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*Original research article*

# Comparison of placenta previa and abruptio placenta and its maternal and perinatal outcome

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**Abstract**
**Background:** Antepartum hemorrhage (APH) continues to be a major cause of maternal and perinatal morbidity and mortality. Its prevalance is 0.5-5%. Authors evaluated the cases of placenta previa and abruptio placenta studied the comparison of its effects on maternal and perinatal outcome.
**Methods:** In this prospective study of one year 109 cases of placenta previa and abruptio placenta were studied. Data was recorded on MS excel sheet for further analysis and processing.
**Results:** Out of total 6693 deliveries a total 150 patients were admitted with APH. 109 patients fulfilled the inclusion criteria for our study. The incidence of APH in our institute is 2.24% and 1.62% were cases of placenta previa and abruptio placenta, rest cases were of undertermined origin and not included in this study. Among 109 deliveries there were 3 twins and 1 triplet so the total number of neonates delivered were 114. Perinatal mortality was observed in 31% of cases. Most common cause are maternal haemorrhage leading to fetal shock. The comparison between placenta previa and abruption and its maternal and perinatal outcome was studied.
**Conclusions:** Antepartum haemorrhage is the leading cause of maternal and perinatal mobidity and mortality. Placenta previa is commonly associated with multipara and patients having obstetrical surgical history. Whereas abruption is commonly seen in patients with hypertension and primigavida. Abruptio placenta has more severe degree of haemorrhage and strongly associated with maternal and perinatal morbidity and mortality.

**Keywords:** Abruptio placenta, placenta previa, antepartum haemorrhage

## Introduction
Antepartum hemorrhage (APH) continues to be a major cause of maternal and perinatal morbidity and mortality even in modern day obstetrics. It is one of the most frequent emergencies in obstetrics occurring at a prevalance of 0.5-5%. Antepartum haemorrhage is defined as bleeding per vaginum occurring after the fetus has reached the period of viability but before the birth of baby. This implies bleeding from genital tract after 20 weeks of gestation until delivery in developed countries and 28 weeks in countries with low resource settings. Maternal and perinatal complications in APH are malpresentation, postpartum hemorrhage, shock, blood transfusion, peripartum hysterectomy, preterm delivery and maternal and perinatal mortality. The causes of antepartum hemorrhage can be divided into three main groups, placenta previa, placental abruption [1].
Placental abruption, defined as the premature separation of the placenta, complicates approximately 1% of births [1]. Abruption is an important cause of vaginal bleeding in the second half of pregnancy and is associated with significant perinatal mortality and morbidity [2].
Placenta previa, an important cause of antepartum hemorrhage, is estimated to occur in 0.31% to 0.60% of pregnancies at delivery. Placenta previa exists when the placenta is inserted wholly or in part into the lower segment of the uterus [3].
Maternal complications of APH are malpresentation, premature labour, postpartum hemorrhage, shock, retained placenta. It also includes higher rates of caeserian sections, peripartum hysterectomies, coagulation failure and even death [1].
Fetal complications are premature delivery, low birth weight, intrauterine death, congenital malformations and birth asphyxia. The latter is due to placental separation or hypotension in mother as a result of haemorrhage. Antepartum haemorrhage may frequently result in low birth weight babies. This can be an effect of preterm labour or repeated small events of haemorrhage

causing chronic placental insufficiency and fetal growth retardation. The overall perinatal mortality increases to between 4-8% [4].

Authors in this study therefore proposed to conduct a prospective study to compare placenta previa and abruptio placenta and its effects on maternal and perinatal outcome.

## Methods

This prospective study was conducted in the Department of Obstetrics and Gynaecology, Kamla Nehru State Hospital for Mother and Child, Indira Gandhi Medical College, Shimla, H.P from July 1, 2016 to June 30, 2017 and total 150 cases of APH were found out of which 109 cases fulfilled the inclusion criteria of comparison between placenta previa and abruptio placenta at its maternal and perinatal outcome.

All cases of antepartum haemorrhage ≥28weeks of gestation with either placenta previa or abruptio were included in this study.

Cases with APH below 28weeks of gestation and patients suffering from any other bleeding disorders were excluded.

The cases of antepartum haemorrhage with clinical findings and ultrasound reports confirming placenta previa or abruptio placenta were admitted in the hospital. The data collected included maternal age, parity, gestational age, presentation, booking status, education, occupation, residential address and severity of haemorrhage. The diagnosis of all cases were made on the basis of history, clinical evaluation and USG. All facilities of neonatal intensive care unit (NICU) to deal with preterm infants were available in Paediatric unit of this institution. Data collected was transformed into MS excel sheet for further processing and analysis.

## Results

Out of total 6693 deliveries a total 150 patients were admitted with APH. 109 patients fulfilled the inclusion criteria for our study. The incidence of APH in our institute is 2.24% and 1.62% were cases of placenta previa and abruptio placenta rest cases were of undertermined origin and not included in this study. Among 109 deliveries there were 3 twins and 1 triplet so the total number of neonates delivered were 114. The comparison between placenta previa and abruption and its maternal and perinatal outcome was studied.

**Table 1:** Causes of APH

| Type | Cause | Percentage |
|---|---|---|
| Abruptio Placentae | 31 | 28.44% |
| Placenta Previa | 78 | 71.55% |
| Total | 109 | 100% |

This table illustrates that 71.55% of the cases were placenta previa and 28.44% were abruptio placentae.

**Table 2:** Distribution of causes of APH with age, gravidity and booking status.

| Age (Years) | Age distribution (Years) | Abruptio placentae | Placenta previa |
|---|---|---|---|
| <20 | 4 | 1(25.0%) | 3(75.0%) |
| 20-25 | 36 | 15(41.0%) | 21(58.0%) |
| 26-30 | 46 | 7(15.0%) | 39(84.0%) |
| 31-35 | 16 | 7(43.7%) | 9(56.0%) |
| >35 | 7 | 1(14.0%) | 6(85.0%) |
| **Gravidity** | | | |
| 1 | 32 | 17(44.7%) | 15(39.47%) |
| 2 | 40 | 7(13.2%) | 33(62.2%) |
| 3 | 22 | 5(9.4%) | 17(70.8%) |
| ≥ 4 | 15 | 2(11.1%) | 13(72.22%) |
| **Booking Status** | | | |
| Booked | 91 | 26(23.85%) | 65 (59.63%) |
| Unbooked | 18 | 5(20.83%) | 13 (54.17%) |

Above table shows that 46 patients were in age group 26-30 years. Youngest patient was 19 years old and eldest was >35 years ie 3 years old.

This table also depicts that 29% patients with APH were primigravida and 71% multigravida. 45% of patients of primigravida were abrutio and 81% of multigravida were placenta previa. Maximum gravidity observed was 7.

The table clearly defines 84% 91 patients of the cases of APH were booked and majority of them (60%) were placenta previa.

**Table 3:** Distribution of gestational age with cause of APH.

| Gest Age at admission | No. of Cases | 28-30w | 31-33w | 34-36.6w | >=37w |
|---|---|---|---|---|---|
| Abruptio Placentae | 31 | 6(19%) | 11(35%) | 7(29%) | 7(16%) |
| Placenta Previa | 78 | 11(14%) | 23(33%) | 14(42%) | 30(10%) |
| **Gest Age at delivery** | | | | | |
| Preterm | 72 | 12 (16%) | 18 (25%) | 42 (58.3%) | 0 (0.0%) |
| Term | 37 | 0 (0.0%) | 0 (0.0%) | 0 (0%) | 37(34%) |

71% of APH were placenta previa and 29% were due to abruption placentae.

42% cases of placenta previa were admitted at 34-37 weeks of gestation and abruptio placenta at 31-33 weeks gestation.

66% of the APH delivered between 28-36.6 weeks of gestation whereas 36% cases delivered at gestation >=37 weeks.

48 Preterm patients admission were seen more in case of placenta previa as compared to abruptio which had only 24 patients.

**Table 4:** Distribution of causes of APH with obstetric history and associated risk factors.

| Previous history | No. of Patients | Abruptio placentae | Placenta previa |
|---|---|---|---|
| Abortion | 19 | 4 (21%) | 15 (79%) |
| Abortion and D&C | 10 | 1 (10%) | 9 (90%) |
| LSCS | 13 | 3 (23.08%) | 10 (76.92%) |
| Abortion, LSCS and D&C | 2 | 1 (50.00%) | 1 (50.00%) |
| **Risk Ractors** | | | |
| Hypertension | 21 | 15 (71%) | 6 (19%) |
| Multiparity | 7 | 1 (14.29%) | 6 (85.7%) |
| Twins | 4 | 3 (75%) | 1 (25%) |
| Malpresentations | 5 | 0 (0.00%) | 5 (100%) |
| IUGR | 4 | 2 (50%) | 2 (50%) |
| Polyhydramnios | 4 | 4 (100%) | 0 (0.00%) |
| Hypothyroidism | 5 | 3(75%) | 2 (25%) |
| Elderly | 3 | 0(0.00%) | 3 (100%) |
| Triplet | 1 | 1(100%) | 0 (0.00%) |

Out of total 15 patients of previous LSCS 76% patients had placents previa.

Whereas 90% patient with history of dilatation and curettage also had placenta previa. Hypertension was noted in 19% of the patients with APH, out of which 71% patients had abruption. Multiparity, malpresentations, polyhydramnios and hypothyroidism were also studied as associated risk factors. Out of total 109 patients 90 with associated risk factors had placenta previa whereas 36 patients had abruptio.

**Table 5:** Mode of delivery.

| Mode of delivery | No of Patients | Abruption | Placenta Previa |
|---|---|---|---|
| LSCS | 78 | 22 (28% ) Preterm 14 term 8 | 56 (72%) Preterm 41 Term 15 |
| Vaginal Delivery | 31 | 9 (29%) Preterm- 6 Term -3 | 22 (70%) Preterm 11 Term 11 |
| **PPH** | | | |
| Present | 51 | 15(27%) | 36(65%) |

78 patients ie 72% of the patients underwent LSCS out of which 72% were done for placenta previa and 28% for abruptio placenta. 31 Patients ie 29% of the patients had vaginal delivery out of which 70% were placenta previa (Type 1) and 29% were abruptio placenta.

This concludes that most number of caesareans were done for placenta previa.

PPH was seen in 51 patients and was more associated with placenta previa this could be due to more number of cases.

**Table 6:** Maternal and Fetal Complications

| Fetal Complication | No. of Cases | Abruptio placentae | Placenta previa |
|---|---|---|---|
| Preterm | 33 | 7(21%) | 26(79%) |
| Asphyxia | 14 | 4(29%) | 10(71%) |
| IUD | 10 | 5(50%) | 5(50%) |
| Jaundice | 8 | 4(50%) | 4(50%) |
| Distress | 3 | 2(75%) | 1(25%) |
| Still Birth | 8 | 4(100%) | 4(0%) |
| Fever | 3 | 2(67%) | 1(33%) |
| Hypoglycemia | 1 | 0(0%) | 1(100%) |
| NO complications | 34 | 10(29%) | 24(81%) |
| **Maternal complications** | | | |
| Anemia | 38 | 14 (36%) | 24 (64%) |
| PPH | 44 | 30(68%) | 14(32%) |
| Anemia, Shock | 4 | 2 (50%) | 2(50%) |
| HELLP | 2 | 1(50%) | 1(50%) |
| Anemia, Pyrexia | 4 | 0 (0%) | 4(100%) |
| Shock, Myocardial infartion, Anemia | 1 | 1 (100%) | 0 (0%) |
| Shock, DIC, pyrexia | 1 | 1 (100%) | 0 (0%) |
| Maternal Death | 0 | 0 | 0 |

This table depicts prematurity as a fetal complications has 33 cases out of which more cases were of placenta previa. IUD and still birthshad 50% rate in both the variables. Distress was more commonly seen in patients with abruptio.34 cases were not associated with any complications.

Anemia was strongly associated with placenta previa. PPH was more commonly seen in abruptio. Shock DIC and Myocardial infarction was more associated with abruption which is due to acute blood loss.

**Table 7:** Birth weight

| Birth Weight | No. of Cases | Abruptio placentae | Placenta previa |
|---|---|---|---|
| <1 | 2 | 1(50%) | 1(50%) |
| 1-1.5 | 20 | 8(32%) | 12(48%) |
| 1.6-2 | 28 | 7(23%) | 21(70%) |
| 2.1-2.5 | 32 | 7(18%) | 24(63%) |
| 2.6-3 | 30 | 8(20%) | 22(55%) |
| >3 | 2 | 2(100%) | 0(0%) |
| **APGAR** | | | |
| 0-3 | 15 | 9 (56%) | 6 (38%) |
| 4-7 | 26 | 10 (32%) | 16(52%) |
| >7 | 73 | 14 (15%) | 59(64%) |

Majority of neonates weighed between 2.1-2.5 Kgs. Low birth weight was due to prematurity. Mean 2.17±. 36 Kgs. 66% of the neonates had APGAR score >7. Abruptio placenta had significant relationship with low APGAR score.

**Table 8:** Fetal Outcome

| Outcome | Total | Abruption | Placenta Previa |
|---|---|---|---|
| Live | 90 | 24(24%) | 76(76%) |
| IUD | 10 | 4(45%) | 6(55%) |
| Still Birth | 8 | 4(50%) | 4(50%) |
| Expired in NICU | 6 | 2(22%) | 7(78%) |
| **Cause of death** | | | |
| RDS | 2 | 1(50%) | 1(50%) |
| Sepsis | 2 | 1(50%) | 1(50%) |
| Shock | 18 | 12(66%) | 6(34%) |
| Pulmonary Haemorrhage | 2 | 0(0.00%) | 2(100%) |
| Total | 24 | 11(58%) | 10(42%) |

Out of the total 109 deliveries total neonates delivered were 114 out of which 90 were live neonates, 6 expired in NICU. 10 were intrauterine deaths and 8 were still births. Neonatal deaths in toto were 24 i.e 21%. Overall deaths of neonates illustrates the most common cause is neonatal shock seen in 75% followed by sepsis and pulmonary haemorrhage.

75% of NICU admissions were due to fetal distress out of which 48% cases were of placenta previa and 36% abruptio placenta.

## Discussion

In our study incidence of APH is 1.6% -- placenta previa 1.15% of total cases and abruption is 0.46%. Incidence of APH varies between 2-5% of all pregnancies. Variation seen in incidence can be explained by the demographic variation and prevalence of illiteracy, socioeconomic status and anemia in the society. Incidences of APH in study conducted by Bhide A *et al.* [5] and Arora A *et al.* [6] had similar incidences of 2.5% and 1.2% respectively. Adekanle DA *et al.* [8] reported 1.5% incidence of ante-partum haemorrhage. Placenta previa were identified 0.33% incidence.

Placenta previa was the main cause of APH ie 71.5% followed by abruptio placentae ie 28.5%. Our results were consistent with the study conducted by Maurya *et al.* [7] with results showing placenta praevia 71% and abruptio placentae 27% and Adekanle DA *et al.* [8] in which the placenta previa and abruptio placentae cases were 55.6%, 33.3% respectively.

Incidence of APH is seen in all age groups. Mean age of women presenting with APH in our study was 26.7 years ± 4.5 years with most patients i.e. 40% were in age group 26-30 years with 84% cases of plancenta previa and 15% abruptio placenta. Age group of 20-25 years had 33% patients. This is consistent with study conducted by Tyagi P *et al.* [9] and Adekanle DA *et al.* [8] in which 61% and 40% cases of APH were observed between 26-30 years of age respectively.

In our study 71% of the women with APH were multigravidae and 29% were primigravidae. Mean parity was 2.24 standard deviation ±1.17. The incidence of placenta previa and abruptio placentae in multigravida was 66.2% and 33.3%, respectively. This was consistent with the study conducted by Samal SK *et al,* [10]. Which had 67%, 33% incidence of APH in multigravida and primigravida which is also consistent with the study conducted by Singhal S *et al.* [20] who found 63.01% patients in their study to be multigravida and 26.99% primigravida. Maurya A *et al.* [7]. Reported high incidence ie 82.1% in multigravida.

Cases of placenta previa is more common in multiparity and with advancing age groups whereas abruption placenta is seen more commonly in primigravida patients. Our booking rate was significantly higher and was inconsistent with other studies because the free facilities provided by the state government gives an easy access for antenatal checkup even in far flung areas.

The mean gestational age at delivery in our study was 35.22± 2.82 weeks and 66% of the patients in our study had preterm deliveries which was consistent with the study conducted by Samal SK *et al.* [10] Which had the incidence of 73%. Sheikh F *et al.* [11] Observed that 79.16% preterm deliveries. Mean gestational age in study conducted by Siddiqui SA *et al.* [12] in placenta previa was 34.24 ± 3.36 weeks and in abruption placentae was 34.40 ± 3.87 weeks similar to our study which had mean gestational age of 33.6± 3.4 weeks in placenta previa and in abruptio placentae of 33.5± 2.6 weeks.

78 patients ie 72% of the patients underwent LSCS out of which 72% were placenta previa and 28% were abruptio placenta. 31 Patients ie 29% of the patients had vaginal delivery out of which 70% were placenta previa (Type 1) and 29% were abruptio placenta.

This concludes that most number of caesareans were done for placenta previa. This was consistent with studies conducted by Chufamo N *et al.* [15] and Sheikh F *et al.* [11] reporting 54.4%, 57.1% cases of placenta previa respectively, who had caesarean section. Similar study conducted by Arora R *et al.* [6] and Bhinde AG *et al.* [14] reported the incidence of caesarean birth in placenta previa as 65% and 82.4% respectively.

66% of the patients had preterm deliveries out of which 76% were preterm LSCS and 26% were preterm vaginal deliveries.

Malpresentations were seen in 5.2% of cases of APH which included breech and transverse lie, along with 3 twins and one triplet pregnancy. This study was consistent with the findings of Samal SK *et al.* [10] Ayushma J *et al.* [16] and Sheikh F *et al,* [11]. Who reported 8.7%, 8.8%, 9.7% incidence of malpresentations respectively.

In our study the most common complications encountered was PPH which had incidence of 41% followed by anemia in 35% cases, shock was reported in 6% cases and, DIC in 1 patient

(0.9%). Our findings were consistent with Kalam F *et al*. [17] which had incidences of anemia at 38%, PPH 38%, shock 22% and DIC 2%.

Similar incidences were found in studies conducted by Sharmila G *et al*. [18] which had 62% anemia, 10% shock, 22% PPH, 2% DIC.

Anemia was more often seen in placenta previa. In two of abruptio patients one developed shock followed by myocardial infarction while other patient went into shock and DIC showing acute effects of abruption. No maternal death was observed.

25.8% neonates had preterm deliveries, out of which 72% were placenta previa. 12.2% cases were associated with asphyxia out of which 59% were placenta previa.

In our study 58.6% of the patients of APH needed blood transfusion Tyagi P *et al*. [9] and Chufamo N *et al*. [15] which had 45%, 50.3% blood transfusions. Only one patient in our study required 8 units of blood transfusion. She developed DIC, was admitted in ICU and recovered well.

Placenta previa was strongly associated with low birth weight.

79% of neonates had birth weight <2.5Kgs. Main contributors to low birth weight (LBW) was prematurity. Mean birth weight in our study was 2.17 $\pm$. 36Kgs. Our findings were consistent with Samal SK *et al*. [10] Sharmila G *et al*. [18] in which 66.5%, 78.43% babies had birth weight <2.5 Kg. The low birth weight could be due to the early decision and surgical intervention in view of maternal health and fetal distress and availability of well-equipped neonatal ICU.

In our study 64% neonates had APGAR score above 7 at 5 mins of birth while 35% had scores less than 7. Out of these 46% cases, 53% were placenta previa and 40% abruptio placentae. Our results were consistent with the findings of Adeknale DA *et al*. [8] which found 61% cases who had APGAR score > 7 in their study, similar results were seen in studies conducted by Rajini P *et al*. [19], Singhal SR *et al*. [20] with 74.6%, 80.4% incidences of APGAR score >7 at 5 mins.

Out of the total 109 deliveries total neonates were 114 out of which 90 were live neonates, 6 expired in NICU. 10 were intrauterine deaths and 8 were still births. Neonatal deaths in toto were 24 i.e 21%. Overall deaths of neonates illustrates the most common cause is neonatal shock seen in 75% followed by sepsis and pulmonary haemorrhage.

In our study the most common complications reported were prematurity 28%, fetal distress and asphyxia 15%, jaundice 9.0%, sepsis 2.1% still birth 7.0%, IUD 8.7%, early neonatal death 5.2%. This is consistent with the studies conducted by Kedar K *et al*, [21]. In which 16% neonates were premature, still birth and IUD were 10% and Samal SK *et al*, [10]. Who established similar results with 38.5% prematurity, 11.8% still births.

Fetal distress was noted in 30.2% of the neonates in our study, this was more commonly seen in placenta previa with prevalence of 48% followed by abruption with 36%. On comparison to studies conducted by Taylor F *et al*. [22] and Bhandiwad A *et al*. [23] fetal distress was reported 69% and 47.8% of the cases. Early surgical intervention to avoid maternal morbidity which may sometimes infact bypass adequate steroid cover, could be the reason of fetal distress. In our study there were no maternal deaths. This was consistent with the findings of study conducted by Samal Sk *et al*. [10] who did not have any maternal mortality, Sheikh *et al*, [11]. Reported maternal mortality of 3%, Chufamo N *et al*, [15]. Reported it to be maternal mortality of 3.1% in their study.

Higher rate of booked cases, proper antenatal check-ups, better referral services, super speciality services, well equipped ICU's and 24*7 blood bank facility may be the reason for zero maternal mortality in our study.

Perinatal mortality was observed in 31% of cases of APH in our study. Most common causes were maternal haemorrhage leading to fetal shock. Neonatal death was seen in 5.2% cases, IUD was noted in 8.7% of the cases of APH and most commonly seen with abruption followed by placenta previa. This was similar to study conducted by Singhal S *et al*. [24]. In which perinatal mortality was 23.70%. Similar findings were observed in studies conducted by Maurya a *et al*, [7]. Which had perinatal mortality of 12.6% and 18.5% in cases placenta previa and abruptio placentae respectively.

## Conclusion

Antepartum haemorrhage is the leading cause of maternal and perinatal mobidity and mortality. Placenta previa is the commonest cause of APH followed by abruptio placenta. Placenta previa is commonly associated with multipara and patients having obstetrical surgical history. Whereas abruption is commonly seen in patietns with hypertension and primigavida. Abruptio placenta has more severe degree of haemorrhage and strongly associated with maternal and perinatal morbidity and mortality.

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