Placental abruption and analysis of risk factors

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Abstract

Objective: It was aimed to evaluate pregnancies with suspected placental abruption and investigate the related risk factors.

Methods: Ninety-four pregnancies who delivered by cesarean section for suspected placental abruption in Zeynep Kamil Hospital between 01.03.2012 and 31.01.2013 were included in this study. During the operation, the placenta was examined macroscopically. The presence of retroplacental bleeding or clots in the placenta confirmed the diagnosis of placental abruption. Age, parity, height, weight, blood group, placental localization, previous delivery type, presenting symptoms, pregnancy complications were recorded.

Results: The diagnosis of placental abruption was confirmed in 43 (46%) patients while 51 of them (54%) were not confirmed. There was no significant difference between the groups in terms of maternal age, gestational age and body mass index. Mean arterial pressure (MAP) was 95.1±17.8 at the group with placental abruption confirmed and 85.4±8.7 (p=0.006) at the group with placental abruption not confirmed. Placental abruption is more frequent in patients with preeclampsia (OR=8.5; p=0.022). When the groups were compared according to their blood groups; 87.5% of pregnant women with 0 Rh (+) blood group was confirmed for diagnosis of placental abruption (OR=8.7; P=0.005).

Conclusion: Identification of risk factors for placental abruption is the basic criterion for the management and reduction of potential complications.

Key words: Abruptio placentae, mean arterial blood pressure, preeclampsia, 0 Rh (+) blood group.

Dekolman plasenta ve risk faktörleri

Amaç: Dekolman plasenta şüphesi olan gebeliklerin değerlendirilmesi ve risk faktörlerinin tanımlanması amaçlanmıştır.

Yöntem: Bu çalışmaya 01.03.2012-31.01.2013 tarihleri arasında Zeynep Kamil Kadın ve Çocuk Hastalıkları Hastanesi'nde dekolman plasenta şüphesi ile sezaryenle doğum yapan 94 hasta dâhil edildi. Operasyon esnasında plasenta makroskopik olarak incelendi. Plasenta da retroplasental kanama veya pıhtı görülmesi ile dekolman plasenta tanısı doğrulandı. Gebelerin yaş, parite, boy, kilo, kan grubu, plasenta lokalizasyonu, gebelik sürecindeki hastalıkları, önceki doğum şekli, başvuru şikâyeti, gebelik komplikasyonları kayıt edildi.

Bulgular: Olguların 43'ünde (%46) dekolman plasenta tanısı doğrulanırken, 51'inde (%54) doğrulanmadı. Gruplar arasında maternal yaş, gebelik haftası ve vücut kitle indeksi açısından fark saptanmadı. Ortalama arteriyel basınç dekolman plasenta saptanan grupta 95.1±17.8 iken dekolman plasenta saptanmayan grupta 85.4±8.7 (p= 0.006) olarak tespit edildi. Preeklampsi gelişen olgularda dekolman plasenta daha fazla saptandı (OR=8.5; p=0.022). Kan gruplarına göre gruplar karşılaştırıldığında; 0 Rh (+) kan grubuna sahip gebelerin %87.5'inde dekolman plasenta tanısı doğrulandı (OR=8.7; p=0.005).

Sonuç: Dekolman plasenta risk faktörlerinin tanımlanması; olguların yönetimi ve olası komplikasyonların azaltılmasında temel kriterdir.

Anahtar sözcükler: Dekolman plasenta, ortalama arteriyel kan basıncı, preeklampsi, 0 Rh(+) kan grubu.

Introduction

Placental abruption is defined as the case where placenta is separated from the uterus completely or partially. Approximately between 0.4% and 1% of pregnancies are complicated by placental abruption. Placental abruption is one of the most significant reasons of maternal and fetal morbidity and mortality.[1] Its clinical findings are vaginal bleeding, uterine tension and painful tetanic contractions. Its most significant risk factor is the placental abruption during pregnancy

and advanced maternal age, intrauterine infections, oligohydramnios, polyhydramniosis, intrauterine growth retardation, extended rupture of membrane, preeclampsia, hypertension, multiple pregnancies, uterine anomalies, trauma, smoking and cocaine use are the other risk factors.[1-6]

The ultrasound diagnostic criteria for placental abruption are considered as the presence of intraamniotic, subchorionic or marginal hematoma, increase of placental thickness (>5 cm) and heterogeneity, preplacental and retroplacental collections, and ' jelly-like' movements on chorionic surface when fetus moves. More than 50% of the cases with placental abruption are not detected during ultrasound imaging and placental abruption diagnosis cannot be excluded if normal ultrasound findings are detected.[2,7]

In this study, we aimed to analyze gestational outcomes together with the demographical and clinical data of cases who delivered by cesarean section for suspected placental abruption.

Method

Ninety-four pregnancies, who delivered by cesarean section for suspected placental abruption in Zeynep Kamil Hospital between 01.03.2012 and 31.01.2013, were included in the study. Multiple pregnancies and those with chromosomal and structural abnormalities were excluded.

Pre-diagnosis of placental abruption was confirmed by clinical findings (vaginal bleeding, uterine sensitivity, and pain) and ultrasound findings (subchorionic or retroplacental hematoma, heterogeneity and thickness increase in placenta). Patients were planned to have cesarean section. During operations, placenta was examined macroscopically. Placental abruption was confirmed by the presence of retroplacental bleeding or clots in the placenta. When retroplacental bleeding or clot was not detected in the placenta, then the diagnosis of placental abruption was ruled out.

Patients who participated in the study were separated into two groups as those with confirmed placental abruption diagnosis and those without confirmed placental abruption diagnosis. Data of patients such as age, week of gestation, parity, blood type, complaint and mean arterial pressure (MAP=[systolic blood pressure + 2 x diastolic blood pressure]/3), body mass index (BMI; kg/m²), gestational outcomes and complications,

fetus gender, birth weight, Apgar score and whether newborn needs intensive care or not were recorded.

Statistical methods

Patient data were analyzed in SPSS 20 package program (SPSS Inc., Chicago, IL, USA). Definitive statistical analyses were carried out. Normal range coherences of variables were evaluated by Kolmogorov-Smirnov test. Independent samples T test was used in the comparison of the parameters with normal ranges while Mann-Whitney U test was used in the comparison of the parameters with abnormal ranges. Chi-square test and Fisher's exact test were used for the comparison of non-qualitative parametric data. The value $p<0.05$ was accepted as statistically significant.

Results

Ninety-four cases with placental abruption pre-diagnosis were included in our study. While the diagnosis of placental abruption in 43 (46%) of the cases, it was not confirmed in 51 (54%) of them. Encephalocele was detected in one of the cases with confirmed placental abruption diagnosis; data of the twelve cases could not be recorded. Thirteen cases were excluded from the study. In the group with confirmed placental abruption diagnosis, mean age was 28.6±6.8, mean parity was 1.0±1.1, mean week of gestation was 32±1, and mean BMI was 29.3± 4.8 kg/m²; while these values were 28.7±5.7, 0.8±1.1, 33±16 and 28.5±4.4 kg/m² in the group with confirmed placental abruption diagnosis, respectively. There was no significant difference between two groups (p≥0.05) (**Table 1**). No significant difference was observed when groups were compared in terms of their complaints (pain, vaginal bleeding, water break [amniotic fluid], decrease in fetal movements etc.) (p=0.55) (**Table 2**). There was also no significant difference between the groups in terms of placental localizations (p=0.22) (**Table 3**). However, placentation could not be detected during ultrasound imaging in one of the cases with confirmed placental abruption diagnosis, and emergency cesarean section was performed due to fetal bradycardia.

Mean arterial pressure (MAP) was 95.1±17.8 mmHg in the group with confirmed placental abruption diagnosis while it was 85.4±8.7 mmHg in the group without confirmed placental abruption diagnosis. As mean arterial pressure was higher than 95 mmHg, OR was found

Table 1. Definitive characteristics of groups with/without confirmed placental abruption diagnosis.

	Group without confirmed placental abruption diagnosis (n=38)	Group with confirmed placental abruption diagnosis (n=43)	p
Age	28.7±5.7	28.6±6.8	0.89
Parity	0.8±1.1	1.0±11	0.52
Week of gestation	33±6	32±1	0.72
BMI	28.5±4.4	29.3±4.8	0.47
MAP	85.4±8.7	95.1±17.8	0.006
1st min. Apgar score	6.7±2	4.5± 2.6	<0.001
5th min. Apgar score	8.2±2.1	6.2±3	0.003
Birth weight	2246±798	1667±718	0.001

BMI: Body mass index, **MAP:** Mean arterial pressure.

5.2 (95% Cl: 1.7-16) for the placental abruption (p=0.006). When groups were compared according to their blood types, placental abruption was detected in 87.5% of cases with 0 Rh (+) blood type (n=16) (OR=8.7; 95% CI: 1.8-41.4) (p=0.005). There was no significant difference between groups in terms of other blood types (p>0.05) (**Table 4**). Although there was no significant difference between groups in terms of smoking habit, cases who were smoking had a high rate of placental abruption (OR=4.8; 95% CI: 0.96-23.7) (p=0.84). Placental abruption diagnosis was confirmed in 88.9% of cases diagnosed with preeclampsia (OR=8.5; 95% CI: 1.1-71) (p=0.022). Placental abruption diagnosis was also confirmed in 71% of cases with intrauterine growth retardation; however, there was no significant difference between groups in terms of intrauterine growth retardation (OR=2.6; 95% CI: 0.74-9) (p=0.22). In 87.5% of the cases with intrauterine fetal death, the diagnosis of

placental abruption was confirmed (OR=7.2; 95% CI: 0.84-61.5) (p=0.93). Three of the cases with confirmed placental abruption diagnosis had oligohydramnios, one of them had polyhydramniosis, two of them had uterine septum, one had IVF pregnancy, four of them had asthma in their medical histories, two of them had hypothyroidism in their medical histories and one of them had hyperthyroidism in the medical history, but there was no difference between groups (**Table 5**). Nineteen percent of the cases placental abruption previously had cesarean section (p=0.281). Babies of 61% of the cases with placental abruption were male but there was no significant difference (OR=2.4; 95% CI: 0.96-5.7) (p=0.096).

In the group with placental abruption, hysterectomy was performed in one case since the active bleeding could not be stopped due to atonia. Couvelaire uterus (with 100% and 60% placental abruption) was detected in two cases. In the control group, postoperative percu-

Table 2. Distribution of the complaints of the cases.

Complaint	Group without confirmed placental abruption diagnosis (n=38)	Group with confirmed placental abruption diagnosis (n=43)
Premature rupture of membrane	100.0% (1)	0.0%
Decrease in baby movements	42.9% (3)	57.1% (4)
Vaginal bleeding	43.3% (13)	56.7% (17)
Bloody water break	33.3% (1)	66.7% (2)
Decrease in baby movements + vaginal bleeding	0.0%	100.0% (1)
Pain + vaginal bleeding	25.0% (1)	75.0% (3)
Labor follow-up	54.2% (19)	45.8% (16)

Table 3. Distribution of placental localizations.

Placentation	Group without confirmed placental abruption diagnosis (n=38)	Group with confirmed placental abruption diagnosis (n=43)
Anterior	39.5% (17)	60.5% (26)
Posterior	53.3% (8)	46.7% (7)
Fundus	55.6% (5)	44.4% (4)
Right lateral	100.0% (3)	0.0% (0)
Left lateral	33.3% (1)	66.7% (2)
Right anterior	100.0% (1)	0.0% (0)
Right posterior	100.0% (1)	0.0% (0)
Sol anterior	40.0% (2)	60.0% (3)
Unknown	0. 0% (0)	100.0% (1)

Table 4. The blood types of the cases.

Blood types	Group without confirmed placental abruption diagnosis (n=38)	Group with confirmed placental abruption diagnosis (n=43)
0 Rh (+)	12.5% (2)	87.5% (14)
0 Rh (-)	33.3% (1)	66.7% (2)
A Rh (+)	50.0% (16)	50.0% (16)
A Rh (-)	57. 1% (4)	42.9% (3)
B Rh (+)	58. 8% (10)	41.2% (7)
AB Rh (+)	80.0% (4)	20.0% (1)
AB Rh (-)	100.0% (1)	0.0%

taneous hematoma was observed in one case in the control group. There was no significant difference between groups in terms of newborn intensive care need.

Discussion

The frequency of placental abruption which is one of the most significant reasons of perinatal mortality and morbidity was reported between 0.9% and 1.38% in Turkey.[8,9] Placental abruption is a clinical diagnosis and it is confirmed by pathological examination of the placenta. The most frequent complaint of the cases is vaginal bleeding. Vaginal bleeding may begin suddenly at second or third trimester and may be accompanied by contractions and pain. Although vaginal bleeding is the characteristic finding of placental abruption, it is observed only in 70-80% of the cases.[1,2,7]

Placental abruption was confirmed in 46% of 94 cases that were included into our study, diagnosed with placental abruption and had cesarean section. Vaginal bleeding was observed as the most frequent finding in cases with confirmed placental abruption diagnosis. Tikkanen et al. reported that vaginal bleeding was the most frequent clinical finding in 70% of the cases while it was abdominal pain in 51% of them, hemorrhagic amniotic fluid in 50% of them, fetal heart rate anomaly in 69% of them, and that 19% of the cases did not have any bleeding and pain. Also, retroplacental bleeding area or clot was detected only in 15% of the cases by ultrasound imaging.[10]

Ananth et al. found in their studies that preeclampsia (OR=1.73; 95% CI: 1.47-2.04), chronic hypertension (OR=3.13; 95% CI: 2.04-4.80), and premature rupture of membrane (OR=3.05; 95% CI: 2.16-4.32)

Table 5. Distribution of clinical findings in groups with and without confirmed placental abruption diagnosis.

Clinical findings	Group without confirmed placental abruption diagnosis (n=38)	Group with confirmed placental abruption diagnosis (n=43)
MAP>95 mmHg	13.2% (5)	44.2% (19)
Preeclampsia	2.6% (1)	18.6% (8)
Intrauterine growth retardation	10.5% (4)	23.3% (10)
Oligohydramnios	2.6% (1)	7% (3)
Polyhydramniosis	2.6% (1)	2.3% (1)
Intrauterine fetal death	2.6% (1)	16.3% (7)
IVF pregnancy	2.6% (1)	2.3% (1)
Asthma	5.3% (2)	9.3% (4)
Diabetes mellitus	2.6% (1)	2. 3% (1)
Hypothyroidism	0.0%	4. 7% (2)
Hyperthyroidism	0.0%	2.3% (1)
Uterine septum	2.6% (1)	4.7% (2)
Smoking	5.3% (2)	20.9% (9)
Male fetus	39.5% (15)	60.5% (26)

were associated with the increased risk of placental abruption.[11] Tikkanen et al. showed that preeclampsia (adjusted odds ratio [aOR]=2.7; 95% CI: 1.3-5.6), chorioamnionitis (aOR=3.3; 95% CI: 1.0-10.0) and placenta previa (aOR=5.7; 95% CI: 1.4-23.1) are independent risk factors for placental abruption.[10] In Turkey, Kale and Ecer reported in their studies that maternal age higher than 30, multiparity and and hypertensive diseases are risk factors.[8] In our study, mean age for the cases with confirmed placental abruption diagnosis was 28.6±6.8 and mean week of gestation was 32±1. Placental abruption diagnosis was confirmed in 88.9% of the cases diagnosed with preeclampsia and when OR=8.5 (95% CI: 1.1-71) and MAP was higher than 95 mmHg, it was found that its OR was 5.2 (95% CI: 1.7-16). Also in 71% of the cases with intrauterine growth retardation (OR=2.6; 95% CI: 0.74-9) and in 87.5% of cases found to have intrauterine fetal death (OR=7.2; %95 CI: 0.84-61.5), placental abruption was confirmed but no significant difference was found. Moreover, in three of the cases with placental abruption had oligohydramnios, one of them had polyhydramniosis, two of them had uterine septum, one had IVF pregnancy, four of them had asthma in their medical histories, two of them had hypothyroidism in their medical histories and one of them had hyperthyroidism in the medical history.

Matsuda et al. indicated in their studies defining risk factors of placental abruption that age higher than 35 (adjusted relative risk; RRs=1.2), IVF pregnancy (RRs=1.38), preterm labor (RRs=1.63), hypertension (RRs=2.48) and hypertension induced by pregnancy (RRs=4.45) are the risk factors.[12] Hasegawa et al. found a different result showing that anemia presence before 20 weeks of gestation (aOR=4.05), presence of SGA (small for gestational age) (aOR=5.20), and the presence of SGA fetus (aOR=5.39), preterm uterine contractions (aOR=5.96) and preeclampsia (aOR=3.37) were the risk factors for placental abruption.[13] Arnold et al. reported that iron deficiency anemia at early gestational period (Hb <10 mg/dl) increased risk of placental abruption for 3.6 times.[14]

Hung et al. analyzed risk factors of placental abruption in Asian population and reported the coefficients of gestational hypertension (aOR=4.9; 95% CI: 3.3-7.3), oligohydramnios (aOR=4.2; 95% CI: 2.7-6.7), polyhydramniosis (aOR=3.3; 95% CI: 1.4-7.7), preterm premature rupture of membrane (aOR=1.9; 95% CI: 1.1-3.1), maternal age higher than 35 (aOR=1.5; 95% CI: 1.1-2) and low BMI value (aOR=1.3; 95% CI: 1.0-1.6) for placental abruption.[15] Deutsch et al. showed in their study conducted in 2010 that placental abruption risk was increasing in slim women (OR=1.4; 95% CI: 1.3-1.5).[16] Salihu et al. indi-

cated that placental abruption risk was increasing if weekly weight gaining of pregnant women with normal weight is ≤0.22 kg/week (aOR=1.8; 95% CI: 1.5-2.2), and the risk was decreasing in obese women.[17] In our study, mean BMI was found as 29.3±4.8 in the group with confirmed placental abruption diagnosis, but there was no significant difference when groups were compared.

Tikkanen et al.[10] reported the aOR of smoking habit for placental abruption as 1.8 (95% CI: 1.1-2.9) while Hung et al.[12] reported the aOR as 8.4 (95% CI: 3.0-23.9).[14] In our study, although there was no significant difference between groups in terms of smoking (p=0.84), placental abruption was found to be higher in smoking women. Also, no association was observed in our study in terms of fetal gender (p=0.096), and Aliyu et al. reported that the placental abruption risk was decreasing in female fetuses (OR=0.89; 95% CI: 0.86-0.93).[18]

In our study, unlike other studies, the placental abruption diagnosis was confirmed in 87.5% of the cases with 0 Rh(+) blood type, and OR was found to be 8.7 (95% CI: 1.8-41) for placental abruption. No study was seen in the literature showing association between blood types and placental abruption.

Conclusion

In conclusion, analyzing risk factors of placental abruption is significant in order to decrease maternal and fetal morbidity and mortality, and to avoid unnecessary surgical interventions and their potential complications.

Conflicts of Interest: No conflicts declared.

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