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Original Research Article

A clinical study of fetomaternal outcome in cases of abruption placentae in tribal population of North East Gujarat

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ABSTRACT

Background: Abruptio placentae is a serious obstetric emergency characterized by premature separation of the normally implanted placenta, leading to significant maternal and perinatal morbidity and mortality. Early identification and prompt management are essential to improve outcomes. Objectives were to evaluate the fetomaternal outcomes in patients with abruptio placentae and to analyze the association of demographic, clinical, and hematological factors with the severity of abruption and neonatal outcomes.
Methods: This hospital-based observational study included 75 patients with clinically and/or ultrasonographically diagnosed abruptio placentae admitted to a tertiary care center. Maternal demographic characteristics, antenatal risk factors, clinical presentation, hematological parameters, and obstetric outcomes were analyzed. The degree of abruption was categorized into grades, and its association with maternal findings, hemoglobin levels, clinical signs, and neonatal outcomes such as birth weight, APGAR score, and fetal survival was assessed.
Results: Most patients were in the 18-25-year age group (48%), and the majority presented in the preterm period (83.99%). Hypertensive disorders and anemia were the most common risk factors. Grade 1 abruption was seen in 50.67% of cases, followed by grade 2 (32%) and grade 3 (17.33%). Severe anemia, pallor, and edema were significantly associated with higher grades of abruption. Low birth weight (<2000 g) was observed in 76% of neonates, and 53.33% had APGAR scores ≤6. Live births accounted for 57.33% of cases, while fetal loss occurred in 42.67%.
Conclusions: Abruptio placentae is associated with high maternal and perinatal risk, particularly in preterm pregnancies with hypertensive disorders and anemia. Early antenatal risk identification, timely referral, and prompt multidisciplinary management are crucial to improve fetomaternal outcomes.

Keywords: Abruptio placentae, Fetal outcome, Maternal outcome, Perinatal mortality

INTRODUCTION

Abruptio placentae, also known as placental abruption, is a serious obstetric emergency associated with significant maternal and perinatal morbidity and mortality worldwide. It is defined as the premature separation of a normally implanted placenta from the uterine wall before delivery of the fetus, leading to disruption of maternal–fetal exchange and resulting in fetal compromise and maternal hemorrhage.[1] Despite advances in antenatal care and obstetric management, abruptio placentae continue to contribute substantially to adverse fetomaternal outcomes, particularly in developing countries where access to timely emergency obstetric care may be limited.[2]

The etiology of abruptio placentae is multifactorial. Hypertensive disorders of pregnancy, including preeclampsia and pregnancy-induced hypertension, are among the most important risk factors due to their association with vascular damage and placental insufficiency.[3] Other contributing factors include advanced maternal age, multiparity, abdominal trauma,

smoking, substance abuse, polyhydramnios, multiple pregnancy, and previous history of placental abruption.[4] The underlying pathophysiology involves rupture of maternal vessels in the decidua basalis, leading to retroplacental hematoma formation and progressive placental separation.[5]

Clinically, abruptio placentae is categorized into mild, moderate, and severe grades based on the extent of placental separation and maternal-fetal compromise. Typical clinical features include vaginal bleeding, abdominal pain, uterine tenderness, and increased uterine tone, although the diagnosis is primarily clinical and may be supported by ultrasonography and laboratory investigations. [6]

Abruptio placentae can result in severe maternal complications such as hypovolemic shock, disseminated intravascular coagulation, and postpartum hemorrhage, while fetal outcomes include prematurity, low birth weight, fetal distress, and stillbirth.[7] Early recognition of risk factors and timely obstetric intervention remain essential to improving fetomaternal outcomes. The study was conducted to evaluate the clinical profile, risk factors, and fetomaternal outcomes associated with abruptio placentae in a tertiary care setting.

METHODS

This prospective observational analytical study was conducted in the Department of Obstetrics and Gynaecology at Zydus Medical College and Hospital, Dahod, Gujarat, India, over a period of 24 months from November 2023 to October 2025. A total of 75 participants were selected for the study fulfilling the inclusion and exclusion criteria. Ethical clearance was obtained from the Institutional Ethics Committee before starting the study.

Inclusion criteria

All pregnant women admitted with gestational age greater than 28 weeks, presenting with abdominal pain associated with uterine irritability and tenderness, cases showing retroplacental clots and areas of infarction in the placenta, presenting with concealed or revealed haemorrhage were included in the study.

Exclusion criteria

Patients presenting with antepartum haemorrhage due to local causes, such as genital tract trauma or lesions, referred for management of postpartum complications, cases diagnosed as placenta previa on clinical or ultrasonographic evaluation were exclude from the study.

After obtaining written informed consent, eligible participants were enrolled consecutively and evaluated using a pre-designed case record form. Detailed clinical history, including demographic characteristics, obstetric history, and presenting complaints, was recorded. General physical examination included measurement of pulse rate, blood pressure, temperature, height, and weight, along with systemic examination. Obstetrical assessment included fundal height, fetal lie, presentation, position, engagement of the presenting part, uterine tone, and fetal heart rate. Clinical variables documented included maternal age, gravidity, gestational age at presentation, hypertensive disorders, oligohydramnios, duration between onset of symptoms and admission, admission-to-delivery interval, mode of delivery, indication for cesarean section, size of retroplacental clot, and maternal complications such as hypovolemic shock, disseminated intravascular coagulation, and acute renal failure. Grades of abruption were diagnosed clinically based on the size of retroplacental clot. Fetal outcomes assessed included gestational age at delivery, birth weight, birth status, Apgar score, NICU admission, and neonatal morbidity or mortality. The mode of delivery was determined based on maternal and fetal condition after stabilization. Data was entered into Microsoft excel and data were analyzed using SPSS version 26. Chi-square test was used for categorical variables, with categorical variables expressed as frequencies and percentages and continuous variables as mean±standard deviation. A $p<0.05$ was considered statistically significant.

RESULTS

Most cases of abruptio placentae occurred in younger women, with 48% aged 18-25 years and 40% aged 25-30 years, while only 12% were above 30 years. Primigravidae comprised 34.67% of the study population, followed by second gravida (24%) and multiparous women (24% with parity ≥4). A majority of abruptions occurred preterm, with 29.33% between 28-31 weeks and 54.67% between 32–36 weeks. Only 16% reached term.

Table 1: Age group, parity and gestational age.

Variables	Category	N
Age group (in years)	18-25	36
	25-30	30
	30-35	7
	>35	2
Parity	Primi	26
	Second	18
	Third	13
	Fourth and above	18
Gestational age (in weeks)	28-31	22
	32-36	41
	37-40 wees	12

Table 2: Fetal outcome.

Fetal outcome	N	Percentage (%)
IUFD	28	37.33
Live birth	43	57.33
Still birth	4	5.33
Total	75	100.00

More than half of pregnancies resulted in live births (57.33%, n=43), while fetal losses considerable, including IUFD in 37.33% (n=28) and stillbirth in 5.33% (n=4), giving combined non-live outcome of 42.67% (n=32). Low birth weight predominated: 76.00% (n=57) of neonates weighed <2000 g, including ELBW <1000 g: 4.00% (n=3) and VLBW 1000-1500 g: 25.33% (n=19). The largest band was 1501-2000 g at 46.67% (n=35). Only 24.00% (n=18) exceeded 2000 g.

Table 3: Birth weight distribution.

Birth weight (g)	N	Percentage (%)
<1000	3	4.00
1000-1500	19	25.33
1501-2000	35	46.67
>2000	18	24.00
Total	75	100.00

Table 4: Association between fetal outcome and degree of abruption, (n=75).

Fetal outcome	Grade 1	Grade 2	Grade 3
IUFD	5 (13.16%)	12 (50.00%)	11 (84.62%)
Live birth	33 (86.84%)	8 (33.33%)	2 (15.38%)
Still birth	0 (0%)	4 (16.67%)	0 (0%)
Total	38	24	13

In grade 1 abruption, 86.84% (33/38) resulted in live birth and 13.16% (5/38) in IUFD, with no stillbirths. Grade 2 had 50.00% (12/24) IUFD, 33.33% (8/24) live births and 16.67% (4/24) stillbirths. Grade 3 showed 84.62% (11/13) IUFD and 15.38% (2/13) live births, with a significant association (p<0.001).

Table 5: Association between hemoglobin level and degree of abruption.

Hemoglobin	Grade 1	Grade 2	Grade 3
Severe anemia (<7.0)	1 (2.63%)	9 (37.50%)	13 (100%)
Moderate (7.0-9.9)	16 (42.11%)	12 (50.00%)	0 (0%)
Mild (10.0-11.9)	19 (50.00%)	3 (12.50%)	0 (0%)
Normal (>12.0)	2 (5.26%)	0 (0%)	0 (0%)
Total	38	24	13

The cases with grade 3 abruption were associated with severe anemia (n=13), whereas the majority of patients with grade 1 abruption were having mild anemia (n=19).

Table 6: Degree of abruption at presentation, (n=75).

Degree	N	Percentage (%)
Grade 1	38	50.67
Grade 2	24	32.00
Grade 3	13	17.33
Total	75	100.00

Over half of cases were grade 1 (50.67%, n=38), while grade 2 comprised 32.00% (n=24) and grade 3 the most severe 17.33% (n=13). Pallor, edema, and bleeding per speculum examination showed statistically significant association with the degree of abruption (p<0.05).

Table 7: Association of clinical findings with degree of abruption, (n=75).

Clinical variables	Grade	Degree of abruption			P value
		Grade 1	Grade 2	Grade 3	
Pallor	Grade I	22 (57.89)	7 (29.17)	0 (0)	<0.001
	Grade II	8 (21.05)	9 (37.50)	1 (7.69)	
	Grade III	0 (0)	6 (25.00)	10 (76.92)	
	Absent	8 (21.05)	2 (8.33)	2 (15.38)	
Edema	Grade I	10 (26.32)	11 (45.83)	5 (38.46)	0.0172
	Grade II	3 (7.89)	3 (12.50)	5 (38.46)	
	Absent	25 (65.79)	10 (41.67)	3 (23.08)	
Bleeding PV per speculum examination	Absent	26 (68.42)	9 (37.50)	2 (15.38)	0.0015
	Present	12 (31.58)	15 (62.50)	11 (84.38)	

Table 8: Association between apgar score and degree of abruption, (n=75).

Apgar score	Degree of abruption			P value
	Grade 1	Grade 2	Grade 3	
0-2	5 (13.16)	14 (58.33)	8 (61.54)	<0.001
2-4	1 (2.63)	1 (4.17)	1 (7.69)	
4-6	6 (15.79)	3 (12.50)	1 (7.69)	
>6	26 (68.42)	6 (25.00)	3 (23.08)	
Grand total	38 (100)	24 (100)	13 (100)	

In grade 1 abruption, 68.42% (26/38) of neonates had Apgar >6 and 13.16% (5/38) had scores 0-2. In grade 2, 58.33% (14/24) had Apgar 0-2 and 25.00% (6/24) >6. Grade 3 showed 61.54% (8/13) with Apgar 0-2 and 23.08% (3/13) >6, with a significant association ($p<0.001$).

DISCUSSION

This study evaluated the fetomaternal outcomes in clinically and/or ultrasonographically diagnosed Abruptio placentae and analysed the association of demographic, clinical and hematological with disease severity and neonatal outcomes in a tertiary care setting. The study population largely consisted of patients from rural and tribal regions with limited access to healthcare, which may influence the disease severity at presentation and overall outcomes.

In the present study, the majority of cases of abruptio placentae occurred among younger women. Nearly half of the patients (48%) belonged to the 18-25-year age group, followed by 40% in the 25-30-year group, while only 12% were above 30 years of age. This age distribution is however affected by multiple confounding factors like delay in seeking medical care, early age of marriage. Similar age distribution was reported by Jadhav et al who observed that 85% of cases occurred in women younger than 30 years.[8] However, Charlotte et al reported a relatively older age profile with a mean maternal age of 31.8±5.3 years, and the most common age group being 30-34 years.[9] These variations highlight that although maternal age may influence risk, disease severity and associated comorbidities such as hypertension and anemia appear to play a more critical role in determining outcomes.

The present study demonstrated a mixed parity distribution, with 34.67% primigravidae and 24% grand multipara (parity ≥4). This indicates that both extremes of parity may predispose to abruptio placentae. Primigravidae may develop abruption secondary to hypertensive disorders such as preeclampsia, however an association of blunt injury due to either RTA or domestic violence could not be assessed due to limited data. Multiparity may contribute through chronic vascular and placental bed changes. These findings are consistent with Macheku et al who reported that high parity was significantly associated with placental abruption (OR 1.4).[10] Similarly, Boisramé et al identified multiparity as an independent risk factor (OR 1.6).[11] These studies collectively suggest that parity influences the risk of placental abruption through vascular and structural changes in the uteroplacental interface.

In the current study, most patients presented in the preterm period, with 29.33% between 28-31 weeks and 54.67% between 32-36 weeks, while only 16% presented at term. This distribution indicates that placental abruption frequently leads to premature delivery, contributing to adverse neonatal outcomes. Comparable observations were reported by Macheku et al who demonstrated that placental abruption significantly increased the risk of low birth weight and perinatal mortality.[10] Boisramé et al further reported that abruption independently increased the risk of severe neonatal acidosis and need for resuscitation even after adjusting for gestational age.[11] These findings highlight the negative impact of abruption on fetal outcome.

In this study, grade 1 abruption accounted for 50.67%**,** grade 2 for 32%**,** and grade 3 for 17.33% of cases. Although mild abruption constituted the majority, nearly half of the cases presented with moderate to severe disease. A similar pattern of severe presentation has been described by Charlotte et al who reported high stillbirth rates associated with advanced disease at admission.[9] Macheku et al also demonstrated that the severity of abruption significantly increased the risk of postpartum hemorrhage, transfusion, and perinatal mortality.[10] These findings were consistent with the fact that patients presenting early experienced less morbidity, with fewer or sometimes no need of transfusions. Whereas those with advanced disease on presentation had a long hospital stay and were given multiple transfusions.

Anemia was highly prevalent in the present study, with 97.33% of patients having hemoglobin levels below 12 g/dL, including 30.67% with severe anemia. Lower hemoglobin levels were more commonly associated with higher grades of abruption. These findings are consistent with Mukherjee et al who observed an extremely high prevalence of anemia (96%) in their cohort.[12] There is a high prevalence of sickle cell disease and trait in the study population. With mean hemoglobin levels in the anemic range, patients were hemodynamically unstable even with milder degrees of abruption.

Pallor, a clinical indicator of anemia and blood loss, was frequently observed in patients with higher grades of abruption. This reflects the hemodynamic impact of concealed or revealed hemorrhage associated with placental separation. Similar clinical correlations have been described by Singhal et al who reported significant rates of postpartum hemorrhage and shock among patients with severe abruption, emphasizing the importance of early recognition and prompt resuscitation.[13]

The presence of edema was more commonly associated with higher grades of abruption in the present study. Edema may reflect underlying hypertensive disorders of pregnancy, which are well-recognized risk factors for placental abruption. However, edema due to other confounding factors like nutritional deficiencies, which is very common in the study population, might have influenced the outcome. Supporting this observation, Boisramé et al reported that gestational hypertension and preeclampsia were significant risk factors for placental abruption.[11]

Bleeding per speculum examination was observed in a substantial proportion of cases and showed an increasing trend with higher grades of abruption. However, some cases of severe abruption occurred without visible vaginal bleeding, suggesting the presence of concealed hemorrhage. This observation aligns with findings from Boisramé et al who noted that the classical triad of abdominal pain, bleeding, and uterine hypertonicity was present in only a minority of patients, indicating that absence of visible bleeding does not exclude severe disease.[11]

In the present study, 76% of neonates weighed less than 2000 g**,** including 4% extremely low birth weight and 25.33% very low birth weight infants. This reflects the combined effects of prematurity and placental insufficiency associated with abruptio placentae. Similar findings were reported by Macheku et al who demonstrated a significant association between placental abruption and low birth weight (OR 5.9).[10]

In the present study, 53.33% of neonates had APGAR scores ≤6, indicating significant neonatal depression. Lower APGAR scores were more commonly observed in higher grades of abruption. Comparable results were reported by Boisramé et al who found that placental abruption significantly increased the risk of neonatal acidosis and need for resuscitation.[11] These findings highlight the direct impact of placental separation on fetal oxygenation and neonatal adaptation.

More than half of the pregnancies in the present study resulted in live births (57.33%), while 42.67% resulted in fetal loss**,** including intrauterine fetal death and stillbirth. These findings reflect the severe fetal compromise associated with abruptio placentae. A higher stillbirth rate of 58.8% was reported by Charlotte et al while Mukherjee et al documented 68% perinatal mortality in their cohort.[9,12] Similarly, Macheku et al reported that placental abruption significantly increased the odds of perinatal mortality (OR 17.6).[10] These studies emphasize that fetal outcome largely depends on the severity of placental separation and the timeliness of obstetric intervention.

This study has several strengths, including its comprehensive evaluation of both maternal and fetal outcomes in clinically and ultrasonographically diagnosed abruptio placentae, and the detailed analysis of demographic, clinical, hematological, and obstetric factors influencing disease severity and outcomes in a real-world tertiary care setting. The study was conducted in a tertiary care centre with a relatively small sample size and lacks generalizability. Additionally, referral bias and delayed presentation from peripheral areas may have influenced disease outcomes.

CONCLUSION

Abruptio placentae remains a serious obstetric complication associated with significant maternal and perinatal morbidity and mortality. In the present study, the condition was more frequently observed among younger women and predominantly occurred in the preterm period. Hypertensive disorders of pregnancy and anemia emerged as major contributing factors. A substantial proportion of patients presented with moderate to severe grades of abruption, often accompanied by hematological abnormalities such as anemia, thrombocytopenia, and coagulation derangements, which increased the risk of hemorrhagic complications.

Fetal outcomes were markedly affected, with a high proportion of low-birth-weight infants, low APGAR scores, and considerable rates of intrauterine fetal demise and stillbirth. The severity of placental abruption showed a clear association with adverse neonatal outcomes, emphasizing the impact of early placental separation on fetal oxygenation and survival.

These findings highlight the importance of early identification of high-risk pregnancies, adequate antenatal care with strict monitoring for hypertensive disorders and anemia, and prompt referral to tertiary care centers. Rapid diagnosis, multidisciplinary management, and timely obstetric intervention are essential to improve both maternal and neonatal outcomes in cases of abruptio placentae.

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