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Original Study

Consequences of antepartum haemorrhage and its perinatal outcome

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Abstract
Background: Antepartum haemorrhage is defined as bleeding per vaginum occurring after the fetus has reached the period of viability, its 20 weeks in developed countries and 28 weeks in developing countries. We evaluated the consequences of antepartum haemorrhage, their perinatal outcome to outline the proper management of neonate in order to improve perinatal morbidity and mortality.
Methods: This one year prospective study totaled 133 cases of APH fulfilling the inclusion criteria were studied. Data was recorded on the MS excel sheet for further analysis and processing.
Results: Total 6693 deliveries were conducted, 133cases ie 1.98% presented as APH. Placenta previa was most common. APH was commonly associated with multigravida in age group of 26-30 years. Most of the PP and abruption cases were admitted at 34-37 weeks and 31-33 weeks respectively. Risk factors included previous LSCS and D&C, hypertension, multiple pregnancies and malpresentations. Most patients underwent preterm LSCS. Fetal complications were due to prematurity. Overall perinatal mortality was 20.1%.
Conclusion: Early diagnoses, timely referrals and transfusion facilities along with trained team of doctors with well-equipped ICU facility goes a long way in avoiding APH related fetal complications.

Keywords: Antepartum haemorrhage. Placenta previa, abruptio placenta

1. Introduction
Haemorrhage is a life threatening event and hence obstetrics has aptly been honoured as the business of blood. Haemorrhage forms a big chunk amongst the causes of perinatal mortality and is infact one of the gravest obstetrics emergencies whether antepartum or postpartum. 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, lacking adequate neonatal facilities. Two to five percent of all pregnancies are complicated by antepartum haemorrhage [1, 2].
Royal College of Obstetricians and Gynaecologists (RCOG) defines blood loss by a combination of volume and signs of clinical shock to guide management [3].

For the purpose of these guidelines, the following definitions have been used
Spotting: Staining, streaking or blood spotting noted on under garments or sanitary protection.
Minor Haemorrhage: Blood loss less than 50 ml that has settled.
Major Haemorrhage: blood loss of 50-1000 ml, with no signs of clinical shock.
Massive Haemorrhage: blood loss greater than 1000 ml with signs of clinical shock.

Antepartum haemorrhage can be due to placenta previa, abruptio placentae or extra placental causes, where first two accounts for more than half of the causes of APH. Placenta previa refers to the condition when the placenta is situated wholly or partially in the lower uterine segment and accounts for one third of all cases of APH. It is further classified as type I-if implantation is in lower segment but does not reach the internal os, Type II- placenta reaches the internal os but does not cover it, Type III- placenta covers the internal os but not at full dilatation, Type IV- placenta covers internal os even at full dilatation of cervix. The second most common cause of APH is placental abruption which is defined as separation of the placenta-either partially or totally from its implantation site before delivery.

Extra placental causes may include cervical polyps, cervical erosions, endocervical erosions, cancer of cervix, cervicitis, varicosities (vaginal, vulvar and cervical) vaginal infections, foreign bodies, genital lacerations, bloody show, degenerating uterine myomata, vasa Previa and marginal placental separation. It may even be of undetermined origin [4].

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% [6].

We therefore proposed to conduct a prospective study, to evaluate the consequences of antepartum haemorrhage, and its perinatal outcome, so as to outline the important causes and proper management of patient in order to improve perinatal morbidity and mortality and specify as to what areas required improvement in a developing country like India to improve the same. Data collected from this prospective study will be used to gauge the severity of this problem so that management and preventive protocol could be established to avert possible fatal perinatal outcome.

2. 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 133 cases of APH were studied. All cases of antepartum haemorrhage ≥28weeks of gestation 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, abruptio placenta or APH due to any other cause 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 which included general physical examination, per abdomen, per speculum, per vaginal exam and USG. Line of management i.e conservative or emergency lower segment caesarean section was planned according to the clinical condition of the patient and fetus. All facilities of neonatal intensive care unit (NICU) to deal with preterm and sick infants were available in paediatric unit of this institution. Data collected was transformed into MS excel sheet for further processing and analysis.

3. Results

Out of total 6693 deliveries a total 150 patients were admitted with APH. 133 patients fulfilled the inclusion criteria. The incidence of APH in our institute is 1.98%. Among 133 deliveries there were 4 twins and 1 triplet so the total number of babies delivered were 139. The comparison between causes of APH and its consequences was studied.

Table 1: Types of APH

Total no of deliveries	**6693**
No of APH cases	**133**
Types of APH	
Abruptio Placentae	(31) 23.31%
Placenta Previa	(78) 58.65%
Undetermined	(24) 18.05%

Out of total cases, 58.65% were placenta previa, 23.31% abruptio placentae and 18.05% undetermined.

Table 2: Age distribution of APH

Age(Years)	**Age distribution (Years)**	**Abruptio placentae**	**Placenta previa**	**Undetermined**
<20	4(25%)	1(25.0%)	3(75.0%)	0(0.0%)
20-25	52(29%)	15(29.0%)	21(40.0%)	16 (31.0%)
26-30	53(13%)	7(13.0%)	39(74.0%)	7(13.0%)
31-35	16(44%)	7(44.0%)	9(56.0%)	0 (0.00%)
>35	8(13)	1(13.0%)	6(75.0%)	1 (13.0%)
Gravidity				
1	38(28.5%)	17(44.7%)	15(39.47%)	6(15.7%)
2	53(39.8)	7(13.2%)	33(62.2%)	13(25.5%)
3	24(18.0)	5(9.4%)	17(70.8%)	2(8.33%)
≥ 4	18(13.5)	2(11.1%)	13(72.22%)	3(16.66%)
Booking Status				
Booked	(109)82%	26(23.85%)	65 (59.63%)	18(16.51%)
Unbooked	(24)18%	5(20.83%)	13 (54.17%)	6 (25.00%)

Maximum number of patients (40%) were in age group 26-30 years. In this study 71.43% patients were multigravida and 28.57% primigravida. Placenta previa was commonly associated with multigravidas whereas abruption was commonly seen in primigravidae. Mean gavidity was 2.24±1.17. Booking rate was 82%. Most cases of APH with placenta previa were seen in lower class and upper lower class of Modified Kuppuswamy classification. Abruption was also commonly associated with lower and lower middle class.

Table 3: Relation of gestation to APH

Gest Age at admission	**No. of Cases**	**28-30w**	**31-33w**	**34-37w**	**>37w**
Abruptio Placentae	(31) 23.31%	6(19%)	11(35%)	9(29%)	5(16%)
Placenta Previa	(78) 58.65%	11(14%)	26(33%)	33(42%)	8(10%)
Undetermined	(24) 18.05%	9(38%)	4(17%)	9(38%)	2(8%)
Gest Age at delivery					
Preterm	(80)60.1%	14 (17.5%)	18 (22.5%)	48 (60%)	0 (0.0%)
Term	(53) 39.8%	0 (0.0%)	0 (0.0%)	22 (41.5%)	31 (58.4%)

77% of APH cases had mild bleeding at presentation out of which 58% were placenta previa. Severe bleeding was observed in 7% cases and 67% of which 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. 60% of the APH delivered between 34-37 weeks of gestation whereas 39.8% cases delivered at gestation >37 weeks.

Table 4: Risk Factors

Previous history	No. of Patients	Abruptio placentae	Placenta previa	Undetermined
Abortion	25(9%)	4 (16.00%)	15 (60.00%)	6 (24.00%)
Abortion and D&C	14(11%)	1 (7.14%)	9 (64.29%)	4 (28.57%)
LSCS	13(10%)	3 (23.08%)	10 (76.92%)	0 (0.00%)
Abortion, LSCS and D&C	2(2%)	1 (50.00%)	1 (50.00%)	0 (0.00%)
Risk Ractors				
Hypertension	22 (16%)	15 (68.8%)	6 (27.27%)	1 (4.55%)
Multiparity	7 (5.26%)	1 (14.29%)	6 (85.7%)	0 (0.00%)
Twins	4 (3%)	3 (75%)	1 (25%)	0 (0.00%)
Malpresentations	7 (5.26%)	0 (0.00%)	5 (71.4%)	2 (28.7%)
IUGR	7 (5.26%)	2 (28.57%)	2 (28.57%)	3 (42.86%)
Polyhydramnios	6 (4.5%)	4 (66%)	0 (0.00%)	2 (33.33%)
Hypothyroidism	6 (4.5%0	3(50%)	2 (33.33%)	1 (16.6%)
Elderly	4 (3.01%)	0(0.00%)	3 (75%)	1 (25%)
Triplet	1 (.75%)	1(100%)	0 (0.00%)	0 (0.00%)

76% patients with previous LSCS and 64% with history of dilatation and curettage had placenta previa. Hypertension was noted in 16% of the patients with APH. Out of these 68.8% patients had abruption. Multiparity, malpresentations, polyhydramnios and hypothyroidism were also studied as associated risk factors.

Table 5: Mode of delivery

Mode of delivery	No of Patients	Abruption	Placenta Previa	Undetermined
LSCS	85(63.9%) Preterm-58 Term- 27	22 (26%)	56 (66%)	7 (8%)
Vaginal Delivery	48(36%) Preterm-21 Term -27	9 (19%)	22 (46%)	17 (35%)

64% of the patients underwent LSCS out of which 66% were placenta previa. 36% of the patients had vaginal delivery out of which 46% were placenta previa (Type 1). 59% of the patients had preterm deliveries out of which 73% were LSCS and 41% of the term deliveries had 50% LSCS rate.

Table 6: Fetal complications

Fetal Complication	No. of Cases	Abruptio placentae	Placenta previa	Undetermined
Preterm	36(25.8%)	7(19%)	26(72%)	3(8%)
Asphyxia	17(12.2%)	4(24%)	10(59%)	3(18%)
IUD	12(8.6%)	5(42%)	6(50%)	1(8%)
Jaundice	10(15.8%)	4(40%)	4(40%)	2(20%)
Distress	4(2.8%)	2(50%)	1(25%)	1(25%)
Still Birth	4(2.8%)	4(100%)	0(0%)	0(0%)
Fever	3(2.15%)	2(67%)	1(33%)	0(0%)
Hypoglycemia	1(.7%)	0(0%)	1(100%)	0(0%)

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.

Table 7: Relation of birth weight and APH

Birth Weight	No. of Cases	Abruptio placentae	Placenta previa	Undetermined
<1	2(1%)	1(50%)	1(50%)	0(0%)
1-1.5	25(18%)	8(32%)	12(48%)	5(20%)
1.6-2	30(22%)	7(23%)	21(70%)	2(7%)
2.1-2.5	40(29%)	7(18%)	25(63%)	8(20%)
2.6-3	40(29%)	8(20%)	22(55%)	10(25%)
>3	2(1%)	2(100%)	0(0%)	0(0%)
APGAR				
0-3	16(12%)	9 (56%)	6 (38%)	1(6%)
4-7	31(22%)	10 (32%)	16(52%)	5 (16%)
>7	92(66%)	14 (15%)	59(64%)	19 (20%)

Majority of neonates weighed between 2.1-2.5 Kgs. Low birth weight was due to prematurity. Mean 2.17$\pm$.36 Kgs. 66% of the neonates had AP GAR score>7. Abruptio placenta had significant relationship with low AP GAR score. 75% of NICU admissions were due to fetal distress out of which 48% cases were of placenta previa and 36% abruptio placenta.

Table 8: Fetal outcome

Outome	Total	Abruption	Placenta Previa	Undetermined
Live	123(88.4%)	24(19.5%)	76(61.7%)	23(18.6%)
IUD	12(8.6%)	5(41.6%)	6(50%)	1(8.33%)
Still Birth	4(2.8%)	4(100%)	0(0.00%)	0(0.00%)
Expired in NICU	12(8.6%)	2(16.6%)	7(58.3%)	3(25%)
Cause of death				
Hypoglycemia, Seizures	1(4%)	0(0.00%)	0(0.00%)	1(100%)
RDS	2(7%)	1(50%)	1(50%)	0(0.00%)
Sepsis, Shock	9(32%)	3(33.33%)	4(44.44%)	2(22.22%)
Shock	13(46%)	7(53.8%)	5(38.4%)	1(0.00%)
Shock, Pulmonary Haemorrhage	3(11%)	0(0.00%)	3(100%)	0(0.00%)
Total	28(100%)	11(39%)	13(46.4%)	4(14.2%)

Out of the total 139 deliveries, 123 were live neonates, 12 expired in NICU. 12 were intrauterine deaths and 4 were still

births. Neonatal deaths in toto were 28 i.e 20.1%. Overall deaths of neonates illustrates the most common cause is neonatal shock seen in 46% followed by sepsis and shock seen in 32% neonates.

Discussion

Incidence of APH in our study was 1.98%. This was in accordance with the findings of Kedar K *et al*, Bhandiwad A *et al*, Bhide A *et al*. and Arora A *et al*. [7-10]

In our study 82% patients of APH were booked and 18% were unbooked. Tyagi P *et al* and Bhandiwad A *et al*. reported higher incidences of unbooked cases in their studies. The inconsistency noted maybe because of the free facilities provided by the state government giving an easy access for antenatal checkup. [8, 11]

Placenta previa was the main cause of APH i.e. 58.5%. Abruptio placentae and undetermined cases were 23.3% and 18.05% respectively. Our results were consistent with the studies conducted by Adekanle DA *et al***.** and Jejani a *et al*. Mean age of women presenting with APH in our study was 26.7±4.5 years with 40% in age group of 26-30 years and 39% between 20-25 years age. This is also consistent with studies conducted by Tyagi P *et al*. and Adekanle DA *et al*. in which 61% and 40% cases of APH were observed between 26-30 years of age respectively [11-13].

The mean gestational age at delivery in our study was 35.22±2.82 weeks and 60.1% of the patients in our study had preterm deliveries which was almost similar to studies conducted by Samal SK *et al*. and Singhal S *et al*. This higher rate of preterm deliveries could be due to early decisions and surgical intervention in view of maternal health [14, 15].

Hypertension was seen in 16% APH cases, out of which 68.8% cases had abruption. This was consistent with the studies conducted by Sarwar I *et al*. and Bhandiwad A *et al*. In our study 19% APH cases had abortions, 22% abortions and 12% patients had previous LSCS which was consistent with the study conducted by Samal SK *et al*. Sekiguchi A *et al*. also reported similar a incidence [6, 14, 16, 17].

Malpresentations were seen in 5.2% cases which was consistent with the findings of Samal SK *et al*. [14], Jejani A *et al*. [13] and Sheikh F *et al*. [14, 18].

Prematurity was the most common cause of LBW which was seen in 70% of the neonates weighing <2.5 kgs. 30% of neonates had birth weight>2.5Kgs. Mean birth weight was 2.17±.36Kgs. Our findings were consistent with Samal SK *et al*, Sharmila G *et al*. and Sekiguchi A *et al*. [14, 17, 21].

In our study 66% neonates had AP GAR score above 7 at 5 mins of birth while 34% had scores less than 7. Our results were consistent with the findings of Adeknale DA *et al*. Rajini P *et al*, Singhal SR *et al* with 74.6%, 80.4% incidences of APGAR score >7 at 5 mins [12, 15, 22].

In our study the most common fetal complications observed were prematurity 25.8%, fetal distress 30%, asphyxia 12.2%, jaundice 7.1%, sepsis 2.1% still birth 2.8%, IUD 2.8%, early neonatal death 5.7%. This is consistent with the studies conducted by Kedar K *et al*. Samal SK *et al*. Taylor F *et al*. and Bhandiwad A *et al*. [8, 14, 23, 24]

Perinatal mortality was observed in 20.1% of cases of APH in our study. Most common causes were prematurity related complications. Neonatal death rate was 8.6%, 11.5% cases were of IUD and these were most commonly seen with abruption followed by placenta previa. Results were similar to studies conducted by Singhal S *et al*. and Maurya a *et al*. Chufamo N *et al*. calculated the perinatal mortality to be 36.9% while Arora R *et al*. reported very high mortality rate of 61.5%. The lower neonatal death in our study may be due better neonatal care facilities with well-equipped NICU at our institute [10, 15, 19].

Conclusion

Antepartum haemorrhage is a leading cause of perinatal morbidity and motality. Placenta previa and abruptio placentae are the commonest type of APH with hypertension and multiparity being the major risk factors for APH. Most common complications include preterm deliveries and low birth weight due to early intervention. Antenatal patients with APH must be considered a high risk pregnancy.

Timely treatment initiated by a trained team of doctors and well equipped ICU facility to deal with these cases goes a long way in avoiding fetal morbidity.

Early diagnoses, timely referrals and transfusion facilities can also aid in decreasing perinatal morbidity and mortality. Above all awareness of antenatal care during pregnancy, knowledge of various government schemes for antenatal patients, importance of institutional deliveries and adoption of various contraceptive methods (temporary as well as permanent) are the key factors to avoid various complications due to APH.

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