

Original Research Article

A clinical study of abruptio placenta and its fetomaternal outcome in a tertiary care hospital

Vanaparthy Kavya^{1,*} and Vidya Manoj Jadhav¹

¹ Department of Obstetrics and Gynecology, Bharati Vidyapeeth (Deemed to be University) Medical College and Hospital, Sangli, India.

* Correspondence: vanaparthykavya@gmail.com

Received: 12 February 2023; Accepted: 13 April 2023; Published: 17 April 2023.

Abstract: Background: Abruptio placenta is a serious pregnancy complication that occurs when the placenta separates partially or completely from the uterus after the age of viability and before delivery, which can result in maternal and fetal morbidity and mortality.

Aim: This study aimed to determine the percentage, sociodemographic characteristics, risk factors, and fetomaternal outcomes of abruptio placenta in a tertiary care hospital, Bharati Vidyapeeth (Deemed to be University) Medical College and Hospital, Sangli.

Materials and Methods: This retrospective study included all cases of abruptio placenta that occurred between June 1st, 2020 and May 31st, 2022 in the obstetrics ward of Bharati Vidyapeeth (Deemed to be University) Medical College and Hospital, Sangli. Sociodemographic characteristics, risk factors, and fetal and maternal morbidity and mortality data were extracted from patient case notes for analysis.

Results: Of the 966 deliveries during the study period, 37 cases (3.83%) of abruptio placenta were identified. The incidence of abruptio placenta was higher in the age group of 20-29 years (64.8%) and in multiparous women (59.4%). Hypertensive disorders of pregnancy were the most common risk factors, observed in 54.05% of cases. Prematurity was the major perinatal morbidity and was found in 56.7% of cases, followed by birth asphyxia in 37.8%. NICU admission was required for 48.6% of babies, and 29.7% were stillborn. The caesarean section rate was 70.3%. Blood transfusion was required for 28 subjects (75.6%), postpartum hemorrhage occurred in 10 subjects (27.02%), and postpartum anemia was observed in 20 subjects (54.05%). There were two maternal deaths, resulting in a maternal mortality rate of 5.4%. The perinatal mortality rate was 51.3% due to a higher percentage of stillbirths.

Conclusion: Abruptio placenta is a serious pregnancy complication that can result in significant maternal and fetal morbidity and mortality. Hypertensive disorders of pregnancy were identified as the most important risk factor. Good antenatal care services and early referral to well-equipped institutions with qualified personnel, efficient blood banking systems, and good neonatal services are essential in reducing the adverse outcomes of abruptio placenta.

Keywords: Abruptio placenta; Fetomaternal outcome; Hypertensive disorders of pregnancy; Perinatal morbidity and mortality; Tertiary care hospital.

1. Introduction

Abruptio placenta is a significant cause of perinatal and maternal morbidity and mortality. While the primary cause remains unknown, there are numerous risk factors associated with it, some of which can be prevented or treated. Abruptio placenta is the partial or complete separation of a normally positioned placenta after the age of viability but before the delivery of the fetus. It affects approximately 1% of pregnancies [1]. The bleeding may be concealed, revealed, or a combination of both. The concealed type is particularly dangerous because maternal vital signs do not correlate with the degree of blood loss, and fetal death is more common compared to the revealed type [2].

Several factors predispose to abruptio placenta, including hypertensive disorders of pregnancy, multiparity, young maternal age (<20 years), advanced maternal age (>35 years), a previous history of abruptio placenta, uterine overdistension (e.g., multiple pregnancies, polyhydramnios), cigarette smoking,

cocaine use, uterine anomalies, retroplacental uterine leiomyoma, blunt abdominal trauma, premature rupture of the membrane, thrombophilic disorders, and a short umbilical cord [3,4]. The clinical features at presentation depend on the degree of placental separation and the amount of vaginal bleeding. The most common presentations are vaginal bleeding and abdominal pain, although others include uterine and abdominal tenderness, preterm labor, signs of hemodynamic instability, fetal distress, and fetal death [1,5].

The diagnosis of abruptio placenta is largely clinical, although ultrasound can be used to exclude placenta previa. The ultrasonographic appearance of abruptio placenta depends on the size and location of the bleed and the time interval between the abruption and the performance of ultrasonography [6]. The diagnosis is confirmed at delivery by the direct visualization of retroplacental clots and indentation of the maternal surface of the placenta.

The management of abruptio placenta entails assessing the patient's clinical status, the amount of blood loss, fetal maturity, whether the patient is in labor, any complication present, and the grade of placental abruption. In most cases of abruptio placenta, immediate delivery either through the vagina or by cesarean section is the preferred management option. The route of delivery is dictated by the severity of the abruption, fetal condition, state of the cervix, and the severity of bleeding [7]. Expectant management is rarely used in abruptio placenta unless in carefully selected cases where bleeding is minimal and has stopped, the fetus is alive with a reactive cardiotocograph, and is remote from term [8].

Major maternal complications associated with abruptio placenta include hemorrhage, shock, disseminated intravascular coagulopathy, acute kidney injury, and postpartum hemorrhage [9,10]. Measures that are useful in managing these complications include transfusion with fresh whole blood, fresh frozen plasma, and cryoprecipitate [8,9]. Emergency hysterectomy may be necessary in cases of intractable postpartum hemorrhage. Abruptio placenta is associated with high fetal morbidity and perinatal mortality [10]. This is often related to the severity of the abruption, misdiagnosis, and delay in instituting treatment.

2. Materials and Methods

The study was conducted in the obstetrics ward of a tertiary care hospital. All case records of patients diagnosed with abruptio placenta between June 1, 2020 and May 31, 2022 were included in this retrospective study. Cases with other causes of antepartum hemorrhage, such as placenta previa and extraplacental causes, were excluded. Data was obtained from the central medical records department, including patients' age, parity, marital and educational status, booking status, risk factors for abruptio placenta, management options (vaginal delivery, caesarean section, or conservative management), and fetal and maternal morbidity and mortality.

Patients underwent a complete obstetrical examination and clinical workup, which included a history and general physical examination, as well as abdominal and pelvic examination. Relevant obstetric history and maternal high-risk factors, such as hypertensive disorders of pregnancy, gestational diabetes mellitus, and polyhydramnios, were noted. Diagnosis of placental abruption was based on clinical features of vaginal bleeding, uterine tenderness, and a hypertonic uterus, and confirmed by retroplacental clots. Appropriate investigations, such as laboratory tests and imaging, were performed. The mode of delivery was decided based on the state of the mother and fetus. All information was collected and analyzed, with maternal complications like postpartum hemorrhage, disseminated intravascular coagulation, acute renal failure, shock, and infections, as well as fetal outcomes such as perinatal mortality, prematurity, and admission to the intensive care unit, being studied.

3. Results

Of the 966 deliveries during the study period, there were 37 cases of abruptio placenta, giving a prevalence of 3.83% (see Figure 1).

Table 1 presents the demographic characteristics of the subjects, including their mean age of 26.7 years (age range: 19–38 years). The majority of the subjects (24; 64.8%) were in the 20–29 years age group, while 2 (5.4%) were less than 20 years of age. Of the total number of subjects, 15 (40.5%) were primigravida, 17 (45.9%) had a parity of two or three, and 5 (13.5%) had parity more than three. Additionally, 31 subjects (83.8%) were unbooked, while only 6 (16.2%) were booked. Among the subjects, 30 (81.1%) presented before term, while 7 (18.9%) presented at term.

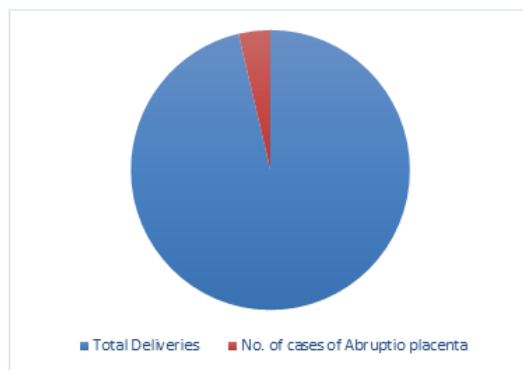


Figure 1. Prevalence of Abruptio Placenta

Table 1. Sociodemographic characteristics of pregnancies complicated with abruptio placenta

Characteristics	No. of cases	Percentage
AGE (in years) <20 20-29 30-35 >35	2 24 9 2	5.4% 64.8% 24.3% 5.4%
Parity Primi Multi (2-3) Grand Multi (≥4)	15 17 5	40.5% 45.9% 13.5%
Booking status Booked Unbooked	6 31	16.2% 83.8%
Gestational age <37 weeks ≥37 weeks	30 7	81.1% 18.9%

Table 2 presents the risk factors associated with abruptio placenta. Hypertensive disorders of pregnancy were observed in 20 subjects (54.1%), 2 subjects (5.4%) had multiple pregnancies, 4 subjects (10.8%) had polyhydramnios, 3 subjects (8.1%) had a previous history of abruption, while in 8 subjects (21.6%) the cause was unknown.

Table 2. Risk factors for abruptio placenta

Risk factors	No. of cases	Percentage
HTN disorders of pregnancy	20	54.1%
Multiple pregnancy	2	5.4%
Polyhydramnios	4	10.8%
Trauma	0	0
Previous Abruptio placenta	3	8.1%
None	8	21.6%

In Table 3, it can be observed that out of the total subjects, 7 (18.9%) were in active labor at the time of presentation. The most common presenting complaints were vaginal bleeding and abdominal pain. Hemorrhagic shock was reported in 5 subjects (13.5%). 26 subjects (70.2%) underwent emergency caesarean section, primarily due to abruptio placenta with a live fetus. On the other hand, 11 subjects (29.8%) had vaginal delivery.

Table 3. Mode of delivery

Mode of delivery	No. of cases	Percentage
Vaginal delivery	11	29.7%
LSCS	26	70.2%

The fetal morbidities associated with abruptio placenta are presented in Table 4. Of the total 37 cases, 26 (70.3%) had live births, while 11 (29.7%) had stillbirths. Among the live births, 8 (30.8%) suffered early neonatal death. Prematurity was the most common perinatal morbidity, observed in 21 (56.7%) babies, followed by birth asphyxia, which was seen in 14 babies (37.8%). A total of 18 babies (48.6%) required admission to the neonatal intensive care unit (NICU).

Table 4. Fetal complications associated with Abruption Placenta

Complications	No. of cases	Percentage
Still birth	11	29.7%
Prematurity	21	56.7%
Asphyxia	14	37.8%
Anemia	3	8.1%
NICU admission	18	48.6%

Table 5 shows that out of the 37 cases of abruption placenta, 19 resulted in perinatal deaths (11 stillbirths and 8 early neonatal deaths). The perinatal mortality rate in cases of abruption placenta was 51.3/

Table 5. Incidence of Perinatal death in Abruption Placenta

Total no. abruption cases	37
Perinatal deaths in cases of abruption	19 (11 still births + 8 early neonatal deaths)
Perinatal mortality rate in Abruption Placenta	51.3%

Table 6 presents the maternal complications observed in the study. A total of 30 subjects (81.1%) required blood transfusion due to severe bleeding. Postpartum anemia was observed in 20 subjects (54.05%), while postpartum hemorrhage occurred in 10 subjects (27.02%). Two subjects (5.4%) had a coagulation disorder, and two subjects (5.4%) had to undergo caesarean hysterectomy. Maternal mortality was recorded in two subjects (5.4%), both of whom died due to severe anemia and irreversible shock.

Table 6. Maternal complications associated with Abruption Placenta

Complications	No. of cases	Percentage
Postpartum Anemia	20	54.05%
Blood Transfusion	30	81.1%
PPH	10	27.02%
Shock/Hypotension	7	18.9%
Couvelaire uterus	1	2.7%
Cesarean Hysterectomy	2	5.4%
DIC	2	5.4%
Febrile morbidity/Sepsis	3	8.1%
Acute Renal failure	3	8.1%
Maternal mortality	2	5.4%

4. Discussion

Abruption placenta is a significant pregnancy complication associated with high fetal and maternal morbidity. In this study, the incidence of abruption placenta was 3.83%, which is slightly higher than estimates from other studies [2,3,5,10]. Interestingly, about 65% of the subjects with abruption placenta were in the age group of 20-30 years, in contrast to their traditional association with advanced maternal age [6,9,11]. This indicates that placental abruption is prevalent in younger obstetric populations, likely due to marriages at a younger age. Additionally, 60% of the subjects had a parity of two or more, correlating with high parity as a well-documented risk factor for abruption placenta [7,12].

The majority of patients with abruption placenta were unbooked [13]. This study demonstrated an association of abruption placenta with hypertension, as more than half of the patients with abruption placenta had a hypertensive disorder during their index pregnancy. Similar findings were reported in other studies [8,9,12]. It is noteworthy that the majority (70.2%) of the patients were delivered by emergency caesarean sections, which is the recommended management for pregnancies complicated by abruption placenta and a live fetus [15]. However, some other studies indicated a larger proportion of patients having a vaginal delivery [14]. The reason for this disparity in the mode of management may be due to the status of the fetus at the time of presentation.

Abruptio placenta is often associated with high perinatal mortality. In this study, there were 19 (51%) perinatal deaths, which is similar to findings in other studies done in other tertiary institutions [12,14,15]. The high perinatal mortality highlights the importance of immediate and appropriate management. Abruptio placenta is also associated with high maternal morbidity, with over 80% of the subjects requiring blood transfusion. Similar findings were reported by other authors [7,11,15]. The two maternal deaths from abruptio placenta in this study were both unbooked patients who presented late to the hospital with irreversible shock following massive hemorrhage. This underscores the importance of early presentation and expert management to prevent the adverse maternal and fetal morbidities and mortalities associated with abruptio placenta.

5. Conclusion

Abruptio placenta is an important pregnancy complication associated with maternal and fetal morbidity and mortality. Hypertensive disorder of pregnancy was identified as the most important risk factor. Good antenatal care which identifies the risk factors like hypertensive disorders in pregnancy plays an important role in decreasing the incidence of abruptio placenta and improving the maternal and fetal outcome. Regular antenatal checkup, anemia correction, early diagnosis & identification of gestational hypertension would prevent the maternal and perinatal morbidity and mortality. More importantly, early referral of identified cases to well-equipped institutions with qualified personnel, efficient blood banking system, and good neonatal services is invaluable in reducing the adverse outcomes of abruptio placenta. Team efforts by obstetricians, intensivists and neonatologist is required for better maternal and fetal outcome.

Author Contributions: All authors contributed equally to the writing of this paper. All authors read and approved the final manuscript.

Conflicts of Interest: The authors declare that they have no conflicts of interest.

References

- [1] Workalemahu, T., Enquobahrie, D. A., Gelaye, B., Thornton, T. A., Tekola, F., et al. (2018). Abruptio placentae risk and genetic variations in mitochondrial biogenesis and oxidative phosphorylation: replication of a candidate gene association study. *American Journal of Obstetrics and Gynecology*, 219(6), 617.
- [2] Sylvester, H. C., & Stringer, M. (2017). Placental abruption leading to hysterectomy. *BMJ*, 11, 211-215.
- [3] Miller, C., Gynspan, D., Gaudet, L., Ferretti, E., Lawrence, S., et al. (2018). Maternal and neonatal characteristics of a Canadian urban cohort receiving treatment for opioid use disorder during pregnancy. *Journal of Developmental Origins of Health and Disease*, 16, 1-6.
- [4] Plowman, R. S., Javidan, C., & Raptis, C. A. (2017). Imaging of pregnancy-related vascular complications. *Radiographics*, 37(4), 1270-1289.
- [5] Bibi, S., Ghaffer, S., Pir, M. A., & Yousfani, S. (2009). Risk factors and clinical outcome in placental abruption: a retrospective analysis. *Journal of the Pakistan Medical Association*, 59(10), 672-674.
- [6] Talpur, N. N., Memon, S. R., Jamro, B., & Korejo, R. (2011). Maternal and fetal morbidity with abruptio placentae. *Rawal Medical Journal*, 36(4), 297-300.
- [7] Sher, G. (1977). Pathogenesis and management of uterine inertia complicating abruptio placentae with consumption coagulopathy. *American Journal of Obstetrics and Gynecology*, 129, 164-170.
- [8] Campbell, S., & Lee, C. (2002). Disorders of placentation. In *Obstetrics* (17th ed., pp. 171-173). Arnold London.
- [9] Shrivastava, V., Kotur, P., & Jauhari, A. (2014). Maternal and fetal outcome among abruptio placentae at a rural tertiary hospital in Karnataka, India: A retrospective analysis. *International Journal of Research in Medical Sciences*, 2(4), 1655-1658.
- [10] Choudhary, V., Rathi, S., & Somani, S. (2015). Evaluation of risk factors and obstetric and perinatal outcome in abruptio placentae. *Indian Journal of Obstetrics and Gynecology Research*, 4(5), 36-39.
- [11] Humayun, S., & Nahid, F. (2005). Comparison of pregnancy outcome among placenta praevia and abruption. *Annals of King Edward Medical University*, 11(1), 58-59.
- [12] Pitaphrom, A., & Sukcharoen, N. (2006). Pregnancy outcome in placental abruption. *Journal of the Medical Association of Thailand*, 89(10), 1572-1578.
- [13] Sheiner, E., Shoham-Vardi, I., Hadar, E., & Hallak, M. (2002). Incidence, obstetric risk factors and pregnancy outcome of preterm placental abruption: A retrospective analysis. *Journal of Maternal-Fetal and Neonatal Medicine*, 11(1), 34-39.

- [14] Allred, L. S., & Batton, D. (2004). The effect of placental abruption on the short-term outcome of premature infants. *American Journal of Perinatology*, 21(3), 157-162.
- [15] Ananth, C. V., Getahun, D., Peltier, M. R., & Smulian, J. C. (2006). Placental abruption in term and preterm gestations: Evidence for heterogeneity in clinical pathways. *Obstetrics and Gynecology*, 107(4), 785-792.



© 2023 by the authors; licensee PSRP, Lahore, Pakistan. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC-BY) license (<http://creativecommons.org/licenses/by/4.0/>).