Original Research Article

Maternal and perinatal outcome in antepartum hemorrhage

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Abstract

Background: Antepartum hemorrhage is defined as any bleeding from or into the genital tract after the period of viability and before the end of second stage of labour.
Aim: To study the maternal and perinatal outcome in antepartum hemorrhage.
Materials and methods: The present study was a prospective observational study undertaken during a period of 2 years from September 2012 to August 2014 in 50 cases of antepartum hemorrhage. Only patients with APH >28 weeks gestational age willing to participate in study were included.
Results: The incidence of antepartum hemorrhage was 3.8%. Abruptio placenta (56%) constituted the largest group. Maximum number of patients was in the age group 20 to 30 years in both abruption (53.5%) and placenta previa (52.5%). In abruption 53.6% and in placenta previa 79% of the patients were multiparous. Majority (56%) of the patients with antepartum hemorrhage had GA of 28 to 34 weeks. Mean period of gestation in APH patients was 33.4 weeks. In abruption, 64% of the patients and in placenta previa 42% were in the age group of 31-34 weeks and 6 days. In the present study, 64% of the patients were anemic at the time of admission. Majority 34% of the anemic patients had Hb of 7.5-9.9 gm. Maximum 35.7% of the patients with abruption had Hb of 5 to 7.4 gm and 42.1% of patients with placenta previa had Hb of 7.5 to 9.9 gm. Pre-eclampsia (36%) was the most common risk factor for APH. The commonest mode of delivery was cesarean delivery i.e. 60%. In abruption majority 53.6% had normal delivery. 89.5% of placenta previa had cesarean section which was the largest group. Post partum hemorrhage was the most common complication observed in 22% of the cases. 5.3% of the patients with placenta previa had placenta accreta. DIC and renal failure were seen in 3.6% each. Majority (64%) of the patients in this study required blood transfusions. 64% of abruption and 68% of placenta previa patients required blood transfusion. IUD or still births were noted in 31% of the cases. Neoantal deaths were observed in 5.8%. Prematurity was the most common complication observed in the present study in 82.8% of the cases followed by neonatal jaundice which

was observed in 51% of the cases. NICU admissions were present in 8.5% of the cases. In the present study, 56% of the patients had an APGAR score of <7 at 1 min and 63% had an APGAR of 4 to 6 at 5 min. Maximum number of births had birth weight of 1.5-2 Kg. In previa 17, majority (39.2%) of births had birth weight of 1.5-2 Kg and in undetermined majority (66.7%) had birth weight of 2.5-3 Kg**.**

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.

Key words

Antepartum hemorrhage, Maternal outcome, Perinatal outcome.

Introduction

Antepartum hemorrhage is defined as any bleeding from or into the genital tract after the period of viability (20 weeks in US, 22 in Malaysia, 24 in UK, 28 in India) and before the end of second stage of labour [1]. APH has always been one of the most feared complications in obstetrics. William Hunter (1718-1783) said that only two emergencies ever scared him one is flooding and other convulsions in antepartum. Hemorrhage is one of the leading causes of maternal mortality and morbidity. According to centre for disease control and prevention, hemorrhage was a direct cause of maternal death in about 30% of cases [2]. Antepartum hemorrhage (APH) complicates about 2-5% of all the pregnancies [3]. Placenta previa complicates 0.33% to 0.55% of all pregnancies and incidence of placental abruption is approximately 0.5-1% [4]. APH can be due to placenta praevia, abruption placentae, indeterminate cause or local causes of genital tract. 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. An Abruptio placenta is the condition whenever bleeding occurs due to premature separation of normally situated placenta and it also contributes to nearly one third of cases. Various extra placental causes are cervical polyp, carcinoma cervix, varicose veins, local trauma, condylomata, cervical erosion etc. forming another one third. The maternal complications in patients with APH are malpresentation, premature labor, postpartum hemorrhage, sepsis, shock and retained placenta. Various fetal complications are premature baby, low birth weight, intrauterine death, congenital malformation and birth asphyxia [4]. Maternal mortality due to APH has significantly decreased in developed countries to about 6/100000 live births due to better obstetrical outcome. In India, maternal mortality is still very high and is 4.08/1000 live births [5]. In developing countries widespread preexisting anemia, difficulties with transport, restricted medical facilities, decreased awareness on part of patient and relatives are largely responsible for high MMR. Perinatal mortality is less than 10 per 1000 total births in developed countries while it is much higher in India 60/1000 total births. Although APH cannot be prevented but maternal and perinatal morbidity and mortality associated with APH can be reduced significantly by aggressive expectant management. Presently increasing use of TAS/TVS for placental localization and to diagnose abruptio placentae, improved obstetrical and anesthetic facilities, increasing use of blood and its products to correct anemia and advanced neonatal care facilities to make increased chances of survival of a preterm infant. All collectively have played important role in decreasing perinatal as well as maternal morbidity and mortality. This study was done to evaluate how far we have come and the effect of

such treatment on the perinatal and maternal outcome.

Materials and methods

The present study was a prospective observational study undertaken during a period of 2 years from September 2012 to August 2014 in Neiloufer Hospital, Telangana, l in 50 cases of antepartum hemorrhage.

Inclusion criteria: APH with gestational age > 28 weeks and who were willing to participate in the study.

Exclusion criteria: All cases of APH with gestational age < 28 weeks, Patients suffering from any other bleeding disorder, Bleeding from a source other than uterus, Those cases who were not willing to participate in the study.

Patients with bleeding per-vaginum >28 weeks who were admitted in the hospital and who met the inclusion criteria were noted. Gestational age was calculated from the last menstrual period or earlier scans. After taking informed consent history was noted, special enquiry of previous spotting per vaginum and associated pre-eclampsia were noted. After thorough history taking, general examination and obstetrical examination was carried out include in FHR. It was confirmed whether patient was in labour or not, duration and amount of bleeding noted. Whether bleeding was associated with pain or not was noted. Amount of blood loss outside hospital was noted either from patient or her attenders when patient was in shock and patient immediately resuscitated when she was in shock. Visible blood loss was noted based on pads soaked. Hb at the time of admission, blood grouping and typing were done immediate. The case was appropriately managed according to the condition of the mother and fetus at the time of presentation.

The outcome in antepartum hemorrhage was then analyzed by using appropriate statistical data.

Results

The present prospective study was conducted in Neiloufer Hospital, Telangana during a period of 2 years (September 2012 to August 2014) to study the maternal and perinatal outcome in antepartum hemorrhage. Total number of cases in study was 1286 in which APH are 50 patient s with a incidence of 3.8%. In 50 patients of APH 28 cases were Abruptio placenta with 56%, Placenta Previa are of 19 cases with 38% and undetermined cases were 3 cases with 6%.

Maximum number of patients was in the age group 20 to 30 years in both abruption (53.5%) and placenta previa (52.5%). In abruption 53.6% and in placenta previa 79% of the patients were multiparous. Majority 56% of the patients with antepartum hemorrhage had GA of 28 to 34 weeks. Mean period of gestation in APH patients was 33.4 weeks. In abruption 64% of the patients and in placenta previa 42% were in the age group of 31-34wks and 6 days (**Table – 1**).

In the present study 64% of the patients were anemic at the time of admission. Majority (64%) of the patients in this study required blood transfusions. 64% of abruption and 68% of placenta previa patients required blood transfusion.IUD or still births were noted in 31% of the cases. Majority 34% of the anemic patients had Hb of 7.5-9.9gm.Maximum 35.7% of the patients with abruption had Hb of 5 to 7.4gm and 42.1% of patients with placenta previa had Hb of 7.5 to 9.9 gm (**Table - 2**).

Pre-eclampsia (36%) was the most common risk factor for APH .The commonest mode of delivery was cesarean delivery i.e. 60%. In abruption majority 53.6% had normal delivery.89.5% of placenta previa had cesarean section which was the largest group (**Table – 3**).

Post partum hemorrhage was the most common complication observed in 22% of the cases .5.3% of the patients with placenta previa had placenta accreta. DIC and renal failure were seen in 3.6% each (**Table – 4**).

Table - 1: Demographic Distribution (n=50).

	Abruption (n=28)	**Placenta previa (n=19)**	**Undetermined (n=3)**	**Total (n=50)**
Registered	7(25%)	5(26.3%)	2(67%)	14(28%)
Unregistered	21(75%)	14(73.7%)	1(33%)	36(72%)
Total	28(100%)	19(100%)	3(100%)	50(100%)
Age distribution (Years)				
<20	4(14.2%)	1(5.3%)	0	5(10%)
20-24	16(57.1%)	10(52.7%)	1(33.3%)	27(54%)
25-29	5(17.8%)	7(36.8%)	2(66.6%)	14(28%)
30-35	0	1(5.3%)	0(0%)	1(2%)
>35	2(7.1%)	0(0%)	0(0%)	2(4%)
Patients according to parity				
0	13(46.4%)	4(21.1%)	2(66.7%)	19(38%)
1	12(42.9%)	10(52.6%)	1(33.3%)	23(46%)
2	2(7.1%)	5(26.3%)	0(0%)	7(14%)
3	0(0%)	0(0%)	0(0%)	0(0%)
4	1(3.6%)	0(0%)	0(0%)	1(2%)
Gestational age at the time of admission				
28-30 wks + 6days	8(28.6%)	6(31.6%)	0	14(28%)
31-33 wks + 6days	9(32.1%)	4(21.1%)	1(33.3%)	14(28%)
34-36 wks + 6days	9(32.1%)	4(21.1%)	0	13(26%)
37-39 wks + 6days	2(7.1%)	5(26.3%)	1(33.3%)	8(16%)
40-42wks	0	0	1(33.3%)	1(2%)
FHR				
Present	9 (32.1%)	16(84.2%)	3(100%)	28(56%)
Absent	12 (42.9%)	1(5.3%)	0	13(26%)
Fetal distress	7(25%)	2(10.5%)	0	9(18%)

Table - 2: Distribution of anemia and transfusions in patients with APH.

Hb in gm	**Abruption (n=28)**	**Placenta previa (n=19)**	**Undetermined (n=3)**	**Total (50)**
>11	5(17.9%)	4(21.1%)	2(66.7%)	11(22%)
10-10.9	2(7.1%)	5(26.3%)	0	7(14%)
7-9.9	10(35.7%)	10(52.6%)	1(33.3%)	21(42%)
4-6.9	10(35.7%)	0	0	10(20%)
<4	1(3.57%)	0	0	1(2%)
No of blood transfusions(unit)				
0	10(35.7%)	6(31.6%)	2(66.7%)	18(36%)
1	5(17.9%)	6(31.6%)	Nil	11(22%)
2	2(7.1%)	2(10.5%)	Nil	4(8%)
3	4(14.3%)	1(5.3%)	Nil	6(12%)
4	3(10.7%)	2(10.5%)	Nil	5(10%)
>or=5	4(14.3%)	2(10.5%)	1(33.3%)	6(12%)

Table – 3: Distribution based on the risk factors of APH.

Risk factors	Abruption (n=28)	Placenta previa(n=19)	Undetermined (n=3)	Total (50)
Preeclampsia, eclampsia	16(57.1%)	2(10.5%)	0	18(36%)
1 Previous LSCS	7(25%)	6(31.6%)	0	13(26%)
2 previous LSCS	1(3.6%)	2(10.5%)	0	3(6%)
Prior curettage	0	3(15.8%)	1(33.3%)	4(8%)
Multifetal gestation	0	1(5.3 %)	0	1(2%)
No risk factors	4	5	2	
Mode of delivery				
Elective LSCS	0	5(26.4%)	0	5(10%)
Emergency LSCS	13(46.4%)	12(63.1%)	0	25(50%)
VD	15(53.6%)	2(10.5%)	3(100%)	20(40%)

Table - 4: Maternal morbidity in terms of complications.

Complication	Abruption (n=28)	Placenta previa (n=19)	Undetermined (n=3)	Total (n=50)
Atonic PPH	7(25%)	4(21.1%)	0	11(22%)
Hemorrhagic Shock	3(10.7%)	1(5.3%)	1(33.3%)	5(10%)
Coagulation failure	1(3.6%)	0	0	1(2%)
Renal failure	1(3.6%)	0	0	1(2%)
Placenta accreta	0	1(5.3%)	0	1
Maternal death	0	1(5.3%)	0	0

NICU admissions were present in 8.5% of the cases. In the present study 56% of the patients had an APGAR score of <7 at 1min and 63% had an APGAR of 4 to 6 at 5 min (**Table – 5**).

Neoantal deaths were observed in 5.8%.Prematurity was the most common complication observed in the present study in 82.8% of the cases followed by neonatal jaundice which was observed in 51% of the cases. Maximum number of births had birth weight of 1.5-2 Kg. In previa 17, majority (39.2%) of births had birth weight of 1.5-2 Kg and in undetermined majority (66.7%) had birth weight of 2.5-3 Kg (**Table – 6**).

Discussion

In the day to day practice, an obstetrician has to tackle the life threatening condition of antepartum hemorrhage and take a timely and judicious decision of terminating pregnancy keeping in mind the welfare of both the mother and the fetus without exposing either of them to undue risk.

The present prospective study was carried out on 50 patients who presented with antepartum hemorrhage in the Department of Obstetrics and Gynecology at a tertiary care hospital from September 2012 to August 2014. In the present study, the incidence of APH was 3.8% which was comparable to that of Arora R, et al. (2.5%) [1]. In a study done by Kwawukume, the incidence of APH was found to be 1.2-1.8% [6]. It was reported to be 1.6% by Bako, et al. [7] and Adegbola reported a lowest incidence of APH of 0.2% [8] as per **Table - 7**. The higher incidence of abruption and lower incidence of placenta previa in the present study in the present set-up compared to the other studies may be because of the higher rate of prevalence of pre-eclampsia.

Table - 5: Perinatal outcome in APH.

Perinatal outcome	Abruptio placenta (n=28)	Placenta previa (n=20)	Undetermined (n=3)	Total (n=51)
IUD or still birth	15(53.57%)	1(5%)	0	16(31.37%)
Live born	13(46.4%)	19(95%)	3(100%)	35(68.7%)
Neonatal death	2(7%)	1(5%)	0	3(5.8%)
Anomaly	0	1(5%)	0	1(1.96%)
APGAR AT 1 min				
<3	1(7.6%)	2(10.5%)	0	3(8.5%)
4-6	10(76.9%)	11(57.8%)	3(100%)	24(68.5%)
≥7	2(15.3%)	6(31.5%)	0	8(22.8%)
APGAR at 5 min				
<3	0	0	0	0
4-6	1(7.6%)	2(10.5%)	0	3(8.5%)
≥7	12(92.3%)	17(89.5%)	3(100%)	32(91.4%)

Table – 6: Distribution based on birth weight and neonatal complications.

Birth weight	Abruption (n=28)	Placenta previa(n=20)	Undetermined (n=3)	Total (n=51)
<1.5kg	9(32.1%)	5(25%)	0	14(28%)
1.5-2kg	11(39.2%)	5(25%)	0	16(32%)
2-2.5kg	3(10.7%)	4(20%)	0	7(14%)
2.5-3kg	5(17.8%)	2(10%)	2(66.7%)	9(18%)
>3kg	0	4(20%)	1(33.33%)	5(10%)
Complication				
Prematurity	13(100%)	15(78.9%)	1(33.33%)	29(62.8%)
MAS	1(7.6%)	0	0	1(2.85%)
RDS	1(7.6%)	1(5.2%)	0	2(5.7%)
NICU admission	3(23%)	0	0	3(8.5%)
NJ	10(77%)	7(36.8%)	1(33.3%)	18(51.4%)

Table - 7: Comparison of causes of APH.

Study	Abruption	Placenta previa	Undetermined	Mixed
B. Bako, et al. [7]	43.6%	50.4%	4%	2%
Archana Mourya, et al. [9]	27%	71%	2%	-
Paintin [10]	24.5	13.8	60.7	-
Amoma, et al. [11]	37	44	19	-
Chakraborty [12]	35	51	14	-
Jaju KG, et al. [13]	68.2	31.8	-	-
Bhandiwad A, et al. [14]	57.5%	25%	17.5%	-
Present study	56%	38%	6%	-

In the present study out of 50 cases of APH, 36 (72%) were unregistered and only 14 (28%) were registered which was comparable to other studies performed by Raj, et al. and Baskette, et al. where in unregistered cases constituted 75% of the study population [15, 16]. In Bhandiwad A, et al. 57.5% were unregistered, 42.5% were registered and Arora R, et al. 62% were unregistered, 38% were registered and in the study conducted by Archana mourya, 62% of cases were unregistered as compared to 38% of registered cases [1, 9, 14]. Above studies were similar to the present study. The low rate of registry for antenatal care in these patients may be because of the low socio-economic status and lack of awareness resulting in complications like pre-eclampsia.

In the present study highest number of cases 31 (62%) were in the age group of 21-29 yrs with a mean age of 23.53 years which was comparable to the study conducted by Archana mourya, et al., where the commonest age group was 21-29 years and mean age of 23 years and Bhandiwad A, et al. reported a mean age of 23.3 ± 3.9 years with the most common age group being 20-29 yrs [9, 14]. In Bako, et al. 45% of the cases were in the age group of 21-29 years with mean age of 27 years [7].

In the present study, as shown in table-4, mean age of presentation in abruptio placenta patients was 24.37 years and most of them (67.8%) were below 25 yrs of age. This was similar to the findings of the study done by Bako, et al. where abruption was common in younger age group [7]. This was because of association with pre-eclampsia at younger age.

As shown in patients with placenta previa, mean age was 22.47 years and 52.7% of them were in the age group of 20-25 years which in contrast to those found in Bako, et al. and Archana Mourya, et al., where mean age at presentation was 31% and 38% of patients with placenta previa were in the age group of 26-30 years respectively [7, 9]. Placenta previa is usually seen in older age group because of multiparity. But in present study most of multiparous patients were between 20-25 years in the present study.

In undetermined hemorrhage group, mean age at presentation was found to be 22.67 years. It was observed that the incidence of antepartum hemorrhage was more common in multipara (62%) than in nullipara (38%) which was comparable to Adekanle, et al. with 75.2% multipara and 24.8% nullipara [28]. This was also comparable to the studies by Cotton, et al. (1980) who found that 83.2% of their patients with APH were multiparous and 16.8% were nulliparous [17]. However, Crenshaw, et al. (1973) reported that 90% patients with APH were multipara [18].

In the present study as shown in table-5, out of 28 cases of abruption, 54% were multiparous and 46% were nulliparous. Bako, et al. reported 79.6% incidence of abruption in multiparous patients [7]. In the studies done by Ananth, et al. and Vaidya, et al., 81.6% and 86% of the patients with abruption were multiparous respectively which was higher than the present study [19, 20].

In the present study as shown in **Table - 5**, the incidence of placenta previa in nullipara was 21.1% compared to 78.9% in multiparous group. Bako, et al. and Archana Mourya, et al. reported that 94%, 84.3% of their patients with placenta previa were found to be multiparous respectively [7, 9]. Advanced age is associated with placenta previa because of vascular changes in the myometrium.

In the present study as shown in **Table - 6**, 56% of the patients had gestational age of 28-34 weeks at the time of admission and mean gestational age at the time of admission was 33.3 weeks which was comparable to Bhandiwad A, et al. in which 52.5% were in the 28-32 weeks group [14]. Contrary to the present study Archana Mourya, et al. found that majority of the patients had gestational age of ≥37 weeks [9]. Bako, et al. also observed that 54% of the patients had gestational age ≥ 37 weeks at the time of admission [9].

In the present study, 64% of patients with abruption had a gestational age of 31-36 weeks and 6 days at the time of admission with mean gestational age was 33.4. Comparable to the present study Bhandiwad A, et al. reported that 52.2% of abruption cases had a gestational age of 28-32 weeks [14]. Contrast to the present study, Archana Mourya, et al. observed that 63% of the patients with abruption had gestational age ≥37 weeks. Bako, et al. also reported that 40.8% of the patients with abruption had gestational age ≥ 37 weeks at delivery [7, 9].

In the present study, placenta previa group, 52.7 % had gestational age of 28-34 weeks at the time of admission and mean gestational age was 33.3% which was comparable to Bhandiwad, et al. who reported that 70% of cases of placenta previa had a gestational age of 28-32 weeks [14]. In contrast to the present study done by Archana, et al., 63% of patients had gestational age ≥ 37 weeks [9]. Bako, et al. also observed that 64% of the patients had gestational age ≥ 37 weeks. For undetermined hemorrhage group in the present study, the mean gestational age was 37 weeks [7].

In the present study as shown in **Table - 7**, 32 (64%) patients with APH were anemic with Hb<10 gm % at the time of admission out of which 34% had Hb% of 7.5 – 9.9 gm.

Similar findings were observed by Chakarborty, et al. (1993) who reported that 60% of their patients were anemic [12]. In contrast Sarwar, et al. reported a high incidence (96.2%) and Bhandiwad A, et al. reported low incidence of 35% [21].

In the present study, 35.7% of the patients with abruption had Hb% of 5 – 7.4 gm and 42.1% of placenta previa group had Hb% of 7.5– 9.9 gm. In undetermined hemorrhage group, 66.7% of the patients were with normal Hb% at the time of admission. Compared to placenta previa most cases of abruption have concealed hemorrhage, so severe anemia is more common in abruption case.

28 cases (56%) with APH had normal FHR at the time of admission, while evidence of fetal distress was noted in 9 cases (18%) and in 13 (26%) cases, FHR was absent at the time of admission. In the Study done by Chakraborty, et al., 66% of the cases had normal fetal heart rate at the time of admission which was comparable to the present study. FHR was absent in 42.9% of the cases at the time of admission and fetal distress was present in 25% of cases among abruption group. Chakraborty, et al. reported that FHR was absent in 33.3% of the patients with abruption [12].

In placenta previa group as shown in **Table - 8**, 84.2% of the cases had normal FHR at the time of admission, 10.5% had fetal distress and 5.3% had absent FHR in the present study which was similar to the findings of Chakraborty, et al. [12] who reported that 72.5% of their cases with placenta previa had normal FHR.

In undetermined hemorrhage group, all had normal FHR at presentation in this study where as Chakraborty, et al. [12] reported that 82.7% of them had normal FHR Abruption is more commonly associated with fetal distress because of concealed hemorrhage, while in placenta previa bleeding is mostly revealed resulting in early presentation and close monitoring.

In the present study, the most common risk factor for APH was hypertensive disorders of pregnancy observed in 18 patients (36%). B. Bako, et al. conducted an 8 year prospective study of clinical review in APH and reported that 49% of the patients with APH had hypertensive disorders [7]. Archana Mourya, et al. observed that 68.2% of their patients had hypertensive disorders [9] which was higher than the present study. In contrast to the present study in Hibbard, et al. (1966) incidence of hypertensive disorders of pregnancy was found to be 7.4% in APH [5]. Rai, et al. (1987) also found lower incidence of hypertensive disorders of pregnancy in APH patients (4.4%) [15].

Table - 8: Comparison of neonatal complications.

Study	Respiratory distress	NICU admission	Jaundice	Prematurity
Jaju KG, et al. [13]	3.03%	28.79%	7.58%	25.76%
Present study	5.7%	8.5%	51.4%	82.8%

In the present study, 16 patients (57%) with abruption and 2 patients (10.5%) with Placenta previa had hypertensive disorders. This was comparable to the clinical study of antepartum hemorrhage done by Bako, et al., it was reported that 43.8% of patients with abruption and 5.2% of the patients with placenta previa had hypertension associated respectively [7]. Similarly Archana Mourya, et al. observed that 65.4% of the patients with abruption had hypertension and 2.8% of the patients with placenta previa had hypertension [9].

None of the undetermined hemorrhage group had pregnancy induced hypertension in the present study. This was similar to that of Archana Mourya, et al. who observed that none of the patients with undetermined hemorrhage had hypertension [9].

In the present study, 16 cases of APH (32%) had a history of previous cesarean section which was comparable to Purohit, et al. (33%) [22]. Contrary to the present study Bako, et al. observed that 14.6% of the patients with APH had history of previous cesarean section. 28.6% of the patients with abruption in the present study had a history of previous cesarean. In contrast to the present study Bako, et al. in their study observed that 9.1% of the patients with abruption had a history of previous cesarean section [7].

In the present study 42% of the patients with placenta previa had history of previous cesarean which was comparable to Purohit A, et al. (40%) [22]. Bako, et al. observed that 19.8% of cases with previa had a history of prior cesarean section. In the above studies the incidence of prior section was lower than present study. There were no cases with previous cesarean section in the undetermined hemorrhage group.

In the present study out of 50 cases, 14 (28%) patients with APH had a history of previous abortion. Bako, et al. noted high incidence (41.3%) of prior abortion in their study [7].

In the present study, 21.4% of the patients with abruption had previous abortion. In a prospective study, Bako, et al. observed that 37.7% of their patients with abruption had prior abortions [7] which was higher than the present study. Purohit, et al. (5.3%), Taylor, et al. stated (14%) of had lower incidence of previous abortion in their studies [22, 23].

9 cases (31.5%) of placenta previa had a previous abortion in the present study, which was similar to the clinical study done by Taylor et al (1994) who reported that 30% patients of placenta previa had a previous abortion [23]. In Bako, et al. 43.8% showed high incidence of prior abortion history. Purohit et al (16%) showed low incidence [7, 22].

In the present study, 4 cases (8%) of the patients with APH underwent prior curettage and none of the abruption cases had prior curettage. Contrary to this in the studies done by Taylor, et al. and Bako, et al, 7.3% and 22.4% of the pateints with abruption had curettage respectively [7, 23].

In patients with placenta previa, 3 (15.8%) had prior curettage. Taylor, et al. (1994) found that 30% patients with placenta previa had a previous curettage [23]. In Bako, et al., 30.7% of the patients with placenta previa had previous instrumentation [7]. Previous cesarean section, prior abortions and dilatation and curettage increases the risk of placenta previa because of decreased vascularity seen in fibrosed tissues. Most common mode of delivery was found to be cesarean section in 30 (60%) cases. The most

common indication was uncontrolled hemorrhage followed by fetal distress. This was similar to the study done by Bsako, et al. in which 63.7% of patients with APH had cesarean section. Chakraborty, et al. reported a cesarean rate of 52% [7, 16].

In abruption 46.4% of the patients had cesarean section. In the present study, 36 (89.5%) patients with placenta previa delivered by Cesarean section. This was comparable to the study done by Chakraborty, et al. (1993); Ilyasu, et al. (1993) and Bako, et al. (2012) where 82%, 78.3%, 86.8% of placenta previa subjects delivered by C.S respectively [7, 12]. In the study of antepartum hemorrhage by Archana Mourya, et al. (2014), 92% of placenta previa cases delivered by cesarean section [9]. Rate of cesarean was more in placenta previa because it is the preferred mode of delivery in these cases.

In the present study, 15 (53.6%) patients with abruption delivered by immediate vaginal delivery because many of the abruption cases had intra uterine death at the time of presentation, vaginal delivery was preferred. 13 cases (46.4%) of abruption group were delivered by LSCS. This study was comparable to the study to Hibbard and Jeffcoate (1966) in which vaginal delivery was reported in 62.2% and Bako et al reported 63.3% of normal deliveries in patients with abruption [5, 7]. Also in a study done by Vaidya, et al. (1984), 73% cases delivered vaginally [19]. In undetermined hemorrhage group, 3 patients (100%) were delivered by vaginal route. In placenta previa 10.5% delivered vaginally which was comparable to the study by Bako, et al. in which 13.2% delivered vaginally [7].

In this study postpartum hemorrhage was the most common complication in patients with antepartum hemorrhage which was observed in 11 cases (22%). This was similar to the study done by Chakraborty, et al. who reported 16.2% incidence of PPH and Hurd, et al. reported 13.3%. Significant shock was present in 10% of cases [12].

As seen in abruption group, incidence of postpartum hemorrhage was 25.1% which was commonest. Acute renal failure was seen in 3.6% of the cases with abruption. Disseminated (DIC) was seen in 3.6% and couvelaire uterus was seen in 5 (17.9%) cases. There were no deaths in abruption group. Rai, et al. (1981) reported couvelaire uterus in10.5% of abruption patients [15].

In the present study, in placenta previa group, 21% of the patients had postpartum hemorrhage. Shock and death was seen in one patient (5.3%). In Archana Mourya, et al., out of 71 cases of placenta previa, only 3 (4.23%) patients died of postpartum hemorrhage and hypovolemic shock [9].

In the present study, 5.3% of the patients with previa had placenta accreta who underwent caesarean with hysterectomy. This was comparable to the studies done by Pedowitz (1965), Cotton, et al. (1980) and McShane, et al. who reported the incidence of placenta accreta as 4.4%, 4% and 6.32% respectively [24, 25].

In the present study, 1 death occurred in placenta previa with placenta percreta which had hemorrhage of 2 litres into peritoneal cavity.

In the present study, 32 (64%) patients with antepartum hemorrhage and 18 (64.3%) patients in abruption group required a blood transfusion which was comparable to the study by William et al who reported blood transfusion in 52.4% cases of abruptio placenta [26].

In this study, 13 (68.4%) cases from placenta previa group required blood transfusion while 1 (33.3%) patient with undetermined hemorrhage group required transfusion. In a study conducted by Crenshaw, et al. (1973), only 24% of patients with placenta previa required blood transfusion in comparison to 68.4% in present study [18]. Maximum no of patients 11 (22%) in this study required one unit of BT followed by 8% of patients who required 2 blood transfusions. This was similar to the study done by William et al in

which (28%) required one unit each, where as 19% required two units each [28]. In this study, 4 (14%) patients of abruption and 6 patients (10%) with placenta previa had >5 blood transfusions. Maximum number of blood transfusions (8) was required in a patient of abruptio placenta with DIC.

In the present study, 68.5% of the patients with antepartum hemorrhage had live births, 31% had either intrauterine death or stillbirth and 5.8% had neonatal deaths. This was comparable to the study by Jaju KG, et al., where 45.5% had either intrauterine death or still birth, and 4.5% were neonatal deaths [13]. Mukherjee, et al. reported higher (67.9%) still births or intra uterine deaths and Purohit A, et al. reported only 15.6% of IUD or still birth. Purohit A, et al. also reported 7% of neonatal deaths which was similar to the present study [22]. In the abruption group 53.57% and placenta previa 95% were live births. This was in contrast to Bako, et al. study where 61% of the births in patients with abruption were dead born [7]. However, only 10% of the births in patients with placenta previa were dead born in the same study.

In the present study, 28 cases (56%) with APH had an APGAR score <7 at one minute. The study conducted by Adekanele, et al. [27] reported that 61.1% of babies in APH group had APGAR score of <6 at one minute. 61.1% had an APGAR score of >at 5 minutes. In patients with antepartum hemorrhage majority 91 % had APGAR score>7 in the present study.

Perinatal outcome based on birth weight

In the present study, majority (32%) of the births in patients with APH had birth weight of 1.5-2 Kg. In previa, majority (39.2%) of births had birth weight of 1.5-2 Kg and in undetermined majority (66.7%) had birth weight of 2.5-3 Kg. In the present study, 78.43% of the births had birth weight <2.5 Kg, similar to the study by Bhandiwad, et al. [14] in which 85% of the births had wt <2.5 Kg. Arora, et al. showed little low incidence compared to the above study where 67% had birth weight <2.5 Kg.

Contrary to the above study Adekanle, et al. only 25% had birth weight <2.5Kg [27]. In the present study, maximum number of babies had low birth weight because of pre-eclampsia association in the mother and also due to prematurity.

In the present study 5.7% had respiratory distress comparable to 3% in the study by Jaju KG, et al., 28.79% had NICU admission contrary to the present study which showed 8.5% .In present study physiological jaundice was high (51.4%) because of prematurity .Contrary to this only 7.58% in study by Jaju KG, et al. had jaundice. Prematurity was seen in 82.8% in this study contrary to which 25.76% in Jaju KG, et al. had prematurity [13].

3 neonatal deaths were observed in this study out of which two were born to mothers with abruption. The cause of death was prematurity with RDS in one and MAS in the other. In babies born to patients with placenta previa, 1 death was seen which was due to prematurity with RDS.

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 placental abruption followed by placenta previa. The commonest mode of delivery was cesarean section.

In abruption group maternal morbidity was high in terms of shock, DIC and renal failure and fetal morbidity and mortality was also high when compared to placenta previa group. This was because most of the cases in abruption group presented late (unbooked) and already had complications at the time of admission, while in placenta previa group diagnosis was made early by ultrasound before they became symptomatic clinically. So they were carefully managed.

Though maternal mortality has been reduced with modern management of antepartum hemorrhage, perinatal mortality was high

because of prematurity. Over all timely cesarean section, liberal blood transfusion, correction of anemia and wider acceptance of expectant line of management in properly selected patients have helped to further lower the maternal morbidity and mortality.

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