

ORIGINAL RESEARCH

Study of fetomaternal outcome in placental abruption

¹Dr. Vaishali P. Panchal, ²Dr. Anil K. Charel, ³Dr. Dixit G. Prajapati, ⁴Dr. Raj Mehta, ⁵Dr. Kartavya Y. Shihora, ⁶Dr. Anubhuti M. Patel

¹Associate Professor, Smt. Shardaben General Hospital, Ahmedabad, India

²Senior Resident of Obgy, Zydus Hospital, Dahod, India

^{3,6}2nd Year Resident, ⁴Senior Resident, ⁵1st Year Resident, Department of Obgy, Smt. Shardaben General Hospital, Ahmedabad, India

Corresponding author

Dr. Raj Mehta

Senior Resident, Department of Obgy, Smt. Shardaben General Hospital, Ahmedabad, India

Received: 16 November, 2023

Accepted: 19 December, 2023

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-Non Commercial-Share Alike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

INTRODUCTION

Abruptio Placentae is early separation of the placenta from its uterine attachment before the delivery of a fetus. The clinical manifestations of abruption typically include bleeding per vaginam and pain in abdomen with a wide variety of abnormal fetal heart rate patterns. The exact cause of placental abruption is not known, but it occurs more frequently among smokers, in hypertensive pregnancies, in pregnancies with intrauterine growth restriction, in chorioamnionitis, in instances of trauma, with advance maternal age, with male fetal gender and in women who had history of previous placental abruption¹. Clinical challenges arise when pregnant women with this condition present with profound vaginal bleeding, necessitating urgent delivery. Placental abruption is significant cause of maternal and prenatal morbidity and mortality. Maternal complications include haemorrhagic shock, coagulopathy and disseminated intravascular coagulation, uterine rupture, renal failure and ischemic necrosis of distal organs². Neonatal complications include death and neuro-developmental problems³. Timely diagnosis and effective treatment can reduce the number of maternal and perinatal complications. Abruption may be “revealed,” in which case blood tracks between the membranes and the decidua, and escapes through the cervix into the vagina. The less common “concealed” abruption occurs when blood accumulates behind the placenta, with no obvious external bleeding. Finally, abruption may be total, involving the entire placenta, in which case it typically leads to fetal death.

AIMS AND OBJECTIVES

- To study incidence and to know risk factors of abruptio placenta
- To determine the maternal outcome in pregnancy complicated by abruptio placenta
- To study the perinatal morbidity and mortality in cases of abruptio placenta.

MATERIAL AND METHODS:

- This is the prospective observational study conducted in the Department of Obstetrics and Gynaecology at a tertiary care teaching hospital during the period of 1 May 2021 to 30 September 2023. Patients with the abruptio placenta who were admitted to Obstetrics & Gynaecology Department at our institute were included in the present study.

INCLUSION CRITERIA

1. All pregnant women diagnosed to have abruptio placenta with gestational age 28 week or more than 28 weeks.
2. Any variety of abruptio placenta – revealed, concealed or mixed.
3. Irrespective of mode previous delivery- vaginal or cesarean.

EXCLUSION CRITERIA

1. All pregnant women with vaginal bleeding due to other causes of Antepartum haemorrhage.
2. All pregnant women diagnosed to have abruptio placenta with gestational age less than 28 weeks.

- All patients referred to the hospital for the management of postpartum complications were excluded from this study.

METHODS

- Careful elucidation of history from the patients.
- Meticulous clinical assessment to exclude from placenta previa.
- Ultra sonography done for placental localization, placental separation and retroplacental clots.
- Baseline investigations done & Vital signs are monitored regularly.
- Blood transfusion and fluid infusion are monitored closely.
- Coagulation failure treated with fresh blood and blood product transfusion.

RESULT AND DISCUSSION

During this study period total 13726 deliveries were conducted out of which 70 cases were diagnosed as accidental hemorrhage which giving an incidence of 0.51%. This can be compared to Pawani C et al⁴ 0.46%. Shashi Sharma et al⁵ had incidence 0.90%. Abruptio complicates 0.6% to 1.2% of

pregnancies⁶⁻⁸. The reported incidence of placental abruptio varies because of differing criteria used for diagnosis⁹.

In the present study majority of cases were found between age group of 21-25 years accounting for 31 (44.29%) cases which was comparable to Pawani C et al⁴ 52% and Shashi Sharma et al⁵ 40.28% in the same age group. The cases found above 35 years 9 (2.85%) and cases below 20 years were 6 (8.57%) were less number. The youngest age at which accidental hemorrhage was present was 18 year and the highest was 38 year. 54% were between the age group of 20-25 years while 28% were between the age group of 26-30 years in study by S. Siddique, H. Afridi, B. Riaz et al¹⁰. A study by Peter Baumann and colleagues showed that, independent of parity, women with placental abruptio were significantly older than the control group. A study conducted at Kuopio University Hospital, Finland, shows that advanced maternal age is a risk factor for placental abruptio¹¹⁻¹². A study at Queens University Kingston showed that placental abruptio was highest in mothers over 40 years of age. In another study by Thieba B and colleagues it was seen that placental abruptio was most frequent with 30 to 34 years old women¹³⁻¹⁴.

Table: 1 Symptoms On Admission:

Symptoms	Present Study		Mukherje S et al ¹⁵ 2014
	No of cases	percentage	
abdominal pain	55	78.57%	71.70%
bleeding pv	46	65.71%	90.60%
absent Fetal movement	23	32.86%	26.50%

(* more than one symptoms present in some cases)

In the present study, 55 (78.57%) cases had complain of abdominal pain, 46 (65.71%) cases had bleeding PV and 23 (32.86%) cases had absent fetal movement. Out of 70 cases of accidental hemorrhage 43 cases had more than one symptoms on admission. Mukherjee S et al¹⁵ shows that the most common presenting symptom was bleeding PV (60.6%) followed by abdominal pain (71.7%) and absent fetal movement (26.4%) wherein the present study most common presenting symptom was abdominal pain followed by bleeding PV and absent fetal movement. Classic symptoms of abruptio include vaginal bleeding and abdominal pain. Uterine contractions are often present, but contractions are not

a specific abruptio characteristic as painful uterine contractions are also present in normal labor. Although there is potential for bleeding from fetal sources, associated vaginal bleeding is typically of maternal origin. Abruptio is ultimately a clinical diagnosis that requires the exclusion of other causes of vaginal bleeding, such as placenta previa and cervical dilation with labor, often termed "bloody show"¹⁶. In an earlier study, 78 percent had vaginal bleeding, 66 percent had uterine tenderness or back pain, and 60 percent had a nonreassuring fetal status (Hurd, 1983). Other findings included frequent contractions and persistent hypertonus⁹.

Table: 2 Associated Obstetric Conditions:

Obstetric Condition	Present Study		mohapatra s et al ¹⁸ 2020	chavan NN et al ¹⁷ 2019
	No of cases	percentage		
anemia	45	64.29%	-	32.20%
hypertension	33	47.14%	58.57%	39.60%
PROM	25	35.71%	2.86%	-
twins	3	4.29%	2.14%	1.50%
polyhydramnios	1	1.43%	2.86%	7%
trauma	0	0%	3%	1.50%

h/o previous Abruption	0	0%	5%	-
------------------------	---	----	----	---

*more than one obstetric condition present in some cases.

In the present study, 45 (64.29%) cases of accidental hemorrhage were associated with anemia. The high frequency of anemia may be due to pre-existing nutritional deficiency, the effect of blood loss or placental separation during accidental hemorrhage. Altered angiogenesis during early pregnancy in anemic women may explain the increased risk. Chavan NN et al¹⁷ 71 showed that 32.2% cases having anemia as main associated obstetric condition. In the present study, 29 (47.14%) cases of accidental hemorrhage were associated with hypertension including preeclampsia. Vasospasm of uteroplacental blood vessels causes anoxic endothelial damage extravasation of blood in the decidua basalis. Mohapatra S et al¹⁸ 68 shows that hypertension including preeclampsia (58.57%) being more common associated condition with accidental hemorrhage. Chavan NN et al¹⁷ 71 also showed 39.6% association of hypertension with accidental hemorrhage. In the present study, 25 (35.71%) cases were associated with PROM. In PROM acute reduction in the uterine volume and intrauterine surface area leads to disruption in the site of placental attachment resulting in abruption. In present study, 3 (4.29%) were associated with twin pregnancy and 1 (1.43%) case was associated with hydramnios. There was no cases with a history of trauma or previous history of abruption in present study. The risk of abruption is 3-

to 4-fold higher among pregnant people with chronic hypertension and 4- to 6-fold higher among those with preeclampsia, particularly preeclampsia with severe features and superimposed preeclampsia¹⁹. Other clinical risk factors for abruption include pregestational and gestational diabetes mellitus, preterm premature rupture of membranes (PROM), chorioamnionitis, and oligohydramnios²⁰. Pregnant people with iron deficiency anemia, infection and other inflammatory states, folate deficiency, and hyperhomocysteinemia are also at increased risk¹⁶. chronic clinical processes associated with oxidative stress, vascular reactivity, and platelet activation, such as FGR and preeclampsia, were associated with increased risk of abruption across all gestations and that acute inflammatory conditions (eg, chorioamnionitis and PROM) were more important drivers of risk in preterm gestations²¹. women with preeclampsia that experience placental abruption have worse maternal, fetal, and neonatal outcomes compared with women experiencing abruption alone (Han, 2019). From a metaanalysis of 10 studies that included term and preterm gestational ages, hydramnios was associated with a twofold greater rate of placental abruption (Khazaei, 2019). Abrupt uterine decompression during membrane rupture may be an inciting factor⁹.

Table: 3 gestational Age

Gestational Age(Weeks)	Present Study	.	Surbhitomarsharma et al ²² 2019
	No of cases	percentage	
28-33	42	60%	29%
34-36	26	37.14%	45%
≥37	2	2.86%	26%

In the present study, 42 (60%) cases were between the 28 -33 weeks of gestational age, 26 (37.14%) cases belong to 34 – 36 weeks and the rest 2 (2.86%) cases were 37 weeks and above gestation. Accidental hemorrhage can occur in any stage gestational age and it depends on associated obstetric conditions. Surbhi Tomar Sharma et al²² found the highest incidence between 34-36 weeks gestational age group which was 45%. A similar study conducted at Hospital in

Multan, showed that 25% were at 28-33 weeks of gestation, 35% were at 34-37 weeks of gestation and 40% had gestational age of 37-40 weeks¹⁰. Thirty patients (30%) presented between 28-32 weeks of gestation, 20 patients (20%) presented between 33-36 weeks of gestation while 50 patients (50%) had a gestational age between 37-40 weeks at presentation¹⁰.

Table: 4 Mode Of Delivery

Mode Of Delivery	Present Study	.	phadtare s et al ²³ 2017	Shabistashaikh s et al ²⁴ 2019
	No of cases	percentage		
vaginal	9	12.86%	23%(1 maternal mortality without delivery)	18%
LSCS	61	87.14%	76%	82%

In the present study out of 70 cases of accidental hemorrhage, 61 (87.14%) cases were delivered by

cesarean delivery while 9 (12.86%) cases had a vaginal delivery. Phadtare S et al²³ and Shabista

Shaikh et al²⁴ had higher Caesarean delivery rates 76% and 82% compared to vaginal delivery 23% and 18% respectively. Out of total 70 cases, 9 cases came with good bishop score. These patients were in labour in which augmentation was done with ARM and oxytocin. They were delivered vaginally without any complication. Factors determine the mode of delivery are associated with amount of bleeding, placental separation, Bishop's score, fetal distress, maternal complication and available neonatal facility. A study at University of Texas, Galveston, showed that cesarean delivery was associated with a significant

reduction in neonatal mortality. The study at Hospital in Multan, showed rate of vaginal delivery to be 67.5% while that of cesarean section to be 35.5%. Thieba B and colleagues showed that in cases of placental abruption, vaginal delivery was preferred to cesarean section in 64.4% of cases¹⁰. If the fetus has died or if it is not considered sufficiently mature to live outside the uterus, vaginal birth is preferable for the mother. The compromised fetus is usually best served by cesarean delivery, and the speed of response is an important factor in perinatal outcomes⁹.

Table: 5 Fetal Outcome

Fetal Outcome	Present Study	.	alka et al ²⁵ 2019	mohapatra s et al ¹⁸ 2020
	No of cases	percentage		
live birth	44	64.38%	28.91%	51.75%
IUD	26	35.62%	71.09%	48.52%

In the present study, 44 (64.38%) were live births and 26 (35.62%) were stillbirths. In present study neonatal death is low as compared to Alka et al²⁵ and Mohapatra S et al¹⁸. It was due to early detection, availability of blood and blood products and NICU facility in our institute.

47 (64.38%) neonates had a birth weight between 1.6-2.5 kg, 12 (16.44%) neonates had a birth weight between 1-1.5 kg and 14 (19.18%) neonates had a birth weight more than 2.5 kg. It was compared to birth weight of Mohapatra S et al¹⁸ and SurbhiTomar Sharma et al²² studies. There was a higher number of low birth weight neonates in both studies.

In the present study majority 34 (48.57%) cases required both blood and blood product transfusion, 18 (25.71%) required only blood transfusion, 2 (2.86%) required only blood component transfusion and 16 (22.86%) does not require any blood or blood component transfusion. Requirement of blood and blood product transfusion depends on baseline haemoglobin level and severity of accidental haemorrhage. Massive hemorrhage in obstetrics is often complicated by coagulopathies that arise due to placental abruption and postpartum hemorrhage.

CONCLUSION

Abruptio placenta is associated with a high rate of maternal and foetal morbidity and mortality. In order to reduce the occurrence of accidental hemorrhage, careful evaluation of associated obstetric conditions or risk factors is required. Unfortunately, neither accurate prediction nor prevention of accidental hemorrhage is possible at present time. Despite the advance in medical technology, the diagnosis of accidental hemorrhage is still a clinical one. When accidental hemorrhage does occur some strategies may help to minimize the risk of morbidity and mortality associated with this condition. This includes early recognition and prompt delivery of the case in which the fetus is mature. Improved attendance to

antenatal care and timely management of these factors may reduce the risk of Abruptio placenta and associated adverse fetomaternal outcomes. Furthermore, better equipped obstetric and neonatal units will improve both maternal and perinatal outcomes.

REFERENCE

1. Workalemahu T, Enquobahrie DA, Gelaye B, Thornton TA, TekolaAyele F, Sanchez SE, et al. 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* 2018 Dec;219(6):617.e1-e17.
2. Sylvester HC, Stringer M. Placental abruption leading to hysterectomy. *BMJ case reports* 2017 Dec 11;2017
3. Tikkanen M. Placental abruption: epidemiology, risk factors and consequences. *Acta obstetrica et gynecologica Scandinavica* 2011;90(2):140-9.
4. Pawani C, Ghori P, Kukadiya S. FETO-MATERNAL OUTCOME IN CASES OF ACCIDENTAL. *IJMS [Internet]*. 2020May 20
5. Maternal complications during third stage of labour in abruptio placentae pregnancies, *International Journal of Scientific Research*, Dr. Shashi Sharma, Dr. AnkitaJaxhar, Dr. SmitaDwivedi. Volume 9, Issue-10, October-2020.
6. Raymond EG, Mills JL. Placental abruption. Maternal risk factors and associated fetal conditions. *Acta Obstet Gynecol Scand* 1993;72: 633-9.
7. Rasmussen S, Irgens LM, Bergsjø P, Dalaker K. Perinatal mortality and case fatality after placental abruption in Norway 1967-1991. *Acta Obstet Gynecol Scand* 1996;75:229-34.
8. Tikkanen M, Luukkaala T, Gissler M, et al. Decreasing perinatal mortality in placental abruption. *Acta Obstet Gynecol Scand* 2013;92:298-305.
9. Williams Obstetrics 25th edition. Obstetrical complications: Obstetrical Haemorrhage. *Placentaabruption*.page:1668-1779.
10. S. Siddique, H. Afridi, B. Riaz et al 1973 *P J M H S* Vol. 15, NO.8, AUG 2021

11. Baumann P, Blackwell SC, Schild C, Berry SM, Friedrich H-J. Mathematic modeling to predict abruptio placentae. *American journal of obstetrics and gynecology* 2000;183(4):815-22.
12. Toivonen S, Heinonen S, Anttila M, Kosma V-M, Saarikoski S. Reproductive risk factors, Doppler findings, and outcome of affected births in placental abruption: a population-based analysis. *American journal of perinatology* 2002;19(08):451-60
13. Jabeen M, Gul F. Abruptio placentae: risk factors and perinatal outcome. *Journal of Postgraduate Medical Institute (PeshawarPakistan)* 2004;18(4).
14. Broers T, King WD, Arbuckle TE, Liu S. The occurrence of abruptio placentae in Canada: 1990-1997. *Chronic Diseases and Injuries in Canada* 2004;25(2):16
15. Mukherjee S, Bawa AK, Sharma S, Nadanwar YS, GadamM. Retrospective study of risk factors and maternal and fetal outcome in Patients with abruptio placentae. *J Nat Sc Biol Med* 2014;5: 425-8.
16. Justin S. Brandt, MD; Cande V. Ananth, PhD, MPH Placental abruption at near term and term gestations. *Am J Obstet Gynecol* 2023.
17. Chavan NN, RohidasV, Waikule H. Accidental haemorrhage in third trimester: maternal and fetal outcome. *Int. J Reprod Contracept, Obstet Gynecol* 2019; 8:1633-6
18. .Mohapatra S, Thanikkal N. A Study of Maternal and perinatal outcome inAbruptio Placenta. *Ann. Int. Med. Den. Res.*2020; OG01-OG6
19. Tikkanen M, Nuutila M, Hiilesmaa V, Paavonen J, Ylikorkala O. Clinical presentation and risk factors of placental abruption. *Acta Obstet Gynecol Scand* 2006;85:700-5.
20. Ananth CV, Peltier MR, Kinzler WL, Smulian JC, Vintzileos AM. Chronic hypertension and risk of placental abruption: is the association modified by ischemic placental disease? *Am J Obstet Gynecol* 2007;197:273.e1-7.
21. Ananth CV, Getahun D, Peltier MR, Smulian JC. Placental abruption in term and preterm gestations: evidence for heterogeneity in clinical pathways. *Obstet Gynecol* 2006;107: 785-92.
22. SurabhiTomar Sharma. Clinical study of maternal and fetal outcome associated with abruptio placentae. *MedPulse-International journal of Gynaecology.* August 2019; 11(2):40-44.
23. .Phadtatre S, Patil SK. Maternal and foetal outcome in abruptioplacentae. *Gynecol* 2019; 8:1633-6. *J. Evolution Med. Dent. Sci.*017; 6(22): 1745-1749.
24. Shabista Shaikh, ShaifaliPatil, Bhakti Bawankule.A Study of Maternal and Fetal Outcome in Abruptio Placenta. *J Med Res Prac.* 2019; 07(01): 05-11.
25. Alka, Dudhreja K. An observational study of fetomaternal outcome in cases of abruptio placentae. *Int. J. ReprodContraceptObstetGynecol* 2017; 6:3264-3270.