MATERNAL MORBIDITY AND MORTALITY DUE TO PRIMARY PPH– EXPERIENCE AT AYUB TEACHING HOSPITAL ABBOTTABAD

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Background: Postpartum Haemorrhage (PPH) remains a significant cause of maternal mortality and morbidity like hypovolemic shock, anaemia, multi organ failure, consumptive coagulopathy, disseminated intra vascular coagulation (DIC), blood transfusion related complications and hysterectomy leading to loss of childbearing potential. The present study was conducted to determine the frequency of PPH and the associated maternal morbidity at the Department of Gynaecology Unit 'B', Ayub Teaching Hospital Abbottabad. **Methods:** The study was carried out in the Department of Obstetrics and Gynaecology Unit B of the Ayub teaching Hospital Abbottabad from 18th April 2006 to 17 July 2006. The study population included all cases admitted with primary PPH during the study period. For calculation of frequencies, the total number of deliveries in the setting during the study period was used. All subjects underwent a complete obstetrical clinical workup comprising of history, general physical examination, abdominal and pelvic examination, relevant laboratory investigations. The maternal condition was assessed and managed according to established hospital protocols which included both pharmacological and surgical intervention. All maternal complications were noted and recorded on pre-designed proformas. Data was entered and analyzed by computer. **Results:** A total of 50 cases of primary PPH were recorded during the study period. The frequency of PPH was calculated as 7.1%. The major cause of PPH was uterine atony found in 29 (58%) cases, followed by cervical, vaginal and perineal tears in 12 (24%) cases. Initially all patients were managed pharmacologically followed by surgical intervention. Subtotal (haemostatic) hysterectomy was performed in 10 (20%) cases. Maternal morbidity was detected in 31 (62%) of cases; the major morbidities were DIC in 3 (6%) cases, Acute renal failure in 3 (6%) patients and shock in 2 (9.9%) cases and anaemia in 20 (90.1%) cases. **Conclusion:** The study concludes that the frequency of primary PPH in this setting is in keeping with globally cited frequencies. Other findings such as causes of primary PPH and maternal morbidity data also agree with most national and international studies on this topic.

Keywords: Postpartum Haemorrhage, Maternal Morbidity, Ante-partum Haemorrhage, Disseminated Intravascular Coagulation, Uterine Atony.

INTRODUCTION

Postpartum haemorrhage is defined as blood loss greater than 500 ml in vaginal delivery and greater than 1000 ml in caesarean delivery or any amount of blood loss that threatens the haemodynamic stability of the women or 10% fall in haematocrit.[1,2] Loss of these amounts within 24 hours is called primary PPH and after 24 hours is called secondary PPH.[2–4] Massive PPH is defined as estimated blood loss of more than 1500 ml within 24 hours of delivery.[5] The incidence of standard PPH, i.e., more than 500 ml blood loss and massive PPH, i.e., more than 1500 ml is 90% and 4.2% respectively.[6] The incidence of PPH following vaginal delivery is 5–8%.[7,8]

Frequency of PPH is related to the management of 3rd stage of labour. Several randomized trails in industrialized countries indicates prevalence rate of PPH of more than 500 ml 5% when active management is done verses 13% when no management is done. Prevalence rate of PPH of more than 1000 ml is 1% when active management is done verses 3% when no management is done.[2]

In a study carried out during 4 years period from 1994 to 1997 in Women and Children Teaching Hospital, Abbottabad MMR was 9.46/1000 live births (LB) and the main cause of death was haemorrhage accounting 27%.[9] Maternal Mortality Rate (MMR) in India is estimated as 560/100000 LB and PPH accounting for 35–56% of these death.[11] In the developing countries PPH is leading cause of maternal death and effects one percent of pregnant women, while in developed countries maternal mortality is 100 folds lower but PPH remains cause of maternal deaths for about 10 women per 100,000 births.[4,11]

The causes of PPH include uterine atony (most common 65%), Genital tract trauma 33%, Retained placenta 27%, Co-agulation disorders and Uterine rupture.[1,2,8,13,14]

Risk factors for PPH include prolong 3rd stage of labour, prolong labour or augmented labour, pre eclampsia, PPH in previous delivery, multiple gestations, multiparity, pregnancy induced hypertension, abruptio placenta, chorioamnionitis, analgesia or anaesthesia, macrosomic baby, polyhydramnios, magnesium sulphate use, arrest of decent, instrumental delivery, previous caesarean section scars, caesarean section, placenta previa, absence of prenatal care and Asian or Hispanic ethnicity.[1-7,12,14]

PPH remains a significant source of morbidity and other maternal complication, i.e., hypovolemic shock,

anaemia multi organ failure associated with circulatory collapse, disseminated intra vascular coagulation (DIC), blood transfusion and transfusion complications, hysterectomy and loss of child bearing potential, need for emergent intervention and potential complications, Sheehan's syndrome secondary to ischemia of hypertrophied pituitary, Asherman's syndrome secondary to multiple sutures through uterus for controlling PPH or vigorous curettage.[1,2,7,15–17]

Active management of 3rd stage of labour is proven to reduce the incidence of PPH. If effective measures are taken to ensure provision of antenatal care to all pregnant ladies, safe home and hospital deliveries and timely referral of such cases to appropriate facilities, can reduce the maternal complications. Proper awareness and availability of contraception is mandatory to reduce maternal morbidity and mortality due to this cause.[14]

Postpartum haemorrhage is very frequently seen in our population however local work on this important condition is very sparse. Few studies have reported maternal morbidity and mortality associated with this condition. No work has been done in our setup. This study was undertaken to observe maternal morbidity and mortality due to primary PPH in Gynaecology 'B' unit of Ayub Teaching Hospital, Abbottabad. The data on primary PPH presentation and management outcome will help to improve maternal morbidity and mortality by identifying high-risk cases in antenatal period, counselling of high-risk cases for hospital delivery and planned prompt management of established PPH.

MATERIAL AND METHODS

This study was conducted in Obstetrics and Gynaecology 'B' unit of Ayub Teaching Hospital Abbottabad. This study was conducted for a period of six months from 18th January 2006 to 17th July 2006.A total of 50 cases of postpartum haemorrhage were admitted during the study period and were included in the study. Patients were selected from all patients admitted for delivery and ending up in primary PPH, or presenting with primary postpartum haemorrhage in out patient department (OPD), casualty department or as referral from other practicing Gynaecologists. All study subjects underwent a complete obstetrical clinical workup including history, general physical examination and systemic examination especially per abdomen examination and vaginal examination. Diagnosis of postpartum haemorrhage was made clinically based on the findings of pelvic examination, condition of uterus and amount of bleeding. Relevant laboratory investigations were carried out. Blood was also sent for cross matching. Patients were evaluated for the presence of shock anaemia, disseminated intravascular coagulation (DIC), renal failure and any additional complication. After initial assessment of the patients, emergency care was provided according to the condition of the patients. Further management of the patients was modified according to the condition of mother and under lying cause based on the management protocol for primary postpartum haemorrhage. All data was collected on predesigned proformas and entered into the computer program SPSS, version 11 and descriptive statistics were used to calculate frequencies, proportion, mean and standard deviation. The Chi-square test was used to test for significant differences of frequencies between groups; the students *t*-test was used for significant difference of means between groups. A p value ≤ 0.5 was considered significant.

RESULTS

A total of 50 cases of PPH were recorded during the study period from January 18, 2006 to July 18, 2006. During this study period a total of 705 cases were admitted for deliveries, thus giving a frequency of 7.1% for PPH.

Ages of patients ranged from 15–45 years, with a mean age of 30.10±5.81 years. One (2%) case was in the 15–20 years age group, 17 (34%) cases were between age group of 21–25 years, 13 (26%) cases in 26–30 years, 10 (20%) cases in 31–35 years, 8 (16%) cases in 36–40 years and only 1 case (2%) was in the 41–45 years age.

Gestational age of patients ranged between 25–45 weeks with mean gestational age of 43.62±20.95 weeks. Four (8%) cases in 25–30 weeks group, 7 (14%) cases in 31–35 week group, 30 (60%) cases in 36–40 weeks group, (3.6%) cases in 41–45 weeks group and 6 (12%) cases presented with PPH who delivered some where else (postnatal group).

Parity of the patients ranged from 0–11 with the mean parity of 3.44±2.78. Nine (18%) cases were nulliparous, 22 (44%) cases having parity 1–4, 18 (36%) cases having parity 5–8 and only one case (2%) having parity more than 8.

Antenatal checkups range from 0–12 with mean antenatal checkups of 2.0±3.07. Majority of patients 29 (58%) had no antenatal check up, 12 (24%) cases had 1–4 checkups, 5 (10%) cases had 5–8 checkups and 4 (8%) cases had 9–12 antenatal checkups.

Twenty-eight (56%) cases presented in labour, 13 (26%) cases presented with antepartum haemorrhage, 3 (6%) cases presented with pre eclampsia and 6 (12%) cases presented with PPH after delivering in home or in private setup.

Twenty (40%) cases were mildly anaemic, 13 (26%) cases had moderate anaemia, while 11 (22%) cases had severe anaemia.

Haemoglobin of patients ranged from 4–12 gm/dl with mean haemoglobin of 8.90±1.71 gm/dl. Haemoglobin distribution showed 6 (12%) cases to be in 4–6 gm/dl groups, 4 (8%) cases to be in 6.1–8.0 gm/dl

group, 30 (60%) cases to be in 8.1–10.0 gm/dl group and 10 (20%) cases to be in 10.1–12.0 gm/dl group.

Blood urea results showed mean blood urea of 6.78±36.36 mg/dl. Forty-six (92%) cases had normal blood urea and 4 (8%) cases had raised urea.

Serum creatinine results showed a mean creatinine level of 0.97±1.24 mg/dl. Forty-six (92%) cases had normal serum creatinine and 4 (8%) cases had raised serum creatinine.

Duration of labour/ induction of labour and mode of delivery are shown in Table-1. Duration of labour ranged from 4–30 Hrs with the mean duration of labour of 12.15±6.23 Hrs. Twenty-three(53.5%) cases had duration of labour less then 10 Hrs, 15 (34.9%) cases had duration of labour of 11–20 Hrs and 5 (11.6%) cases had duration of labour of 21–30 Hrs.

Table-1: Delivery and operative data of patients (n=50)

Variables	Number	%	Mean±SD
Duration of labour (hrs)	**(43)**		
< 10	23	53.5	12.15±6.23
11 – 20	15	34.9	
21 – 30	5	11.6	
Induction/Augmentation of labour	**(50)**		
Done	10	20	-
Not done	40	80	
Mode of delivery	**(50)**		
Vaginal	23	46	
Vaginal with episiotomy	6	12	-
Operative vaginal	2	4	
Caesarean	19	38	

In 10 (20%) cases Induction/Augmentation of labour was needed but in 40 (80%) cases it was not. Twenty (46%) cases were delivered vaginally, 6 (12%) cases delivered by vaginal delivery with episiotomy, 2 (4%) cases had operative vaginal delivery and 19 (38%) cases had caesarean section.

Causes of PPH are shown in Table-2. The most common cause of PPH was uterine atony 29 (58%) cases followed by cervical, vaginal, perineal tears 12 (24%) cases, retained placenta and abnormal placentae (placenta accreta) 3 (6%) cases each. In 3 (6%) cases there were combined causes that are uterine atony and tears 2 (66.7%) cases followed by retained placenta and tears 1 (33.3%) cases.

Table-2: Causes of Post Partum Haemorrhage (PPH) in patients (n=50)

Causes	Number	%
Uterine atony	29	58.0
Cervical, Vaginal, Perineal tears	12	24.0
Retained placenta	3	6.0
Abnormal placentae	3	6.0
Combined	**(3)**	**(6.0)**
Uterine atony and tears	2	66.7
Retained placenta and	1	33.3
Tears	1	33.3

The patients ending up with PPH under went caesarean section with the indication of ante-partum haemorrhage 8 (42.1%) cases, foetal macrosomia/CPD 6 (37.6%) cases, Obstructed labour/failure to progress 4 (21.1%) cases, and Pre-eclampsia 1 (5.2%) cases.

Management options of patients with PPH are shown in Table-3. Forty-seven (94%) cases were managed pharmacologically, 3 (6%) cases had no pharmacological management. Forty-nine (98%) cases were managed surgically and one case had no surgical management.

Table-3: Pharmacological and surgical management options of patients (n=50)

Management	Number	%
Pharmacological		
Yes	47	94.0
No	3	6.0
Surgical		
Yes	49	98.0
No	1	2.0
Surgical Management	**(49)**	
Uterine massage	11	22.4
Tear repair	10	20.4
STH	10	20.4
Uterine exploration	6	12.2
Uterine artery ligation with B Lynch application	3	6.1
Combined	**(9)**	**(18.4)**
Uterine artery ligation + STH	3	33.3
Uterine massage + tear repair	2	22.2
Tear repair + uterine exploration	2	22.2
Uterine massage + exploration	2	22.2
Blood Transfusions given (units)		
0	16	32.0
1–3	24	48.0
4–6	9	18.0
>6	1	2.0

In surgical management (49 cases) uterine massage was done in 11 (22.4%) cases, Tear repair in 10 (20.4%) cases, subtotal hysterectomy in 10 (20.4%) cases, Uterine exploration in 6 (12.2%) cases and Uterine artery ligation with B-Lynch application in 3 (6.1%) cases. Some of the patients 9 (18.4%) cases had combined surgical options that is more than one surgical technique were applied. Uterine artery ligation and subtotal hysterectomy together in 3 (33.3%) cases, Uterine massage + tear repair in 2 (22.2%) cases, Tear repair + uterine exploration 2 (22.2%) cases and Uterine massage + exploration in 2 (22.2%) cases.

No blood transfusion was given in 16 (32%) cases, 1–3 units blood was given in 24 (48%) cases, 4–6 units blood was given in 9 (18%) cases and more than 6 unit of blood was given in one (2%) cases.

Maternal outcome is shown in Table-4. There was no maternal morbidity in 19 (38%) cases. Anaemia in 20 (40%) cases, acute renal failure in 2 (4%) cases and DIC in 1 (2%) cases. In some of the patients 8 (16%) cases, there were combined morbidity. Shock plus Anaemia in 2 (25%) cases, Anaemia plus DIC in 5 (62.5%) cases and anaemia, DIC and Acute renal failure in 1 (12.5%) cases. There was no maternal mortality.

Table-4: Maternal and foetal outcome in patients (n=50)

Outcome	Number	%
Maternal morbidity		
Normal	19	38.0
Anaemia	20	40.0
Acute renal failure	2	4.0
DIC	1	2.0
Combined	**(8)**	**(16.0)**
Shock + anaemia	2	25.0
Anaemia + DIC	5	62.5
Anaemia + DIC + ARF	1	12.5
Mortality Maternal		
Yes	-	-
No	50	100
Foetal		
Yes	18	36.0
No	32	64.0
Type of foetal mortality		
Intrauterine death	15	83.3
Early neonatal death	3	16.7

DISCUSSION

The result of the present study indicate a frequency of approximately 7% for PPH which is within the expected range of 5 to 8 % quoted in global literature.[7] PPH was not associated with any maternal mortality. Major maternal morbidity was DIC (66%) and acute renal failure in 3 (33.3%) cases (Table-4). Minor morbidity but most commonly occurring was anaemia 20 cases (40%). The only other national study[18] conducted in Quetta, Pakistan from January 1993 to December 1996 on 13,850 deliveries, showed a PPH frequency of 2.4%, which is quite low as compared to global figures, and the findings of the present study. The reasons for this low incidence were not mentioned in above study; however, the duration of study, nature of population, referral biases and natural tendencies may have contributed to the marked variation in frequency figures.

Regarding possible aetiologies for primary PPH, the main cause of PPH in this study was uterine atony with a frequency of 58% (29 cases) (Table-2). Another local study[14] conducted in Rawalpindi, Pakistan, also stated uterine atony as the most common cause of PPH, found in 65% cases. The association of uterine atony with PPH has been mentioned in other studies.[1,19–21] In another national study,[18] uterine atony was found in 34% of cases. In international studies uterine atony was the most common cause of PPH, ranging from 50%[7] to 76%[28] of cases.

Some factors possibly contributing to uterine atony deserve mention. In this study, the number of antenatal checkups were significantly less in the atony group as compared to non-atony group (p=0.002). Similarly the number of caesarean sections performed in patients with atony were significantly more as compared to the non-atony group (p=0.02), reflecting the greater number of patients presenting with APH leading to atony. The number of blood transfusion was more in patients with atony as compared to the non-atony group (p=0.039) indicating the greater magnitude of anaemic patients requiring treatment.

Table-5: Distribution of significant differences between APH and non-APH groups.

Variables	APH group (n=13)	Non-APH group (n=37)	*P* value
Age in years (Mean±SD)	33.85±5.5	28.78 ± 5.38	0.006
Gestational ages (wks)			
25–30	4 (30.7%)	-	
31–35	6 (46.2%)	1 (2.7%)	
36–40	3 (23.1%)	27 (73.0%)	0.003
41–45	-	3 (8.1%)	
Postnatal	-	6 (16.2%)	
Mean±SD	32.38±3.62	47.57±23.05	0.023
Parity (Mean±SD)	4.92±2.1	2.92±2.82	0.024
Hb (g/dl) (Mean±SD)	7.74±2.49	9.30±1.12	0.004
PT (Sec.) (Mean±SD)	24.62±17.83	16.86±2.94	0.013
APTT (Sec.) Mean±SD)	45.23±22.64	35.92±2.60	0.016
Blood Transfusions given (units)			
0	-	16	
1–3	8	16	0.017
4–6	5	4	
>6	-	1	
(Mean±SD)	3.23±1.58	1.49±2.11	0.009

Table-6: Distribution of significant differences of caesarean section and outcome between APH and non-APH groups

Variables	APH group (n=13)	Non-APH group (n=37)	*p*-value
Caesarean section			
No	5	26	0.042
Yes	8	11	
Indications for C-S			
APH	8	-	
Macrosomia / CPD	-	5	
Obstructed labour / Failure	-	4	0.002
to progress	-	1	
Pre eclampsia			
Maternal morbidity			
Normal	1	18	
Anaemia	7	13	
Acute renal failure	1	1	
DIC	1	-	0.05
Combined			
Shock + anaemia	-	2	
Anaemia + DIC	2	3	
Anaemia + DIC + ARF	1	-	
Foetal Mortality			
No	3	29	<0.001
Yes	10	8	

Regarding the management of PPH in patients with atony, there was a greater need for surgical intervention measures, so that sub total hysterectomies and uterine massage were required far more frequently in the atony group as compared to the non-atony group (p<0.001), which is highly significant. Foetal mortality was greater in atony group as compared to the non-atony group (p=0.003); this poor foetal outcome was possibly

secondary to APH (Abruption), which constituted the most common cause of uterine atony.

Moreover, the greater percentage of sub-total hysterectomies in the atony group may have contributed to the higher percentage of maternal morbidity in this group.

The second most common cause of primary PPH was vaginal, cervical and perineal tears (24%) (Table-2). Another local study[14] also mentioned traumatic lesions as the second commonest cause of PPH occurring in 33% of cases. International studies also mention a higher frequency of traumatic lesions as the cause of PPH, ranging from 9%[22] to 20%[7] of cases.

Retained placenta occurred in 6% (Table-2) of cases while a local study from Rawalpindi, Pakistan[14] mentioned 27% frequency of retained placenta. According to one national study in Quetta, Pakistan[18] the frequency of retained placenta was 37%, as compared to 5 to 10% quoted in the international literature.[7] This difference merely indicates a referral bias, as all cases were those referred after home deliveries or from private clinics and no case of retained placenta occurred in hospital deliveries. Abnormally adherent placenta occurred in 6% of cases causing PPH.

Demographic profiles of patients with PPH also provided meaningful data. Subjects had a lower age profile as compared to the international figures. The mean age of patients was 30.10±51.81 years, with the highest number of cases 17 (34%) falling in the 21–25 years age group, while other studies[7,21] mention most cases being over 35 years. In the present study, the majority of patients 41 (82%) were of age 35 or below. The reason for this difference perhaps lies in the younger age of marriage in our country in general associated with the relative increased gravidity and parity at younger ages.

Parity of patient is another risk factor in many studies.[3,5,9,18,24] Mumin *et al*[24] mentioned a three-fold increased risk of PPH in grand multiparous patients as compared to non-grand multiparous patients. Multiparity, particularly grand multiparity has been specified as a factor predisposing to increase frequency of PPH.[3,5,9,18,24] The number of multipara females in this study was 41 (82%), while primigravida were only 9 (18%); of multiparous females 22 (44%) patients were in the 1–4 children group, 18 (36%) were grand multiparas (more than 4 children) and one patient was in the parity group of more than 8 children. Thus the present study would tend to support multiparity as a risk factor for PPH.

Most patients presented in labour 28 (56%), while 13 (26%) patients presented with APH; 3 (6%) patients presented with complaints of pre eclampsia and had caesarean delivery later on, while 6 (12%) patients presented with PPH after delivery at home or at some private setup (postnatal presentation). The presentation of patients with APH is markedly high if compared with about 14.6% quoted in the literature[23] and may reflect the relative lack of antenatal checkups in our patients. Haemorrhage during pregnancy is a risk factor for PPH.[7] Pre eclampsia is another risk factor for PPH.[1,18]

Twenty-nine (58%) patients who had PPH were un-booked and referred from emergency department; thus this study had more un-booked patients presenting with PPH, as is also mentioned in other studies.[4,9,25,26]

Forty-four (88%) patients had anaemia. Out of these, 20 (45.5%) had mild anaemia, 13 (29.5%) had moderate anaemia, while severe anaemia was present in 11 (25%) cases. Anaemia is a major risk factor for PPH.[7,27] The high frequency of maternal anaemia is reflective of underlying chronic nutritional deficit, which is common in our country.

The mode of delivery also determines the risk for PPH. Total number of vaginal deliveries occurred in 31 (62%) cases (Table-1). Spontaneous vaginal deliveries were 23 (46%); vaginal deliveries with episiotomy were 6 (12%) and operative vaginal deliveries were 2 (4%). Caesarean sections were performed in 19 (38%) cases. The risk of PPH increases with caesarean deliveries as mentioned in many studies[2,12,22] and this risk also increases with operative vaginal deliveries[1,7] but in our study the frequency of vaginal delivery is greater as compared to caesarean section. The reason for this variation is probably due to less number of antenatal checkups and high frequency (91.2%) of anaemic patients. Regarding the cause of PPH in vaginal delivery group, uterine atony had highest frequency (56.5%) followed by tears (34.7%). The frequency of retained placenta was (17.3%).

APH, macrosomia, CPD, obstructed labour, pre-eclampsia and failure to progress are all risk factors for PPH. As mentioned in many studies[5,14,23,28] the frequency of PPH is more in patients with APH (Abruption placenta and Placenta previa). One of the local studies in Women and Children Hospital, Kohat[23] showed an incidence of PPH in 22 (14.75%) cases of APH. In an international study conducted in UK[5], PPH occurred in 12 (8%) cases of APH .

Significant differences were noted between the APH and non-APH groups as shown in Tables-5 and 6. Overall the APH group patients were of an older age group (33.85±5.5 years vs 28.78±5.38 years, p=0.006), presented at an earlier gestational age (32.38±3.62 weeks vs 47.57±23.05 weeks, p=0.023) and had a higher parity (4.92±2.1 vs 2.92±2.8, p=0.024). Multiparity has been reported as a risk factor for APH, as reported in some studies.[5,14,23] The clinical profile showed that the APH patients were significantly more anaemic than the non APH patients (Hb% 7.74±2.49 vs 9.30±1.12, p=0.004), with increased PT (24.62±17.83 Sec. vs 16.86±2.94 Sec., p=0.013), APTT (45.23±22.64 Sec. vs 35.92±2.60 Sec., p=0.016) and required more blood transfusions (3.23±1.58 units vs 1.49±2.11 units, p=0.009). This not only reflects their disease profile (underlying abruptio placentae in all cases of APH except one in which the

cause was placenta previa), but also increases their risk of uterine atony and PPH.

Out of total 13 cases of APH, 8 patients had caesarean section while 5 delivered vaginally. In non-APH group 11 out of 37 patients had caesarean section and 26 delivered vaginally (Table-6); this difference in the mode of delivery between APH and non APH groups is statically significant (p=0.042) and reflects the greater number of vaginal deliveries in the non APH group of patients. Morbidity was greater in APH patients as compared to non APH patients, that is 12 out of 13 cases (92%) in APH group as compared to 19 out of 37 patients (51.3%) in the non APH group, which is statistically significant (p=0.05). However, the distribution of the type of morbidity between the two groups was not significant.

Pharmacological management was done in 47 (94%) cases followed by surgical management which was needed in 49 (98.0%) cases with one case of abruption needing only pharmacological management (Table-3); the 3 cases with no pharmacological management had direct sub total hysterectomies due to couvelair uterus. This denotes a routine management of cases of PPH.

Maternal outcome figures as shown in Table-4 indicate that the majority (31 cases, 62%) of mothers suffered some type of morbidity. Twenty (40%) patients had anaemia, 2 (4%) patients had acute renal failure, 1 (2%) had DIC and 8 (16%) patients had combined morbidity, i.e., shock plus anaemia occurring in 2 (25%) cases, anaemia plus DIC occurring in 5 (62.5%) cases and DIC with Anaemia and Acute renal failure in 1 (12.5%) case. It is reasonable to pinpoint underlying maternal anaemia as a major contributory factor to maternal morbidity.

Distribution of maternal morbidity in terms of the causes of PPH indicates that uterine atony was the major factor determining morbidity (14 cases, 35%), followed by cervical, vaginal and perineal tears (4 cases, 10%).

PPH has been reported as a significant source of maternal morbidity, severe anaemia, coagulation disorders and need for blood transfusion and haemostatic hysterectomies[11,17] findings of the present study also tend to agree with such studies.

There is no doubt that primary PPH represent a potentially serious obstetrical problem that can lead to major maternal morbidity. Based upon present study it can be said that the frequency of primary PPH in our setting is almost equivalent to global frequency.

PPH has as major contributing factors, lack of antenatal care and maternal anaemia leading to APH; lesser contributions to PPH include IUD and multiparity.

Despite prompt and standardized pharmacological and surgical management protocols, a sizeable majority of patients suffer morbidity, of which anaemia alone or combined with DIC forms the biggest proportion.

If effective measures are taken to ensure provision of antenatal care to all pregnant ladies, safe home/hospital deliveries and timely referral of high-risk cases to appropriate facilities, maternal complications are expected to be reduced.

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