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Maternal Anxiety, Depression, and Stress during Pregnancy and Neonatal Growth Indices at Birth

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ABSTRACT

Background: Anxiety, depression, and stress during the pregnancy period are usually overlooked in women despite their detrimental effects on the mother and infant. Studies have shown an increase in the risk of behavioral and psychological problems in an infant's life because of the mother's exposure to negative excitement and stress before childbirth. In the present study, we aimed to assess the effect of maternal anxiety, depression, and stress during pregnancy on neonatal growth indices at birth.

Methods: This longitudinal survey was done on 102 pregnant women referred to the obstetrics clinic of Shahid Sadoughi Hospital of Yazd for prenatal care from September 2019 to March 2020. They were asked to fulfill two questionnaires related to the study. After delivery, the further information and growth indices of neonates were extracted by telephone.

Results: Regardless of the severity of depression, anxiety, and stress, a significant relationship was found between maternal age and stress (P= 0.033), so in mothers with younger age, pregnancy stress was more. Moreover, the study showed a significant relationship between height and maternal anxiety (P = 0.018).

Conclusion: Based on the findings of this study and due to the possible association of neonatal indices with maternal anxiety, depression, and stress during pregnancy, more attention to maternal emotional health seems necessary.

Introduction

Mental disorders (MD) are considered a public health problem. Worldwide studies have shown that women are more likely than men to suffer from mental disorders.[1,2] Since pregnancy is a life-changing period, it is propounded as a risk factor for developing and exacerbating mental disorders.[1,3] About 10% of pregnant women experience mental disorders, especially depression, although it is higher in developing countries.[3,4] Perinatal psychological disorders, if left untreated, have a considerable negative impact on maternal and fetal health.[5,6]

Unfortunately, more attention is paid to this period's physical and physiological dimensions than its mental and psychological dimensions.[7] Numerous studies have reported an association between depression, anxiety, and stress with growth indices or preterm delivery, although some studies have found no significant association.[1,5-8]

A study of about 10,000 adults living in Yazd, a city in central Iran, showed that the prevalence of depression, anxiety, and stress is 29%, 32.2%, and 34.8%, respectively. In addition, the prevalence of depressive symptoms is significantly higher in women than men.[9] This study aimed to investigate the effect of anxiety, depression, and stress during pregnancy on growth indices at birth in neonates of pregnant women referred to the obstetrics clinic of Shahid Sadoughi Hospital in Yazd in 2019.

Materials and Methods

This study was a longitudinal survey on all pregnant women referred to the obstetrics clinic of Shahid Sadoughi Hospital of Yazd for prenatal care from September 2019 to March 2020. Exclusion criteria were any underlying maternal disease such as diabetes mellitus, hypertension, seizures, and so on, as well as multiple births, stillbirths, neonatal abnormalities, and the unwillingness of pregnant mothers to participate in the study. Before starting the study, the Ethics Committee approved it (IR.SSU.MEDICINE.REC.1398.102).

After obtaining informed consent and providing the necessary explanations about the study, two questionnaires were given to research subjects. Age, last menstrual period (LMP), estimated date of confinement (EDC), the number of children, level of education, maternal diseases, medications used, the planned location for delivery and communication methods to mothers were all included in the first questionnaire.

The latter questionnaire was a Persian translation of the 42-item version of the depression, anxiety, and stress scale (DASS) questionnaire. DASS is a simple and approved tool for estimating depression, anxiety, and stress in adults, with 14 questions in each part, and the final score is acquired with the total score of the associated questions.[10] Each question was scored by a Likert scale, ranging from 0 (never) to three (almost always). Higher scores demonstrate a higher level of disorder. Subjects are classified into normal, mild, moderate, severe, and very severe based on their answers. Numerous studies confirm that DASS is a reliable and valid device to assess the characteristics of depression, anxiety, and stress.[10-12] Twenty days before EDC, participants were contacted, and preterm deliveries were followed up. Then, after delivery, growth indices of neonates and their gestational age were extracted by telephone. Statistical package for social sciences (SPSS) software version 21.0 (IBM Corp., TX., US.) was used to analyze the data.

Results

Out of 102 participants included in the study, ten had gestational diabetes, three had incomplete questionnaires, three had twins, two had abortions, and two did not respond to the follow-up. Finally, 82 cases were reviewed. Participants' ages ranged from 17 to 43 years, and the mean age of the mothers was 28.32.

Thirty-two point nine percent of mothers were over 30 years old, and 67.1% were 30 and younger. Also, the employment status of mothers shows that 79.3% were housewives and 20.7% were employed.

The mean gestational age at delivery was 38.3 ± 1.9. Also, the minimum gestational age was 30 weeks, and the maximum was 42 weeks. The frequency distribution of depression, anxiety, and stress has been reported in Table 1.

Table 1. The Frequency Distribution of Depression, Anxiety, and Stress in Participants

	Frequency	Percentage
Depression		
Normal	50	61
Mild	13	15.9
Moderate	10	12.1
Severe	9	11
Anxiety		
Normal	30	36.6
Mild	15	18.3
Moderate	18	22
Severe	19	23.1
Stress		
Normal	35	42.7
Mild	14	17.1
Moderate	25	30.4
Severe	8	9.8

Growth indices at birth showed that the average height, weight and head circumference in infants were 49.44 cm, 3002 g and 33.93 cm, respectively.

Table 2 examines and compares the mean neonatal height between depression, anxiety, and stress groups. Based on the results of analysis by ANOVA, the mean neonatal height at birth was not significantly different for depression, anxiety, and stress. However, after re-analyzing the data, regardless of the severity of depression, anxiety, and stress, a significant relationship was found between height and maternal anxiety (P = 0.018).

Table 3 shows the comparison of the mean weight in the depression, anxiety, and stress groups. Different levels of anxiety, depression, and stress exhibited no significant relation to mean neonatal weights. However, the mean birth weight of neonates in mothers with and without anxiety, regardless of severity, is significantly different (P = 0.030).

Moreover, the head circumference of the newborns was not significantly different among the depressed, anxious, and stressful women compared to their counterparts (Table 4).

There was no significant difference between gestational age at delivery in depressed, anxious, and stressful women versus normal women. Also, regardless of severity, no significant relationship was detected between preterm birth with depression, anxiety, and stress (P = 0.287).

In the analysis using the chi-square test, there was no significant difference between the frequency distribution of maternal age groups and different intensities of depression, anxiety, and stress.

Table 2. Comparison of Mean Neonatal Height between Groups of Depression, Anxiety and Stress

	Mean ± SD	Min	Max	P
Depression				0.163
Normal	49.46 ± 4.6	32	57	
Mild	49.92 ± 2.4	45	53	
Moderate	47.6 ± 4.1	41	52	
Severe	50.67 ± 2.4	47	55	
Anxiety				0.018*
Normal	50.83 ± 2.6	42	57	
Mild	47.73 ± 6.0	32	52	
Moderate	48.83 ± 3.2	41	53	
Severe	49.16 ± 4.3	36	55	
Stress				0.079
Normal	50.31 ± 3.7	35	57	
Mild	47.71 ± 5.4	32	53	
Moderate	48.60 ± 3.8	36	53	
Severe	51.25 ± 2.2	47	55	

*Regardless of the severity

Table 3. Comparison of Mean Neonatal Weight between Groups of Depression, Anxiety and Stress

	Mean ± SD	Min	Max	P
Depression				0.254
Normal	3050 ± 673	1150	4600	
Mild	3030 ± 584	1650	3700	
Moderate	2605 ± 781	1650	3900	
Severe	3132 ± 622	2150	3890	
Anxiety				0.030*
Normal	3213 ± 530	1700	4600	
Mild	2748 ± 789	1220	3880	
Moderate	2970 ± 676	1650	3800	
Severe	2899 ± 730	1150	3900	
Stress				0.020**
Normal	3203 ± 610	1220	4600	
Mild	2769 ± 632	1400	3580	
Moderate	2758 ± 706	1150	3880	
Severe	3291 ± 607	2150	3900	

*Regardless of the severity; **Between Normal and Moderate groups (ANOVA test)

The findings determined that maternal age and stress are significantly associated (P = 0.033), irrespective of stress severity. So that in mothers with younger age, pregnancy stress was more.

There was a significant relationship between mothers' employment and the presence or absence of stress in pregnancy (P = 0.046).

Discussion

Although the physical care of pregnant women has improved over the years, their emotional care has unfortunately been neglected.[13] Besides, most depression and anxiety experienced by pregnant women are not diagnosed by health caregivers, and little help is likely to be available.[14] Studies have linked prenatal stress to low gestational age at delivery as well as low birth weight.[15] We examined the depression, anxiety, and stress in pregnant women according to their age, gestational age at delivery, and employment status. We also investigated the consequences of this depression, anxiety, and stress on growth indices at birth.

In this study, 39%, 63.4%, and 57.3% of pregnant women had depression, anxiety, and stress, respectively. Tang et al. showed the prevalence of stress, anxiety, and depression in early pregnancy as 91.86%, 04.04%, and 5.19%, respectively.[16]

Table 4. Comparison of Mean Neonatal Head Circumference between Groups of Depression, Anxiety and Stress

	Mean ± SD	Min	Max	P
Depression				0.163
Normal	33.95 ± 1.8	28	37	
Mild	34.346 ± 1.3	31	36	
Moderate	32.9 ± 1.6	31	36	
Severe	34.4 ± 1.7	31.5	37	
Anxiety				0.533
Normal	34.3 ± 1.2	31	36.5	
Mild	33.7 ± 2	29	36.5	
Moderate	33.6 ± 1.5	31	36	
Severe	33.8 ± 2.3	28	37	
Stress				0.126
Normal	34.257 ± 1.5	29	36.5	
Mild	34 ± 1.3	31	37	
Moderate	33.28 ± 1.9	28	36.5	
Severe	34.5 ± 1.7	31.5	37	

The prevalence of stress in this study was higher, and anxiety and depression were significantly lower than our study. Pregnant women in our society likely experience more anxiety because family, friends, and the community do not provide much emotional support during pregnancy. In a study in Saudi Arabia, the prevalence of depression in pregnant women was 26.8%, and anxiety was 23.6%.[17] This difference could be due to the use of different questionnaires and assessment methods. A study reported the prevalence of depression, anxiety, and stress in women in Yazd, 36.5%, 41.9%, and 40.9%, respectively.[9] This difference indicates the nature of pregnancy as one of the stressful and anxious situations in every woman's life.

In the recent study, the mean age of mothers was 28 years, and the majority (67.1%) were 30 years and younger. There was a significant relationship between maternal age and prenatal stress, so that in pregnant women with younger age, stress was higher. Two different studies showed a significant relationship between maternal age and the prevalence of anxiety and depression in pregnant women.[18,19]

We found a significant relationship between stress and low birth weight, but not with neonatal height, which is in line with Diego et al.'s study. According to their study, anxiety, and stress in mothers were associated with low birth weight, while it was not associated with height at birth.[20] A recent study reported that there is a significant relationship between maternal anxiety and birth height and weight. Pinto et al. demonstrated that maternal depression or anxiety causes her baby's length, weight, and head circumference to decrease. This decrease is much more significant in mothers with higher stress than mothers with lower stress.[21]

Conclusion

This study showed that 63.4%, 39%, and 57.3% of pregnant women have anxiety, depression, and stress, respectively. Moreover, there was a significant relationship between maternal stress and anxiety and growth indices at birth. Given that most attention is paid to the physical health of pregnant mothers, it seems more attention to the emotional health of pregnant women by health center experts and health care providers is required.

Conflict of Interests

Authors have no conflict of interests.

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