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Original article

Assessment of Feto-Maternal Outcomes Following Abruptio Placentae: A Retrospective Cross-Sectional Study

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ABSTRACT

Abruptio placentae (AP) is defined as placental detachment before and during delivery. It is a major obstetric complication associated with an increased risk of foetal and maternal morbidity and mortality globally, especially in developing countries. This study was a retrospective cross-sectional study conducted from 2019 to 2021 at Aljala Maternity Hospital. Data were collected from 104 medical files of pregnant women diagnosed with abruptio placentae, using a structured, predesigned questionnaire. Multiple variables were used to assess the feto-maternal outcomes related to abruptio placentae. Data were coded and analysed using SPSS (Statistical Package for the Social Sciences) version 16. All variable results were considered statistically significant at a P value of less than 0.05. We studied 104 pregnant women diagnosed with abruptio placentae, whose age ranged between 17 and 48 years; the most frequent age group was 20-25 years, which accounted for 47% of cases. The mean gestational age at hospital admission was 36.81 ± 3.564 weeks (minimum 21, maximum 39 weeks), the mean parity was 2.97 ± 1.745, and the mean number of previous miscarriages was 1.90 ± 2.45. The most frequent blood group was B Rh-positive (39.42%), followed by A Rh-positive (34.62%). The mean number of previous caesarean sections was 2.71 ± 1.426. The most frequent risk factors for abruptio placentae were preeclampsia (43.5%), followed by previous abruptio placentae in the last pregnancy (32.7%) and bronchial asthma (17.6%). Regarding mode of delivery, 73.1% of women delivered by caesarean section (C/S), of which 91.45% were emergency procedures. Male neonates were more prevalent than female neonates (59.22% vs 40.78%). Maternal and neonatal mortality were 1% and 33.2%, respectively, and 26.4% of mothers were admitted to the intensive care unit (ICU), complicated by disseminated intravascular coagulation (DIC) and pulmonary embolism as causes of death. This study identified preeclampsia and previous abruptio placentae as the most important risk factors, occurring with the highest frequency. Early assessment and diagnosis of abruptio placentae are therefore critical to preventing adverse health outcomes for both mothers and neonates.

Introduction

Placental abruption (PA) is the premature separation of the placenta before or during delivery [1]. It occurs in 0.38–1% of singleton pregnancies, rising to 1–2% in twins [2,3]. PA is a major obstetric complication linked to significant fetal and maternal morbidity and mortality worldwide, especially in developing countries [1,4-6], with over half of related perinatal deaths involving preterm delivery. [7] PA accounts for 20–25% of antepartum haemorrhage cases and increases the risk of disseminated intravascular coagulation, maternal shock, renal failure [1,8], postpartum haemorrhage, and maternal death [1,9,10]. Fetal risks include low birth weight, preterm birth, growth restriction, birth asphyxia, fetal distress, low Apgar scores, NICU admission, stillbirth [1,10-12], congenital anomalies, and perinatal mortality ranging from 4.4–67.3%. [1,9,13] Recognised risk factors include prior small-for-gestational-age delivery, extremes of maternal age (<20 or ≥35 years), previous abruption or caesarean delivery, maternal migraine history, diabetes mellitus, grand multiparity, smoking, multiple gestation, chronic hypertension, preeclampsia, premature rupture of membranes, thrombophilia, abdominal trauma, and polyhydramnios [4,9,14-21]. No test definitively diagnoses PA; investigations mainly exclude other conditions and establish baselines [19-21].

Ultrasound helps rule out placenta previa but has low sensitivity for abruption itself, as acute haemorrhage appears isoechoic with placental tissue. A biophysical profile score ≤6 indicates fetal compromise in conservatively managed cases. Baseline workup includes complete blood count, coagulation studies, BUN, and blood type/Rh screening. The Kleihauer-Betke test does not diagnose abruption but quantifies fetomaternal haemorrhage, guiding Rh(D) immune globulin dosing in Rh-negative women. PA usually presents suddenly and severely, requiring immediate treatment. Prehospital care involves advanced life support and transfer to a facility with full obstetric and neonatal ICU capability. On arrival, patients receive IV fluids, oxygen, and continuous maternal-fetal monitoring, with further management guided by clinical findings, gestational age, and severity of distress [22,23].

Placental abruption is a serious obstetric emergency best managed by a multidisciplinary team (obstetrician, radiologist, haematologist, obstetric nurse, intensivist), with prompt triage recognition, urgent obstetrician notification, ICU transfer,

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blood crossmatching, and coordinated anaesthesia, radiology, and OR readiness, plus neonatal ICU alert if the fetus is premature. While unpreventable, smoking cessation and avoidance of cocaine use—with drug counselling or rehabilitation as needed—are advised to reduce risk [24-25]. This study aims to assess feto-maternal outcomes following placental abruption.

Methods and Materials

Study Design

Retrospective cross-sectional study.

Study Setting and Period

From 2019 to 2021 at Aljala Maternity Hospital, Tripoli, Libya.

Study Population

Data were collected from 104 medical files of pregnant women diagnosed with abruptio placentae, using a structured, predesigned questionnaire.

Inclusion Criteria

All patients diagnosed with abruptio placentae.

Exclusion criteria

Patients who did not give written consent.
Multiple variables were used to assess the feto-maternal outcomes related to abruptio placentae.

Data Management

Data were coded and analysed using SPSS (Statistical Package for the Social Sciences) version 16. Descriptive statistics, including frequency, percentage, mean, and standard deviation, were used for the relevant variables. All variable results were considered statistically significant at a p-value of less than 0.05.

Ethical Consideration

This study was ethically approved by the health authority and Aljala Maternity Hospital. The objectives of the study were designed to meet the intended benefits, and all collected data were anonymised, with confidentiality maintained throughout the study.

Results

Demographic Data

We studied 104 pregnant women diagnosed with abruptio placentae, whose ages ranged between 17 and 48 years; the most frequent age group was 20-25 years, which accounted for 47% of cases (Table 1).

Table 1. Distribution of maternal age, Tripoli, Libya, 2019-2021 (N = 104)

Statistic	Value (years)
Mean	34.04
Median	35.00
Mode	39
Std. deviation	6.048
Minimum	17
Maximum	48

Obstetric Parameters

On assessing the obstetrical data, the mean gestational age (GA) at hospital admission was 36.81 ± 3.564 (SD), with a minimum GA of 21 weeks and a maximum GA of 39 weeks. The mean parity was 2.97 ± 1.745 (SD), and the mean number of previous miscarriages was 1.90 ± 2.45 (SD) (Table 2).

Table 2. Summary of obstetric and clinical parameters, Tripoli, Libya, 2019-2021 (N = 104)

Variable	Mean ± SD	Minimum	Maximum

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Gestational age at admission (weeks)	36.81 ± 3.564	21	39
Parity	2.97 ± 1.745	—	—
Number of previous miscarriages	1.90 ± 2.45	—	—
Number of previous caesarean sections	2.71 ± 1.426	—	—
Units of blood transfused	4.15 ± 3.785	—	—

— = not reported in the original dataset.

Blood Group and Rhesus Classification

On assessing blood group and Rhesus classification, the most frequent blood group was B Rh-positive, which accounted for 39.42%, followed by A Rh-positive at 34.62% (Table 3).

Table 3. Distribution of blood group and Rhesus classification, Tripoli, Libya, 2019-2021 (N = 104)

Blood group	Percentage (%)
B Rh-positive	39.42
A Rh-positive	34.62
O Rh-positive	20.19
AB Rh-negative	5.77

Previous Caesarean Sections

On evaluating the number of previous caesarean sections, the mean was 2.71 ± 1.426 (SD) (Table 4).

Table 4. Distribution of number of previous caesarean sections, Tripoli, Libya, 2019-2021 (N = 104).

Number of previous C/S	Frequency	Percentage (%)
0	8	7.7
1	11	10.6
2	28	26.9
3	28	26.9
4	14	13.5
5	15	14.4

Risk Factors for Abruptio Placentae

The most frequent risk factors for abruptio placentae were preeclampsia, which accounted for 43.5%, followed by previous abruptio placentae in the last pregnancy, which accounted for 32.7%, and bronchial asthma at 17.6% (Table 5).

Table 5. Most frequent risk factors for abruptio placentae, Tripoli, Libya, 2019-2021 (N = 104)

Risk factor	Percentage (%)
Preeclampsia	43.5
Previous abruptio placentae	32.7
Bronchial asthma	17.6

Mode of Delivery

On assessing mode of delivery, 73.1% of women had delivered by caesarean section (C/S), of which 91.45% were emergency C/S (Table 6).

Table 6. Distribution of mode of delivery, Tripoli, Libya, 2019-2021 (N = 104)

Mode of delivery	Percentage (%)
Caesarean section (C/S)	73.1
Normal vaginal delivery (NVD)	26.9
— Emergency C/S (of all C/S)	91.45
— Elective C/S (of all C/S)	8.55

Blood Transfusion

On evaluating the number of units of blood transfusion, the mean rate was 4.15 ± 3.785 (SD) (Figure 1).

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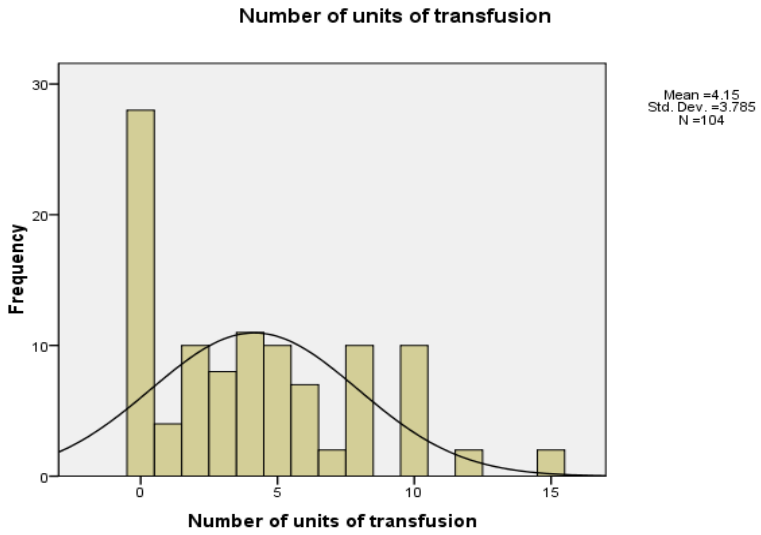

Figure 1. Distribution of units of blood transfusion, Tripoli, Libya, 2019-2021 (original SPSS histogram, N = 104)

Gender of Neonates

Regarding the gender of neonates, male neonates had a higher prevalence compared to female neonates, at 59.22% (Table 7).

Table 7. Distribution of gender of neonates, Tripoli, Libya, 2019-2021 (N = 104)

Gender	Percentage (%)
Male	59.22
Female	40.78

Maternal and Neonatal Outcomes

(Table 8) shows the distribution of maternal and neonatal outcomes: 1% and 33.2% died, respectively (Figure 9). In addition, 26.4% of mothers were admitted to the intensive care unit (ICU), with disseminated intravascular coagulation (DIC) and pulmonary embolism as causes of death. Maternal ICU admission rate: 26.4% (complicated by DIC and pulmonary embolism as causes of death).

Table 8. Distribution of maternal and neonatal outcomes, Tripoli, Libya, 2019-2021 (N = 104)

Variable (N = 104)	Alive	Died
Maternal outcome	99%	1%
Neonatal outcome	66.8%	33.2%

Discussion

We studied 104 pregnant women diagnosed with abruptio placentae, whose ages ranged from 17 to 48 years; the most frequent age group was 20-25 years, which accounted for 47% of cases. Recent studies have reported an association between an increased risk of abruptio placentae and chronic hypertension [24-26] and preeclampsia/eclampsia [15,21,25,27-29], but these contrast with the findings of Wandabwa and colleagues [22], who observed that neither the severity of blood pressure nor proteinuria were predictive factors for abruptio placentae. The possible reason for this difference in findings could be explained by differences in the nature of the studied populations and the prevalence of these risk factors.

Compared to our study, the most frequent risk factors for abruptio placentae were preeclampsia, which accounted for 43.5%, followed by previous abruptio placentae in the last pregnancy, which accounted for 32.7%, and bronchial asthma at 17.6%. The second important finding of previous studies pertains to the association between previous caesarean delivery and an increased risk of abruptio placentae. [24-26] The risk of abruptio placentae increased by nearly two-fold for women with a prior caesarean section delivery. A similar observation was reported elsewhere [18-20,30], but in our study it was lower than the seven- and ten-fold increases reported by Wandabwa et al. and Nayama et al. [22,31]. The increased risk of abruption among women with prior caesarean delivery may imply that these women had a ruptured scar from the previous caesarean. The differences in the risk of abruptio placentae between our study and others may be explained by differences in the pre-existing conditions associated with abruptio placentae between the studied populations. In our study, when evaluating the number of previous caesarean sections, the mean was 2.71 ± 1.426 (SD). Various studies have confirmed

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that abruptio placentae in a previous pregnancy is an important risk factor for abruptio placentae in subsequent pregnancies [32].

An association between prior abruptio placentae and its recurrence in subsequent pregnancies was demonstrated by Rasmussen and colleagues in a Norwegian cohort [33], who reported a five-fold increase in the relative recurrence risk of abruptio placentae. This indicates that more persistent risk factors, such as preeclampsia and chronic hypertension, may play a role. In previous studies, the occurrence of abruptio placentae was higher in women with high parity and multigravida status compared to nulliparous or primigravid women. These results are in line with many previous studies [24,25,34-38] but contrast with the findings of Sanchez and colleagues [21], who observed that neither of these factors was associated with abruptio placentae. Previous studies have reported that both maternal cigarette smoking [4,5] and alcohol consumption during pregnancy [27,28,39] are associated with abruptio placentae. In contrast, in our study, these variables were not associated with abruptio placentae. The proportion of women who smoked was too low to assess the influence of smoking on abruptio placentae. Furthermore, the lack of association between alcohol consumption and abruptio placentae may be partly explained by variation in the amount, type, and mode of alcohol used by participants between studies.

The occurrence of abruptio placentae has been associated with an increased risk of maternal and foetal morbidity and mortality in previous studies. [1,3,6,22] Women with abruptio placentae had a 12-fold higher risk of postpartum haemorrhage compared to women in the comparison group. Similarly, Sarwar and colleagues in Pakistan [10] reported that 22.2% of abruptio placentae patients experienced severe postpartum haemorrhage as a result of uterine atony, coagulation failure, or puerperal sepsis. However, it is worth noting that the diagnosis of abruptio placentae is subject to misclassification and is recorded with knowledge of the outcome of pregnancy; therefore, a pregnancy with severe haemorrhage may be more likely to be recorded as abruptio placentae if the baby dies. This could in part explain the increased risk of postpartum haemorrhage attributed to abruptio placentae in our study. The observed maternal death rate related to abruptio placentae in our study is above the maximum acceptable rate of 1%, [7], but the case fatality rate is lower than the 4.7% reported by Seema et al. [6]. In our study, women with pregnancies complicated by abruptio placentae had a six-fold risk of delivering an infant with low birth weight compared to women in the control group. A similar finding was reported in Uganda. [22] The high risk of low-birth-weight delivery among women with abruptio placentae may be explained by the effect of preterm birth due to premature termination of pregnancy performed by clinicians because of the severity of abruptio placentae, or by the effect of intrauterine foetal growth restriction. The risks of stillbirth, early neonatal death, and perinatal death were also higher among women with abruptio placentae compared to women without abruptio placentae. These results are congruent with previous studies. [1,6,9,13,21,23].

It has been previously reported that the magnitude of stillbirth depends on the degree of placental separation, particularly when it exceeds 50%. [12] This could be the case for some women in the present study, which in turn could explain the observed high risk of perinatal death and its components. However, the observed excess risk of perinatal death may also likely be caused by prematurity and intrauterine foetal growth restriction. It is worth noting that the perinatal mortality rate observed in our study is higher than the 25.6 per 1000 deliveries reported elsewhere [6]. Previous investigators reported an increased risk of preterm birth among women with abruptio placentae [9]. The association between abruptio placentae and preterm birth disappeared after adjustment for covariates in the model. Furthermore, patients with abruptio placentae were more likely to deliver a baby with a low Apgar score at the 1st and 5th minutes, respectively. The high risk of a low Apgar score may be due to prematurity or may indicate a lack of equipment/supplies and life-saving skills for newborns born preterm/with low birth weight in the study setting. In the present study, when evaluating the distribution of maternal and neonatal outcomes, 1% and 33.2% died, respectively, and 26.4% of mothers were admitted to the ICU, with DIC and pulmonary embolism as causes of death. A limitation of our study is that it was retrospective, which is liable to missing data; however, a strength of our study is the adequate sample size, which allows generalisation of our results.

Conclusion

In our study, we identified preeclampsia and previous abruptio placentae as important risk factors, occurring with the highest frequency. Therefore, early assessment and diagnosis of abruptio placentae is critical to prevent adverse health outcomes for both mothers and their neonates. Further studies are recommended to assess the feto-maternal adverse outcomes related to abruptio placentae.

Conflict of interest. Nil

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