

An Investigation of Probable Relationships between Depressive Symptoms, Mixed Symptoms and Affective Temperaments in a Sample of Pregnant Women

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ABSTRACT

Objective: Antenatal depression is associated with several obstetric complications that pose a risk for both maternal and fetal health. The recognition of mixed characters in the major depressive period is very important for the prognosis and treatment choice. Recent studies have reported remarkable relationships between affective temperaments and mood disorders. In this context, the current study aims at determining the frequency of depressive symptoms in a sample of pregnant women and investigating the probable relationships between mixed depressive symptoms and characteristics of temperament.

Method: This study was conducted at Dinar State Hospital from January 2018 to July 2018. It included 164 volunteers comprising of pregnant women who were consecutively referred to the Obstetrics and Gynecology Outpatient Clinic. The pregnant participants filled out a sociodemographic data form, Beck's Depression Inventory (BDI), Modified Hypomania Checklist (MHC), and TEMPS-A (Temperament Evaluation of Memphis, Pisa, Paris, San Diego Autoquestionnaire) inventories.

Results: The participants' BDI median score was found to be 5.00 ± 4.00 , and 4.3% pregnant women scored above the BDI cutoff value. MHC mean score was 2.00 ± 2.00 . There was only one pregnant woman with mixed-symptom depression risk. Despite the absence of a significant correlation between TEMPS-A sub-inventory scores and MHC, BDI, and TEMPS-A sub-inventory scores presented significant correlations.

Conclusions: Our findings suggest that pregnancy neither increases the risk of depressive symptoms nor could be considered a protective factor for the progression of depressive symptoms. Bearing in mind the characteristics of temperament in the scanning of antenatal depression and taking them into account for the intervention plans might be valuable. Further prospective studies are essential for the better evaluation of the presence and impacts of mixed symptoms in the gestational depression.

Key words: Pregnancy, depression, mixed symptoms, hypomania, affective temperament

ÖZ

Gebelik Döneminde Depresif Belirtiler, Karma Belirtiler ve Mizaç Özellikleri Arasındaki Olası İlişkilerin Araştırılması

Amaç: Gebelik döneminde depresyon hem anne hem de fetal sağlık için risk oluşturan çeşitli obstetrik komplikasyonla ilişkilidir. Majör depresif dönemde karma özelliklerin tanınması, tedavi seçimi ve prognoz açısından önem taşımaktadır. Yakın dönemdeki çalışmalarda affektif mizaçlarla duygudurumdaki bozulmalar arasında önemli ilişkiler bildirilmiştir. Bu çalışmada gebe kadınlardan oluşan bir örnekleme depresif belirtilerin sıklığının saptanması ve karma depresif belirtiler ile mizaç özellikleri arasındaki olası ilişkilerin incelenmesi amaçlanmıştır.

Yöntem: Bu çalışma Ocak 2018 ile Temmuz 2018 tarihleri arasında Dinar Devlet Hastanesi'nde yürütülmüştür. Kadın Hastalıkları ve Doğum polikliniğine ardışık olarak başvuran ve çalışmaya katılmayı kabul eden 164 gebe kadın dahil edilmiştir. Sosyodemografik veri formu, Beck Depresyon Ölçeği (BDÖ), Değiştirilmiş Hipomani Kontrol Listesi (DHKL), TEMPS-A (Temperament Evaluation of Memphis, Pisa, Paris, San Diego Autoquestionnaire) ölçekleri gebeler tarafından doldurulmuştur.

Bulgular: Katılımcıların BDÖ ortanca puanının $5,00 \pm 4,00$ olduğu ve gebelerin %4.3'ünün BDÖ kesme puanının üzerinde oldukları değerlendirildi. DHKL ortanca puanı $2,00 \pm 2,00$ idi. Karma belirtili depresyon riskinde olan sadece bir gebe vardı. TEMPS-A alt ölçek puanları ile DHKL puanları arasında anlamlı korelasyon bulunmazken, BDÖ puanları ile TEMPS-A alt ölçek puanları arasında anlamlı korelasyonlar saptanmıştır.

Sonuç: Bulgularımız gebelik döneminin depresyon riskini artırmadığı gibi depresyon gelişimi için koruyucu bir faktör olarak da değerlendirilemeyeceğini düşündürmektedir. Mizaç özelliklerinin gebelik döneminde depresyonun taranmasında ve müdahale planlarında dikkate alınmasında faydalı olabilir. Gebelik dönemi depresyonunda, karma özelliklerin varlığının ve olası etkilerinin değerlendirilmesinde ileriye dönük ve uzunlamasına izleminin planlandığı çalışmalara ihtiyaç duyulmaktadır.

Anahtar sözcükler: Gebelik, depresyon, karma belirtiler, hipomani, affektif mizaç

INTRODUCTION

Pregnant women experience numerous physiological and psychological changes. Although many of them are able to adapt to those changes, a significant portion of them may present imperative psychological changes.¹ Gestational and postpartum depression poses a serious health problem for women and their families. Some studies have reported that 10-16% of the women are diagnosed with major depression during pregnancy or within the postpartum first year.^{2,3} These figures are higher than the prevalence of depression in adult women, which is reported to be 4.4%.⁴ Although postpartum depression is a clinical condition that has been known for many years, it is still underdiagnosed. A significant proportion of women with gestational psychiatric symptoms are unable to receive necessary treatment.⁵ For instance, a recent study reports that 66% of the women with gestational depression had never been diagnosed.⁶

Gestational depression is associated with preterm labor, low birth weight, neonatal complications, and many other obstetric complications that may pose a health risk to both mother and infant.⁷ Infant's early exposure to stress due to maternal depression may deteriorate the Hypothalamic-Pituitary-Adrenal (HPA) system axis, increase the infant's sensitivity to stressors, and break the infant's self-regulation mechanisms.⁸ Additionally, antenatal depression is a strong specifier of postpartum depression.⁹ The infants who are exposed to maternal depression during pregnancy experience more frequent cognitive, emotional and behavioral problems.^{10,11} The perinatal period is a critical period wherein epigenetic programming is affected, and not only the prenatal health but also future generations are determined in this period.¹² On the other hand, the interventions to maternal depression have been found to be creating a positive effect on both mothers and infants.¹³ The significance of the early recognition of maternal depression has been accepted in many international best-practice guidelines.^{14,15}

The mixed depression has been specified in the latest version of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) and is defined as the presence of at least 3 manic symptoms accompanying depression. Distractibility, short temper, and increased psychomotor activity are excluded from those symptoms.¹⁶ Although mixed depression is included in the categorization as part of the DSM-5, several studies have reported pressured speech, short temper, a flight of ideas, increased psychomotor activity and distractibility to be the most frequently observed symptoms of depression in some cases.¹⁷ On the other hand, apart from the fact that mixed depression cases are more resistant to treatment, it is accompanied with more comorbidities such as increased risk of self-destruction, worse clinical course, substance abuse, anxiety disorders, etc.^{18,19} In such patients, compared with non-mixed unipolar depression cases, variables such as family history of bipolar disorder (BDP) and early onset are similar to those of the BDP.^{20,21}

Moreover, Akiskal and Mallya reported a relationship between bipolar disorder and affective temperament features. They also mentioned that affective temperament features contribute to a susceptibility to mood disorder episodes.²² The affective temperament does not meet the criteria for the diagnosis of any mood disorder, yet these features have diagnostic validity; they can be inherited genetically, but they do not require treatment.²³ Recently, substantial evidence has been reported to suggest that affective temperament features are associated with the clinical features of mood disorders and their treatment. Mania was found primarily to be associated with a hyperthymic temperament, whereas depression was associated with a depressive temperament.²⁴ Numerous studies have been conducted on the im-

pact of affective temperament on prognosis and reporting an association between an affective temperament and psychopathology.^{25,26}

Bearing in mind the scope of our study, the main hypotheses that our study aims to test are as follows:

Hypothesis 1: During pregnancy, women are exposed to a higher risk of depression.

Hypothesis 2: Symptoms of gestational depression and mixed depression symptoms are correlated.

Hypothesis 3: Temperament could be a significant factor to affect depressive symptoms and mixed symptoms among pregnant women. In this context, besides a negative correlation between hyperthymic temperament and depressive symptoms, there is a positive correlation between depressive temperament, anxious temperament, irritable temperament and the severity of depressive symptoms.

METHODS

The present study, descriptively and cross-sectionally designed, was conducted between January 2018 and July 2018 at Dinar State Hospital. The research population included the pregnant women who were referred to the Gynecology and Obstetrics Clinic at Dinar State Hospital. A total of 190 consecutively referred pregnant women participated in the study. 22 individuals refused to participate or did not meet the inclusion criteria, and 4 individuals were excluded from the study because they failed to fill out the forms appropriately. The inclusion criteria were as follows: being older than 18, having sufficient mental capacity to fill out the form, and consent to participate in the study. Poor Turkish language skills, illiteracy, and intellectual disability, substance use disorder and psychotic disorders that may impair judgment by evaluating past medical records and anamnesis information comprised of the exclusion criteria. The ethical board's approval of the study was obtained on September 6, 2017, (Approval no. 2017-14). Following the ethical board's approval, the participants were comprehensively informed about the study, and we included them in the study after having their written consent. Participants filled out a socio-demographic data form, Beck's Depression Inventory (BDI), Modified Hypomania Checklist (MHC), and TEMPS-A inventories.

The sample size calculation was based on the calculated mean (\pm SD) BDI scores of 5.0 ± 4.0 . A post-hoc sample size calculation revealed that a sample of 148 participants was enough to estimate the BDI scores with a confidence interval of 95%, and a margin of error of 0.65 (high).

Data Collection Tools

Sociodemographic Data Form

Using the data form, participants were asked to provide information about their age, marital status, family type, educational background, level of income, occupation, number of births delivered, stage of pregnancy, whether the pregnancy was voluntary, the presence of any medical complaint during pregnancy, and the history of psychiatric problems in the family.

Beck Depression Inventory (BDI)

The Beck's Depression Inventory (BDI) aims at determining the presence of depression, its severity and grade. It was developed by Aaron T. Beck in 1961.²⁷ Questioning the cognitive, physical and behavioral symptoms of depression, the inventory includes questions about 21 depressive symptoms. BDI is one of the most commonly employed measurement tools around the world for assessing the symptoms and severity of depression in psychiatric patients and normal samples. The validity and reliability studies were conducted in Turkey. The cutoff score was set to be 17.²⁸

Modified Hypomania Checklist (MHC)

We utilized the modified version of the Hypomania Checklist (HL) by Altınbaş et al.²⁹, which was originally developed in 2005 by Angst et al. for identifying depressive period cases presenting mixed features. To evaluate the prevalence of accompanying manic symptoms and their clinical correlations in patients with depression, we employed a modified version of the Hypomania Checklist developed by Altınbaş et al. in 2014 (MHC-32).³⁰ Rather than lifelong hypomanic symptoms, MHC-32 inventory was modified to question actual hypomanic symptoms.³⁰

Temperament Evaluation of Memphis, Pisa, Paris, San Diego, Autoquestionnaire (TEMPS-A)

It was developed by Akiskal et al. for measuring the dominant affective temperament. The original inventory consists of 110 items for women and 109 items for men.³¹ The Turkish version of the inventory consists of 100 items to identify depressive, hyperthymic, irritable, and anxious temperaments. The test-retest reliability and the Cronbach-alpha coefficients of the Turkish translation are found to be between 0.73-0.93 and 0.75-0.84, respectively. The participants were asked to provide answers in the form of "yes" or "no" by considering their entire life. "Yes" scores 1, and "no" scores 0. As a part of the questionnaire, depressive temperament is questioned with 19 items, cyclothymic temperament with 19 items, hyperthymic temperament with 20 items, irritable (short-tempered) temperament with 18 items, and anxious temperament with 24 items. The cutoff values to evaluate the dominant temperament are 13, 18, 20, 13, and 18, respectively. In the present study, the Turkish version of TEMPS-A was primarily employed to identify temperament features and to compare such features between the patient groups identified.³²

Statistical Analysis

The data was analyzed with the Statistical Package for the Social Sciences (SPSS) 22.0 program. Number, percentages, mean, standard deviation, median, and interquartile ranges were employed to summarize descriptive variables. The normal distribution status of the entire data collected as part of the study was assessed with the Kolmogorov-Smirnov test. The correlation analyses for non-normally distributed inventory scores were performed by using Spearman's Correlation Test. Correlation coefficients were graded as follows: 0.000 to 0.250 were considered as very weak, 0.260 to 0.500 as weak, 0.500 to 0.690 as moderate, 0.700 to 0.890 as high, and 0.900 to 1.000 as very high correlation.³³ A p-value <0.05 was accepted as statistically significant.

RESULTS

The average age of 164 patients included in the study was 23.81 ± 2.86 years. 56.0% (n=92) pregnant women were primary or secondary school graduates, 29.3% (n=48) finished high school, while 14.7% (n=24) finished university. 49.4% (n=81) participants were housewives, 17.1% (n=28) were employed at a temporary job, and 33.5% (n=55) were employed permanently. 64.6% (n=100) participants earned equal to or less than the minimum wage, while 35.4% (n=58) earned higher. 54.2% (n=89) participants were pregnant for the first

time. In the study group, 7.9% (n=13) conceptions were involuntary, whereas 23.2% (n=38) were planned. Regarding the stage of pregnancy, 29.9% (n=49) pregnant women were in the first trimester, 35.3% (n=58) in the second trimester, and 34.8% (n=57) in the third trimester. All the participants were married. The 84.8% (n=139) pregnant women lived with their nuclear family, 12.8% (n=21) with an extended family, and 2.4% (n=4) lived alone. Other demographic characteristics have been summarized in Table 1.

92.3% of pregnant women had no chronic disease, and 92.1% had no relatives with psychiatric disorders. The participants' BDI median score was 5.00 ± 4.00, and 4.3% pregnant women scored above the BDI cutoff value. MHC median score was 2.00 ± 2.00. The proportion of pregnant women exposed to the risk of depression with mixed features was 0.6% (n=1). TEMPS temperament mean scores have been provided in Table 2.

No significant correlation was found between BDI and MHC scores. With the BDI and TEMPS-A inventories, a significant positive correlation was found among depressive, anxious, irritable, and cyclothymic temperament scores, while the hyperthymic temperament presented a significant negative correlation ($r=0.906/p=0.0001$,

$r=0.716/p=0.0001$, $r=0.737/p=0.0001$, $r=0.297/p=0.0001$, $r=0.759/p=0.0001$, and $r=-0.716/p=0.0001$, respectively) (Table 3).

Table 2. Questionnaire scores of the study group

Questionnaire	Mean±SD	Median±IQR
Beck Depression Inventory	5.60 ± 3.90	5.00 ± 4.00
Modified Hypomania Checklist	2.56 ± 2.20	2.00 ± 2.00
TEMPS Depressive Temperament	6.84 ± 1.95	7.00 ± 3.00
TEMPS Anxious Temperament	6.01 ± 2.73	5.50 ± 3.00
TEMPS Irritable Temperament	3.97 ± 1.59	4.00 ± 2.00
TEMPS Cyclothymic Temperament	5.37 ± 1.20	5.00 ± 1.00
TEMPS Hyperthymic Temperament	5.58 ± 1.81	5.00 ± 3.00

SD: Standard deviation, IQR: Interquartile range

DISCUSSION

Contrary to the primary hypothesis of our study, we found that the risk of depression was not higher in pregnant women than non-pregnant women, and there was no significant correlation between BDI scores and MHC scores. However, in line with our hypothesis, the depression scores and temperament features of the pregnant women presented significant correlations.

Studies are reporting an increased prevalence of gestational depression with even closer rates to the postpartum period, suggesting that the patients exposed to risk could not be identified appropriately as the gestational depressive symptoms are somewhat overlooked as compared to the postpartum symptoms. However, other studies are reporting no increased risk of depression during pregnancy, even lower risks, suggesting that pregnancy is a protective factor against depression.³⁴ In the present study, the proportion of individuals with depression risk in the sample of pregnant women was closer to the

proportions of non-pregnant individuals in similar age groups.⁴ Our findings suggest that the period of pregnancy does not pose an increased risk for women's health in terms of depression. All pregnant women in our sample were married, and the majority of them lived with their spouse in the form of a nuclear family, which may be associated with the proper support received by the pregnant women from their spouses. Given that 92.3% of pregnant women had no chronic disease and 92.1% had no relatives with psychiatric disorders, this situation may be associated with our sample's lower depression rate in comparison with the hypothesis. However, one must give due consideration to the finding that the proportion of pregnant women with depression risk in our sample was similar to that of the society at large. This result supports the previous data¹³ suggesting that pregnancy is not a protective factor against depression. As depression affects women's well-being and poses a future risk of psychiatric pathologies for the infant, there is a need for the government to lay more emphasis on this matter while shaping public health policies.

Table 3. The relationship between the questionnaire scores of the study group

		BDI	MHC	Depressive Temperament	Anxious Temperament	Irritable Temperament	Cyclothymic Temperament
MHC	r	-0.023					
	p	0.769					
Depressive Temperament	r	0.906	-0.045				
	p	0.0001	0.566				
Anxious Temperament	r	0.716	-0.014	0.771			
	p	0.0001	0.856	0.0001			
Irritable Temperament	r	0.737	-0.027	0.835	0.732		
	p	0.0001	0.733	0.0001	0.0001		
Cyclothymic Temperament	r	0.297	0.051	0.362	0.360	0.404	
	p	0.0001	0.516	0.0001	0.0001	0.0001	
Hyperthymic Temperament	r	-0.759	0.023	-0.843	-0.634	-0.703	-0.308
	p	0.0001	0.771	0.0001	0.0001	0.0001	0.0001

r: Correlation coefficient, p: Spearman's Correlation Test. BDI: Beck's Depression Inventory, MHC: Modified Hypomania Checklist. Depressive temperament, anxious temperament, irritable temperament, and cyclothymic temperament are subgroups of TEMPS Inventory.

Investigating the prevalence of mixed symptoms during the depressive period and their impact on the clinical course has recently been an attractive subject of research. However, to the best of our knowledge, this one is the first study to investigate mixed depressive symptoms in the gestation period. A multi-center study involving 2.811 adult patients with major depressive episode reported the proportion of individuals meeting mixed-feature depression criteria of DSM-5 to be 7.5%. However, the proportion of individuals with mixed features who were scanned for criteria other than DSM-5 was 29.1%.³⁵ On the other hand, Çelik et al. reported a correlation between mixed symptoms and depressive symptoms in the postpartum period.³⁶ Additionally, only 14.3% of pregnant participants exposed to depression risk as part of this study scored above the MHC threshold. Furthermore, no significant correlation was found between the depressive symptoms and mixed symptoms in the participant pregnant women as part of the study. In our opinion, this could be explained by the fact that the majority of our sample was not exposed to a risk of depression and the relationship between depression and mixed symptoms was not evaluated adequately. Therefore, the prevalence of mixed symptoms in pregnant women with depression and the description of probable relationships remain an open question. Also, the investigation of mixed symptoms in pregnant women with depression through further prospective studies with respect to the impact on prognosis may con-

tribute to the literature in this field of research.

Although it is more or less lacking in descriptive classification systems such as DSM and ICD, temperament is a concept that contributes to numerous pathologies, some types of which are even considered to have subclinical appearances.^{37,38} As a part of the present study, we discovered strong correlations between BDI scores and TEMPS-A scores. Our findings are generally consistent with the previous studies in the relevant literature.^{39,40}

However, no significant relationship was revealed between MHC and TEMPS-A scores. A study that evaluated temperament features and mixed symptoms involved a total of 3099 patients; 1921 patients were diagnosed with major depressive disorder, and 1178 had a bipolar disorder based on DSM-5. The individuals with mixed features were observed to have significantly higher levels of cyclothymic and irritable temperament features. Those temperament features were identified not only in individuals with a major depressive disorder but also in those diagnosed with both depression and bipolar disorder.⁴¹ Given that the pregnant participants' MHC scores were inadequate to predict mania or hypomania, it may account for the absence of a significant relationship between hypomanic symptom scores and temperament scores as part of this study.

We found a positive correlation between BDI scores and depressive temperament, irritable temperament, cyclothymic temperament, and anxious temperament, and a negative correlation between BDI scores and hyperthymic temperament scores. Mania was found to be primarily associated primarily with the hyperthymic temperament and depression with the depressive temperament.¹⁰ In addition, hyperthymic temperament has been found to be prevalent among patients with bipolar I disorder, cyclothymic temperament with bipolar II disorder, and depressive temperament with unipolar major depression.^{42,43,44} These findings may suggest the hyperthymic temperament to be a protective factor concerning depressive symptoms. Consistent with the relevant literature, depressive, anxious and irritable temperaments could be perceived as factors that may create a susceptibility to the progression of depression.

The present study should be interpreted by taking its limitations into account. Above all, the evaluation depends on self-report inventories, which pose a memory bias. In addition, it must be taken into account that the inventory employed to identify the individuals exposed to depression risk may have limitations during pregnancy concerning specificity and sensitivity. In the study, accurate diagnosis of depression and not evaluating comorbid psychiatric disorders is an important limitation as there is no interview for diagnosis. Therefore, it could be beneficial if further studies employ structured clinical interviews. Our study was conducted cross-sectionally, which prevents the establishment of a causal relationship between the data. Further prospective studies are required to shed light on these relationships. Besides, the size and content of our sample might have been inadequate to evaluate the relationship between subthreshold depressive symptoms and mixed symptoms. It is necessary to be cautious about making

generalizations as the current data is being studied on a non-representative sample. Lastly, given the fact that the present study was not conducted on a representative sample, our findings could not be generalized. For a generalization, repeated studies are needed to be conducted on different samples.

CONCLUSION

The present study did not reveal an increased depression risk or increased mixed symptoms in pregnant women. Apart from this, it is important to monitor prenatal depression, which is one of the most important specifiers of postpartum depression, because it exposes both the mother and fetus to probable negative outcomes. Strong correlations were revealed between depressive symptoms and affective temperaments, which hint at potential benefits in the further popularization of postpartum scanning and in the consideration and inclusion of affective temperaments in the relevant scanning along with interventions. Investigating mixed symptoms in patients with gestational depression with structured interview prospectively-designed studies may shed further light on the impact of mixed symptoms on prognosis and treatment.

Conflict of interests: None

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