Prevalence and Its Feto-Maternal Outcome in Placental Abruption: A Retrospective Study for 5 Years from Dubai Hospital

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Keywords

Disseminated intravascular coagulation · Maternal morbidity · Perinatal morbidity · Pre-eclampsia · Placental abruption

Abstract

Introduction: Placental abruption (PA) is a major obstetric complication leading to increased risk of maternal and neonatal morbidity and mortality globally. This study aims to determine the prevalence and its feto-maternal outcome in cases of placental abruption in our population. **Methods:** A retrospective descriptive case study was conducted from January 2013 till December 2017 in Dubai Hospital, Dubai, UAE. All patients admitted with suspicion of placental abruption at 28 weeks of gestation and beyond were included in the study. The clinical information like maternal age, parity, antenatal risk factors, gestational age at delivery, mode of delivery, postpartum complications and perinatal outcome were studied. **Result:** A total of 15,079 deliveries occurred during the study period; PA accounted for 0.61%. 62% of the women had revealed abruption and 38% had concealed abruption. The antenatal risk factors associated with abruption were diabetes (26%), chronic hypertension (2.2%), pre-e-

clampsia (19.5%), previous cesarean section (26%), and multiple pregnancy (9.8%). Cesarean section was the mode of delivery in 78% of abruption cases. 33% had postpartum hemorrhage and 20% had received blood products. Adverse fetal outcomes were as follows: 51% of the cases had pre-term delivery, 47% of the babies had a birth weight of less than 2.5 kg, 8 cases died of intrauterine fetal death and there was 1 neonatal death. **Conclusion:** Even when being aware of the risk factors, placental abruption still remains unpredictable or unpreventable. Having better equipped obstetric and neonatal units with multidisciplinary management can improve both maternal and perinatal outcome in cases of placental abruption.

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Introduction

Placental abruption (PA) is defined as the complete or partial separation of a normally implanted placenta before delivery. It is a serious multifactorial obstetric complication, and its etiopathogenetic mechanism is not yet entirely understood [1]. PA occurs in about 0.38–1% of singleton births, and in 1–2% of twin pregnancies [2, 3].

Fig. 1. Placental abruption cases in different nationalities.

It is a major obstetric complication associated with an increased risk of fetal and maternal morbidity and mortality globally, especially in developing countries where the incidence varies from 4 to 6% [4, 5].

PA accounts for 20–25% of antepartum hemorrhage, resulting in increased maternal peripartum risk factors like disseminated intravascular coagulopathy, postpartum hemorrhage, severe maternal shock, emergency hysterectomy, acute renal failure and maternal death [3, 6–8]. Adverse fetal outcomes like intrauterine growth restriction, preterm birth, low birth weight, fetal distress, low Apgar score, transfer to neonatal intensive care unit, stillbirth, congenital anomalies and perinatal death ranging from 4.4 to 67.3% are also observed in cases of PA [9, 10].

Although PA occurrence is often unpredictable, several risk factors have been associated such as previous history of PA, extremes of maternal age, previous history of cesarean section, grand multiparity, multiple gestation, diabetes mellitus, cigarette smoking, chronic hypertension, pre-eclampsia, premature rupture of membranes, abdominal trauma, and polyhydramnios [3, 7, 11].

Most of the studies of PA have been done in different populations of the world, with very few in Gulf countries. The aim of this retrospective study is to evaluate the interval prevalence of PA in our multinational population and feto-maternal consequences in our hospital.

Methods

A retrospective observational study was conducted in Dubai Hospital, Dubai, UAE, from January 1, 2013 to December 31, 2017. All patients who were admitted with suspicion of PA at 28 weeks of gestation and beyond were included in the study. PA was diagnosed based on clinical signs and symptoms of vaginal bleeding, tense and tender abdomen, hypertonic uterus and was confirmed at delivery by local examination of the placenta for separation or presence of a retroplacental clot. Women with a gestational age of less than 28 weeks, women diagnosed with placenta previa, with pathology in the lower genital tract, with bleeding disorders and those with missing records of PA were excluded from the study. All data were retrieved from the maternity register, patient files and computerized hospital database. The following clinical information was collected: maternal age, gravidity, parity, antenatal care, gestational age at delivery, birth weight, and medical complications such as diabetes mellitus, hypertension, pre-eclampsia, previous cesarean section, intrauterine growth restriction and preterm premature rupture of membranes.

Maternal outcome was assessed by mode of delivery, postpartum hemorrhage, need for blood transfusion, disseminated intravascular coagulation (DIC), intensive care unit admission or multiorgan failure. Neonatal outcome was assessed by preterm birth, low Apgar score, neonatal intensive care unit admission and perinatal death. This study was approved by the Dubai scientific research ethics committee (DSREC-02/2018_04) and confidentiality of data was maintained.

The Statistical Package for the Social Sciences Version 24.0 (IBM Corp., Armonk, NY, USA) was used to analyze the data. Continuous variables were reported as means and standard deviation (SD) for bell-shaped data. For skewed data, median and range were reported. Categorical variables were reported as frequency and percentages.

Fig. 2. Clinical presentation of placental abruption.

Table 1. Demographic and obstetric risk factors associated with placental abruption

	Cases	Percentage
Maternal age		
20–34 years	61	66
≥35 years	31	34
Antenatal care		
Booked	80	87
Unbooked	12	13
Gravidity		
1	17	18
2–4	46	50
≥5	29	32
Parity		
0	21	23
1–4	60	65
≥5	11	12
Antenatal risk factor		
Diabetes	24	26
Pre-eclampsia	18	19.5
Chronic hypertension	2	2.2
Multiple pregnancy	9	9.8
Previous cesarean section	24	26.1
Preterm premature rupture of membrane	7	7.6
Intrauterine fetal death	7	7.6

Results

The total number of deliveries during the study period from January 1, 2013 to December 31, 2017 was 15,079. PA was observed in 92 cases accounting for an interval prevalence of 0.61% (92/15,079). Out of the 92 cases, 49 (53%) women were from the United Arab Emirates and 43 (47%) were other nationals (Fig. 1).

Thirty-five (38%) women had concealed abruption and 57 (62%) had revealed abruption. Bleeding was the most common clinical presentation followed by a combination of pain and bleeding. There were 35 cases of fetal distress, in whom diagnosis of PA was made after delivery by placental inspection (Fig. 2).

The mean maternal age of the women was 32.0 ± 4.8 years, the youngest being 22 years and the eldest being 43 years old. Eighty patients who had abruption were booked cases, who had more than 3 visits in the antenatal clinic of Dubai Hospital, as compared to 12 who were unbooked. Associated antenatal risk factors observed were diabetes in 24 (26%) patients, chronic hypertension in 2 (2.2%), pre-eclampsia in 18 (19.5%), multiple pregnancy in 9 (9.8%), and preterm premature rupture of membrane in 7 (7.6%). Out of 92 cases, only 4 (4.3%) patients had a history of previous abruption, 24 (26%) had a history of previous cesarean section, and 7 (7.6%) had intrauterine growth restriction (Table 1). Regarding the mode of delivery, most of the patients with abruption were delivered by cesarean section; 78% as compared to 22% who were delivered vaginally. The postpartum outcome of our patients is summarized in Table 2. The duration of hospitalization as inpatient exceeded 4 days for 62 (67%) patients with a median of 5 days (range –2 to 37), showing that PA is associated with a prolonged hospital stay. There was no maternal death during the study period.

As far as neonatal outcome is concerned, it is summarized in Table 3. Thirty-five cases (40%) were labelled as fetal distress. Median gestational age at delivery was 36 weeks (range 28–41). Forty-three cases (47%) had a birth weight of less than 2.5 kg. Forty-nine babies were admitted to the neonatal intensive care unit due to prematurity and a hypoxic event. Eight out of 103 babies died of intra-

Table 2. Postpartum outcome associated with abruption

	Cases	Percentage
Postpartum hemorrhage		
Yes	30	33
No	62	67
Need for blood products		
Yes	18	20
No	74	80
Duration of hospital stay		
>4 days	62	67
≤4 days	30	33
Admission to ICU		
Yes	5	6
No	87	94

Table 3. Fetal outcome associated with abruption

	Babies	Percentage
Apgar score at 5 min		
≥7	100	98
<7	3	2
Intrauterine fetal death	8	7.7
Gestational age at delivery		
28 to 31 ⁺⁶ weeks	22	24
32 to 36 ⁺⁶ weeks	26	28
≥37 weeks	44	48
Birth weight		
≤2 kg	40	39
2.1–3 kg	38	37
>3 kg	25	24

uterine fetal death and 1 of the 28 weeks' preterm baby died a neonatal death on day –5 of life accounting for a perinatal mortality rate of 8.7%.

Discussion

In our study, we found a prevalence of abruption of 0.61%, which falls within the range of 0.5–1% as reported in American, European and East Asian populations [2, 3, 6, 12]. In developing countries, the incidence is as high as 4–5%. This could be due to different study populations, designs and diagnostic criteria [4]. Abruptio is more common in elderly women aged more than 35 years, but this is usually observed due to multiparity, which is independent of the age factor [1]. In our study, 64% (19/31) of our elderly patients were para 3 and above. Also, the occurrence of abruption was higher in women with multi-

parity and multigravidity as compared to primigravida. Bleeding was the most common presentation in 37 (38%) women compared to 25% reported by Tikkanen [1]. Pain or uterine hypertonia without bleeding is seen in 16% of women.

The most common antenatal risk factor in our study was diabetes mellitus (26%), which we did not find in any previous study and this could be attributed to a high prevalence of diabetes in our population. We had 2% with chronic hypertension and 19.5% with pre-eclampsia associated with PA. In the study by Ananth et al. [14], the rate of abruption among women with or without chronic hypertension was 1.56 and 0.6%, respectively. After adjustment of potential confounders, women with chronic hypertension had a 2.4-fold increased risk of abruption. Severe pre-eclampsia is a strong risk factor for PA, but some studies showed that transient hypertension and mild pre-eclampsia have also been linked to PA [3, 5, 13, 14]. Chronic diseases like hypertension and diabetes mellitus lead to placental insufficiency, which results in PA. Preterm premature rupture of the membranes before 37 weeks of gestation leads to 4–12% of cases of PA. The risk increases with decreasing gestational age at membrane rupture [15]; we had 7.6% cases of preterm premature rupture of membrane developing PA. Previous cesarean section increases the risk of PA by 30–40% in the next pregnancy in comparison to women who had vaginal delivery [16]. We had 26% of abruption cases who had a history of previous cesarean sections. The risk of PA is increased by 2- to 3-fold in twin pregnancy and with increasing multiplicity, the risk of PA also increases [3, 17].

PA is associated with a high risk of maternal morbidity and mortality. Bleeding caused by PA can lead to hypovolemic shock and multiorgan failure. In cases of concealed hemorrhage when placental detachment is large enough, this leads to fetal death and coagulation cascade resulting in DIC. In our study, we had 4 cases of DIC and 2 cases of acute renal injury, which were associated with intrauterine fetal death at presentation. The incidence of cesarean section was 78% in PA cases, which is much higher compared to our average cesarean section incidence of 25% in our hospital. This is mainly due to fetal distress or a previous multiple uterine scar. Maternal mortality associated with abruption has decreased from 8% in 1919 to less than 1% in 1995 and the UK confidential inquiry reported 2 maternal deaths between 2003 and 2005 [1, 18]. We had no case of mortality due to PA during our study period of 5 years in our hospital.

PA leading to fetal and neonatal morbidity and mortality is mainly associated with preterm birth, low birth

weight and fetal distress. According to Ananth et al. [19], around 40–60% of babies are born before 37 weeks due to abruption and approximately 14% of abruption occur before 32 weeks. We had 51% of our abruption cases delivered before 37 weeks and 21% before 32 weeks. 47% cases had a birth weight of less than 2.5 kg and 40% had fetal distress during the intrapartum period. Forty-nine babies were admitted to the neonatal intensive care unit and 1 baby died a neonatal death within 5 days. Abruption involving more than 50% of the placental surface can lead to fetal death. We had 8 cases of intrauterine fetal death and 4 of them were associated with DIC. Perinatal mortality can be as high as 60%, but in developed countries, it is in the range of 9–12% [20]. We had 8.7% (9/103) of perinatal mortality in our unit during this period, proving that our standards are comparable to developed countries.

Conclusion

PA is a complex disease. Although several risk factors are known, the etiopathogenesis is not fully understood and its occurrence often remained unpredictable or unpreventable. Adequate antenatal care, early identification and proper monitoring of risk factors with timely intervention may reduce the risk of PA and its feto-maternal outcome. Though the majority of our patients were booked (87%), we still had 4 cases of stillbirth among our booked patients with adequate antenatal care. We did not have any maternal mortality and our perinatal mortality rate is comparable to that of developed countries. This shows that an appropriate multidisciplinary management strategy will enable to limit the maternal mortality, but perinatal mortality, which occurs essentially in utero, is still not preventable.

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Limitation of the Study

This is a retrospective observational study, so recall bias is possible as data were gathered from the medical files. As the data came from a single hospital, the conclusions inferred may not be applicable to the entire population of the UAE. There is no comparison with a control group, so statistical significance cannot be drawn for the risk factors.

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Statement of Ethics

The authors had the approval from the Dubai Scientific Research Ethics Committee (DSREC-02/2018_04).

Disclosure Statement

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Author Contributions

S.S.: Idea for the proposal, literature review, ethical approval, writing up the article, communicating with statistician and submission.

L.K.H.: Literature review and reviewing the article.

A.A.: Data collection.

F.S.: Data collection.

M.A.: Data evaluation and tabulation.

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