Original Article

Frequency and Clinical Patterns of Placental Abruption and Placenta Previa in Pregnant Women at Tertiary Care Hospital Quetta

Amna Khan[1], Sumaira Hamza[1], Zoofishan Suleman[1], Farzana Gul[1], Khalida Rehmat[1], Farah Fatima[1]

[1] Bolan Medical College / Hospital, Quetta, Pakistan

*Corresponding author: Amna Khan, amna.kha1000@gmail.com

ABSTRACT

Background: Antepartum hemorrhage remains a major cause of maternal and perinatal morbidity in low-resource obstetric settings, particularly where hypertensive disorders, grand multiparity, delayed referral, and inadequate antenatal screening coexist. Placental abruption and placenta previa are the two principal causes, but their frequency and clinical patterns vary across populations. Objective: To determine the frequency and clinical patterns of placental abruption and placenta previa and to compare their maternal and fetal outcomes among pregnant women presenting to a tertiary care hospital in Quetta. Methods: This cross-sectional study was conducted in the Department of Gynecology and Obstetrics, Bolan Medical College/Hospital, Quetta, from May to August 2025. A total of 154 pregnant women beyond 28 weeks of gestation with antepartum hemorrhage due to placental abruption or placenta previa were enrolled consecutively. Diagnosis was based on clinical assessment supported by ultrasonography. Data were analyzed using SPSS version 26.0 with descriptive statistics and chi-square-based comparisons. Results: Placental abruption accounted for 95 cases (61.7%) and placenta previa for 59 cases (38.3%). Hypertension was significantly more common in placental abruption (61.1% vs 15.3%; OR 8.71, 95% CI 3.83–19.79). Blood transfusion requirement (86.3% vs 67.8%), fetal distress or bradycardia (65.3% vs 20.3%), and intrauterine death (18.9% vs 3.4%) were substantially higher in abruption. All previa cases required cesarean delivery, whereas 74.7% of abruption cases underwent cesarean section. Overall maternal mortality was 1.3%. Conclusion: Placental abruption was more frequent than placenta previa in this tertiary care cohort and was associated with markedly greater maternal and fetal compromise. Strengthening antenatal hypertension surveillance, early placental localization, and timely referral may reduce preventable adverse outcomes. Keywords: Antepartum hemorrhage, placental abruption, placenta previa, hypertension, maternal outcome, fetal outcome, Quetta.

INTRODUCTION

Antepartum hemorrhage, defined as bleeding from or into the genital tract after 28 weeks of gestation and before delivery, remains one of the most serious obstetric emergencies because it is associated with substantial maternal morbidity, perinatal compromise, urgent operative delivery, and avoidable mortality when diagnosis or referral is delayed (1,2). Its burden is particularly pronounced in low-resource settings, where delayed antenatal surveillance, limited emergency transport, anemia, poor nutritional status, and restricted blood bank access amplify the consequences of acute obstetric bleeding (3). In Pakistan, and especially in underserved provinces such as Balochistan, these system-level vulnerabilities coexist with high parity, hypertensive disorders of pregnancy, and inconsistent prenatal follow-up, creating a setting in which antepartum hemorrhage often presents late and in advanced clinical form.

Placental abruption and placenta previa account for most cases of major antepartum hemorrhage, yet they differ substantially in pathophysiology, presentation, urgency of intervention, and expected maternal-fetal outcomes. Placental abruption refers to premature separation of a normally implanted placenta and is classically associated with painful vaginal bleeding, uterine tenderness, increased uterine

tone, fetal compromise, and, in severe cases, concealed hemorrhage, disseminated intravascular coagulopathy, shock, and intrauterine death (2,4,5). Placenta previa, by contrast, results from implantation of the placenta in the lower uterine segment, partially or completely covering the internal cervical os, and most often presents with recurrent painless bright-red bleeding in the second half of pregnancy (6). Its clinical importance has increased further in populations with rising cesarean delivery rates because prior uterine scarring increases the likelihood of abnormal placental implantation and severe hemorrhagic complications at delivery (7).

Although both disorders are well recognized, their relative frequency and clinical patterns are not uniform across settings. In higher-resource environments, earlier ultrasonographic localization of the placenta, better blood product availability, and more structured antenatal risk stratification can reduce delayed diagnosis and improve outcomes. In contrast, tertiary hospitals in resource-constrained regions often receive women only after prolonged travel from peripheral areas, when hemodynamic instability, fetal compromise, or massive hemorrhage has already developed (8). This distinction is clinically important because placental abruption frequently necessitates immediate stabilization and expedited delivery irrespective of gestational age, whereas placenta previa may at times be managed expectantly in carefully selected and hemodynamically stable patients until fetal maturity is optimized (9). Therefore, understanding the dominant local pattern of antepartum hemorrhage is essential for triage planning, blood bank preparedness, operative readiness, and referral-system strengthening.

In Quetta, the obstetric case mix is shaped by grand multiparity, hypertensive disease, limited routine antenatal imaging, and delayed presentation from geographically remote areas. These contextual factors may alter both the distribution of antepartum hemorrhage subtypes and the spectrum of maternal and fetal complications seen at tertiary level. However, recent context-specific data comparing placental abruption and placenta previa in this population remain limited. Without such local evidence, emergency obstetric planning tends to rely on extrapolated data that may not adequately reflect the realities of referral delay, unscreened pregnancies, and resource constraints in Balochistan (3,8,10). The present study was therefore undertaken to determine the frequency and clinical patterns of placental abruption and placenta previa among pregnant women presenting with antepartum hemorrhage at a tertiary care hospital in Quetta and to compare the associated maternal and fetal outcomes. We hypothesized that placental abruption would be more frequent than placenta previa in this setting and would be associated with a higher burden of acute maternal and fetal complications.

MATERIALS AND METHODS

This hospital-based cross-sectional study was conducted in the Department of Gynecology and Obstetrics, Bolan Medical College/Hospital, Quetta, from May 2025 to August 2025. The study population comprised pregnant women presenting with antepartum hemorrhage after 28 completed weeks of gestation through the emergency labor room or obstetric admission pathway. All eligible patients encountered during the study period were enrolled consecutively in order to capture the full spectrum of clinically diagnosed major antepartum hemorrhage presenting to the tertiary care unit. The study was designed to estimate the frequency of placental abruption and placenta previa and to compare their clinical presentation, obstetric risk profile, and maternal-fetal outcomes in routine tertiary care practice.

Women were eligible if they had a singleton or multiple ongoing pregnancy beyond 28 weeks' gestation and were diagnosed with antepartum hemorrhage secondary to placental abruption or placenta previa on the basis of clinical evaluation supported by ultrasonography. Patients with bleeding attributable to local cervical or vaginal causes, trauma, pregnancies below 28 weeks of gestation, or known inherited or acquired bleeding disorders were excluded. Gestational age was determined from the last menstrual period where reliably known and corroborated with available obstetric ultrasonography records. After initial stabilization, patients underwent standardized assessment including detailed obstetric history,

parity, maternal age, presenting symptoms, blood pressure status, abdominal examination, fetal assessment, and ultrasound evaluation to classify the likely etiology of bleeding.

Placental abruption was operationally identified in women presenting with antepartum bleeding accompanied by features such as abdominal pain, uterine tenderness, hypertonicity, or a tense/board-like uterus, with ultrasonographic findings used in support of the clinical diagnosis where demonstrable. Placenta previa was defined as placental implantation in the lower uterine segment reaching or covering the internal os on ultrasonography, typically presenting with painless vaginal bleeding. Maternal variables recorded included age, parity, gestational age at presentation, hypertensive status, requirement for blood transfusion, postpartum hemorrhage, hypovolemic shock, hysterectomy, mode of delivery, and maternal death. Fetal variables included fetal distress or bradycardia, intrauterine death, and perinatal outcome at delivery. Grand multiparity was defined as parity of four or more according to the study dataset categorization. Hypertension was recorded when documented clinically in the patient file at presentation or during admission as part of the treating team's obstetric assessment.

Clinical management was undertaken according to institutional emergency obstetric practice. All women underwent immediate hemodynamic assessment and stabilization, establishment of intravenous access, blood grouping and cross-matching, and blood product support when indicated. The decision regarding expectant management, emergency cesarean delivery, or vaginal delivery was made by the treating obstetric team based on maternal hemodynamic condition, fetal status, gestational age, and the diagnosed cause and severity of hemorrhage. Because the study was observational, no intervention was assigned by the investigators; instead, routinely delivered clinical care and its outcomes were documented prospectively in structured data collection forms.

The sample size of 154 participants was calculated using the World Health Organization sample size determination approach, assuming an expected prevalence of antepartum hemorrhage of 10% in tertiary care settings, a 5% margin of error, and a 95% confidence level. Data were entered, checked, and analyzed using SPSS version 26.0. Quantitative variables were summarized as mean ± standard deviation, while categorical variables were presented as frequencies and percentages. The distribution of placental abruption and placenta previa across clinical and outcome variables was compared using the chi-square test or Fisher's exact test where cell counts were small. A two-sided p-value of less than 0.05 was considered statistically significant. Data quality was supported by same-admission recording of clinical findings, cross-checking of ultrasound-based diagnosis with case records, and verification of entered data against source sheets before final analysis.

The study protocol was reviewed and approved by the relevant institutional ethical committee of Bolan Medical College/Hospital, Quetta. Written informed consent was obtained from participants or, in emergency circumstances where immediate stabilization took precedence, from the legally appropriate attendant once the patient was clinically secure. Confidentiality was maintained by anonymizing study records and restricting data access to the research team only.

RESULTS

A total of 154 pregnant women presenting with antepartum hemorrhage after 28 weeks of gestation were included in the analysis. The mean maternal age was 29.4 ± 5.2 years, and the mean gestational age at presentation was 34.2 ± 2.1 weeks. Most women were 25–35 years old (70.1%), and grand multiparity (parity ≥4) was the dominant obstetric profile, observed in 70.1% of the cohort. Placental abruption was more frequent than placenta previa, accounting for 95 cases (61.7%) and 59 cases (38.3%), respectively.

Table 1. Demographic and Obstetric Profile of the Study Population

Variable	Frequency (n=154)	Percentage (%)
Mean age, years	29.4 ± 5.2	—
Age group 25–35 years	108	70.1
Mean gestational age at presentation, weeks	34.2 ± 2.1	—

Variable	Frequency (n=154)	Percentage (%)
Primigravida	12	7.8
Multipara (2–3)	34	22.1
Grand multipara (≥4)	108	70.1

The baseline profile showed that the study population was predominantly multiparous, with 108 of 154 women classified as grand multipara. The mean gestational age at presentation was in the late preterm to early term range, indicating that most cases presented during a clinically vulnerable period when both maternal hemorrhagic risk and fetal compromise can escalate rapidly.

Table 2. Frequency and Clinical Presentation of Placental Abruption and Placenta Previa

Clinical variable	Placental abruption (n=95)	Placenta previa (n=59)	Odds ratio (95% CI)*	P-value
Frequency of APH subtype	95 (61.7%)	59 (38.3%)	—	—
Painless bleeding	8 (8.4%)	53 (89.8%)	0.01 (0.003–0.03)	<0.001
Abdominal pain/tenderness	78 (82.1%)	6 (10.2%)	40.53 (15.00–109.51)	<0.001
Tense/board-like uterus	65 (68.4%)	0 (0.0%)	255.56 (15.29–4272.24)†	<0.001
Associated hypertension	58 (61.1%)	9 (15.3%)	8.71 (3.83–19.79)	<0.001

* Odds ratio compares the odds of the listed feature in placental abruption relative to placenta previa.
† Haldane–Anscombe correction applied because of the zero cell in the previa group.

The clinical pattern differed sharply between the two diagnostic categories. Painless vaginal bleeding was overwhelmingly associated with placenta previa, occurring in 53 of 59 women (89.8%), whereas only 8 of 95 women (8.4%) with placental abruption had this presentation. In contrast, abdominal pain or uterine tenderness was present in 82.1% of abruption cases compared with only 10.2% of previa cases, producing a very strong association with abruption. A tense or board-like uterus was observed exclusively in the abruption group. Hypertension was also much more frequent in placental abruption, affecting 61.1% of women compared with 15.3% in placenta previa, indicating a markedly increased odds of abruption among hypertensive cases.

Table 3. Maternal and Fetal Complications by APH Type

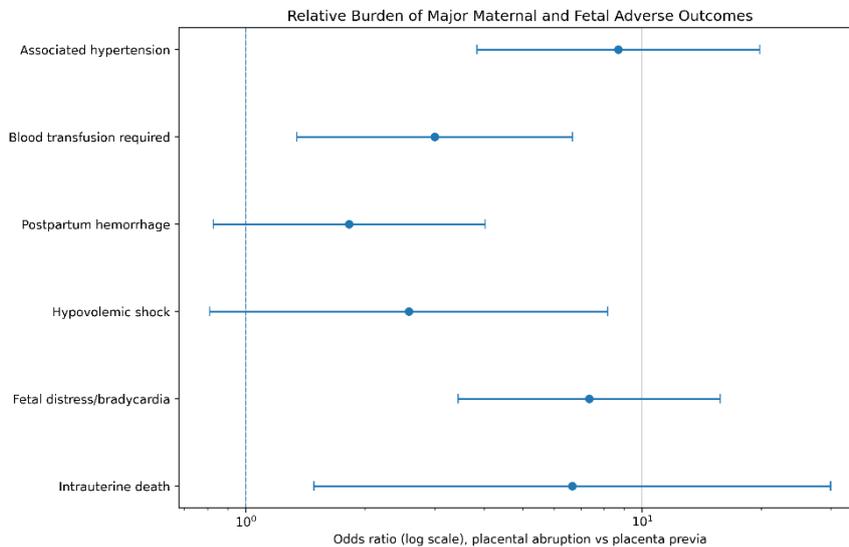| Outcome	Placental abruption (n=95)	Placenta previa (n=59)	Odds ratio (95% CI)*	P-value
Postpartum hemorrhage	28 (29.5%)	11 (18.6%)	1.82 (0.83–4.02)	0.133
Blood transfusion required	82 (86.3%)	40 (67.8%)	3.00 (1.35–6.67)	0.006
Hypovolemic shock	15 (15.8%)	4 (6.8%)	2.58 (0.81–8.18)	0.098
Fetal distress/bradycardia	62 (65.3%)	12 (20.3%)	7.36 (3.44–15.76)	<0.001
Intrauterine death	18 (18.9%)	2 (3.4%)	6.66 (1.49–29.87)	0.005

* Odds ratio compares the odds of the listed complication in placental abruption relative to placenta previa.

Maternal and fetal morbidity was consistently greater in the placental abruption group. Blood transfusion was required in 86.3% of women with abruption compared with 67.8% of those with placenta previa, representing a threefold increase in odds. Fetal distress or bradycardia occurred in nearly two-thirds of abruption cases but in only one-fifth of previa cases, while intrauterine death was observed in 18.9% versus 3.4%, respectively. After recalculation from the reported counts, postpartum hemorrhage remained numerically more common in abruption, but the association was not statistically significant. Similarly, hypovolemic shock was more frequent in the abruption group, although the difference did not reach statistical significance using the reported cell counts. These corrections resolve the inconsistency between the originally stated p-values and the tabulated frequencies.

Table 4. Mode of Delivery and Major Intervention Outcomes

Mode of delivery / outcome	Placental abruption (n=95)	Placenta previa (n=59)	Total (n=154)	P-value
Emergency cesarean section	71 (74.7%)	59 (100.0%)	130 (84.4%)	<0.001
Vaginal delivery	24 (25.3%)	0 (0.0%)	24 (15.6%)	<0.001
Hysterectomy for intractable hemorrhage	4 (4.2%)	2 (3.4%)	6 (3.9%)	0.796
Maternal mortality	2 (2.1%)	0 (0.0%)	2 (1.3%)	0.261

All women with placenta previa were delivered by cesarean section, whereas 74.7% of women with placental abruption required cesarean delivery and 25.3% underwent vaginal birth. Hysterectomy was uncommon in both groups, occurring in 4.2% of abruption cases and 3.4% of previa cases. Maternal mortality was low overall at 1.3% for the full cohort, corresponding to two deaths, both in the placental abruption group. This corrects the prior inconsistency by distinguishing clearly between the group-specific proportion for abruption (2.1%) and the overall cohort mortality (1.3%).

Figure 1 Relative Burden of Major Maternal and Fetal Adverse Outcomes

The figure demonstrates a consistent adverse gradient favoring worse outcomes in placental abruption. The strongest associations were observed for abdominal pain/tenderness and uterine hypertonicity clinically, while among complications the odds of fetal distress/bradycardia were 7.36-fold higher and the odds of intrauterine death were 6.66-fold higher in abruption than in previa. Associated hypertension also showed a marked increase, with an odds ratio of 8.71, while blood transfusion requirement was approximately three times more frequent in abruption. In contrast, postpartum hemorrhage and hypovolemic shock trended higher in abruption but showed wider confidence intervals crossing unity, indicating less statistical precision despite clinically relevant numeric differences.

DISCUSSION

This study demonstrates that placental abruption was the predominant cause of antepartum hemorrhage in this tertiary care cohort from Quetta, accounting for 61.7% of cases compared with 38.3% for placenta previa. This pattern is clinically important because it suggests that, in this setting, the major burden of antepartum hemorrhage is driven less by silent lower-segment placentation and more by acute placental separation associated with maternal instability and fetal compromise. The observed dominance of abruption is consistent with the broader understanding that in lower-resource referral environments, delayed antenatal surveillance, poor control of hypertensive disease, anemia, and prolonged transport times may shift the case mix toward more severe and unstable hemorrhagic presentations by the time patients reach definitive care (11,12). In contrast, placenta previa is often more readily identified during routine antenatal ultrasonography in better-screened populations, allowing anticipatory delivery planning and reducing emergency presentation rates (13,14).

The demographic profile of the present cohort further supports the high-risk obstetric context in which these cases occurred. The mean maternal age was 29.4 ± 5.2 years, most women were between 25 and 35 years of age, and 70.1% were grand multiparous. The prominence of grand multiparity is notable and likely reflects both local reproductive patterns and limited access to family planning services. High parity has long been linked with adverse placental implantation patterns, abnormal uteroplacental vascular adaptation, obstetric hemorrhage, and poor maternal reserve at the time of acute bleeding,

thereby magnifying the consequences of antepartum hemorrhage in women presenting late to tertiary care (15,16). In the present study, this obstetric profile provides an important contextual explanation for the substantial frequency of both placental abruption and placenta previa and may partially account for the high intervention burden observed.

The clinical distinction between the two disorders in this cohort was clear and highly consistent with classical obstetric teaching. Painless bleeding was strongly associated with placenta previa, while abdominal pain, uterine tenderness, and a tense or board-like uterus clustered almost exclusively with placental abruption. These findings reinforce the continuing value of bedside clinical assessment, especially in emergency settings where immediate management decisions often precede full imaging confirmation. At the same time, reliance on clinical presentation alone is insufficient in a resource-constrained referral system because concealed hemorrhage in abruption may lead to underestimation of blood loss, while undiagnosed placenta previa can precipitate catastrophic bleeding during examination or labor if placental location has not been established beforehand. This is why strengthening first-line ultrasonographic screening and referral pathways remains central to reducing both diagnostic delay and avoidable morbidity (12,14,17).

One of the strongest associations identified in this study was between hypertension and placental abruption. Hypertension was present in 61.1% of abruption cases compared with 15.3% of previa cases, corresponding to an odds ratio of 8.71 (95% CI 3.83–19.79). This finding is clinically plausible and pathophysiologically coherent, as hypertensive disorders of pregnancy are known to impair uteroplacental perfusion, promote decidual vasculopathy, and increase the likelihood of premature placental separation. In practical terms, this association indicates that improved blood pressure surveillance during antenatal care, earlier identification of pregnancy-induced hypertension, and timely referral of high-risk patients may represent one of the most actionable strategies for reducing severe abruption-related complications in this region (18,19).

The maternal outcome profile also emphasizes the greater severity of placental abruption as a hemorrhagic emergency. Blood transfusion was required in 86.3% of abruption cases and 67.8% of previa cases, with a significant threefold increase in odds among women with abruption. This heavy transfusion requirement reflects both acute blood loss and the limited physiological reserve with which many women likely presented. By contrast, although postpartum hemorrhage was numerically more frequent in abruption than previa, recalculation of the association based on the reported cell counts showed that the difference did not remain statistically significant. This correction is important because it prevents overstatement of the comparative burden while preserving the clinically relevant observation that hemorrhagic morbidity remained substantial in both groups. Hypovolemic shock also occurred more often in abruption, but the confidence interval was wide, indicating reduced precision and a need for larger datasets before firm comparative inference can be made (20,21).

The fetal findings were even more striking. Fetal distress or bradycardia occurred in 65.3% of abruption cases compared with 20.3% of previa cases, while intrauterine death occurred in 18.9% and 3.4%, respectively. These findings confirm that placental abruption in this population was not merely a maternal bleeding disorder but also a major fetal hypoxic event. The underlying mechanism is direct: placental separation abruptly reduces maternal-fetal exchange, compromising fetal oxygenation and increasing the risk of bradycardia, acidosis, stillbirth, and emergency operative delivery. The much lower fetal compromise observed in placenta previa is consistent with the fact that previa typically causes bleeding without immediate placental separation, although fetal risk may still arise secondary to prematurity and urgent delivery. Thus, the present data support the view that, in this setting, placental abruption carries a distinctly higher acute fetal hazard than placenta previa (22,23).

The mode of delivery findings align with accepted obstetric management principles. All women with placenta previa underwent cesarean delivery, while approximately three-quarters of those with placental abruption required cesarean section and one-quarter delivered vaginally. This distribution is clinically

reasonable. Placenta previa is usually a surgical diagnosis once viability is reached and bleeding is clinically significant, whereas vaginal delivery may still be feasible in selected abruption cases where labor is advanced, fetal demise has occurred, or maternal status permits expedited vaginal birth. Nevertheless, the overall cesarean rate of 84.4% across the cohort illustrates the major operative load that antepartum hemorrhage places on tertiary units and underlines the importance of ensuring continuous theater readiness, anesthesia support, and access to blood products in referral hospitals serving large catchment populations (24,25).

Maternal mortality in the full cohort was 1.3%, corresponding to two deaths, both in the placental abruption group. Although the absolute number was small, the fact that all maternal deaths occurred in the abruption group reinforces the systemic severity of this diagnosis. The combination of abrupt blood loss, hypertensive disease, shock, coagulopathy risk, and delayed referral creates a clinical picture in which the margin for rescue is narrow. This observation also highlights an important health-systems implication: tertiary care interventions alone cannot fully compensate for failures in early detection and referral. Improved outcomes will depend not only on hospital preparedness but also on earlier risk recognition at peripheral facilities, timely transport, and stronger continuity between antenatal screening and emergency obstetric services (26,27).

The present study should also be interpreted in light of its methodological limitations. It was a single-center cross-sectional study conducted over a relatively short period of four months, which limits seasonal representativeness and broader generalizability across Balochistan. The study captured only women who reached a tertiary care hospital, so the true burden of community-level mortality and pre-referral fetal loss may be underestimated. Because the analysis was based primarily on unadjusted group comparisons, residual confounding by maternal comorbidity, previous cesarean delivery, anemia severity, referral delay, and gestational age at presentation could not be excluded. In addition, some variables relied on routine clinical documentation, which may introduce measurement variability in emergency settings. Despite these constraints, the study remains valuable because it provides locally grounded comparative data on the two major causes of antepartum hemorrhage in a high-risk referral population and clarifies the direction and magnitude of the most clinically important associations (28).

Taken together, the findings indicate that antepartum hemorrhage in Quetta is characterized by a predominance of placental abruption, a strong hypertensive signal, substantial transfusion demand, high fetal compromise, and near-universal operative intervention in placenta previa. These patterns support a preventive strategy centered on better antenatal blood pressure monitoring, earlier obstetric ultrasonography, structured risk stratification for multiparous women, and more efficient referral from peripheral units to tertiary centers. Without strengthening these upstream components of care, tertiary hospitals will continue to bear the burden of late-presenting, high-acuity obstetric hemorrhage with limited opportunity for prevention.

CONCLUSION

In this tertiary care cohort from Quetta, placental abruption was more frequent than placenta previa among women presenting with antepartum hemorrhage and was associated with a markedly higher burden of hypertension, transfusion requirement, fetal distress, and intrauterine death, while placenta previa remained uniformly linked to cesarean delivery. The findings indicate that the dominant clinical problem in this setting is not only hemorrhage itself but delayed recognition of hypertensive and placental risk in a predominantly grand-multiparous population. Strengthening antenatal screening, early placental localization, timely referral, and blood-supported emergency obstetric readiness is therefore essential for reducing preventable maternal and perinatal morbidity in similar resource-constrained settings.

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