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The Effect of Prenatal Screening Tests on Maternal Anxiety Levels

Prenatal Tarama Testlerinin Maternal Kaygı Düzeyine Etkisi

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Abstract

Objective: Pregnancy is a challenging period for women, both physically and psychologically. Prenatal screening tests that provide an estimate of the risk of a fetal anomaly may affect maternal anxiety levels. The study aimed to investigate the state and trait anxiety levels of women in the first trimester before examination, after examination, and after receiving the results of the risk estimation.

Method: Pregnant women who applied to the Department of Perinatology at Cerrahpaşa Medical Faculty, İstanbul University-Cerrahpaşa for the first-trimester examination between January 2010 and December 2015 were included in the study. Twin pregnancies and women with psychiatric disorders were excluded. The Spielberger state-trait anxiety inventory was administered to 317 women to assess their anxiety levels.

Results: The level of state anxiety was lowest after the first-trimester examination. Differences in state anxiety levels between periods were statistically significant.

Conclusion: After the first-trimester examination, state anxiety levels decreased. Viewing the fetus on the screen and being informed about its anatomy have a reassuring effect on the women.

Keywords: Anxiety, first trimester, pregnancy

Öz

Amaç: Gebelik, kadınlar için hem fiziksel hem de psikolojik olarak zorlayıcı bir süreçtir. Fetal anomali için risk tahmini veren prenatal tarama testlerinin anne adaylarının kaygı düzeylerine etkisi olabilir. Çalışmada birinci trimester muayene öncesi, muayene sonrası, risk tahminini öğrendikten sonra kadınların durumluk ve sürekli kaygı düzeylerinin incelenmesi amaçlanmıştır.

Yöntem: İstanbul Üniversitesi-Cerrahpaşa, Cerrahpaşa Tıp Fakültesi Perinatoloji Bölümü'ne Ocak 2010 ile Aralık 2015 arasında birinci trimester muayenesi için başvuran gebe kadınlar çalışmaya dahil edilmiştir. İkiz gebelikler ve psikiyatrik hastalığı olan kadınlar hariç tutulmuştur. Spielberger durumluk ve sürekli kaygı envanteri 317 kadına kaygı düzeylerini değerlendirmek için uygulanmıştır.

Bulgular: Birinci trimester muayene sonrası durumluk kaygı düzeyinin en düşük olduğu bulunmuştur. Farklı dönemler arasında durumluk kaygı düzeyleri bulguları istatistiksel olarak anlamlıydı.

Sonuç: Birinci trimester muayene sonrası durumluk kaygı düzeyleri azalmıştır. Fetüsün ekranda görülmesi ve anatomisi hakkında bilgi alınması kadınlarda rahatlatıcı bir etkiye sahiptir.

Anahtar kelimeler: Birinci trimester, gebelik, kaygı

Introduction

Pregnancy, which causes both physical and psychological burdens, is a challenging period in a woman's life. Feelings of responsibility for the baby's well-being, being faced with many uncertainties during pregnancy, and worries about childbirth and motherhood may increase anxiety levels (1,2).

Prenatal screening tests that estimate fetal anomaly risk are routinely offered to pregnant women in many countries (3,4). First trimester screening test which is composed

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of a combination of biochemical markers together with ultrasonographic markers is one of the tests used for the anomaly risk estimation (5). In the case of a high-risk of fetal anomaly, diagnostic tests are recommended to improve diagnostic accuracy (5,6). The effect of the prenatal ultrasound (USG) examination on maternal anxiety was first investigated many years ago (7).

Several tests were provided to evaluate the level of maternal anxiety. Among the tests, the Spielberger state-trait anxiety inventory measures two distinct constructs—state and trait—each of which comprises 20 questions, with responses scored on a scale from 1 to 4. The total score ranges from 20 to 80. A higher score indicates a higher level of maternal anxiety (8-11).

The aim of the study is to evaluate maternal anxiety levels before the first-trimester screening examination, after the screening, and after receiving the risk-estimation results.

Materials and Methods

Between January 2010 and December 2015, pregnant women who applied to the Department of Perinatology of Cerrahpaşa Medical Faculty, İstanbul University for the first trimester examination were included in the study. Women with twin pregnancies and those with psychiatric disorders were excluded from the study. The research was approved by Ethics Committee of the İstanbul University-Cerrahpaşa, Cerrahpaşa Faculty of Medicine (date: 05/04/2017, number: 131570). The study was conducted in accordance with the Declaration of Helsinki.

First-trimester examination is carried out to assess the risk of trisomies. During the examination, the fetus is shown to the expectant mother, and information is provided about the anatomy of the fetus. The anxiety levels of the women were evaluated before and after the first-trimester examination, and after being informed of the risk-estimation result. In three distinct periods, the Spielberger State-Trait Anxiety Inventory, which consists of two parts (state and trait), each containing 20 questions scored from 1 to 4, was completed by the women. The total score ranges from 20 to 80; higher scores indicate greater anxiety (8-11). While state anxiety refers to feelings at a specific moment, trait anxiety describes how the patient generally feels (10,11).

Statistical Analysis

Statistical analyses were carried out using SPSS version 20. The Kolmogorov-Smirnov test was used to evaluate the homogeneity of parametric variables. Values are presented as mean ± standard deviation, minimum, and maximum. Paired-samples t-test, chi-square test, and Wilcoxon test were used as appropriate for comparisons. $P<0.05$ was considered statistically significant.

Results

After excluding two women with psychiatric disorders and 16 twin pregnancies, 317 pregnant women who applied to the Department of Perinatology, Cerrahpaşa Medical Faculty, İstanbul University, for a first-trimester examination between January 2010 and December 2015 participated in the study.

The mean age of the participants was 29.11±4.87 years (range 18-41), and 185 (58.4%) were nulliparous. Table 1 presents the general and obstetric characteristics of the pregnant women in the study.

The state anxiety level was highest in during state 3 (after learning the risk-estimation results) and lowest in state 2 (after the first-trimester examination) ($p<0.05$).

In terms of trait anxiety, the highest score was recorded before the first-trimester examination, while the lowest score was recorded after the risk estimation (Table 2).

A subgroup analysis was performed. Women were categorized based on parity (nulliparous and non-nulliparous) and age (<35 years and ≥35 years), and comparisons were made between the groups.

No statistically significant differences in anxiety levels were observed across age groups.

Table 1. General and obstetrical characteristics of pregnant women participated in the study

Age (min-max) (mean ± SD)	(18-41) 29.11±4.87
Parity (min-max) (mean ± SD)	(0-4) 0.57±0.80
Nulliparous (n/N, %)	185/317, 58.4%
Abortus (n/N, %)	54/317, 17%
Termination (n/N, %)	11/317, 3.5%
Comorbidity (n/N, %)	26/317, 8.2%

SD: Standard deviation

No statistically significant difference was observed in relation to parity; however, nulliparous women showed a higher level of state anxiety (Tables 3, 4).

Discussion

Pregnancy causes physical and emotional changes in expectant mothers. Taking responsibility for someone other than the mother's own life, fear of childbirth, uncertainty about motherhood and the future, and concern for the baby's well-being are responsible for these changes (1,2).

Over time, prenatal screening tests, now part of routine prenatal care in many countries, have been developed to estimate the risk of fetal anomalies, and these tests may affect the psychological state of expectant mothers (3,4).

In our study, the state and trait anxiety levels of pregnant women were evaluated at three time points: before the first-trimester screening examination, after the examination, and after learning the risk estimation result. It was found that pregnant women had the lowest level of state anxiety after the first-trimester examination. This finding is similar to Da Silva et al.'s (9) study in which 146 pregnant women and 150 non-pregnant women were investigated in terms of their anxiety levels. Da Silva et al. (9) found that anxiety levels in pregnant women improved after the USG examination, and that advanced maternal age had a protective effect against stress. However, in terms of maternal age, we did not find a statistically significant difference in anxiety levels (9). USG examination helps to visualize the fetus and to perceive it concretely. For this reason, it generates reassurance about fetal well-being and attachment to the fetus (12).

In another study, Kowalcek et al. (13) investigated the state and trait anxiety levels of 332 pregnant women before and after examinations with negative or positive prenatal findings. Prenatal examinations revealed positive findings in 37 patients. While trait anxiety levels before prenatal examination did not differ significantly between the group with a positive prenatal test result and the group with a

Table 2. Comparison of the state trait anxiety levels according to evaluation periods

	Mean ± SD	Mean ± SD	p
Trait 1 vs. Trait 2	48.58±5.73	48.28±5.72	0.206
Trait 2 vs. Trait 3	48.28±5.72	47.90±5.56	0.153
Trait 3 vs. Trait 1	47.90±5.56	48.58±5.73	0.019*
State 1 vs. State 2	42.57±6.8	41.93±6.15	0.029*
State 2 vs. State 3	41.93±6.15	43.40±6.41	<0.001*
State 3 vs. State 1	43.40±6.41	42.57±6.8	0.028*

*: P<0.05, SD: Standard deviation

Table 3. Comparison of the state and trait anxiety levels according to parity

	Nulliparous (185)	Non-nulliparous (132)	p
Trait 1	48.70±6.03	48.40±5.29	0.632
Trait 2	48.31±5.83	48.25±5.59	0.992
Trait 3	48.05±6.09	47.69±4.75	0.553
State 1	43.13±6.46	41.78±7.24	0.089
State 2	42.46±6.18	41.19±6.04	0.069
State 3	43.94±6.16	42.64±6.71	0.079

Table 4. Comparison of the state and trait anxiety levels of the pregnant women according to age

	Under the age of 35 (264)	Age of 35 years and above (53)	p
Trait 1	48.57±5.81	48.71±5.57	0.865
Trait 2	48.36±5.87	48.00±5.21	0.647
Trait 3	47.83±5.72	48.54±4.68	0.335
State 1	42.64±7.02	41.98±5.79	0.468
State 2	42.08±6.29	40.98±5.46	0.196
State 3	43.48±6.62	43.00±5.61	0.578

negative result, state anxiety levels of the pregnant women, even before the prenatal test, differed significantly. There was no statistically significant difference in the state anxiety levels of women with positive findings before and after the prenatal test. State anxiety levels were significantly reduced after a negative result when pre- and post-prenatal-test measurements were compared (13).Chueh et al.'s (11) study compared maternal anxiety levels, measured with the STAI before screening, 1 week after screening, at the 22nd week of gestation, and at the 6th week postpartum, between two groups: one with increased nuchal translucency thickness and positive screening results (n=172) and the other with normal nuchal translucency thickness and negative screening results (n=180). Women who screened positive had higher state anxiety one week after screening, but no differences in state or trait anxiety levels were detected between the groups at other time points. Therefore, increased anxiety in women with positive screening test results does not persist. Consequently, clinicians' concerns about maternal anxiety should not constitute a barrier to screening tests (11).

High-risk and low-risk patients at 18-22 weeks' gestation were included in Api et al.'s (14) study. The high-risk group consisted of patients over the age of 35, those with abnormal maternal serum screening and suspicious fetal anatomy. Patients without these risk factors who were referred only for exclusion of anomalies constituted the low-risk group. High- and low-risk pregnant women underwent a USG examination, and their anxiety levels were assessed. No significant differences in trait anxiety levels were found between the two groups, both before and after USG examination. However, state anxiety scores recorded before the genetic sonogram were significantly higher in both groups than those observed after the genetic sonogram (14). This finding is consistent with the results of our study, as the women's state anxiety levels were lower after the first-trimester examination than before the USG examination.

Simó et al. (2) compared the anxiety levels of pregnant women before and after USG scans across the three trimesters. Consistent with previous studies, USG reduced state anxiety levels in each trimester (2). In our study, state and trait anxiety levels were analyzed in the first trimester, and state anxiety decreased after the first-trimester examination.

Study Limitations

A strength of the study is that it was conducted in the perinatology clinic, where physicians provided information to patients. On the other hand, the fact that not all pregnant women were evaluated by a single physician constitutes a limitation of the study.

Conclusion

To date, numerous studies have shown that ultrasound examination provides reassurance to expectant mothers. Viewing the fetus on the screen and receiving information about fetal anatomical structures help reduce anxiety in pregnant women.

Ethics

Ethics Committee Approval: The research is approved by the Ethics Committee of the İstanbul University-Cerrahpaşa, Cerrahpaşa Faculty of Medicine (date: 05/04/2017, number: 131570).

Informed Consent: All participants provided informed consent.

Footnotes

Authorship Contributions

Concept: I.S., C.Ş., Design: I.S., C.Ş., Data Collection or Processing: I.S., C.Ş., Analysis or Interpretation: I.S., C.Ş., Literature Search: I.S., C.Ş., Writing: I.S., C.Ş.

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