistical methodology was reviewed in consultation with a biostatistician.

Statistical Analysis: Statistical analyses were performed using the IBM SPSS Statistics 31.0 package program. The Shapiro-Wilk test was used to determine whether the continuous variables follow a normal distribution. For the comparison between two independent groups, the Independent Samples t-test was applied if the data conformed to a normal distribution, with the results expressed as mean ± SD. The Mann-Whitney U test was used for non-normally distributed data, and results were expressed as median (25th – 75th percentile). The relationships between the qualitative variables were analyzed using Pearson's χ^2 test. Spearman correlation coefficients were calculated to assess relationships between continuous variables. Point biserial correlation coefficients were calculated to evaluate the relationship between binary categorical and continuous variables. Logistic regression analyses (both univariable and multivariable) were performed to identify independent predictors of PPD in the entire cohort and in the HEG subgroup. Multivariable analysis was conducted using a backward likelihood ratio (Backward LR) elimination method. Statistical significance was defined as a p-value < 0.05.

Results

A total of 160 cases were included in the study: 80 pregnant women diagnosed with HEG and 80 healthy pregnant women with similar characteristics in terms of age, parity, and gestational age. When demographic characteristics were examined, no significant differences were found between the groups in terms of age, gravida, parity, nulliparity rate, body mass index, and gestational age ($p>0.05$). As expected, weight loss was observed in the HEG group, and 45% of cases required hospitalisation.

When EPDS scores were evaluated, the median EPDS score in the HEG group was found to be significantly higher than in the control group ($p<0.001$). When threshold values for depression risk were examined, EPDS ≥13 was found in 20% of the HEG group and 7.5% of the control group ($p=0.022$); EPDS ≥9 was found in 41.3% and 22.5%, respectively ($p=0.011$).

In obstetric and neonatal outcomes, gestational age at birth and birth weight were significantly lower in the HEG group ($p=0.017$ and $p=0.013$, respectively). The caesarean section rate was similiar between groups ($p=0.056$). The NICU admission rate was 5% in both groups, with no significant difference observed (Table 1).

When laboratory parameters were compared (Table 2), AST ($p<0.001$) and ALT ($p=0.003$) levels were found to be higher in the HEG group. In addition, BUN levels were significantly lower in the HEG group ($p=0.022$) and urine specific gravity was significantly increased ($p<0.001$). No significant differences were found between the two groups in other haematological (Hb, WBC, platelets) and electrolyte parameters (Na^+, K^+, Cl, Ca^{+2}, Mg^{+2}, P) ($p>0.05$ for all).

In the correlation analysis, a positive correlation was found between BMI and EPDS score in the HEG group ($r=0.235$, $p=0.036$). Furthermore, a negative relationship was found between serum creatinine levels ($r=-0.234$, $p=0.036$) and urine specific gravity ($r=-0.268$, $p=0.016$) and the EPDS score (Table 3). When considering the

Table 1: Comparison of Demographic, Obstetric, Neonatal, and Psychological Characteristics Between The Study and Control Groups

Variables	HEG (n=80)	Control (n=80)	p-value
Age (years)	25 (23–28)	28 (25–32)	0.373[a]
Gravidity	2 (1–2)	2 (1-2)	0.661[a]
Parity	0 (0-1)	1 (0-1)	0.427[a]
Nulliparity	43 (53.8%)	38 (47.5%)	0.429[b]
BMI (kg/m2)	30.82 (25.65–36.64)	29.63 (24.22–34.65)	0.091[a]
Weight Loss (kg)	2 (2–3)	-	-
Weight gain during pregnancy (kg)	10 (10-15)	11 (8-15)	0.778[a]
Gestational Age (week)	9.6 (7.3–12.3)	9.1 (7.1–13.0)	0.519[a]
Hospitalisation requirement	36 (45.0%)	-	-
Length of Hospital Stay (day)	0 (0-3)	-	-
EPDS Score	8 (4-11)	4 (1-8)	<0.001[a]
EPDS ≥ 13	16 (20.0%)	6 (7.5%)	0.022[b]
EPDS ≥ 9	33 (41.3%)	18 (22.5%)	0.011[b]
Gestational age at Birth (week)	39.0 (38.3–39.6)	39.4 (38.6–40.3)	0.017[a]
Birth Weight (g)	3110 (2870-3360)	3215 (3030–3460)	0.013[a]
Birth Method			0.056[b]
Vaginal	39 (48.8%)	51 (63.7%)	
Caesarean	41 (51.2%)	29 (36.3%)	
Fetal Distress	12 (15.0%)	7 (8.8%)	0.222[b]
Apgar Score at 1st minute	9 (9-9)	9 (8–9)	0.136[a]
Apgar Score at 5th minute	10 (10-10)	10 (10-10)	0.363[a]
NICU admission	4 (5.0%)	4 (5.0%)	>0.99[b]

[a] The Mann–Whitney U test was used for comparisons between groups. Data are presented as median (interquartile range).
[b] Categorical variables were compared using the chi-square or Fisher's exact test, as appropriate. Results are shown as n (%).
Abbreviations: HEG, Hyperemesis gravidarum; BMI, body mass index; EPDS, Edinburgh Postnatal Depression Scale; NICU, neonatal intensive care unit

entire cohort, there is a positive correlation between age (r=0.192, p=0.015) and BMI (r=0.201, p=0.011) values and EPDS scores (Table 4).

In the regression analysis conducted in the HEG group, only BMI was found to be a significant independent predictor for EPDS ≥13 (aOR: 1.101, 95% CI: 1.012–1.198, p=0.026). This result indicates that each unit increase in BMI increases the risk of depression by approximately 10%. Age, weight loss, week of diagnosis, ketone positivity, mode of delivery, and NICU requirement were not found to be significant (Table 5).

In the regression analysis including the entire cohort, the presence of HEG was identified as an independent factor significantly increasing the risk of EPDS ≥13 (aOR: 3.319, 95% CI: 1.167–9.446, p=0.025). Accordingly, it was demonstrated that the risk of PPD in pregnant women diagnosed with HEG was approximately three times higher than in healthy pregnant women (Table 6).

Discussion

In this study, we found that women diagnosed with hyperemesis gravidarum (HEG) had significantly higher postpartum depressive symptom scores compared with healthy pregnant controls, and that the likelihood of reaching the clinical threshold for postpartum depressive symptoms (EPDS ≥13) was notably increased.

This association remained significant even after adjusting for potential confounding variables in multivariable analysis, suggesting that HEG itself

Table 2: Comparison of Haematological, Biochemical, and Urinary Parameters Between The Heg and Control Groups

Variables	HEG (n=80)	Control (n=80)	p-value
Haemoglobin (g/dl)	12.9 ± 1.3	12.5 ± 1.3	0.064[a]
WBC ($10^3/\mu L$)	8.71 ± 1.64	9.21 ± 1.89	0.078[a]
Platelet ($10^3/\mu L$)	270 (239–316)	256 (209–309)	0.090[b]
AST (U/L)	17 (14–20)	14 (13–17)	<0.001[b]
ALT (U/L)	13 (10–19)	11 (9–14)	0.003[b]
BUN (mg/dl)	15.40 (12.15–18.85)	17.15 (14.55–20.55)	0.022[b]
Creatinine (mg/dl)	0.52 ± 0.09	0.54 ± 0.11	0.111[a]
Na^+ (mEq/L)	136 (135-137)	136 (135-137)	0.968[b]
K^+ (mEq/L)	4.00 (3.85–4.18)	3.99 (3.84–4.13)	0.567[b]
P (mEq/L)	3.32 ± 0.46	3.34 ± 0.50	0.790[a]
Cl (mEq/L)	103 (102–104)	103 (102–104)	0.450[b]
Ca^{+2} (mEq/L)	8.88 (8.52–9.10)	8.65 (8.46–8.99)	0.148[b]
Mg^{2+} (mEq/L)	1.91 ± 0.14	1.92 ± 0.15	0.702[a]
Urine pH	6.0 (6.0–6.5)	6.0 (6.0–6.5)	0.984[b]
Urine specific gravity	1.027 (1.022–1.030)	1.022 (1.016–1.026)	<0.001[b]
Urine ketone			
+1	18 (22.5%)	-	-
+2	22 (27.5%)	-	-
+3	40 (50.0%)	-	-

[a] Independent samples t-test was used for comparisons between groups. Data are presented as mean ± standard deviation.

[b] The Mann–Whitney U test was used for comparisons between groups. Data are presented as median (interquartile range).

Abbreviations: WBC, White Blood Cell Count; AST, Aspartate Aminotransferase; ALT, Alanine Aminotransferase; BUN, Blood Urea Nitrogen; Na, Sodium; K, Potassium; P, Phosphorus; Cl, Chloride; Ca, Calcium; Mg, Magnesium

is an independent risk factor for postpartum depressive symptomatology.

HEG, through persistent nausea, vomiting, dehydration, and functional impairment, increases psychological vulnerability and may precipitate depressive symptoms. Therefore, HEG should be regarded not only as a physical condition but also as an independent risk factor for the development of postpartum depressive symptoms. A meta-analysis conducted in 2017 demonstrated a significant increase in the prevalence of depression and anxiety among women with HEG and emphasised the need to develop psychological care and support services for these women (13). In another study, where an EPDS score ≥9 was considered indicative of postnatal depression, all forms of nausea and vomiting during pregnancy (NVP) were found to be associated with PPD, with this association increasing gradually with symptom severity (14). In another study where EPDS scores were measured at 15 and 20 weeks of gestation, depressive symptom levels in the HEG group were shown to be statistically significant compared to the control group at both measurement times (15). Consistent with the existing literature, the frequency of postpartum depressive symptoms was higher among women with HEG in our study. Moreover, HEG remained an independent predictor of postpartum depressive symptoms in multivariable regression analysis, highlighting its significant contribution to maternal mental health risk.

There are many studies in the literature examining the relationship between BMI and perinatal depression. A study published in 2021 associated pre-pregnancy obesity with a 33% increased risk of pre-natal depressive symptoms and pre-pregnancy obesity was associated with an increased risk of depressive symptoms in the mother both during pregnancy and in the postpartum period (16). A more recent review found that women with high BMI during pregnancy had higher depressive symptoms during and after pregnancy (17).

Table 3: Correlation Between EPDS Scores and Clinical, Haematological, Biochemical, and Urinary Parameters In The HEG Group

Variables	EPDS Score		EPDS ≥ 9		EPDS ≥ 13	
	r	p-value[a]	r	p-value[b]	r	p-value[b]
Age (year)	0.202	0.072	0.204	0.069	0.096	0.396
Parity	0.084	0.460	0.140	0.216	0.096	0.396
BMI (kg/m2)	0.235	0.036	0.198	0.079	0.232	0.038
GA at Diagnosis (week)	0.167	0.140	0.204	0.070	0.125	0.268
Hospitalization duration (days)	-0.067	0.553	-0.070	0.538	-0.019	0.870
Weight loss (kg)	0.068	0.551	0.110	0.331	0.048	0.670
Weight gain during pregnancy (kg)	-0.006	0.956	0.040	0.728	-0.035	0.757
Haemoglobin (g/dl)	-0.112	0.323	-0.134	0.237	-0.058	0.612
WBC ($10^3/\mu L$)	0.069	0.545	-0.015	0.893	0.092	0.417
Platelet ($10^3/\mu L$)	-0.141	0.212	-0.059	0.604	0.049	0.665
AST (U/L)	-0.177	0.117	-0.178	0.115	-0.082	0.469
ALT (U/L)	-0.109	0.335	-0.170	0.133	-0.113	0.316
BUN (mg/dl)	-0.101	0.373	-0.157	0.165	-0.091	0.420
Creatinine (mg/dl)	-0.234	0.036	-0.217	0.054	-0.074	0.515
Urine density	-0.268	0.016	-0.204	0.069	-0.121	0.284
GA at Delivery (week)	0.070	0.540	0.130	0.250	-0.035	0.761
Birth weight (g)	-0.035	0.757	0.060	0.5595	-0.218	0.052

[a] Spearmen's correlation analysis was used to assess associations between continuous variables.
[b] Point-biserial correlation was used to assess associations between continuous and categorical variables.
Abbreviations: EPDS, Edinburgh Postnatal Depression Scale; BMI, body mass index; GA, Gestational age; WBC, White Blood Cell Count; AST, Aspartate Aminotransferase; ALT, Alanine Aminotransferase; BUN, Blood Urea Nitrogen

In our study, body mass index was found to be an independent predictor of EPDS ≥13 in the HEG group (aOR≈1.10). In this context, the relationship between BMI and depressive symptoms observed in our study is consistent and in line with the literature.

In terms of obstetric outcomes, the lower gestational age at delivery and birth weight in the HEG group is consistent with previous studies showing that HEG is associated with adverse perinatal outcomes. A retrospective cohort study of 232,476 pregnancies found that women with hyperemesis gravidarum had higher odds of preterm birth and caesarean delivery (18). Similarly, a 2023 meta-analysis emphasised that HEG was associated with various adverse perinatal outcomes, including low birth weight and preterm birth, but no association with foetal loss, perinatal deaths, or neonatal deaths (19). These results support the small but significant differences observed in our findings. Although the difference did not reach statistical significance, the numerically higher rate of fetal distress observed in the HEG group may reflect the increased physiological and metabolic stress associated with severe nausea and vomiting during pregnancy. From a biochemical perspective, the elevation of AST and ALT levels and increased urine specific gravity in the HEG group are consistent with findings in the literature. A study published in 2020 reported elevated liver enzymes in approximately half of HEG cases (20). Another study reported a marked increase in AST and ALT levels and a significant decrease in Na^+ and K^+ levels in pregnant women diagnosed with HEG (21). This indicates that HEG is associated with biochemical hepatocellular involvement and fluid-electrolyte imbalance. Similarly, in our study, there was an increase in liver enzymes and urine specific gravity. However, no significant difference was found in serum electrolyte levels between the HEG group and the control group; this may be due to the variability in the severity of nausea and vomiting and the degree of metabolic involvement

Table 4: Correlation Between EPDS Scores and Clinical Parameters In The Entire Study Cohort

Variables	EPDS Score		EPDS ≥ 9		EPDS ≥ 13	
	r	p-value[a]	r	p-value[b]	r	p-value[b]
Age (year)	0.192	0.015	0.225	0.004	0.127	0.109
Parity	0.003	0.972	0.147	0.064	0.066	0.404
BMI (kg/m2)	0.201	0.011	0.180	0.023	0.114	0.152
Weight gain during pregnancy (kg)	0.085	0.284	0.083	0.295	-0.023	0.771
Haemoglobin (g/dl)	0.002	0.981	-0.033	0.682	0.051	0.526
WBC ($10^3/\mu L$)	-0.020	0.800	-0.078	0.326	0.035	0.662
GA at Delivery (week)	0.010	0.898	0.116	0.144	-0.003	0.968
Birth weight (g)	-0.117	0.139	-0.034	0.670	-0.150	0.058

[a] Spearmen's correlation analysis was used to assess associations between continuous variables.
[b] Point-biserial correlation was used to assess associations between continuous and categorical variables.
Abbreviations: EPDS, Edinburgh Postnatal Depression Scale; BMI, body mass index; GA, Gestational age; WBC, White Blood Cell Count; AST, Aspartate Aminotransferase; ALT, Alanine Aminotransferase; BUN, Blood Urea Nitrogen

Table 5: Univariable and Multivariable Logistic Regression Analysis of Factors Associated With EPDS ≥ 13 in the HEG Group

Variables	Univariable			Multivariable		
	OR	95% CI	p-value	aOR	95% CI	p-value
Age (year)	1.069	0.948–1.206	0.273	-	-	-
BMI (kg/m2)	1.069	0.999–1.144	0.052	1.101	1.012–1.198	0.026
Weight gain during pregnancy (kg)	0.984	0.882–1.098	0.776	-	-	-
Weight loss (kg)	1.192	0.708–2.008	0.509	-	-	-
Hospitalisation requirement	1.286	0.429–3.852	0.654	-	-	-
GA at HEG diagnosis	1,096	0.947–1.270	0.219	-	-	-
Urine ketone level (ordinal)	1.076	0.541–2.138	0.835	-	-	-
Nulliparity	0.605	0.200–1.825	0.372	-	-	-
Mode of delivery (1-Caesarean section)	0.686	0.228–2.068	0.504	-	-	-
NICU requirement	4.429	0.574–34.194	0.154	-	-	-

Note: Urine ketone level was coded ordinally.
Abbreviations: OR, odds ratio; aOR, adjusted odds ratio; CI, confidence interval; BMI, body mass index; EPDS, Edinburgh Postnatal Depression Scale; HEG, Hyperemesis gravidarum; GA, Gestational age; NICU, neonatal intensive care unit

among patients with HEG.

When these findings are evaluated together, it can be considered that HEG creates a bidirectional interaction between biological stress (dehydration, weight loss, liver enzyme changes) and psychological stress (depressive symptoms). Current clinical guidelines also emphasise the necessity of a multidisciplinary approach in the management of HEG (22,23). In particular, the routine use of screening scales such as the EPDS may contribute to the early identification of at-risk pregnant women. The findings of our study provide evidence that psychological assessment should be an integral part of obstetric follow-up in pregnant women diagnosed with HEG. From a biopsychosocial perspective, prolonged exposure to severe nausea, vomiting, dehydration, nutritional deficiency, and repeated hospitalizations may act as biological stressors, while functional impairment, reduced quality of life, and anxiety related to pregnancy

Table 6: Univariable and Multivariable Logistic Regression Analysis of Factors Associated With EPDS ≥ 13 in the Entire Study Cohort

Variables	Univariable			Multivariable		
	OR	95% CI	p-value	aOR	95% CI	p-value
Age (year)	1.085	0.992–1.188	0.075	-	-	-
BMI (kg/m2)	1.041	0.988–1.097	0.134	-	-	-
Weight gain during pregnancy (kg)	0.997	0.910–1.091	0.941	-	-	-
Mode of delivery (1-Caesarean section)	1.083	0.439–2.676	0.862	-	-	-
NICU Admission	2.200	0.415–11.663	0.354	-	-	-
Nulliparity	0.635	0.255–1.582	0.329	-	-	-
HEG	3.083	1.139–8.349	0.027	3.319	1.167–9.446	0.025

Abbreviations: OR, odds ratio; aOR, adjusted odds ratio; CI, confidence interval; BMI, body mass index; NICU, neonatal intensive care unit; HEG, Hyperemesis gravidarum

complications may contribute psychological stress, collectively increasing vulnerability to depressive symptoms.

Strengths and Limitations: This research contributes to the literature by jointly evaluating psychological and biochemical parameters in HEG. However, the single-centre nature of the study and the assessment of depression solely through a self-report scale may partially limit its generalisability. Nevertheless, the reporting of similar findings in different populations supports the external validity and scientific consistency of the results obtained. Additionally, potential confounding factors such as social support, educational level, and other psychosocial variables could not be included in the regression models due to the retrospective design and limitations of available clinical records.

This study has demonstrated that (HEG) is not merely a physical pregnancy complication but also a clinical condition that significantly affects psychological well-being. Consequently, it is clear that hyperemesis gravidarum must be addressed holistically, considering both its biological and psychological aspects. In clinical follow-up, it is important to routinely assess not only hydration and metabolic improvement but also mental state. In particular, the use of easily applicable scales such as the EPDS can contribute to the early identification of pregnant women at risk. These findings emphasise the importance of a multidisciplinary approach in the management of hyperemesis gravidarum during pregnancy, particularly through collaboration between obstetricians, psychiatrists, and nutritionists.

Interestingly, higher EPDS scores were negatively correlated with serum creatinine levels and urine specific gravity in the HEG group. This finding may reflect alterations in hydration status or metabolic stress associated with severe nausea and vomiting; however, the clinical significance of this association remains unclear and warrants further investigation.

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