

# Risk factors and maternal/fetal outcomes of pregnant women with abruptio placenta: a retrospective, descriptive study

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## ABSTRACT

**Aim:** Abruptio placenta is one of the most important causes of antepartum bleeding and is linked to the major (unpleasant) obstetrics consequences leading to the increased risks of fetal and maternal morbidity and mortality. The aim of our study is to establish a prevalence in our tertiary hospital and find out the fetal and maternal outcomes, along with the patient's demographic characteristics and risk factors of abruptio placenta.

**Material and Method:** This trial was carried out in Profesör Doktor Cemil Taşcıoğlu State Hospital, between January 2018 and March 2022. Patient data were extracted from computer system, and files were retrospectively evaluated. We established the fetal and maternal outcomes, along with the demographic characteristics and risk factors of abruptio placenta. All analysis was performed using SPSS software (Statistical Package for the Social Sciences, version 25.0, SPSS Inc., Chicago, IL, USA).

**Results:** Within the review period there were 7126 deliveries. And 112 cases with abruptio placenta were seen out of the total deliveries. In our population, prevalence of the abruptio placenta was calculated as 1.5%. Because of the incomplete data in certain files, only a total of 102 cases (91%) were eligible for the study.

**Conclusion:** In conclusion, since the abruptio placenta is highly associated with maternal and fetal morbidity and mortality, timely diagnosis is crucial to prevent devastating consequences.

**Keywords:** Abruptio placenta, risk factors, complications

## INTRODUCTION

After the fetal viability and before the birth, partial or total detachment of a normally located placenta is called as abruptio placenta (1). The situation can be encountered in 0.5%–1% of pregnancies (2,3). It is one of the most important causes of antepartum bleeding and is linked to the major obstetrics consequences leading to the increased risks of fetal and maternal morbidity and mortality (4). Concealed or revealed types of hemorrhage may be seen in abruptio placenta. The concealed type is considerably hazardous due to the blood loss level does not correspond with maternal heart rate and blood pressure and is concluded to have more fetal death in comparison to the revealed type as well (5). Predisposing factors for abruptio placenta comprise hypertensive disorders of pregnancy, multiparity, being under the age of 20, advanced maternal age which is above 35, formerly having abruptio placenta, uterine anomalies, multiple

pregnancy, polyhydramnios, smoking, cocaine use, blunt abdominal trauma, retroplacental leiomyoma, premature rupture of membranes, thrombophilic disorders, and short umbilical cord (4). The clinical signs depend on the degree of placental detachment and bleeding amount. Vaginal bleeding and abdominal pain are the most encountered presentation scenario. On the other hand uterine tenderness, preterm labor, hemodynamic instability, fetal distress, and fetal death may also be seen (2,5). The diagnosis is essentially clinical, although the sensitivity of ultrasound is low for diagnosis of abruptio placenta, it is useful for differential diagnosis for placenta previa (3,6). The low sensitivity of ultrasound is due to the fact that a retroplacental hematoma may be seen isoechoic relatively to the placenta on ultrasonography (7). The ultrasonographic view of abruptio placenta depends on the size, location, and the time period between the abruptio and the ultrasonography (7). Diagnosis of abruptio placenta is almost always confirmed via direct

visualisation of retroplacental clots at the separation site. Abruptio placenta should be evaluated and managed based upon the patient's clinical condition, blood loss level, fetal maturity and well being, whether the delivery starts or not, presence of any complication and the severity of placental abruption. In most of the cases decision comes out in favor of immediate delivery. The type of delivery is decided based upon the level of abruptio placenta, fetal well being, Bishop's score and severity of hemorrhage (8). Expectant and far from term management can be preferred in diligently selected cases with light bleeding, live fetus, reassuring cardiotocography (9). The aim of the expectant management is to help fetus get mature enough to survive. Some important maternal complications are antepartum hemorrhage, hypovolemic shock, pulmonary edema, disseminated intravascular coagulopathy, acute renal failure, and postpartum bleeding (2,10,11). Transfusions, if required, should include fresh whole blood, fresh frozen plasma, and cryoprecipitate (12). Emergency hysterectomy may be required in resistant postpartum bleeding. Abruptio placenta impose a high risk of fetal morbidity and mortality of which reasons are usually severe separation, misdiagnosis and delay in intervention (13,14).

In the light of all this, the aim of our study is to establish an incidence rate in our population based hospital and find out the fetal and maternal outcomes, along with the demographic characteristics and risk factors of abruptio placenta.

## MATERIAL AND METHOD

The study was carried out with the permission of the Okmeydanı Training and Research Hospital Clinical Researches Ethics Committee (Date: 02.04.2019, Decision No: 1207) and informed consent was obtained from each participant. All procedures were carried out in accordance with the ethical rules and the principles of the Declaration of Helsinki.

This trial was carried on in a tertiary public hospital. 102 women with abruptio placenta were enrolled in the study that are confirmed during delivery between January 2018 and March 2022. Patient data were extracted from the computer system and files were retrospectively evaluated. Age, gravida, parity, gestational age, the clinical and sonographic findings at presentation, predisposing factors like hypertension, pre-eclampsia, eclampsia, polyhydramnios, early rupture of membranes, preterm labor, intrauterine growth restriction, smoking, blunt abdominal trauma and retroplacental leiomyoma, blood pressure, hemoglobin level, the gender of the fetus, birth weight, first- and fifth-minute Apgar scores, fetal demise, neonatal intensive care unit requirement are all obtained. At the same time, maternal complications

such as disseminated intravascular coagulopathy, hypovolemic shock, acute kidney failure, presence of seizure, hysterectomy requirement, pulmonary edema, transfusion requirement, death were all recorded as well. Patients with complaints of vaginal bleeding and abdominal tenderness, along with ultrasonographic findings of retroplacental hematoma or collection and heterogeneity in placenta were prediagnosed as placental abruption. Definitive diagnosis was made by the direct visualization of retroplacental clots on the separated site during caesarean section or vaginal delivery. Chronic hypertension was determined as systolic blood pressure above 140 mmHg and diastolic pressure above 90 mmHg before the gestational age of 20 weeks or before the conception. Preeclampsia was described as systolic blood pressure above 140 mmHg and diastolic blood pressure above 90 mmHg after the gestational age of 20 weeks with proteinuria (>300 mg/24 h or +1 by urine dipstick) or hypertension with thrombocytopenia, visual deterioration, pulmonary edema, increased serum creatinine levels, and abnormal liver and kidney function tests without proteinuria (15). Anemia is defined as having a hemoglobin (g/dL) value below 11 (acog ve anemi)???. Preterm labor was defined as labor between 24 and 37 gestational weeks whereas early preterm labor is accepted that occurring before 34 weeks of pregnancy. Rupture of membranes before the onset of labor was defined as early rupture of membranes; and the presence of regular contractions or cervical dilation before 37 weeks of pregnancy was termed as preterm labor (16). Education level of the patients was classified into 3 subgroups: illiterate, education for 8 years or below and education period above 8 years. This is done since the compulsory schooling period in our country is 8 years.

All analysis was performed using SPSS software (Statistical Package for the Social Sciences, version 25.0, SPSS Inc., Chicago, IL, USA). Kolmogorov-Smirnov test was used to evaluate the eligibility of the data for normal distribution. None of the variables did follow the normal distribution. So, descriptive statistical methods were used to evaluate frequency (n), percentage (%), and median (minimum-maximum) when appropriate.

## RESULTS

During the review period there were 7126 deliveries. And 112 cases with abruptio placenta were seen out of the total deliveries submitting a prevalence of 1.5%. Because of the incomplete data in certain files, only a total of 102 cases (91%) were eligible. Median value with minimum and maximum values of patients' ages was 31.5 (19-42) years. Four cases (4%) were nulliparous, whereas 53 patients (51,9%) had parity of two or above. Median value with minimum and maximum values of patients' parities was

2 (0-4). Of all, 89 subjects (87.2%) were before term, while 13 (12.8%) presented at term. Among all, of the subjects, 85 (83,3%) cases had anemia. Eighteen subjects (17.6%) had an education period above 8 years whereas the rest (84 (82.4%)) had an education period of 8 or below. Forty three (42.1%) among all the cases were immigrants. Of all the cases, 49 subjects (48%) were unbooked with no antenatal recordings, they were referred from other hospitals. Dispersion of age, parity and education level data according to the subcategories is listed in **Table 1**. **Table 2** shows the risk factors of abruptio placenta. Hypertensive disorder of pregnancy was seen in 82 (80.3%) subjects. In all, 38 (37.2%) subjects were smokers. At the time of hospitalization, just 21 cases (11.7%) were in established labor. Majority of the complaints at presentation were vaginal bleeding along with abdominal pain as a second significant complaint. Fifteen cases (14.7%) were with early rupture of membranes. Most of the caesarean section decisions were made on account of abruptio placenta with live fetus. Twelve subjects (11.7%) had vaginal delivery whereas 90 (88.3%) had caesarean section. One (1%) subject was managed conservatively. Conservatively managed case went through caeserean section 24 hours after presentation. Twenty four (23.5%) subjects appeared to have concealed bleeding whereas 78 (76.5%) cases had revealed one. Maternal outcomes are depicted in **Table 3**. Of all, 2 (2%) maternal deaths were encountered. One patient having abruptio placenta was with subplacental leiomyoma and hypovolemic shock and was one of the two maternal losses in this study. Other maternal death had resulted from the hypovolemic shock led by abruption after a traffic accident. In all, 51 (50%) subjects had hypertensive disorders. Fourty four (43.1%) subjects received blood transfusion due to heavy bleeding. Twenty four (27%) of those that had caesarean section were with a Couvelaire uterus. Neonatal outcomes are depicted in **Table 4**. There were 89 live births (87.3%) and 13 still births (12.7%). Median value of fetal birth weight and gestation age were 2600 (880-3100) and 34 (28-38), respectively. The number of the subjects with an Apgar score below 7 at first-minute and at fifth minute were 73 (71.6), and 48 (47.1%), respectively. In 13 (12.7%) of the subjects, the first-minute Apgar score was noted as "0." Fifty seven (55.9%) fetuses were male. Among stillbirths, 10 (77%) fetuses were male. Fourty one (40%) fetuses were admitted to the neonatal intensive care unit just after delivery.

## DISCUSSION

Abruptio placenta is one of the most dangerous complications of pregnancy, since it has poor outcomes for the mother and the child. In our study the incidence of abruptio placenta was 1.5%. This value is slightly higher than the 0.5-1.1% rate of incidences observed in West

and Asian populations (4,17-19). The higher incidence of AP in our study may be due to the fact that our hospital is a tertiary referral public hospital with its high patient capacity. Some observational studies have concluded that the levels of vitamin A, b-carotene, and vitamin E in peripheral venous blood of women with abruptio placenta. In our study 43 (42.1%) patients were immigrants, 84 subjects (82.4%) had an education period of 8 or below and 85 (83.3%) patients had anemia, however it could not be concluded if the anemia was the cause or consequence, of antepartum hemorrhage, since many patients were unbooked (49(48%)) with no antenatal records. We suppose that the high frequency of maternal anemia is a result of both the bleeding of abruption and maternal nutritional deficits commonly prevalent in immigrants and populations with low socioeconomic strata.

**Table 1. Sociodemographic characteristics along with subcategories**

	Frequency (n)	Percentage (%)
Age		
≤19	2	2
20-29	43	42.2
30-39	49	48
≥40	8	7.8
Parity		
0	4	4
1	45	44.1
2	34	33.3
3	14	13.7
4	5	4.9
Education level		
Illiterate	10	9.8
≤8 years education	74	72.6
>8 years education	18	17.6

**Table 2. Risk factors for abruptio placenta**

	Frequency (n)	Percentage (%)
Hypertensive disorders	82	80.3
Trauma	1	1.4
Subplacental leiomyoma	1	1.4
Smoker	38	37.2
Short cord	1	1.4
Preterm birth	12	16.9
Multiparity	53	51.9

**Table 3. Maternal Complications**

	Frequency (n)	Percentage (%)
Blood transfusion	44	43.1
Postpartum haemorrhage	14	13.7
Acute renal failure	5	4.9
Disseminated intravascular coagulation	16	15.6
Caesarean hysterectomy	4	3.9
Ligation of internal iliac or uterine arteries	8	7.8
Maternal mortality	2	2
Hypovolemic shock	3	2.9
Couvelaire uterus	24	23.5

Table 4. Neonatal outcomes	
Gestational age in years (Median (min-max))	34 (28-38)
Birth weight (Median (min-max))	2600 (880-3100)
Gender	
Female (n (%))	45 (44.1)
Male (n (%))	57 (55.9)
First minute APGAR score (Median (min-max))	5 (0-8)
Fifth minute APGAR score (Median (min-max))	7 (0-10)
Stillbirth (n (%))	13 (12.7)
Neonatal intensive care unit admission (n (%))	41 (40)

High parity and advanced maternal age are accepted as well-known risk factors for abruptio placenta (6, 20-23). In our study 51% of patients had parity of two and above. This rate is not consistent with the result of 80% in Adalı et al.'s (24) article. On the other hand, rates of maternal age above 30 of our study and Adalı et al.'s article were 57% and 46%, respectively.

The association of abruptio placenta with hypertension was demonstrated in some studies (10,11,13). In our study 80,3% of the subjects had hypertensive disorders. In our country, in two studies, this rate is reported as 30% and 53,3% which are not consistent with ours (24,25). The reason of this discrepancy may be due to the fact that significant number of the subjects in our study were unbooked and our hospital is a tertiary center where referred patients are accepted. Lack of appropriate antenatal care and low socioeconomic status are linked with unfortunate medical conditions like hypertension in pregnancy (26).

In this study it is documented that majority (88.3%) of the subjects were delivered by emergency caesarean sections. This is similar to a study conducted by Cakmak et al. (27). However, some other studies revealed a larger proportion of patients having vaginal delivery (14). This disparity may depend on the fetal well being at presentation. And in our study there were only 21 cases (11,7%) in established labor. Since the time from presentation to the birth has a big impact on fetal well being, emergency caesarean section may be the prompt choice for practitioners. The best management for abruptio placenta with a live fetus is caesarean section (2).

Preterm labor and early rupture of membranes are also risk factors for placental abruption. In our study there were 15 (14.7%) subjects presented with early rupture of membranes. This rate is consistent with some other studies which have a range between 8 and 16% (17,26,27).

The risk of placental detachment after trauma is 2% which should be carefully taken into account (26,28). In this study, we observed only one case (1%) of abruptio placenta with a history of trauma. American College

of Obstetricians and Gynecologists recommends a minimum of 4-hour surveillance for the pregnant women after abdominal trauma (29). We, in our practice, accept the pregnant women with a history of trauma as inpatient for at least 24 hours.

It is noteworthy that only one patient (1%) was managed conservatively. This is an exception since abruptio placenta is an obstetric emergency. Early onset severe preeclampsia, requires delivery of the fetus at a very preterm gestation in order to prevent severe maternal complications. This may cause poor perinatal outcomes. The complications of iatrogenic premature birth are more common in low resource settings. Expectant management of severe preeclampsia, far from term, therefore may be necessary to prevent such detrimental events in the fetus. But expectant management may result in fetal loss or fetal asphyxia (9,30)

Abruptio placenta is also associated with high perinatal mortality and morbidity. It has been concluded that 12% of all perinatal deaths is due to abruptio placenta (2). In our study, there were 13 (12.7%) perinatal deaths. This is consistent with the results in some other studies carried on in other tertiary hospitals (2,22). The high perinatal mortality rates highlight the importance of immediate intervention. During pregnancy, intrapartum and postpartum periods disseminated intravascular coagulation rate is about 35%, and it is more encountered among placental abruption cases (31). Furthermore, in placental abruption subjects, the rates of maternal loss, hysterectomy, pulmonary edema, disseminated intravascular coagulation and renal failure were revealed to be high especially due to hypertensive disorders (26). In our study there were 44 (43.1%) cases that had blood transfusion which is consistent with some other studies (18,27). In 20-30% of cases vaginal bleeding can be absent when hemorrhage is concealed in the uterus (5,32). Therefore, the observed amount of bleeding is useless to estimate the accurate loss from the maternal circulation. In our study 24 (23.5%) subjects were with concealed hemorrhage which is consistent with the literature.

The two maternal deaths in our study were both unbooked patients with no antenatal surveillance in our department. Both cases were found to be presented late to the hospital with irreversible shock with massive hemorrhage. This highlights the importance of early presentation and immediate management to refrain from the adverse maternal and fetal outcomes of abruptio placenta.

There is an association between placental abruption and preterm labor, low birth weight, fetal demise (8). The perinatal mortality and morbidity of placental

abruption is dependent on the amount of placenta separated and the gestational week. Stillbirth rate is considerably high when the separation percentage is over 50% relative to the whole placental bed (33). In abruptio placenta the rate of perinatal death secondary to the preterm birth is reported with a range of 36-59% (2,11). In a Turkish study mean gestational week and birth weight are found as 31,36 weeks and 2153 gram, respectively (24). In another Turkish study, mean gestational age and mean birth weight are reported as 28,25 weeks and 1988 grams, respectively (26). In our study, median gestational age was 34 (28-38) weeks and median birth weight was 2600 (880-3100) grams. In abruptio placenta, neonatal asphyxia and death rate tend to be high. Furthermore, APGAR scores of the neonates have a tendency to be lower in patients with abruptio placenta. Adalı et al. (24) reported the first and fifth minute APGAR score mean values as 2 and 2,9, respectively. On the contrary, we found the same scores in median values as 5(0-8) and 7 (0-10), respectively. The reason of the discrepancies between studies, is that stillbirth rate was 12.7% in our study whereas the same rate was 61% in Adalı et al. (24) article. Moreover there is one report concluding that if the fetus is male, the risk of abruptio placenta is higher (34). In our study, of all fetuses there were 57 (55.9%) male fetuses and among 13 stillbirths, 9 (70%) were male.

## CONCLUSION

Since the abruptio placenta is highly associated with maternal and fetal morbidity and mortality, timely diagnosis is crucial to prevent devastating consequences. In pregnant women presenting with vaginal bleeding, pain and even if the ultrasonographic examination is normal placental abruption should still be kept in mind in differential diagnosis. Antenatal care which reveals the risk factors like hypertensive disorders has a big role in preventing the abruptio placenta and alleviating the maternal and fetal outcome.

## ETHICAL DECLARATIONS

**Ethics Committee Approval:** The study was carried out with the permission of the Okmeydanı Training and Research Hospital Clinical Researches Ethics Committee (Date: 02.04.2019, Decision No: 1207).

**Informed Consent:** Because the study was designed retrospectively, no written informed consent form was obtained from patients.

**Referee Evaluation Process:** Externally peer-reviewed.  
**Conflict of Interest Statement:** The authors have no conflicts of interest to declare.

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**Author Contributions:** All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

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