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Original Research Article

Maternal and perinatal outcome in antepartum haemorrhage patients attending tertiary care hospital in central India: a prospective observational study

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ABSTRACT

Background: Antepartum haemorrhage (APH) is an emergency obstetrical condition that accounts for 2-5% of pregnancies and contributes to high level of maternal and perinatal mortality and morbidity. The present study was undertaken to assess the incidence of APH and to determine the maternal and fetal outcome in women with APH.
Methods: This study was conducted in 130 women diagnosed with APH (gestational age ≥28 weeks) admitted in the department of obstetrics and gynaecology, at tertiary care hospital in central India over a period of 18 months from January 2020 to June 2021.
Results: The overall incidence of APH was 1.09% and majority of them had abruptio placentae (AP-53.08%) followed by placenta praevia (PP-38.46%) and unknown (UK-8.46%). Anaemia (90%) was the commonest maternal morbidity. A significant association found between APH type and HELLP infection ($p<0.0001$), PPH ($p=0.028$) and DIC ($p<0.0001$). Rate of maternal morality was 9.23% and commonest causes of mortality were renal failure and PPH (91.67% each). Most common neonatal morbidities were birth weight of <2.5 kgs (84.32%) and NICU admission (27.61%). APH type was significantly associated with birth weight ($p<0.0001$). Majority of neonates were born live (56.72%), 36.57% were IUDs, 6.72% were still born, and 14.18% were neonatal deaths. APH type was significantly associated with live births and IUDs, ($p<0.0001$).
Conclusions: APH is still a leading cause of maternal morbidity and mortality. Most of the patients were booked at other centres and were presented late with complications at the time of admission. Both these factors have contributed significantly to the incidence of APH as well as maternal and perinatal morbidity and mortality.

Keywords: APH, Mortality, Morbidity, AP, PP, Anaemia

INTRODUCTION

Antepartum haemorrhage (APH) is defined as bleeding from or into the genital tract, occurring from 24+0 weeks of pregnancy and prior to the birth of the baby. Obstetric haemorrhage accounts for 22-25% of maternal mortality and amongst this APH is the most common cause of morbidity and mortality accounting for half of these deaths.[1] APH complicates 3-5% of pregnancies and is a leading cause of perinatal and maternal mortality worldwide.[2] The main causes of APH are PP and AP; however, the exact cause of bleeding in some cases may be undetermined.[3]

Maternal consequences of APH include shock, postpartum haemorrhage, coagulation failure, preterm labour and increased rate of caesarean section.[4] Although analysing various risk factors like previous placental abruption, pre-eclampsia, multiparity and nonvertex presentation are important in predicting abruptio placenta, APH remains largely unpredictable and has heterogeneous pathophysiology.[5] On the other hand, an increase in the

rate of caesarean section in modern obstetrics has a role in increasing incidence of PP with an increased risk of morbidly adherent placentae.[6] APH is regarded an important obstetric cause of perinatal mortality and morbidities like prematurity, birth asphyxia and low birth weight. The frequency of such complications will increase when the haemorrhage is heavy, or the baby delivered prematurely.[7]

Being a tertiary care centre, maximum patient of APH referred from periphery for further management, though maternal and perinatal morbidity and mortality is preventable in APH but as patients presented late with complications at the time of admission increases maternal and perinatal morbidity and mortality. Presently, increasing use of ultrasonography for placental localization and to diagnose AP, improved obstetrical and anaesthetic facilities, increasing use of blood and its products to correct anaemia and advanced neonatal care facilities to make increased chances of survival of a preterm infant.[8] However, the early diagnosis and timely referral reduce the maternal and perinatal morbidity and mortality by timely management, keeping in mind welfare of both mother and foetus without exposing either of them to undue risk.[9] Thus, the present study aimed to determine the maternal and fetal outcome in obstetric women with APH, so that we can plan for future strategy and can provide better patient care.

METHODS

Type of study

This was a prospective, observational, single centre study.

Study setting/ place

The study was performed in the department of obstetrics and gynaecology of a tertiary care teaching hospital situated in the central India (Government medical college and hospital, Nagpur).

Period of study

The study was performed over a period of 18 months i.e., from January 2020 to June 2021.

Selection criteria of the patients

Inclusion criteria

Women with gestational age of 28 weeks or more and women presenting with APH were included in the study.

Exclusion criteria

Women with gestational age less than 28 weeks, women diagnosed with any bleeding disorder, and women with bleeding from sources other than uterus were excluded from the study.

Procedure

A total of 130 patients with antenatal haemorrhage were included in this study. All the patients were screened and explained the study procedure in their native language. The patients who were willing to participate and signed the informed consent document were enrolled in the study. A previous history of unexplained foetal loss, pregnancy induced hypertension, LSCS, curettage, previous APH, multiple pregnancies, malpresentation and pre-eclampsia were recorded. Demographic characteristics included age, booking status, area of residence, socio-economic status, and gestational age at presentation were noted. Clinical characteristics included presenting complaints, foetal heart sounds (normal, reduced, and absent), and obstetric factors were recorded. Patients were then subjected to ultrasound of the abdomen in the Department of Radiology performed by an experienced radiologist with Hitachi Aloka Arietta s70 machine. It was done to ascertain uterus height, gestational age, location and size of placenta, presentation of foetus, position of foetal head (fixed or floating), FHS, status of uterus (contracted or relaxed) and intra- or retro-placental clots. Per speculum examination was done to look for cervical OS and presence of bleeding. Per vaginal examination was done to know the status of cervical OS, effacement of cervix, and appropriateness of pelvis.

Laboratory investigations included complete blood counts (haemoglobin, total leucocyte count, differential leucocyte count), liver function test (bilirubin-total/direct/indirect, alanine transaminase (ALT), aspartate transaminase (AST), and albumin to globulin ratio), kidney function test (blood urea, serum creatinine, serum sodium, and serum potassium), bleeding time, clotting time, and prothrombin time-international normalised ratio (PT/INR). The patients who tested positive for HBV or HCV excluded from study.

Maternal outcomes noted were PPH, shock, blood transfusion, Included sepsis, HELLP syndrome, mode of delivery (vaginal or LSCS), indication of LSCS, hysterectomy, renal failure, and mortality. Whereas neonatal outcomes included birth weight, neonatal morbidity (IUGR, hypoglycaemia, RDS, birth asphyxia, septicaemia, NICU admission, neonatal jaundice), and neonatal outcomes (live born, IUD, still born, and neonatal death). Finally, association of types of APH with various maternal and neonatal factors and outcomes was assessed. The present study protocol was approved by the institutional ethics committee.

Statistical analysis

The data was analysed with SPSS (IBM, Armonk, NY, USA) version 23.0 for windows, with the help of statistician. The categorical and continuous variables were represented as frequency (percentage) and mean (standard deviation, SD). Chi-square test was used to assess the association of APH type with maternal and neonatal factors. A two-tailed probability value of <0.05 considered as statistically significant.

RESULTS

During the study period, a total of 11981 deliveries took place. Overall incidence of APH was 1.09%. On further analysis, the incidence of AP, PP, and UK was 0.58% (69), 0.42% (50), and 0.09% (11), respectively. Majority of the patients were booked (54.62%) and have rural area of residence (67.69%), most belonged to the lower SE class (54.61%) followed by upper lower (21.54%), lower middle (17.69%) and upper middle SE class (6.15%).

Majority of the patients belonged to the age group of 25-29 years (50.77%) followed by 30-35 (21.54%) years. Association of APH type with age and parity distribution were not significant (p>0.05) while there was significant association between APH type and gestational age of 28-34 weeks (p=0.049) and type of LSCS (elective or emergency) (p=0.003) as shown in Table 1. Majority of the patients underwent LSCS for severe haemorrhage (56.99%) followed by Grade IV PP (19.35%), foetal distress (11.83%), bleeding PP (5.38%), Transverse lie (3.23%) and previous LSCS + APH (3.23%). On statistical analysis, there was no significant association between APH type and indications of LSCS (p>0.05).

Majority of the patients presented with bleeding PV (45.38%) followed by pre-eclamptic features (26.15%) and abdominal pain (9.23%) as depicted in Figure 1.

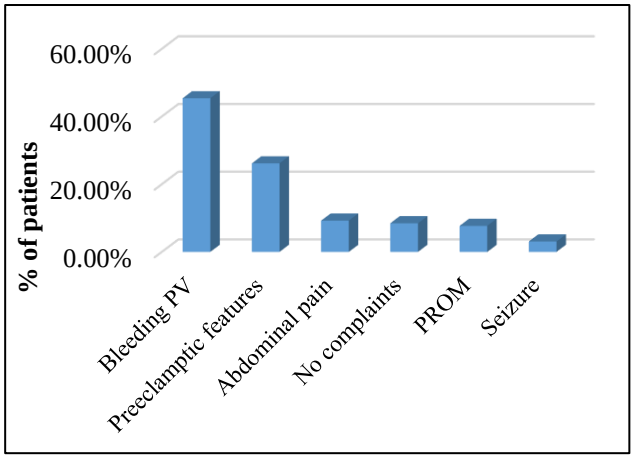

Figure 1: Distribution of patients according to chief presenting complaints.

There was significant association between APH type and previous PIH (p=0.016), previous LSCS (p=0.001), previous curettage (p=0.002), pre-eclampsia (p<0.0001), and previous APH (p=0.026), (Table 2).

Majority of the patients had normal FHS (40%) while, FHS were reduced in 25.38% of patients and absent in 34.62% patients. APH type was significantly associated with present and absent FHS (p<0.0001), while it was not significantly associated with reduced FHS (p=0.584). Foetal heart sounds were present in 52 (40%), reduced in 33 (25.38%) and absent in 45 (34.61%) patients.

Majority of the patients had haemoglobin in the range of 7-9.9 (51.54%). APH type was not significantly associated with haemoglobin levels (p=0.354). Patient frequently required transfusion of 1-2 units (37.69%) units of blood and blood products. APH type was significantly associated with units of blood transfused (p=0.008) shown in the Table 3.

Among various maternal outcomes evaluated, most common was anaemia (90%). There was a significant association between APH type and HELLP syndrome (p<0.0001), PPH (p=0.028) and DIC (p<0.0001). Among various modalities, most common was bilateral uterine artery ligation (46.15%) which found significant association with APH type (p=0.016) as shown in the Table 4.

Rate of maternal morality was 9.23% and most common causes of maternal mortality were renal failure and PPH (91.67% each). APH type was significantly associated with DIC (p=0.023) while it was not significantly associated with other causes of maternal mortality [renal failure (p>0.05), PPH (p>0.05), hypovolemic shock (p>0.05), HELLP (p>0.05), obstetric hysterectomy (p=0.679), and sepsis (p=0.408)].

Most common neonatal morbidities were birth weight of <2.5 kgs (84.32%) and NICU admission (27.61%). APH type was significantly associated with birth weight (p<0.0001). There was no significant association between APH type and other morbidities. Majority of the neonates were born live (56.72%) while, 36.57% were IUDs, 6.72% were still born, and 14.18% were neonatal deaths. APH type was significantly associated with live births and IUDs, (p<0.0001) as shown in Table 5.

DISCUSSION

In the present study, the overall incidence of APH was 1.09%. Moreover, the incidence of AP was 0.58%, PP was 0.42%, and UK was 0.09%. Similar to the findings of the present study, Sharmila et al reported an overall incidence of 3.8%. Moreover, the incidence of AP, PP and UK haemorrhage was 2.18%, 1.48% and 0.23% respectively.[10] In a study done by Kwawukume, the incidence of APH was found to be 1.2-1.8%.[11] It was reported to be 1.6% by Bako et al and Adegbola et al reported a lowest incidence of APH of 0.2%.[12,13] Jain et al reported an overall incidence of 2.43%. The incidence of PP, AP and UK haemorrhage was 1.31%, 0.82% and 0.29% respectively.[14] In another study, Arora et al observed 2.53% incidence of APH and the incidence of PP was 1.17%, AP was 0.63%, and UK haemorrhage was 0.52%.[15] The higher incidence of abruption and lower incidence of PP 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.[11,12] Moreover, majority of the study was performed during the COVID-19 pandemic, and this could have led to rise in incidence of APH.

Table 1: Association of APH type with age groups and obstetric characteristics.

Parameters			Total (%)	AP (%)	PP (%)	UK (%)	P value
Age groups (years)	<20		04 (3.08)	02 (2.89)	01 (2)	01 (9.09)	0.464
	20-24		22 (16.92)	11 (15.94)	08 (16)	03 (27.27)	0.633
	25-29		66 (50.77)	32 (46.38)	28 (56)	06 (54.55)	0.565
	30-35		28 (21.54)	18 (26.09)	10 (20)	00 (0)	0.440
	>35		10 (7.69)	06 (8.69)	03 (6)	01 (9.09)	0.848
Gestational age (weeks)	28–34		48 (36.92)	42 (60.87)	20 (40)	4 (36.36)	0.049
	>34-37		47 (36.15)	18 (26.09)	18 (36)	3 (27.27)	0.497
	≥37		35 (26.92)	9 (13.04)	12 (24)	4 (36.36)	0.105
Parity	Primigravida		37 (28.46)	24 (34.78)	10 (20)	3 (27.27)	0.210
	Multigravida		93 (71.54)	45 (65.22)	40 (80)	8 (72.73)	
Mode of delivery	Vagina, (n=37)	Spontaneous	20 (54.05)	15 (53.57)	1 (3.57)	1 (20)	0.203
		Induced	14 (37.84)	12 (42.86)	00 (0)	2 (40)	
		Instrumental	03 (8.11)	1 (3.57)	00 (0)	2 (40)	
	LSCS, (n=93)	Elective	17 (18.28)	2 (4.88)	15 (32.61)	00 (0)	0.003
		Emergency	76 (81.72)	39 (95.12)	31 (67.39)	6 (100)	

Table 2: Association between APH type and associated obstetric factors.

Obstetric factors	Total (%)	AP (%)	PP (%)	UK (%)	P value
H/o foetal loss	42 (32.31)	21 (30.43)	19 (38)	2 (18.18)	0.396
Previous PIH	20 (15.38)	16 (23.19)	2 (4)	2 (18.18)	0.016
Previous LSCS	42 (32.31)	15 (21.74)	26 (52)	1 (9.09)	0.001
Previous curettage	17 (13.08)	3 (4.35)	13 (26)	1 (9.09)	0.002
Previous APH	15 (11.54)	12 (17.81)	3 (6)	0 (0)	0.026
Pre-eclampsia in present pregnancy	59 (45.38)	53 (76.81)	3 (6)	3 (27.27)	<0.0001
Malpresentation	25 (19.23)	10 (14.49)	15 (30)	0 (0)	0.145
Multiple pregnancies	06 (4.62)	5 (7.25)	1 (2)	0 (0)	0.819

Table 3: Association of APH type with haemoglobin levels and units of blood and blood products transfused.

Parameters		Total (%)	AP (%)	PP (%)	UK (%)	P value
Haemoglobin levels (gm/dL)	≤ 6.9	24 (18.46)	16 (23.19)	7 (14)	1 (9.09)	0.354
	7-9.9	67 (51.54)	36 (52.17)	28 (56)	3 (27.27)	
	10-10.9	26 (20)	11 (15.94)	9 (18)	6 (54.55)	
	≥ 11	13 (10)	6 (8.69)	6 (12)	1 (9.09)	
Units of blood and blood products transfused	0	14 (10.77)	4 (5.79)	5 (10)	5 (45.45)	0.008
	1-2		20 (28.99)	27 (54)	2 (18.18)	
	3-4	27 (20.77)	19 (27.54)	5 (10)	3 (27.27)	
	>4	40 (30.77)	26 (37.68)	13 (26)	1 (9.09)	

Table 4: Association of APH type with maternal outcomes and modalities.

Variables	Total (%)	AP (%)	PP (%)	UK (%)	P value
Maternal outcome					
Anaemia	117 (90)	63 (93.10)	50 (100)	10 (90.90)	<0.0001
Atonic PPH	40 (30.77)	27 (39.13)	13 (26)	0 (0)	0.028
Haemorrhagic shock	27 (20.77)	16 (23.19)	11 (22)	0 (0)	0.470
Renal failure	27 (20.77)	17 (24.64)	10 (20)	0 (0)	0.114
HELLP	21 (16.15)	21 (30.43)	0 (0)	0 (0)	<0.0001
DIC	18 (13.85)	17 (24.64)	1 (2)	0 (0)	<0.0001
Sepsis	11 (8.46)	8 (11.59)	3 (6)	0 (0)	0.172
Retained placenta	06 (4.62)	3 (4.35)	3 (6)	0 (0)	0.987
Placenta accreta	04 (3.08)	0 (0)	4 (8)	0 (0)	NA
Maternal mortality	12 (9.23)	7 (10.14)	5 (10)	0 (0)	0.702

Continued.

Variables	Total (%)	AP (%)	PP (%)	UK (%)	P value
Modalities					
B/L UA ligation	60 (46.15)	28 (40.58)	32 (64)	0 (0.0%)	0.016
B-lynch suture	25 (19.23)	13 (18.84)	12 (24)	0 (0.0%)	0.758
Obstetric hysterectomy	13 (10)	6 (8.70)	7 (14)	0 (0.0%)	0.598
Bilateral IIA ligation	04 (3.08)	0 (0)	4 (8)	0 (0.0%)	NA

DIC: Disseminated intravascular coagulation; PPH: Postpartum haemorrhage; IIA: internal iliac artery; B/L UA ligation: Bilateral uterine artery ligation.

Table 5: Neonatal morbidities and outcomes.

Morbidities and outcomes		Total (%)	AP (%)	PP (%)	UK (%)	P value
Neonatal birth weight (kg)	<1.5	31 (23.13)	23 (31.94)	6 (11.76)	2 (18.18)	<0.0001
	1.5-2.5	82 (61.19)	47 (65.28)	30 (58.82)	5 (45.45)	
	>2.5	21 (15.67)	2 (2.78)	15 (29.41)	4 (36.36)	
Neonatal morbidity	NICU admission	37 (27.61)	22 (30.56)	11 (21.57)	4 (36.36)	0.435
	RDS	19 (14.18)	9 (12.50)	8 (15.69)	2 (18.18)	0.816
	Birth asphyxia	22 (16.42)	11 (15.28)	10 (19.61)	1 (9.09)	0.645
	Septicaemia	16 (11.94)	9 (12.50)	4 (7.84)	3 (27.27)	0.193
	Neonatal jaundice	12 (8.96)	4 (5.56)	5 (9.80)	3 (27.27)	0.061
Neonatal outcome	Live birth	76 (56.72)	26 (36.11)	40 (78.43)	10 (90.91)	<0.0001
	IUD	49 (36.57)	40 (55.56)	8 (15.69)	1 (9.09)	<0.0001
	Still born	09 (6.72)	7 (9.72)	2 (3.92)	0 (0)	0.134
	Neonatal death	19 (14.18)	9 (12.50)	7 (13.73)	3 (27.27)	0.422

RDS: Respiratory distress syndrome; IUD: Intrauterine device

Table 6: Comparison of incidence of APH between present study and previous studies.

Previous studies	Incidence of APH (%)			
	Total	**AP**	**PP**	**UK**
Arora et al (2001)[15]	2.53	0.63	1.17	0.52
Bako et al (2008)[12]	1.6	0.69	0.81	-
Jain et al (2016)[14]	2.43	0.82	1.31	0.29
Sharmila et al (2016)[10]	3.8	2.18	1.48	0.23
Present study	10.9	0.58	0.42	0.09

Table 7: Comparison of maternal outcome between present study and previous studies.

Maternal outcomes	Rathi et al (2010)[24] (%)	Rajini et al (2016)[27] (%)	Das et al (2020)[23] (%)	Present study (%)
Anaemia	35	42.7	-	90
B/L uterine artery ligation	-	-	-	46.15
Atonic PPH	39	13.6	9.8	30.77
Renal failure	10	1.8	0.9	20.77
Haemorrhagic shock	22	29.1	-	20.77
Maternal mortality	3	1.8	0.9	9.23

Table 8: Comparison of neonatal outcome between present study and previous studies.

Neonatal morbidity	Sharmila et al (2016)[10] (%)	Samal et al (2017)[29] (%)	Chandnani et al (2019)[28] (%)	Das et al (2020)[23] (%)	Present study (%)
Birth weight < 2.5 kgs	74	66.5	-	-	84.32
NICU admission	8.5	50.4	-	-	27.61
Birth asphyxia	-	-	23.8	-	16.42
RDS	5.7	-	7.1	3.5	14.18
Septicaemia	-	-	13.1	7	11.94
Neonatal jaundice	5.4	-	29.8	14	8.96

The incidence of APH was highest (50.77%) in the age group 25-29 years followed by 30-35years (21.54%) which is in concordant with the study conducted by Kulkarni et al and Yadav et al.[16,17] The maximum patients had rural area of residence (67.69%), were booked (54.62%), and belonged to the lower SE class (60.77%). Most of the patients had gestational age of 28-34 (36.92%) and >34-37 (36.15%) followed by ≥37 weeks (26.92%). These results are comparable with the previous studies.[18,19] Majority of the patients underwent LSCS (71.54%), of which most were emergency type (81.72%). The incidence of LSCS in patients with PP was 90% and in patients with AP was 59.42%. Moreover, a significant association was observed between PP and type of LSCS (p=0.003). These findings are comparable with the study conducted by Yadav et al and Khouri et al.[17,20]

Foetal heart sounds indicate foetal well-being. Absence of FHS or evidence of foetal distress was important in gauging the condition of foetus and the obstetric management of patient partially depended on this. In the present study, majority of patients had normal FHS (40%), while FHS were reduced in 25.38% and absent in 34.62% of patients. However, significantly greater number of patients with AP (52.17%) than PP (16%) had absent FHS at admission (p=0.002). Thus, patients with AP have significantly reduced FHS and thus, higher chances of still birth. These results are similar to that of Lakshmipriya et al.[8]

APH was mostly observed in multigravida patients (71.54%) which is comparable with the study conducted by Yadav et al.[17] No significant association was observed between causes of APH and parity (p=0.210). This confirming the role of endometrial damage caused by repeated childbirth, a risk factor for uteroplacental bleeding in pregnancy. Previous LSCS, and abortion increases the risk of PP because of decreased vascularity seen in fibrosed tissue. In the present study, history of previous LSCS and curettage was present in 42 (32.31%) and 17 (13.08%) patients, respectively. Moreover, 52% with PP had previous LSCS and 26% had curettage and a significant association was observed between PP and previous LSCS (p=0.001) and previous curettage (p=0.002). Similar findings are reported in other studies.[9,21] History of previous PIH was present in 20 (15.38%) patients and it was significant higher in patients with AP (23.19%) than those with PP (4%) (p=0.016) which is comparable with the study done by Wasnik et al.[3] Pre-eclampsia was present in 59 (45.38%) patients. It was commonest in AP (76.81%) and a significant association was observed between causes of APH and pre-eclampsia (p<0.0001). This is in agreement with study conducted by Kedar et al[9] and Hamadameen et al.[22] History of previous APH was present in 15 (11.54%) patients and a significant association was observed between AP and previous APH (p=0.026). Malpresentation was present in 25 (19.23%) patients. Moreover, there was no significant association between causes of APH and malpresentation (p=0.145). This is consistent with the earlier studies.[15,22]

Anaemia found to be an important risk factor for all types of APH. However, no significant association was observed between causes of APH and Hb levels (p=0.354). 89.23% patients required blood transfusion. Moreover, majority of them required 1-2 units (37.69%) of blood transfusion followed >4 units (30.77%). AP significantly associated with ≥3 units of blood transfusion (p=0.008). Similar results reported in study done by Hamadameen et al.[22]

The most common maternal outcomes were anaemia (90%) followed by bilateral uterine artery ligation (46.15%), atonic PPH (30.77%), renal failure (20.77%), and haemorrhagic shock (20.77%). Moreover, rate of maternal morality was 9.23%. Other studies have reported comparatively less maternal morbidity.[23,24] This could be due large sample size and presence of women with high risk factor in the present study. Among various maternal outcomes, AP was significantly associated with HELLP infection (p<0.0001), PPH (p=0.028), and DIC (p<0.0001). While PP was significantly associated with bilateral uterine artery ligation (p=0.016). These findings are comparable with the earlier studies.[25,26] Other studies have reported comparatively less maternal morbidity. This could be due large sample size and presence of women with high risk factor in the present study (Table 7).

The most common neonatal morbidity was birth asphyxia (16.42%) followed by RDS (14.18%), septicaemia (11.94%), and neonatal jaundice (8.96%). No significant association was observed between causes of APH and RDS (p=0.816), birth asphyxia (p=0.645), septicaemia (p=0.193), and neonatal jaundice (p=0.061). Similar findings are reported in previous studies.[17,23] Most of the neonates had birth weight of <2.5 kgs (84.32%). Low birth weight was significantly greater among neonates born to women with AP (97.22%) than those born to women with PP (70.58%), (p<0.0001)). 37 (27.61%) neonates required NICU admission. However, there was no significant association between causes of APH and NICU admission (p=0.435). These results are in accordance with the study conducted by Das et al and Chandnani et al.[27,28] Of the neonates that died, majority were IUD (36.57%) followed by neonatal deaths (14.18%) and still born (6.72%). Thus, the perinatal mortality was 20.89%. A statistically significant association was observed between causes of APH and IUDs (p<0.0001). There was no significant association between causes of APH and still birth (p=0.134) and neonatal death (p=0.422). Similar results are found in other studies.[22,24,28]

Limitation

The main limitation was a small sample size of the study. The intended sample size was greater than three hundred.

However, because the study was done during the COVID period, from the January 2020 to June 2021, a smaller sample size was used in the current study.

CONCLUSION

From the present study, it can be concluded that APH is still a leading cause of maternal morbidity and mortality. It needs to be highlighted that majority of the cases of present study were enrolled during the COVID-19 pandemic. Moreover, majority of the patients were booked at other centres and were presented late with complications at the time of admission. Both these factors have contributed significantly to the incidence of APH as well as maternal and perinatal morbidity and mortality. The commonest APH type was AP followed by PP. Anaemia and low birth weight were the most common maternal and neonatal morbidities, respectively.

Recommendations

All the pregnant women and their relatives should be aware of regular antenatal check-up, iron and folic acid supplementation, adequate nutrition, correction of anaemia during antenatal period, importance of institutional delivery, family planning and immunization. Regular training of medical officers, ANM, Asha workers, midwives, Anganwadi workers to be given to diagnose the cases of APH during antenatal period and early referral should be arranged to the higher centre with free transport facility. Especially in cases of PP, senior obstetrician and anaesthetist must be available during delivery. Hence timely referral, timely caesarean section, liberal blood transfusion, correction of anaemia and wider acceptance of different modalities with expectant line of management in tertiary centre with availability of blood transfusion and good neonatal intensive care unit will help further to lower the perinatal and maternal morbidity and mortality. However, various government programme including recent Pradhanmantri Surakshit Matritva Abhiyan and previous scheme like Janani Suraksha Yojana should be followed.

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