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Study of antepartum hemorrhage and its maternal and perinatal outcome

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Abstract

Background: Antepartum hemorrhage (APH) is defined as bleeding from or into the genital tract after the period of viability until delivery of fetus. Etiology includes placenta previa, abruptio placentae, local causes, systemic causes and idiopathic origin. Objective of this study was to identify factors associated with APH, and to quantitate maternal morbidity, mortality and perinatal outcome in patients with APH at a tertiary care center in India.

Methods: This is a prospective analytical study over the period of 18 months. The total number of deliveries within the study period was obtained from the labour ward records. The data was analysed using SPSS version 21. Chi-square was used to test for significance

Results: Within the 18 months period under review, out of a total of 14675 deliveries, 145 had antepartum-hemorrhage (0.98% incidence rate). Abruptio-placentae was the commonest cause and accounted for 70.34% of the cases (incidence of 0.69%) while placenta praevia accounted for 22.75% of the cases (incidence rate of 0.22%). Majority (69.6%) of the women were unbooked. The risk factors were preeclampsia, eclampsia, multiparity and advanced maternal age. (52.4%) women were delivered caesarean section while 47.5% were delivered vaginally. Postpartum-hemorrhage occurred in 51.7% (75) of the cases while prematurity was the commonest fetal complications. Maternal mortality was 15.17% (22) while IUD birth was 53.79% (78)

Conclusion: APH is an obstetric emergency with a high prevalence in our environment, and it is one of the most common causes of significant maternal and perinatal morbidity and mortality. Clinical care should therefore concentrate on prevention, early detection, and prompt management. Furthermore, pregnant women with APH should be considered high risk and timely management should be offered by a trained team and women at risk of

Keywords: Antepartum hemorrhage, placenta previa, abruptio placenta, post-partum hemorrhage

Introduction

Even through the morbidity and mortality reduced dramatically now a days, death due to hemorrhage remains prominent in the majority of cases.

Obstetric hemorrhage remains one of the major causes of maternal death in developing countries and is the cause of up to 50% of the estimated 500000 maternal deaths that occur globally each year.[1] APH complicates 3-5% of pregnancies and is a leading cause of perinatal and maternal mortality worldwide.[2] Thirty percent of maternal deaths are caused by antepartum hemorrhage of which 50% are associated with avoidable factors.[3] The main causes of APH are placenta previa, abruption placentae, indeterminate cause or local causes of genital tract.

Methods

This is a prospective analytical study conducted at study institute. It is a tertiary care institute with primary health centers attached to it in Maharashtra, India. The case files of the patients were retrieved from the medical records department. The total number of deliveries within the study period was obtained from the labour ward records. The feto-maternal outcome measures were; prevalence of caesarean-section, postpartum-hemorrhage, hysterectomy, need for blood-transfusion, maternal death, prematurity, need for admission in intensive-care-unit and still births. The data was analyzed using spss version 21. Chi-square was used to test for significance. In this study period of 18 months, 145 cases were reported at our institute and were included in study.

Inclusion criteria

- pregnant mothers who were suspected and diagnosed with antepartum hemorrhage and gestational age more than 24 weeks.

Exclusion criteria

- Patient came with per vaginal bleeding before 24 weeks of gestational age.
- Patients with bleeding disorders.

Placental Abruption

Abruptio placenta is the premature separation of normally situated placenta from the uterine wall. Bleeding into the decidua basalis leads to placental separation. Hematoma formation may further separate the placenta from uterine wall and compromise fetal blood supply. The degree of separation or abruption of placenta will determine the effect on fetus.

Placental abruption, defined as the ‘complete or partial separation of the placenta before delivery’ is one of the major causes of vaginal bleeding in the second half of pregnancy[5]. Risk factors for placental abruption include advanced maternal age, multiparity, low body mass index (BMI), abruption in a previous pregnancy, pre-eclampsia, polyhydramnios, intrauterine infection, premature rupture of membranes, abdominal trauma, smoking, drug misuse (cocaine and amphetamines), pregnancy following assisted reproductive techniques and maternal thrombophilias.[6]

Abruptio placenta is the major cause of hemorrhagic shock, DIC, renal failure, ischemic necrosis of organs in the mother. Fetal complications include hypoxia, anemia, growth restriction, prematurity, neuro developmental problems and premature death. In spite of increasing awareness about placental abruption, it still largely remains unpredictable and hence unpreventable. Hypertensive disorder of pregnancy is associated with 2.5% to 17.9% of placental separation [7].

Page (1954)[8]: proposed the following classification based on the degree of severity

Grade 0 – clinical features suggestive of placental separation may be absent

Grade 1 – case with external bleeding, uterine tenderness may or may not be present but no maternal shock. Fetal heart beats are good

Grade 2 – cases with or without external bleeding, uterine tenderness is present. Fetal distress or fetal death but no maternal shock

Grade 3 – cases with or without external bleeding, marked uterine tenderness, fetal death, maternal shock or coagulation defects.

Sher and Statland classified placental abruption into three degrees of severity [9]

Mild (grade 1): This is not recognized clinically before delivery and usually diagnosed by the presence of a retro-placental clot. This is a retrospective diagnosis.

Moderate (grade 2): This is an intermediate grade in which the classical clinical signs of abruption are present but the fetus is still alive. The frequency of fetal heart rate abnormalities is high.

Severe (grade 3): This is the severe grade in which the fetus is dead and coagulopathy may be present. The volume of blood loss is appreciable in this condition.

Placenta Previa

The Latin previa means going before—and in this sense, the placenta goes before the fetus into the birth canal. In obstetrics, placenta previa describes 'a placenta that is implanted somewhere in the lower uterine segment, either over or very near the internal cervical os'.

Classification:

Classification of placenta praevia is important in making management decisions because the incidence of morbidity and mortality in the fetus and mother increases as the grade increases.

- Type I: Low-lying placenta: Where the lower placental edge in the lower uterine segment, but does not reach the internal OS.
- Type 2: Marginal praevia: where the lower placental edge reaches the internal OS.
- Type 3: Incomplete central praevia: Where the placental edge overlaps the internal OS, but the placental attachment is asymmetric across the internal OS.
- Type 4: Complete central praevia: Where the placental edge symmetrically overlaps the internal OS.

Types I and II are regarded as minor, and types III and IV as major degrees of placenta praevia. Care must be taken not to confuse these grades with grades of placental maturity.

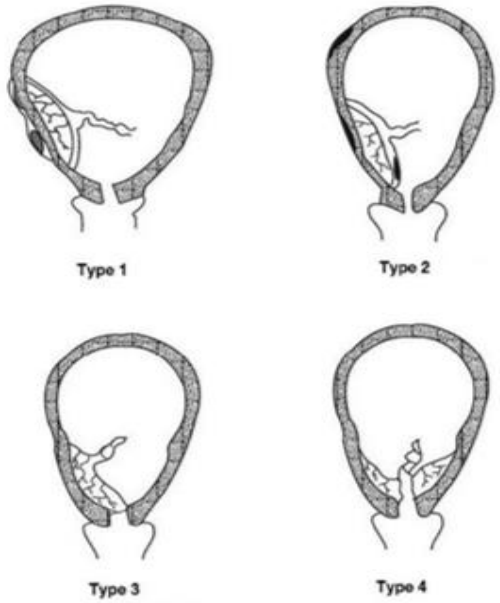

FIGURE 10.1 Types of placenta praevia.

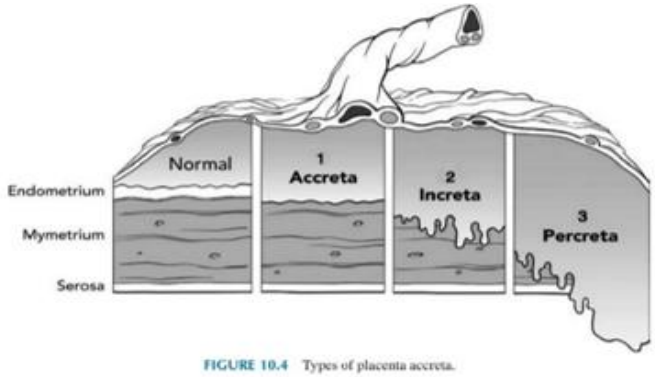

FIGURE 10.4 Types of placenta accreta.

Placenta praevia should be suspected in all women with vaginal bleeding after period of viability.

Approximately, 1.5 – 4.2 % of viability. Placenta praevia should be suspected in all women with vaginal bleeding after period of viability.

Approximately, 1.5 – 4.2 % of placentas are found to be low lying on ultrasound examination at anomaly scan. Several studies have demonstrated that placenta praevia at term will not be encountered unless the placental edge is at least reaching the internal cervical os at mid pregnancy.[10]

The etiology of placenta previa remains controversial. The major theories focus on endometrial damage in the corpus and defective genetics or placental mechanism. In humans the blastocyst is completely embedded in the substance of endometrium so abnormalities of endo metrial vascularization, delayed ovulation, and prior trauma to the endometrium appear to influence the site of implantation, therefore contributing to the probability of Placenta Previa.[11,12]

A number of studies have established its association with[6,13]:

- Advanced maternal age (>40 years)
- Multiparity
- Previous placenta previa
- Deficient endometrium due to presence or history of: uterine scar (previous caesarean section, pregnancy termination followed by curettage), endometritis, manual removal of placenta, or submucous fibroid
- Multiple pregnancy
- Smoking

Results

Table 1: causes of antepartum hemorrhage

Sr. No.	Type of Antepartum hemorrhage	No. of cases	%
1	Total abruptio placenta	102	70.34%
2	Total placenta previa	33	22.75%
3	Total indeterminant	10	6.89%
	Total	145	100%

Table 2: Demographic distribution of cases

		No. of cases		
		Abruptio placenta	Placenta previa	Indeterminate
Age Distribution	18 – 20	19	5	5
	21 – 25	38	14	2
	26 – 30	38	11	1
	31 – 35	7	2	1
	36 – 40	0	1	1
Gravida	Gravida 1	38	4	3
	Gravida 2	27	16	2
	Gravida 3	18	8	1
	Gravida 4	8	2	4
	Gravida 5	8	3	0
	Gravida 6	2	0	0
	Gravida 7	1	0	0
ANC status	Booked	31	14	3
	Unbooked	71	19	7
Socio-economic status	Lower	72	21	8
	Lower middle	30	12	2

145 patients with APH were analyzed which during the 18 months study period and a total of 14675 deliveries were similarly recorded during the same period included 70.34% cases of abruptio placenta, 22.75% cases of placenta previa and 6.89% with unknown cause. Giving an institutional prevalence of 0.98%, with

Abruptio placentae having 0.69%, placenta previa 0.22%, while unknown causes had 0.068%.

Table 3: Gestational age

		No. of cases		
		Abruptio placenta	Placenta previa	Indeterminat
Gestational age	25 to 28 Weeks	11	3	0
	29 to 32 Weeks	21	1	1
	33 to 36 Weeks	26	10	5
	37 to 40 Weeks	29	13	4
	41 to 42 Weeks	1	1	0
	Total	102	33	10

Table 4: High risk factors

a) Abruptio placenta

High Risk Factor	No. of patients
Preeclampsia	25
Imminent Eclampsia	5
Eclampsia	2
HELLP Syndrome	4
Anemia	68
Previous LSCS	13
Age More than 35 years	4
Increased Maternal Parity	64
PROM	2

b) Placenta previa

High Risk Factor	No. of patients
Previous LSCS	7
Age More than 35 years	1
Increased Maternal Parity	29
Multiple Pregnancy	3

Table 5: Mode of delivery

	No. of Patients		
Mode of delivery	Abruptio placenta	Placenta previa	indeterminate
Vaginal delivery	62	0	7
C-section	40	33	3
Total	102	33	10

Majority of patients were in the age group of 21-30 years (71.72%). In patients with abruptio placenta, 37.25% were primigravida while placenta previa was more common in multigravida with 87.87%.

66.89% of APH patients were unbooked (69.60% cases of abruptio and 57.57% cases of placenta previa).

Majority of the APH patients belonged to lower class of Modified Kuppuswamy Prasad's classification.

44.13% cases of antepartum hemorrhage were 29-36 week of gestational age and need to delivered preterm out of that 37.25% were cases of abruptio placenta and 69.69% were placenta previa.

Pregnancy induced hypertension and its complications (35.29%) and increased maternal parity (62.74%) were major.

Table 6: Maternal complications

Sr. No.	Complication	Abruptio placenta		Placenta previa		Indeterminate	
		No.	Percentage	No.	Percentage	No.	Percentage
1	Anaemia	68	66.7%	20	60.6%	1	10%
2	DIC	52	51%	6	18.2%	0	0%
3	Shock	24	23.5%	6	18.2%	0	0%
4	ARF	27	26.5%	4	12.1%	0	0%
5	Sepsis	9	8.8%	2	6.1%	0	0%
6	Multiorgan Failure	21	20.6%	2	6.1%	0	0%
7	Atonic PPH	54	52.9%	21	61.6%	0	0%

Table 7: Broad intervention

			Abruptio placenta		Placenta previa		Indeterminate	
Sr No.	Intervention		No.	Percentage	No.	Percentage	No.	Percentage
1	Blood and Blood product transfusion	a) PCV	86	84.31%	33	100%	1	10%
		b) FFP	89	87.25%	8	24.24%	0	0%
2	Surgical Intervention	a) Bilateral uterine artery ligation	35	34.3%	31	93.3%	0	0%
		b) B-Lynch	11	10.8%	14	42.4%	0	0%
		c) Internal iliac artery ligation	2	2%	7	21.2%	0	0%
		d) Obstetric hysterectomy	1	1%	3	9.1%	0	0%
3	Glove balloon tamponade		54	52.9%	21		0	0%
4	ICU admission		62	60.8%	27	81.8%	0	0%
5	Ventilatory support		24	23.5%	12	36.4%	0	0%
6	Inotropic support		24	23.5%	12	36.4%	0	0%
7	Dialysis required		3	2.94%	0	0%	0	0%
8	CPAP required		2	1.96%	2	6.06%	0	0%

Factors found in abruptio placenta and 66.66% cases were found anemic.

Increased maternal parity (87.87%) were major risk factor for placenta previa followed by previous caesarean section seen in 21.21% cases.

Mode of delivery in 52.41% cases of aph was lscs while vaginal delivery was seen in 47.58% of cases. In patients that had placenta previa, 100% (33 out of 33) had lscs while 39.21% cases of abruptio placenta had lscs and 60.78% had vaginal delivery.

In abruptio placenta dic occurred in 51% cases, 23.5% had hypovolemic shock, 26.5% cases developed acute renal failure, 8.8% cases had sepsis. 20.6% cases landed in multiorgan failure, atonic pph was found in 52.9% cases while in placenta previa 60.6% cases were anemic, 18.2% cases had dic and shock, 12.1% cases had arf 6.1% cases had sepsis and multiorgan failure 61.6% cases and atonic pph.

Out of total cases of abruptio placenta 84.3% cases required blood and blood product transfusion. In surgical management, out of 102 cases of abruptio placenta in 35 cases bilateral uterine artery ligation was done, 11 cases managed with b- lynch suture, 2 cases required internal iliac ligation, 54 cases managed with glove balloon tamponade, 1 case underwent obstetric hysterectomy. (60.8%) cases required icu admission, (23.4%) cases required ventilatory support and inotropic support, (2.94%) cases required dialysis, (1.96%) cases required cpap.

In placenta previa, 100% cases required blood transfusion. In surgical management, out of 33 cases of placenta previa in 31 cases bilateral uterine artery ligation was done, 14 cases managed with b- lynch suture, 7 cases required internal iliac ligation, 21 cases managed with glove balloon tamponade, 3 case underwent obstetric hysterectomy. (81.8%) cases required icu admission, (36.4%) cases required ventila tory support and inotropic support, (6.06%) cases required cpap.

Table 8: Maternal mortality

Maternal mortality	Abruptio placenta		Placenta previa		Indeterminate	
	No.	%	No.	%	No.	%
YES	19	18.6%	3	9.1%	0	0%
NO	83	81.4%	30	90.9%	10	100%
Total	102	100%	33	100%	10	100%

Total maternal mortality in APH was 15.17%, In that 13.1% were abruptio placenta cases and 6.2% cases of placenta previa.

In neonatal outcome out of 102 cases of abruptio placenta, 26 cases had live birth; 76 cases were IUD. Amongst live births, 53.8% required NICU admission while in placenta previa out of 33 cases 31 had live birth, 2 cases were IUD and 51.6% cases required NICU admission.

Table 9: Fetal outcome

	Abruptio placenta		Placenta previa		Indeterminate	
	No.	%	No.	%	No.	%
Live	26	25.5%	31	93.9%	10	100%
IUD	76	74.5%	2	6.1%	0	0%
NICU admission	14	53.8%	16	51.6%	0	0%

Discussion

The incidence of APH was 0.98% in this study which is comparable to 1.5% reported from Oshogbo.[14] It is however lower than 5.4% documented in Pakistan[15] and

15.3% from Qatar.[16] The lower figure found in our study may be an underestimate of the actual figure as many patients with APH fail to reach the hospital in time.

The leading cause of antepartum hemorrhage in this study was found to be abruptio placenta followed by placenta previa as opposed to findings in Tyagi P et al.[17] in which placenta previa was found to be the leading cause. Hypertension has also been found to be the most consistent predisposing factor associated with abruptio placentae.[18]

The finding of advanced maternal age is similar to findings by other authors. It is also similar to the finding from a study in Enugu (33.3%)[19] and Niger (38.2%)[20], (33%) of akai et al[21]. Study was within the 35–39-year age group. (41.37%) of our patients in the study were within the 25–35-year age group and probably age – re lated chronic medical conditions such as hypertension might have set in.

66.89% cases of APH cases in our study were unbooked and reported in emergency with bleeding per vaginum or labor pains. This was similar to previous studies done by Tyagi P et al which reports 66% unbooked cases and same result was seen with study by Pandey et al.[22]

The gestational age at termination of pregnancies with APH in our study was less than 37 completed weeks in 53.1% of APH patients in maternal interest which is one of the factors accounting for high perinatal mortality of 53.81% in our study. 56.8% pregnancies with abruptio placenta were terminated before 37 weeks and 39.3% patients with placenta previa delivered before 37 weeks. Similar results were appreciated in study by Maurya et al[23] in which 52% patients delivered before 37 weeks with majority being cases of Placenta previa.

In this study, pregnancy induced hypertension and its complications (35.29%) which was 41% in study of Kulkarni AR et al[4] and increased maternal parity (62.74%) were major risk factors found in abruptio placenta, comparable with Takai, et al study it was 63.2 %[21].

In our study increased maternal parity (87.87%) were major risk factor for placenta previa but in Takai, et al[21] study it was 36.8%, followed by previous caesarean section seen in 21.21% cases, comparable with study Tyagi P et al it was 33.75%.[17]

In our study 52.41% % APH cases had LSCS and 47.58% had vaginal delivery. 100% cases of Placenta previa were delivered by caesarean section, 39.21% cases of AP had LSCS and 60.78% delivered vaginally, which is similar to study by Takai et al[21] with 100% LSCS rate in placenta and 98% vaginal deliveries.

In our study out of APH cases DIC occurred in 40% cases, 21.38% cases developed acute renal failure, 7.5% cases had sepsis. 20.6% cases landed in multiorgan failure, Atonic PPH was found in 51.52% cases which was compared with study of Kulkarni AR et al, out of APH cases patient had DIC in 3.3% cases, 8.4% cases had ARF, 6% cases had sepsis, 42% cases had PPH.[4]

In this study total 88.2% of APH cases received blood Transfusions Intra operatively (84.3% of abruption place Abruptio placenta and all cases of placenta previa). In study of Kulkarni AR et al[4] Total 88% of APH cases received blood transfusions Intra operatively (85% of abruptio placenta and all cases of placenta previa) found similar management. (6.9%) cases with abruptio placenta and, 7 (21.2%) cases with placenta previa had required >4 blood transfusions. Maximum number of blood transfusions (6) was required in a patient of placenta previa with severe anemia with DIC.

In this study, stepwise devascularization required in 34.3% cases of abruptio placenta, 93.9% cases of

placenta previa. In abruptio placenta; Bilateral uterine artery ligation done in 34.4% cases; Internal iliac ligation done in 2% cases whereas, in placenta previa bilateral uterine artery ligation done in 93.9% cases, internal iliac ligation done in 21.2% cases. In the present study, 3 (9.3%) of the patients with placenta previa had placenta accreta who underwent caesarean hysterectomy. Incidence of placenta accreta syndrome in patients with placenta previa and scarred uterus, in Tyagi P et al.

In our study glove balloon tamponade was done as treatment of PPH and prophylactically to prevent PPH in 75 (54.15%) cases of antepartum hemorrhage. Out of that 52.9% cases were abruptio placenta, and 63.3% cases of placenta previa managed with glove balloon tamponade. In Kulkarni AR et al4 study uterine balloon tamponade done in 8.3% cases of abruptio placenta and 16% cases of placenta previa.

In the present study, 3 (9.1%) maternal deaths occurred in placenta previa whereas 19 (18.6%) patients of abruption died. In study of Dr. RANJANI PRIYA C24, 8 (21.05%) cases of placenta previa died whereas no death seen in abruptio placenta group. In study of Tyagi P et al17 6% mortality was reported in placenta previa.

In our study 60.8% cases of abruptio placenta and 81.8% cases of placenta previa required ICU admission, whereas in Tyagi P et al17 study 26.31% cases of abruptio placenta, 20% cases of placenta previa required ICU admission.

In this study, 23.5% cases of abruptio placenta, 36.4% cases of placenta previa required ventilatory support, it compared to study of Tyagi P et al17 had 26.31% abruptio placenta and 6.25% cases of placenta previa required ventilatory support.

Perinatal outcome was poor in abruptio placenta as compared to placenta previa, 74.5% perinatal mortality in abruptio placenta as against 6.1 % in placenta previa. The studies done by Tyagi P et al, Maurya et al Pandey et al also showed the perinatal outcome to be worse in AP patients.

Conclusion

From the present study it can be concluded that antepartum hemorrhage is still a leading cause of maternal morbidity and mortality in our country. The commonest cause of antepartum hemorrhage was placen tal abruption followed by placenta previa. In abruption group maternal morbidity was high in terms of shock, DIC and renal failure and fetal morbidity and mortality was also high as grade III abruptio placenta are more as compared to placenta praevia group.

Perinatal mortality was high because of prematurity. The decision on the mode of delivery in APH is individualized but guided by fetal viability, gestational age, onset and stage of labor as well as severity of the disease based on maternal and fetal status. Vaginal delivery has been suggested in cases of fetal demise or advanced labor with imminent delivery.

In conclusion, there was very high maternal morbidity with increased rates of anemia, postpartum hemorrhage, blood and blood products transfusion, caesarean section rates, preterm deliveries and prolonged post-operative stay. Similarly perinatal morbidity was high including preterm deliveries including low birth weight, birth asphyxia leading to NICU admission for variable periods. Better antenatal services, early diagnosis and timely referral, increased awareness, improved trans portation, improved nutritional status can help to address some of the complications associated with antepartum hemorrhage.

We would like to recommend that all those cases having high risk factors, like preeclampsia, anemia, placenta

previa should be diagnosed early in ANC period, should be identified and labelled as high-risk pregnancies and should not be kept at peripheral health care centers. Once labelled as high-risk case should be referred to tertiary care center and pregnancy should be managed throughout their antenatal period at tertiary care level for correction of anemia and effective control of preeclampsia to avoid placental abruption and in cases of placenta previa by correction of anemia and serial ultrasound and planning their elective caesarean section, in an order to avoid morbidity and mortality.

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