A Comparison of Obstetric and Neonatal Outcomes and Subchorionic Hematoma Effects in Pregnant Women with Threatened Abortion and Healthy Controls

Abortus İmminensli ve Sağlıklı Gebe Kadınlarda Obstetrik ve Neonatal Sonuçların ve Subkoriyonik Hematomun Etkilerinin Karşılaştırılması

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Abstract

Aim: In this study, we aimed to compare the obstetric and neonatal outcomes and effects of subchorionic hematoma (SH) in women with threatened abortion (TA) and healthy controls.

Methods: The medical records of pregnant women were retrospectively reviewed. The obstetric and neonatal outcomes in 138 pregnant women diagnosed with TA (study group) were compared with those in 138 randomly selected healthy controls. The outcomes were also compared according to SH presence as revealed by ultrasonography (USG) in the first trimester.

Results: The groups were demographically homogeneous. The mean infant weight and 1st-minute Apgar score were lower and the low-birth-weight infant rate was higher in the study group. The SH rate was statistically significantly higher in the study group ($p<0.05$), while there was no significant difference between the two groups in terms of birth week, preterm labor, postmaturity, delivery type, preeclampsia, placental abruption, and 5th-minute Apgar scores ($p>0.05$). In the control group, there was no significant difference between women with and without SH in terms of obstetric and neonatal outcomes. In the study group, the mean 5th-minute Apgar score was found to be significantly ($p=0.002$) higher in pregnant women with SH than in those without.

Conclusion: TA may increase the likelihood of a low-birth-weight infant and a low 1st-minute Apgar score by affecting fetal weight gain and well-being. SH alone without other risk factors does not appear to affect neonatal and obstetric outcomes in healthy pregnant women. Concomitant SH and TA without additional risk factors may positively affect 5th-minute Apgar scores.

Keywords: neonatal outcomes; obstetric outcomes; threatened abortion

Öz

Amaç: Bu çalışmada abortus imminensli (Aİ) kadınlarda ve sağlıklı kontrollerde obstetrik ve neonatal sonuçları ve subkoriyonik hematom (SH) varlığının etkilerini karşılaştırmak amaçlanmıştır.

Yöntem: Gebe kadınlara ait tıbbi veriler retrospektif olarak incelendi. Aİ tanılı 138 gebenin (çalışma grubu) obstetrik ve neonatal sonuçları, rastgele seçilmiş 138 sağlıklı kontrolün sonuçları ile karşılaştırıldı. Bu sonuçlar birinci trimesterde ultrasonografiyle tespit edilen SH varlığına göre de karşılaştırıldı.

Bulgular: Gruplar demografik açıdan homojendi. Çalışma grubunda ortalama bebek ağırlığı ve 1. dakika Apgar skoru daha düşük, düşük doğum ağırlıklı bebek oranı daha yüksekti. SH oranı çalışma grubunda istatistiksel olarak anlamlı biçimde daha yüksekken ($p<0,05$), iki grup arasında doğum haftası, erken doğum, postmatürite, doğum şekli, preeklampsi, plasental abrupsiyon ve 5. dakika Apgar skorları açısından anlamlı fark yoktu ($p>0,05$). Kontrol grubunda SH'li ve SH'siz kadınlar arasında obstetrik ve neonatal sonuçlar açısından anlamlı fark yoktu. Çalışma grubunda ise SH'siz kadınlara kıyasla SH'li kadınlarda 5. dakika Apgar skorları anlamlı biçimde ($p=0,002$) daha yüksekti.

Sonuç: Aİ, fetal kilo alımını ve iyilik halini etkileyerek düşük doğum ağırlıklı bebek ve düşük 1. dakika Apgar skoru ihtimalini artırabilir. Diğer risk faktörleri olmaksızın tek başına SH, sağlıklı gebelerde neonatal ve obstetrik sonuçlar üzerinde etkili görünmemektedir. Diğer risk faktörleri olmadığında konkomitan Aİ ve SH 5. dakika Apgar skorlarını olumlu etkileyebilir.

Anahtar Sözcükler: abortus imminens; neonatal sonuçlar; obstetrik sonuçlar

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INTRODUCTION

Threatened abortion (TA) is uterine bleeding that develops without cervical dilation during the first 20 weeks of pregnancy, and seen in 16–25% of all pregnancies (1). With current conservative methods, treatment is possible only in 50% of the cases. Following first-trimester hemorrhages, 95–98% of the pregnancies with fetal heartbeat on ultrasonography (USG) can be up to 20 weeks of gestation (2). The etiology is mostly unknown. Bleeding seen in early pregnancy causes serious anxiety in expectant mothers.

It remains important to determine the risks following the first-trimester hemorrhage and the likely maternal and obstetric outcomes for the timely delivery of the necessary ante- and perinatal care. Elucidation of the TA etiology depends on accurate determination of the underlying pathophysiology, which is thought to increase some risks in the later stages of pregnancy, with many hypotheses proposed so far but no clear conclusions yet (3,4). Thus, in the present study we aimed to review and compare the clinical outcomes and complications in a number of randomly selected healthy pregnant women and pregnant women with TA.

MATERIALS AND METHODS

We retrospectively reviewed the medical records of patients who were treated for TA in the gynecology and maternity ward of the Amasya Sabuncuoğlu Şerefeddin Training and Research Hospital between 1 January 2016 and 31 December 2017. The study was conducted in May 2019.

During the study period, the number of pregnant women hospitalized and treated for TA was 226. In 52 of these patients, spontaneous abortion occurred before a fetal heartbeat was observed and some patients underwent dilatation/curettage due to missed pregnancy. Eight pregnant women had thrombophilia and were excluded from the study because thrombophilia could affect obstetric and neonatal outcomes. Twenty-eight women had spontaneous abortion in the following days. After the exclusion of all these patients, the remaining 138 pregnant women with TA formed the study group.

During the study period, a total of 3884 pregnant women were followed up and delivered at the study hospital. We excluded 1950 women with a history of hypertensive diseases of pregnancy (n=357), thrombophilia (n=443), hyperemesis gravidarum (n=776), gestational diabetes mellitus and diabetes mellitus (n=311), and other systemic diseases (n=63) because these conditions could affect obstetric and neonatal outcomes. Then, from among the remaining 1934 healthy pregnant women, 138 were selected randomly and formed the control group. Randomization was performed using a simple random numbers table to equalize the size of the study and control groups.

We compared demographic and other characteristics (age, height, weight, body mass index [BMI], parity, education level), obstetric outcomes (birth weight, birth week, delivery type, low-birth-weight infant, preterm labor, postmaturity, preeclampsia, and placental abruption), and neonatal results (1st- and 5th-minute Apgar scores). The groups were also compared according to the presence of subchorionic hematoma (SH) as detected ultrasonographically in the first trimester.

Statistical analysis

All statistical analyses were performed using the SPSS (v. 21.0) software package. The sample size being >30, normality of the data was checked using the Shapiro–Wilk test. Intergroup comparisons were made using the Mann–Whitney U test and the independent sample *t*-test for non-normally and normally distributed variables, respectively. The relationships between categorical variables was analyzed using the chi-square test. $p<0.05$ was considered statistically significant.

Study ethics

The study protocol was approved by the ethics committee of the Amasya University (02.05.2019-30).

RESULTS

The age, parity, height, weight, BMI, and education level distributions were similar in the two groups ($p>0.05$) (Table 1). The mean birth week in the patient and control groups were 38.63±1.54 and 38.82±2.59 weeks, respectively; and the difference was not statistically significant ($p=0.456$) (Table 2). The mean birth weight was significantly ($p=0.018$) lower in the study group (3180.22±458.77 g) than in the control group (3306.64±462.98 g) (Table 2).

Table 1. Comparison of sociodemographic and other characteristics

		Study group (n=138)	Control group (n=138)	*p*
Age (year)		27.77±5.82	28.46±5.78	0.927
Height (cm)		162.30±5.02	161.51±5.96	0.831
Weight (kg)		80.5±8.14	81.54±11.62	0.659
BMI		30.64±3.53	31.30±4.50	0.132
Education level	Illiterate	2 (1.4%)	3 (2.2%)	0.906
	Primary school	8 (5.8%)	13 (9.4%)	
	Middle school	33 (23.9%)	38 (27.5%)	
	High school	58 (42.0%)	44 (31.9%)	
	University	27 (19.6%)	14 (10.1%)	
Parity	Nulliparity	64 (46.4%)	38 (27.5%)	0.540
	Multiparity	74 (53.6%)	100 (72.5%)	

BMI: body mass index

p values were calculated with the chi-square test (education level and parity) and the independent samples *t*-test.

Table 2. Comparison of obstetric and neonatal outcomes

		Study group (n=138)	Control group (n=138)	*p*
Birth weight (g)		3180.22±458.77	3306.64±462.98	*0.018*
Birth week (week)		38.63±1.54	38.82±2.59	0.456
Preterm labor	Yes	15 (10.9%)	7 (5.1%)	0.074
	No	123 (89.1%)	131 (94.9%)	
Postmaturity	Yes	6 (4.3%)	10 (7.2%)	0.485
	No	132 (95.7%)	128 (92.8%)	
Low birth weight	Yes	9 (6.5%)	2 (1.4%)	*0.034*
	No	129 (93.5%)	136 (98.6%)	
Delivery type	Normal	51 (37.0%)	57 (41.3%)	0.461
	Caesarean	87 (63.0%)	81 (58.7%)	
Preeclampsia	Yes	2 (1.4%)	0 (0%)	0.999
	No	136 (98.6%)	138 (100.0%)	
Placental abruption	Yes	2 (1.4%)	0 (0%)	0.999
	No	136 (98.6%)	138 (100.0%)	
1st-minute Apgar score		8.74±0.71	8.91±0.53	*0.025*
5th-minute Apgar score		9.76±0.66	9.86±0.43	0.309
Subchorionic hematoma	Yes	98 (71.0%)	15 (10.9%)	*0.009*
	No	40 (29.0%)	123 (89.1%)	

p values were calculated with the independent samples *t*-test (birth weight, birth week, 1st-minute Apgar score, 5th-minute Apgar score) and the chi-square test.

Table 3. The SH-based intergroup comparison of obstetric and neonatal outcomes

	Study group (n=138)			Control group (n=138)		
	SH on USG	**No SH on USG**	***p***	**SH on USG**	**No SH on USG**	***p***
Birth weight (g)	3187.45±466.74	3162.50±443.93	0.856	3401.33±358.14	3296.22±474.11	0.237
1st-minute Apgar score	8.74±0.66	8.73±0.85	0.383	8.80±0.56	8.93±0.53	0.372
5th-minute Apgar score	9.82±0.48	9.63±0.98	*0.002*	9.87±0.35	9.86±0.45	0.854
Low birth weight	5 (5.1%)	4 (10.0%)	0.242	0 (0%)	2 (1.6%)	0.794
Placental abruption	2 (2.0%)	1 (2.5%)	0.654	0 (0%)	0 (0%)	-
Preeclampsia	1 (1.0%)	1 (2.5%)	0.497	0 (0%)	0 (0%)	-

SH: subchorionic hematoma; USG: ultrasonography

p values were calculated with the independent samples *t*-test (birth weight, 1st-minute Apgar score, 5th-minute Apgar score) and the chi-square test.

The rate of delivery by Cesarean section was 63% (n=87) in the study group and 58.7% (n=81) in the control group. There was no significant difference between the groups in terms of delivery type (p=0.461) (Table 2). When the two groups were compared for the presence of placental abruption and preeclampsia, there were 2 (1.4%) women with preeclampsia and 2 (1.4%) with placental abruption in the study group while there was no subject with preeclampsia or placental abruption in the control group. However, the difference between the groups was not significant (p>0.05) (Table 2).

The rate of preterm labor was 10.9% (n=15) in the study group and 5.1% (n=7) in the control group, with the difference being not significant (p=0.074) (Table 2). The rate of postmaturity was 4.3% (n=6) in the study group and 7.2% (n=10) in the control group, and again the difference between the two groups was not significant (p=0.48) (Table 2).

Significantly (p=0.034) more low-birth-weight infants were delivered in the study group (9 [6.5%] vs. 2 [1.4%]) (Table 2). The mean infant weight was also significantly lower in the study group. These findings suggest that TA has a negative effect on fetal weight gain.

The mean 1st-minute Apgar score was significantly (p=0.025) lower in the study group than in the control group (8.74±0.71 vs. 8.91±0.53). (Table 2). However, there was no significant (p=0.309) difference between the groups in terms of mean 5th-minute Apgar scores (9.76±0.66 vs. 9.86±0.43, respectively) (Table 2).

The obstetric USG performed in the first trimester revealed a SH area in 71% (n=98) of the study group and 10.9% (n=15) of the control group, and the difference between these rates was significant (p=0.009) (Table 2). In the control group, there was no significant difference between women with and without SH in terms of obstetric and neonatal outcomes. In the study group, the mean 5th-minute Apgar score was found to be significantly (p=0.002) higher in pregnant women with SH than in those without (9.82±0.48 vs. 9.63±0.98) (Table 3).

DISCUSSION AND CONCLUSION

TA affects almost one-quarter of all pregnancies. It has been hypothesized that the underlying pathophysiologies cause an increase in various risks in the later stages of pregnancy (2), and that detecting the possible complications in later pregnancy could help to better understand the currently unclear TA pathophysiology (3,4), as well as to reduce TA-associated costs. Although measures that can be taken based on identified risks can also cause a cost increase, if neonatal mortality can be reduced, this can be ignored. SH detected on USG without bleeding can cause anxiety in the physician and expectant mother. Studies have shown that pregnant women with SH have an increased risk of abortion and intrauterine growth retardation, and that SH is associated with an increased risk of early and late pregnancy loss, placental abruption, and early membrane rupture. In the present study, in addition to our assessments of obstetric and neonatal outcomes, we also assessed for SH-related intergroup differences (5,6).

TA was found to be associated with high rates of preterm labor and abortion (2,7). In normal pregnancy, the contractile and relaxant mechanisms of the uterus are in equilibrium. If this balance is disturbed, uterotonic mediators are exposed and the uterus begins to contract, which may increase the risk of abortion and preterm labor (8,9). While increasing the uterine contractility, as has been shown previously, this reduces the risk of atony in the postpartum period (10). Therefore, it can be hypothesized that there is an excessive response to intrinsic uterotonics based on TA (7,8,11). In our study, we found a higher rate of preterm labor in the study group (10.9% vs. 5.1%), although the difference was not significant (p=0.074) (Table 2). Of the initial 226 pregnant women with TA, 52 had spontaneous abortion without any fetal cardiac activity or had dilatation/curettage due to missed pregnancy, and 28 had spontaneous abortion in the following days. According to these numbers, 80 (35%) of a total of 226 pregnant women with TA had abortion.

The maternal and perinatal outcomes reported in 31 studies were reviewed in a meta-analysis performed to identify the subsequent risks in pregnant women treated for TA. First-trimester bleeding was found to increase the risks of premature labor, intrauterine growth retardation, and perinatal death, which were hypothesized to be associated with chronic inflammatory reaction occurring in the decidua with bleeding, defects in placental development, thin and fragment-

ed placental wall formation, and minimal cytotrophoblast invasion of the spiral arteries (4,12). It was suggested that placenta previa, placental abruption, and antepartum bleeding of unknown cause could be caused by placental development disorders while preterm labor, premature-preterm membrane rupture, and preeclampsia are caused by impaired invasion of the spiral arteries (9,12). In our study, we found that the mean infant weight was lower in the study group, and that the percentage of low-birth-weight infants was also higher in the study group ($p<0.05$) (Table 2). We also found that 1st-minute Apgar scores were affected and were lower in the study group ($p=0.025$) (Table 2). However, there was no significant ($p=0.309$) difference between the study and control groups in terms of 5th-minute Apgar scores (Table 2). Also, the two groups did not differ significantly in the number of preeclampsia and placental abruption cases they included (Table 2).

While we observed generally lower 1st-minute Apgar scores in the study group, we unexpectedly found that pregnant women with SH in the same group had better 5th-minute Apgar scores ($p=0.002$) (Table 3), which was also supported by the fact that the presence of isolated SH in healthy pregnant women without additional risk factors did not appear to negatively affect obstetric and neonatal outcomes. A clinical hematoma may have a positive effect on Apgar scores by limiting bleeding and playing a mitigating role, compared to TA, where there is only bleeding. However, larger studies would be needed to prove this hypothesis.

An important issue in obstetrics is antenatal care, which, for example, includes the use of vaginal progesterone to prevent preterm labor in pregnant women with a short cervix (13,14) and use of low-dose aspirin to prevent preeclampsia development in those with a history of preeclampsia (12). It is thus important to determine the TA-related risks in later pregnancy, as this would allow precautions to be taken in order to prevent neonatal deaths due to these complications.

In our study, USG revealed that 71% (n=98) of the study group had SH around the gestational sac while only 10.9% (n=15) of the control group had SH. Bleeding around the gestational sac may play a triggering role in the release of mediators in the uterus, leading to the onset of a chronic inflammatory process and affecting placental development. Such bleeding, rather than SH presence, can be considered sufficient for these risks to exist (15) and, according to our results, may cause low fetal weight by negatively affecting intrauterine fetal weight gain and well-being. Finally, it should be noted that, similar to previously reported findings (16), we observed that isolated SH in the absence of additional risk factors did not affect obstetric and neonatal outcomes in healthy pregnant women. Moreover, SH in TA may positively affect 5th-minute Apgar scores, possibly with a limiting effect on bleeding. However, more studies are needed to draw firm conclusions.

Conflict of Interest and Financial Disclosure

The authors declare that they have no conflict of interest to disclose. The authors also declare that they did not receive any financial support for the study.

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