



The Evaluation of Attachment Style and Temperament in Patients With Hyperemesis Gravidarum: Does the Idea That Hyperemesis Gravidarum Has a Psychological Origin Persist?

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Abstract

Background: Hyperemesis Gravidarum (HG) is a common disease in pregnancy during the first trimester. Patients suffering from HG commonly present with dehydration, nutritional depletion, electrolyte imbalance, and the loss of at least 5% of body weight. Although the psychological etiology of HG is not clear, it has been shown that psychiatric symptoms are extensively present in patients with HG.

Objectives: The aim of this study was to investigate the relationship between temperament, attachment style and hyperemesis gravidarum.

Materials and Methods: This case-control study was conducted at Kırıkkale University Hospital in Kırıkkale, Turkey, between May 2015 and May 2017. A total of 98 pregnant women suffering from HG in their first trimester of pregnancy (HG group) and 95 healthy pregnant women in their first trimester of pregnancy (control group) were included in the study. Adult attachment styles were determined as secure, fearful, preoccupied, and dismissing. The evaluation of temperament was done using the TEMPS-A scale.

Results: The mean secure attachment style score in the HG group was 3.9 ± 0.9 and significantly lower than the mean attachment style score (4.6 ± 1.1) in the control group ($P = 0.001$). In the TEMPS-A scale, patients with HG showed significantly higher mean depressive (9.7 ± 3.8) and mean anxious scores (13 ± 2.3) than those of the control group (6.6 ± 2.9 and 8 ± 0.9 , respectively) ($P = 0.001$ and $P = 0.040$, respectively).

Conclusions: This study revealed that HG patients had more common depressive and anxious temperament characteristics and lower secure attachment style than non-HG patients. Due to the fact that attachment and temperament styles are relatively stable throughout life, we thought that psychiatric problems may play a role on development of HG.

Keywords: Hyperemesis Gravidarum, Temperament

1. Background

Nausea and vomiting are frequent symptoms of pregnancy during the first trimester. Hyperemesis gravidarum (HG) is an extreme form of these symptoms with a prevalence varying between 0.3% and 2% of pregnancies (1). Patients suffering from HG commonly present with dehydration, nutritional depletion, electrolyte imbalance, and the loss of at least 5% of body weight. HG usually begins during the 1st trimester and lasts until the midpoint of the 2nd trimester. Approximately 10% of HG patients require hospitalization (2).

Endocrine factors, gastrointestinal dysfunction, autonomic nervous dysfunction, and psychosomatic factors may play a role in the pathogenesis of HG (3). Although

the psychological etiology of HG is not yet clear, psychiatric symptoms are extensively present in patients with HG and the opinion that HG has a psychological origin is still valid (4). According to psychoanalytic theory, subconscious psychological conflict or distress, which cause somatization and conversion in patients with HG, results from an underlying psychiatric problem (5). A recent meta-analysis by Mitchell-Jones et al., reported a relationship between HG and depression and anxiety in pregnancy. Mitchell-Jones et al., concluded that their meta-analysis demonstrated an increase in psychological morbidity in women with HG (6). It has been reported in some studies that depression risk enhanced in HG patients with a history of depression (7, 8), however, on the contrary, it has been reported in some

studies that depression risk enhanced in HG patients with no history of depression (9, 10). The results of the studies investigated the relationship between the grade of HG and the risk of psychological distress such as depression and anxiety are also conflicting (11-14).

It is not clear in literature yet that whether psychiatric problems cause HG or HG causes psychiatric problems. In a recent study, Kjeldgaard et al., investigated the the risk of emotional distress during and after pregnancy in HG patients and they reported that enhanced risk of developing emotional distress might primarily be a result of HG (15). In an another recent study, Kjeldgaard et al., investigated the history of depression and risk of hyperemesis gravidarum. They reported that the majority of women with HG had no symptoms of depression. Depression does not seem to be a main driver in the aetiology of HG (16). Aksoy et al., reported in their prospective case-control study that psychological distress associated with HG was a direct consequence rather than a cause of HG (9). On the other hand, Tan et al. reported that much of the psychological distress in acute hyperemesis gravidarum is self-limiting and probably in the causal pathway of hyperemesis gravidarum (14). Simsek et al., suggested that increased anxiety and depression levels may be involved in the pathogenesis of hyperemesis gravidarum (17).

Attachment theories center on interactions between a child's developing self-regulatory system and their primary care provider's reactions, which can influence the individual's cognitions, emotions, and behaviors during life (18). The literature suggests that an individual's characteristic attachment behaviors are activated as a result of an illness or threat (19).

According to the psychobiological model, temperament represents constitutionally based individual differences in emotional and motor reactivity, as well as self-regulation, demonstrating consistency across situations, and relative stability over time in life (20). The temperament evaluation of Memphis, Pisa, Paris, and San Diego-auto questionnaire (TEMPS-A) was developed by Akiskal et al., to determine affective temperaments in psychiatric patients and healthy volunteers and was recently reviewed by Dembinska-Krajewska et al., (21). The evaluation measures affective temperaments on five scales, including depressive, cyclothymic, hyperthymic, irritable, and anxious. Affective temperaments are accepted ancestor of psychiatric disorders and their determination is important for early diagnosis and treatment of psychiatric disorders. It has been reported that depressive temperament is associated with depressive disorder. Irritable, hyperthymic, and cyclothymic temperaments are associated with bipolar disorders (22).

In this study we aimed to investigate the possible dif-

ference between patients with and without HG for affective temperaments and attachment styles. Due to the fact that the attachment style is shaped by child's developing self-regulatory systems, affective temperaments are an accepted ancestor of psychiatric disorders and they are relatively stable over time. In this study, we hypothesized that the determination of attachment style and affective temperament in HG patients could be useful clarifying the confusion about whether psychiatric problems cause HG or HG causes psychiatric problems.

2. Materials and Methods

This case-control study was conducted at Kırıkkale University Hospital, a tertiary reference center in Kırıkkale, Turkey, between May 2015 and May 2017. A total of 100 pregnant women, suffering from HG, who were hospitalized in our Obstetric Inpatient Clinic (HG group), as well as 100 healthy pregnant women who were admitted to our obstetric outpatient clinic for routine antenatal care (control group) were included in the study. Information about the study was given to all participants and informed consent was obtained from all participants. The study protocol was approved by the local Ethics Committee (27.04.2015-10/18). The study was conducted according to the principles of the Declaration of Helsinki.

2.1. Patient Selection

Our study included criteria for both inclusion in the study and the control group.

The inclusion criteria for the study group were as follows:

Age 18 years or older, Singleton viable intrauterine pregnancy at first trimester (confirmed by precise date of the last menstrual period and an ultrasound scan), Diagnosis of HG: [Symptoms including frequent vomiting (more than three times a day), incapability to continue oral nutrition, weight loss of more than 5% of body mass, positive ketonuria test (1+, 2+, 3+)], Ability to speak Turkish, No systemic illness or concomitant psychiatric condition before pregnancy.

The inclusion criterias for the control group were as follows:

Age 18 years or older, Singleton viable intrauterine pregnancy at first trimester (confirmed by precise date of the last menstrual period and an ultrasound scan). No diagnosis for HG, Ability to speak Turkish, and no systemic illness or concomitant psychiatric condition before pregnancy.

The criteria for exclusion from both the study and control groups were as follows:

Medical disorders including cardiovascular and pulmonary system diseases, peptic ulcer, hyperthyroidism and other endocrine abnormalities, hepatic disorders, urinary tract infection, or intracranial disorders, Psychological disorders (depression, anxiety, bipolar disorder, delirium, eating disorders, and psychotic disorder). Chronic intake of any drug, Multiple pregnancy. Known obstetric complications such as imminent abortion, gestational trophoblastic disease and ectopic pregnancy.

One patient with HG and one healthy pregnant patient were excluded from the study due to the urinary tract infection. One patient with HG and two healthy pregnant patients were excluded from the study due to chronic intake of antidepressant drug. A total of two healthy pregnant patients were excluded from the study due to hyperthyroidism.

The patients' age, gestational age, number of pregnancies, weight at admittance, body mass index (BMI) at admittance, weight before pregnancy and BMI before pregnancy were recorded. Attachment style evaluation and temperament evaluation were performed.

2.2. Attachment Style Evaluation

The study used the Relationships Questionnaire (RQ) and Relationships Scales Questionnaire (RSQ) of the Bartholomev and Horowitz adult attachment styles framework, which defines styles as secure, fearful, preoccupied, and dismissing (23). Sümer and Güngör reported on the validity and reliability of the Turkish version of these questionnaires (24). Relationships Questionnaire (RQ) consists of four question and Relationships Scales Questionnaire (RSQ) consists of 30 question. Responses to the questions were numbered from 1 to 7. Number one was described as it never describes me and number seven was described as it completely defines me. The sum of the scores given to the questions was statistically analyzed.

2.3. Temperament Evaluation

The temperament evaluation used the TEMPS-A scale, developed by Akiskal et al., (25). Vahip et al., studied the validity and reliability of the Turkish version of the scale (26). The Turkish form of the scale has 18 items for depressive characteristics, 19 items for cyclothymic characteristics, 20 items for hyperthymic characteristics, 18 items for irritable characteristics, and 24 items for anxious temperamental characteristics. In the scale, the cutoff points for dominant temperaments are 13, 18, 20, 13, and 18 characteristics, respectively.

All patients were asked how much she wanted the pregnancy. The response of this question was performed by the patient with standard 100 mm visual analogue scale (VAS).

The HG group was divided into 2 groups according to the VAS scores of recent pregnancy request. The HG1 group had a VAS score ≤ 5 and the HG2 group had a VAS score > 5 .

The patients were accompanied by the same observer during the filling of the questionnaires.

2.4. Statistical Analysis

Data analysis was performed using SPSS for Windows Version 16.0 (IL.Chicago.USA). Continuous variables were reported as mean \pm standard deviation (SD). The Shapiro-Wilk test was used to find normality for continuous variables in groups. The variables showed a normal distribution ($P > 0.05$), therefore, student t-test was used to compare the groups. The relation between parameters was done with the Pearson correlation test. Two-sided p values of < 0.05 was considered as statistically significant. Power analysis of the study was performed with program of G Power. The sample size of 98 patients per arm provides 82% power at the two-sided significance level of 5%.

3. Results

The demographic features of groups in the study are presented in Table 1. There were no significant differences between the groups for the parameters of age, gestational age, gravidy, prepregnancy weight, prepregnancy BMI, weight at admittance, and BMI at admittance ($P > 0.05$) (Table 1).

Attachment styles and models of self-stigma and others in the HG and control groups are shown in Table 2. The mean secure attachment style score in the HG group was significantly lower than that in the control group ($P < 0.01$). There were no significant differences between groups for the scores of fearful attachment style, dismissing attachment style, preoccupied attachment style, models of self, and models of others ($P > 0.05$).

The TEMPS-A subscales of the HG and control groups are shown in Table 3. Patients with HG showed significantly higher depressive and anxious scores compared to those in the control group. There were no differences between the groups for scores of cyclothymic, hyperthymic, and irritable temperament according to TEMPS-A scale.

The comparison of attachment styles and models of self-stigma and others between groups of HG1 and HG2 are shown in Table 4. The mean preoccupied attachment style score of the HG1 group was significantly higher than the preoccupied attachment style score of the HG2 group ($P = 0.040$). There were no significant differences between the 2 groups for the other attachment styles, models of self, and models of others parameters ($P > 0.05$).

The TEMPS-A subscales in the HG1 and HG2 groups are shown in Table 5. Depressive and irritable temperament

Table 1. The Demographical Characteristics in HG and Control Groups^{a,b}

	HG (N = 98), Mean ± SD	Control (N = 95), Mean ± SD	P Value
Age, years	26 ± 5.5	28 ± 6.9	0.190
Gravidity, number	1.9 ± 0.8	2.6 ± 1.2	0.005
Gestational age, weeks	9.8 ± 1.4	8.7 ± 1.8	0.055
Pre-pregnancy weight, kg	66.8 ± 8	67.4 ± 13	0.969
Pre-pregnancy, BMI, (kg/m ²)	25.5 ± 2.6	24.9 ± 3.6	0.427
Weight at admission, kg	64.6 ± 8	68.8 ± 13	0.084
BMI at admission, (kg/m ²)	24.6 ± 2.2	25.6 ± 3.5	0.121

^aValues are expressed as mean ± SD.^bStudent's t-test, P < 0.05 was considered significant.**Table 2.** Attachment Styles and Models of Self-Stigma and Others in HG and Control Groups^{a,b}

	HG (N = 98), Mean ± SD	Control (N = 95), Mean ± SD	P Value
Secure attachment style	3.9 ± 0.9	4.6 ± 1.1	0.001
Fearful attachment style	4.4 ± 1.2	4.7 ± 1	0.234
Preoccupied attachment style	4.1 ± 1	4.2 ± 1.2	0.498
Dismissing attachment style	4.3 ± 1.2	4.8 ± 1.2	0.146
Models of self	0 ± 0.4	1 ± 0.4	0.107
Models of others	0.2 ± 0.3	0 ± 0.4	0.726

^aValues are expressed as mean ± SD.^bStudent's t-test, P < 0.05 was considered significant.**Table 3.** TEMPS-A Subscales in HG and Control Groups^{a,b}

	HG (N = 98), Mean ± SD	Control (N = 95), Mean ± SD	P Value
Depressive	9.7 ± 3.8	6.6 ± 2.9	0.001
Cyclothymic	7.5 ± 0.7	9 ± 3.9	0.143
Hyperthymic	8.7 ± 3.9	10.3 ± 4.4	0.091
Irritable	3.5 ± 0.3	4.4 ± 0.6	0.197
Anxious	13 ± 2.3	8 ± 0.9	0.040

^aValues are expressed as mean ± SD.^bStudent's t-test, P < 0.05 was considered significant.**Table 4.** Attachment Styles and Models of Self-Stigma and Others in HG Group 1 (VAS ≤ 5) and HG Group 2 (VAS > 5)^{a,b}

	HG Group 1 (VAS ≤ 5) (N = 31), Mean ± SD	HG Group 2 (VAS > 5) (N = 67), Mean ± SD	P Value
Secure attachment style	3.8 ± 0.8	3.9 ± 0.9	0.700
Fearful attachment style	4.8 ± 1.1	4.2 ± 1.2	0.100
Preoccupied attachment style	5.0 ± 1	4.2 ± 1.2	0.040
Dismissing attachment style	4.2 ± 0.8	4.2 ± 1.1	0.500
Models of self	-0.8 ± 2.4	0.2 ± 3.7	0.600
Models of others	0.4 ± 2.8	0.1 ± 2.3	0.600

^aValues are expressed as mean ± SD.^bStudent's t-test, P < 0.05 was considered significant.

scores in the HG1 group were significantly higher than scores in the HG2 group (P < 0.05). There were no differences between groups for the cyclothymic, hyperthymic, and anxious scores in the TEMPS-A scale.

In the HG group, we observed positive correlations between weight loss and depressive temperament (R = 0.22, P = 0.040) and between weight loss and anxious tempera-

ment (R = 0.27, P = 0.010). We also evaluated a possible relationship among ketonuria, depressive temperament, and secure attachment style. When there was a positive correlation between ketonuria and depressive temperament (R = 0.36, P < 0.010), a negative correlation was observed between ketonuria and secure attachment style (R = -0.24, P = 0.030). We detected a positive correlation between depres-

Table 5. TEMPS-A Subscales in HG Group 1 (VAS ≤ 5) and HG Group 2 (VAS > 5)^{a, b}

	HG Group 1 (VAS ≤ 5) (N = 31), Mean \pm SD	HG Group 2 (VAS > 5) (N = 67), Mean \pm SD	P Value
Depressive	11.8 \pm 2.8	9 \pm 3.9	0.014
Cyclothymic	8.8 \pm 5.2	7 \pm 4.6	0.300
Hyperthymic	8 \pm 4	8.9 \pm 3.8	0.500
Irritable	5 \pm 2.3	3 \pm 2.2	0.014
Anxious	13.1 \pm 5.3	14.2 \pm 8.1	0.400

^aValues are expressed as mean \pm SD.

^bStudent's t-test, P < 0.05 was considered significant.

sive temperament and anxious temperament ($R = 0.216$, $P < 0.050$), and a negative correlation between secure attachment style and depressive temperament ($R = -0.08$, $P = 0.040$). We observed a negative correlation between depressive temperament and VAS score of recent pregnancy request ($R = 0.275$, $P < 0.050$), and positive correlation between secure attachment style and VAS score of recent pregnancy request ($R = 0.245$, $P < 0.050$).

4. Discussion

To our knowledge, this study is the first investigating the relationship among HG, temperament, and attachment styles. Our results show that mean secure attachment style score in the HG group was significantly lower than that in control group. Patients with HG had significantly higher depressive and anxious scores in the TEMPS-A scale than the control group. We observed a positive correlation between depressive temperament and anxious temperament in the HG group, and a negative correlation between secure attachment style and depressive temperament.

Many psychiatric risk factors associated with HG have been mentioned, such as psychosocial stress, depression, anxiety, personality disorders, and psychological conflict (27-29). A retrospective case control study noted that women hospitalized with a diagnosis of HG exhibited more frequent psychiatric symptoms (7). Swallow et al., reported that HG in early pregnancy is related to psychiatric morbidity (13). Hoirisch-Clapauch et al., concluded that mental disorders could cause adverse obstetric outcomes such as HG (30). Poursharif et al., reported that over 80% of HG patients suffered some negative psychosocial impact (31). One study showed that HG in early pregnancy is related to psychiatric morbidity (13), another study concluded that mental disorders could cause adverse obstetric outcomes such as HG (30), while another study determined that over 80% of HG patients suffered some negative psychosocial impact (31). As a result of all this, it can be mentioned that there is a consensus in the literature about the increased morbidity of psychiatric disorders in

HG patients. Although HG patients usually present psychiatric symptoms, the relationship between HG and psychiatric disorders has not been clearly demonstrated. Furthermore, the literature reveals some controversial results about the relationship between HG and psychiatric disorders (32, 33) while failing to demonstrate the causal relationship between HG and psychiatric disorders. In a recent population-based pregnancy cohort study, Kjeldgaard et al., reported that increased risk of developing emotional distress may primarily be a consequence of HG (15). However, we showed that in this study, depressive and anxious temperaments as well as secure attachment style, which are relatively stable throughout life, are significantly different in HG patients; therefore, we thought that psychiatric disorders could be important in the aetiology of HG.

Depression is the most frequent psychiatric disorder associated with HG in the literature. Senturk et al., reported that patients who suffered from HG experienced more frequent postpartum depression, negative psychiatric status, and higher probability of depression in the postpartum period (34). Annagur et al., concluded that HG seems to be associated with depression and anxiety symptoms (35). In a systematic review and meta-analysis, it was noted that frequency of depression and anxiety was significantly higher in patients with HG (6). Ezberci et al., found higher depression scores in patients with HG (36), while another study concluded that severity of symptoms of HG could be associated with frequency of depression symptoms (12). Hizli et al., reporting on their prospective case-control study, determined that depression risk is raised in patients with HG, and psychiatric consultation should be made for these patients (37). Simsek et al., suggested that increased anxiety and depression levels may be embedded in the pathogenesis of hyperemesis gravidarum (17). We found that depressive temperament was more frequent in HG patients than controls, and that depressive temperament was also more frequent in patients that showed more less recent pregnancy desire. Our results showed concordance with previous studies. We also found a positive correlation among depression score, weight loss, and ketonuria in HG patients. In the literature, there is

confusion as to whether HG causes depression disorder, or if depression causes HG. Kjeldgaard et al., reported in another population-based pregnancy cohort study that depression does not seem to be a main driver in the aetiology of HG (16). However, in this study we found significantly increased depressive temperament score, which is relatively stable throughout life in HG patients. In addition, we decided depression may have a role in the aetiology of HG.

There is little data in the literature examining the relationship between HG and anxiety. Seng et al., reported in their retrospective case control study that women who have experienced post-traumatic stress disorder were almost 4 times more likely to have suffered from HG as a pregnancy complication (38). In a retrospective study, Vasconcelos et al., found that obsessive compulsive disorder was more common in HG patients (39). Similar to previous studies, we found that anxious temperament was more frequent in HG patients. We also found that our study participants exhibiting an anxious temperament showed positive correlation with weight loss and ketonuria.

Attachment is a comparatively durable emotional component that develops between a child and mother or other primary care giver (40). Research indicates that an individual's characteristic attachment behavior is likely activated as a result of an illness or threat and can cause extended need for caring (19). For example, Tarantion et al., found that insecure attachment could cause severe pain and psychological symptoms in children suffering from migraine (41). Appel et al., reported that bariatric surgery results could be affected by patients attachment styles (42). Maras et al. concluded that insecure attachment style was significantly associated with a higher BMI, and an increased BMI could be the result of an eating disorder associated with insecure attachment (43). In this study, we found that secure attachment style was significantly lower in HG patients than in the control group. In addition, there was a negative correlation between depressive temperament and secure attachment style.

Our study has the following limitation. We performed temperament and attachment style questionnaires in patients with HG and control group in the first trimester while complaints of nausea and vomiting continue. Control questionnaires in the 2nd or 3rd trimester, when nausea and vomiting ended, could be done.

In conclusion, this study revealed that HG patients had more common depressive and anxious temperament characteristics and lower secure attachment style than non-HG patients. Due to the fact that attachment and temperament style are relatively stable throughout life, we thought that psychiatric problems may play a role on development of HG. Determination of temperament and attachment style in HG patients is a new research area and further ex-

panded studies are needed to explore our results.

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