

Original Article

The Impact of Decision-Delivery Interval on Feto-Maternal Outcome of Women Presenting with Severe Placental Abruption in Northern Nigeria

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Abstract

Background: Severe placental abruption, which is the commonest form seen in referral hospitals in our environment, is a major cause of maternal and perinatal morbidity and mortality. Such patients require prompt resuscitation and delivery to save the life of the mother, and the fetus where it is still alive. **Objectives:** The aim of this study is to evaluate the impact of decision-delivery interval (DDI) on the feto-maternal outcomes of severe abruption. **Methods:** This is a prospective study of all women presenting with severe placental abruption at the labour wards of Abubakar Tafawa Balewa University Teaching Hospital (ATBUTH), Bauchi and the Federal Medical Centre (FMC) Azare, Bauchi state. The sociodemographic data of the patients as well as their clinical presentation were captured on a research proforma. After the consultant decided on the mode of delivery, the patients were monitored regularly by research assistants, looking for co-morbidities, complications, and feto-maternal outcomes. The mothers, and the babies where alive, were followed up until discharged from hospital or for 7 days if still on admission. The data obtained was entered into SPSS version 25 software, coded and analyzed. **Results:** There was a total of 2,460 deliveries during the study period, with 95 cases of severe abruption, giving an incidence of 3.9%. Sixty-one (67%) of patients had co-morbidities, most of which were hypertensive disorders of pregnancy occurring in 52.8% of cases. Most patients presented with vaginal bleeding and abdominal pain as occurred in 97.6% and 81.3% of cases respectively. Abdominal tenderness was elicited in 54.9% of patients, while the uterus was characteristically tense on palpation in 52.7% of patients. DDI of less than 30 minutes was associated with the best maternal outcome. As the DDI increased, complications also increased with a high possibility of maternal death if delivery was delayed for more than 2 hours. Similarly, for mothers presenting with live fetus, delivery within 30 minutes gave the best fetal outcome. As the DDI increased, the fetal outcome worsened with birth asphyxia, SCBU admission and early neonatal death increasing with time. **Conclusion:** The early causes of delay for caesarean section for women with live fetuses were delay in obtaining consent for surgery and delay in resuscitation. As time went on, the delay in obtaining results of laboratory investigations became an issue. Because of the busy obstetric theatre, the delay in obtaining operation space and logistics of moving the patients to the theatre became problematic. It is recommended that obstetric emergency services in our referral centers be revamped to perform better. The NHIS services should also be extended to the poor masses to enable women access free or subsidized health care.

Keywords: placental abruption, decision-delivery interval, co-morbidities, complications, caesarean section

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INTRODUCTION

Placental abruption is the second commonest cause of antepartum haemorrhage after placenta praevia but is more associated with both maternal and perinatal morbidity and mortality. Its cause is unknown and occurs in about 1% of all pregnancies (1). Placental abruption accounts for 16% of cases of severe maternal morbidity seen in tertiary hospitals in northeastern Nigeria (2). It is regarded as a progressive disease and when the fetus is alive, emergency delivery is recommended to salvage the fetus (3). Urgent evacuation of the uterus is also important for the mother in order to control the bleeding which is serious enough to require transfusion in over 80% of cases (4).

About 80% of patients presenting with placental abruption may require blood transfusion and about 6% may progress to develop acute kidney injury (2). Perinatal death is also high, reaching up to 60% in tertiary hospitals (4, 5). These complications of placental abruption can only be mitigated by balancing the need for adequate resuscitation and emergency caesarean section to save both the mother and the baby.

The aim of this study is to assess the impact of the decision-delivery interval on the feto-maternal outcome in abruptio placentae. The specific objectives were: To determine the average decision-delivery interval in patients presenting with abruptio placentae, to identify factors responsible for delay in delivery, to determine the immediate maternal outcomes, and to determine the short-term neonatal outcomes.

MATERIALS AND METHODS

This study was conducted at the labour ward of Abubakar Tafawa Balewa University Teaching Hospital, Bauchi and the Federal Medical Centre, Azare, Bauchi state. All patients admitted in the labour wards of the two institutions (ATBUTH Bauchi and FMC Azare) with the diagnosis of placental abruption, and consented to participate in the study were recruited. Data was collected using a research proforma administered by research assistants to eligible women. The research proforma consisted of 3 sections: section one captured the biodata and clinical presentation of the mother, section two captured the labour events from admission till delivery, section three captured the maternal and fetal outcomes. The purpose of the study was explained to the patients and a written informed consent obtained. Timing of events was commenced from the time the consultant took a decision for the mode of delivery. Reasons for delay were identified and documented at 15 minutes intervals for one hour, then half-hourly until delivery. Blood samples were taken on admission for packed cell volume, grouping and cross-matching, renal functions and clotting profile of the mother. The mother and baby were followed up until discharge from the hospital or for one week if still on admission. Ethical clearance for the study was obtained from the health research ethics committee of the two institutions before the commencement of the study. The study was

conducted over a six-month period, from first October 2024 to 31st march 2025 inclusively. The data obtained was entered into SPSS version 23 software for analysis

RESULTS

There was a total of 2,460 deliveries over the study period, with 95 cases of severe abruptio, giving an incidence of 3.9%. Four of the cases had incomplete records and were excluded from further analysis. Table 1 shows the sociodemographic profile of women presenting with severe abruptio. The mean age was 29.7 years and the mean parity was 4. The mean gestational age at presentation was 34.9 weeks. Majority of the patients were unemployed housewives with no formal education, only 5% of them accessed the national health insurance scheme and 70% of them were not booked for antenatal care.

Table 1 Sociodemographic profile of women with severe abruptio placentae

Variable	value
Age	
Mean	29.7±7.2 years
Range	16-43 years
Parity	
Mean	4.2
Median	4.0
Range	0-14
Gestational age	
Mean	34.9±3.1 weeks
Median	35 weeks
Range	28-41 weeks
Booking status	
Booked	21(23.1%)
Unbooked	70(76.9%)
Occupation	
Housewives	76(83.5%)
Businesswoman	9(9.9%)
Farmer	2(2.2%)
Civil servant	2(2.2%)
Teacher	1(1.1%)
Level of education	
Non-formal	35(38.5%)
Primary	19(20.9%)
Secondary	24(26.4%)
Tertiary	13(14.3%)
NHIS Registration	
Registered	5(5.5%)
Unregistered	86(94.5%)

Table 2 shows the co-morbidities the patients had, with pre-eclampsia/eclampsia present in 33(36.3%) of the patients. With 15(16.5%) of patients having chronic hypertension, hypertensive disorders occurred in 52.5% of patients. Preterm labour was also present in 29(31.9%) of the patients. Other co-

morbidities included twin gestation, elderly mother and teenage pregnancy.

Table 2 Co-morbidities occurring in abruptio placentae

Co-morbidity for all cases	Proportion
Co-morbidity present	61(67%)
Specific co-morbidities†	
Pre-eclampsia/eclampsia	33(36.3%)
Chronic hypertension	15(16.5%)
Preterm labour	29(31.9%)
Twin gestation	5(5.5%)
Elderly mother	4(4.4%)
Teenage pregnancy	2(2.2%)
Trauma	2(2.2%)
Polyhydramnios	1(1.1%)

† some patients had more than one co-morbidities.

Table 3 shows the clinical features of the patients at presentation with 88(96.7%) presenting with vaginal bleeding and 74(81.3%) with abdominal pain. Abdominal tenderness was elicited in 54.9% of the patients and the typical tense abdomen found in 52.7% of the patients. Only 13(14.3%) of the patients presented in shock.

Table 3 clinical presentation of patients with abruptio placentae

Clinical features	Proportion
Vaginal bleeding	88(96.7%)
Abdominal pain	74(81.3%)
Abdominal tenderness	50(54.9%)
Tense abdominal wall	48(52.7%)
Fetal heart beat present (fetus alive)	42(46.2%)
Tachycardia	61(67.0%)
Dizziness	51(56.0%)
Established labour	41(45.1%)
Moderate-severe pallor	53(58.3%)
Hypotension/shock	13(14.3%)

Table 4. Decision-delivery interval with maternal outcome.

Decision-delivery interval (DDI) in minutes	Antepartum blood transfusion	Postpartum blood transfusion	Acute kidney injury (AKI)	Disseminated intravascular coagulation (DIC)	Maternal death (MD)	Total
<31	3	3	0	0	0	6
31-60	3	9	0	0	0	12
61-90	7	10	0	0	0	17
91-120	8	14	0	0	1	23
>120	34	38	1	3	2	78
Total	55	74	1	3	3	136

Patients delivered within 30 minutes suffer no additional morbidity. As the DDI increased, the patients required additional blood transfusion after delivery and other complications like acute kidney injury (AKI), disseminated intravascular coagulation (DIC) and maternal death (MD) increased. All (100%) patients had blood transfusion, whether antepartum, postpartum or both.

Table 5. DDI and fetal outcome.

Decision-delivery interval (DDI) in minutes	Birth asphyxia	SCBU admission	Stillbirth (SB)	Early neonatal death (ENND)	Total
<31	1	1	0	0	2
31-60	4	2	0	0	6
61-90	4	3	0	0	7
91-120	4	3	2	2	11
>120	7	5	1	1	12
Total	20	14	3	3	40

Table 6 Causes of delay in performing caesarean section in patients with abruptio placentae

Causes of delay	At 15 minutes N=40	At 30 minutes N=39	At 60 minutes N=28	At 90 minutes n=10	At 120 minutes N=5
Delay in obtaining consent	14(35.0%)	9(23.1%)	2(7.1%)	0(0.0%)	0(0.0%)
Delay in resuscitation	12(30.0%)	1(2.6%)	0(0.0%)	0(0.0%)	0(0.0%)
Delay in getting investigation results	5(12.5%)	14(35.9%)	7(25%)	3(30%)	2(40%)
Delay in obtained crossmatched blood	3(7.5%)	7(17.9%)	3(10.7%)	1(10%)	1(20%)
Delay in moving patient to theatre	2(5.0%)	2(5.1%)	8(28.6%)	1(10%)	1(20%)
Busy theatre suites	0(0.0%)	1(2.6%)	0(0.0%)	1(20%)	1(20%)

Table 5 shows DDI and fetal outcome. Babies delivered within 30 minutes of admission were less likely to have birth asphyxia. As the DDI increased, the number of babies with birth asphyxia increased, and stillbirth and early neonatal death also increased. A total of 42 mothers presented with live fetus, 2 were in advanced labour and delivered by vacuum extraction

without delay, the remaining 40 were scheduled for emergency caesarean section.

Table 6 highlights the major causes of delay for timely surgery in patients presenting with acute abruption and live fetuses. At 15 minutes of taking decision to deliver the patients by caesarean section, delay in obtaining consent for surgery was the major problem occurring in 15(35.7%) of the patients. At 30 minutes the cause of delay shifted to getting investigation results and at 60 minutes the major issue was moving the patient to the theatre.

DISCUSSION

Placental abruption is a major cause of maternal and perinatal morbidity and mortality. Due to lack of effective screening and diagnostic methods in resource-limited regions like ours, placental abruption presents as an acute event resulting in an increased burden on the already overburdened emergency obstetric facilities in the tropics. The urgent need to resuscitate the mother and empty the uterus in order to arrest the bleeding and salvage the baby where it is alive, must be balanced. This study aimed to determine the impact of decision-delivery interval (DDI) on maternal and perinatal outcomes in women presenting with severe placental abruption. The incidence of 3.9% of all deliveries in this study is similar to the findings in previous retrospective reviews in our environment (3,4), but higher than the incidence reported in a referral hospital in Tanzania (6). Comparison with western figures reporting the incidence with all pregnancies as the denominator is difficult, but a recent meta-analysis suggests the incidence to be higher among black women (8). The sociodemographic profile of our patients is that of young, multiparous women from the low socioeconomic class, who do not access antenatal care. Smoking, alcohol consumption, unmarried status and maternal age >35 years have been associated with placental abruption (7,8,10). These were not elicited in our study. This disparity may be due to socio-cultural reasons; smoking and alcohol consumption among women is very rare in our environment and early marriage is the norm.

In our study, 67% of the women presenting with acute abruption had at least one co-morbidity. These included hypertensive disorders of pregnancy in 52% of cases. Other co-morbidities included preterm labour, elderly mother, twin gestation, teenage pregnancy, trauma and polyhydramnios. These have been shown to be independent risk factors for placental abruption (11,12,13). Diabetes mellitus, earlier antepartum haemorrhage and placental praevia have also been associated with placental abruption but were not found in our study subjects. One previous placental abruption has been shown to have 10-fold recurrence risk in subsequent pregnancy and a 25-fold recurrence risk in the third pregnancy, making previous abruption the single highest risk factor for placental abruption (11,14). There was no history of previous placental abruption among our patients.

Acute placental abruption is characterized by sudden onset of vaginal bleeding and abdominal pain. Uterine contractions are often present but not specific to placental abruption since painful uterine contractions are also present in normal labour. Uterine tenderness is characteristic of placental abruption. In our study, the patients presented with vaginal bleeding and abdominal pain in 96.7% and 81.3% of cases respectively. Abdominal tenderness was present in about 50% of the patients. About 14% of cases presented in hypovolaemic shock. Placental abruption is ultimately a clinical diagnosis that requires the exclusion of other causes of vaginal bleeding such as placenta praevia and heavy show in normal labour (10). The value of ultrasound scan in the diagnosis of placental abruption is for exclusion of placenta praevia as its sensitivity in detecting placental abruption is low (15,16). Concealed abruption may manifest in pregnant women with symptoms of abdominal pain with little or no vaginal bleeding. Concealed abruption can be severe and lead to fetal death and maternal coagulopathy (17). Approximately 10% of preterm labour has been attributed to concealed abruption (18).

In placental abruption, rupture of maternal decidual vessels leads to bleeding at the decidual-placental interface (19). Blood accumulates in this space, and detachment of the placenta from the uterus occurs, often accompanied by vasospasm of small vessels (19). Decidual bleeding that results in dissection and laceration along the decidual plane may lead to retroplacental, subchorionic, and subamniotic bleeding (20). Intraplacental accumulation of blood may also occur due to disruption of vasculopathy in decidual arterioles in a setting of maternal hypoperfusion (21). Inadequate myometrial contractions are unable to constrict bleeding vessels and sinuses at the placental bed due to the gravid uterus. Consequently, bleeding continues and intravascular channels for thromboplastic materials remain open which may precipitate disseminated intravascular coagulation (DIC) (22,23).

With both the mother and the fetus at risk of death, how fast should and can the uterus be emptied to save them, or at least the mother? In our study, when the mother was delivered within 30 minutes of decision to deliver, additional morbidities were limited to postpartum anaemia requiring blood transfusion in a few cases. Delay in delivery after 30 minutes increasingly lead to more postpartum blood transfusion, acute kidney injury, disseminated intravascular coagulation and maternal death. In a previous retrospective study of placental abruption with intrauterine fetal death, it was noted that serious complications were rare if the mother was delivered less than 6 hours after the onset of placental abruption (24). Similarly, babies delivered within 30 minutes of diagnosis in our study rarely required admission into the special care baby unit (SCBU). Delivery after 30 minutes was associated with increasing number of babies requiring admission into SCBU, stillbirth, and early neonatal death.

The reasons for the delay in timely delivery of those who presented with live fetuses ranged from delay

in obtaining consent for surgery in the first 15 minutes, to delay in resuscitating the patient. In our hospital, most patients pay out of pocket for their medical care on admission, making lack of cash and the logistics of payment a major factor delaying the management of obstetric emergencies. As time went on, delay in obtaining investigation results, as well as delay in grouping and cross matching blood for transfusion became obstacles to delivery. Logistic issues like lack of space in the theatre and delay in moving the patient to the theatre became obstacles even 3 to 4 hours after the decision to section the patient was made.

CONCLUSION

Severe placental abruption is common in our environment, and hypertensive disorders of pregnancy remain the single most important risk factor. Urgent resuscitation and delivery within 30 minutes give the best feto-maternal outcomes. It is recommended that the emergency obstetric care facilities be revamped, and the national health insurance scheme be expanded to reach the majority population of low socioeconomic status.

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