

Original Research Article

Study the incidence, management and outcome of primary postpartum hemorrhage in a tertiary care hospital

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Received: 16 September 2022

Revised: 07 October 2022

Accepted: 10 October 2022

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ABSTRACT

Background. Postpartum hemorrhage (PPH) is a major cause of serious maternal morbidity and mortality worldwide. To avoid the same, it is essential to find out avoidable factors and to reduce their consequences. So, the present study is taken to see the incidence, management and outcome of primary PPH in a tertiary care centre. Objective of current study was to study the incidence, management and outcome of primary PPH in a tertiary care hospital.

Methods: This observational cross-sectional study was conducted in a tertiary care hospital over a period of one year. A total of 200 patients developing primary PPH after delivery were divided into two groups-Group A: Patients with primary atonic PPH and Group B: Patients with traumatic PPH.

Results: The incidence of primary PPH in our study came out to be 8.3%. Most of the cases were in the age group of 26 -30 years. 84% of the patients belonged to rural areas. 72.5% of patients had hemoglobin levels below 9g%. The main cause of PPH in our study was uterine atony with an incidence of 73% followed by traumatic PPH in 24% cases. Cesarean sections constitute about 55% cases whereas spontaneous vaginal delivery constitutes 45% cases. Primary PPH was noted in 60% cases that underwent induction of labor followed by 28.9% having augmented labor and 11.1% had spontaneous onset of labor.

Conclusions: Every pregnancy should culminate in a healthy mother and healthy baby and for that we should make sure that every woman should have access to top quality essential and emergency obstetric services to cut back maternal mortality. Finally, the surest prophylaxis of PPH is that the correct management of all stages of labor should be done.

Keywords: Postpartum, Hemorrhage, Atonic, Traumatic, Maternal, Mortality

INTRODUCTION

A woman in labor preparing for childbirth has to go through different stages of labor categorically described as four stages of labor. The most crucial and significant phase of labor is after delivery of baby as deadly complication lies hereafter that is heralded by excessive bleeding specifically described as Postpartum hemorrhage (PPH). Pregnancy and birth are major life

events and are considered “risky” especially for the mother. Postpartum hemorrhage is a major cause of serious maternal morbidity and untimely deaths through the years. Primary PPH is defined as obstetric hemorrhage with a blood loss of over 500 ml or more from the genital tract within 24 hours of the vaginal birth of a baby or 1000ml or more after a cesarean delivery. PPH can be Minor PPH (500-1000 ml) or Major PPH (more than 1000 ml). Major PPH can be divided into:

moderate (1000-2000 ml) and severe (more than 2000 ml).¹ The four important causes of PPH are: uterine atony; trauma; retained placenta or adherent placenta and coagulation abnormalities. Most common cause is uterine atony which is episodic and unpredictable. In India PPH incidence is 2-4% following vaginal delivery and 6% following cesarean section. PPH accounts for 19.9% of maternal mortality in India. About 75-90% of PPH cases are caused by uterine atony.² Almost 60-70% of atonic PPH incidence can be prevented by active management of third stage of labor. Monitoring of pulse, blood pressure, bleeding during fourth stage of labor and using bedside tool, modified early obstetric warning system (MEOWS) in all obstetric inpatient are important and crucial to prevent morbidity and mortality. Active management of third stage of labor (AMTSL) reduces incidence of PPH, quantity of blood loss and reduces need for blood transfusions.³ Three components of AMTSL are: Oxytocics, Delayed cord clamping, Controlled cord traction. Uterine massage has been advocated as an effective method of reducing blood loss and is advocated in poor resource settings (WHO,2006). Oxytocin (Pitocin/syntocinon) is regarded as first line treatment and preferred over other uterotonic. If oxytocin is not available or alone is not effective, ergometrine or (oxytocin+ergometrine) syntometrine fixed dose combination should be given as second line treatment. If above second line treatment is not available or not effective a prostaglandin should be offered as third line treatment. Uterine massage is a simple, inexpensive intervention that could save lives. Uterine massage is less effective than intramuscular oxytocin with or without uterine massage.⁴ A multidisciplinary approach is cornerstone of treatment; it involves use of medical treatment followed by mechanical treatment followed by surgical treatment. The various mechanical methods include:intrauterine balloon tamponade: various types of balloon used are Foleys catheter, rusch balloon, bakri balloon, sengstaken-blackmore oesophageal catheter or condom, intrauterine packing.⁵ Surgical treatment includes: exploration under anesthesia (EUA) for cervical and vaginal tears, manual removal of placenta, B-lynch suture, Hayman sutures, bilateral uterine artery/iliac artery ligation or obstetric hysterectomy. The consequences of PPH are disastrous and lead to maternal death and morbidity. So, the present study is taken to see the incidence, management and outcome of primary PPH in a tertiary care centre. Emergency obstetric care will definitely reduce the incidence of PPH in India in future.

Aims and objectives

Aim and objectives of current study was to find out incidence, management and outcome of primary PPH in a tertiary care hospital.

METHODS

This observational cross-sectional study was conducted in Department of obstetrics and gynecology, SMGS

Hospital, Jammu over a period of one year from (1 November 2020 to 31 October 2021) after proper institutional ethical approval and informed written consent from participants. A total of 200 patients developing primary PPH after delivery in hospital were divided into two groups: Group A: Patients with primary atonic PPH and Group B: Patients with traumatic PPH. In Group A: After delivery of placenta, uterus was palpated per abdominally and if uterus was atonic and blood loss more than normal, bimanual uterine massage followed by volume replacement by crystalloids and blood transfusion was done as per each case requirement along with medical treatment was started immediately. In group B: Those patients having trauma to genital tract despite a well contracted uterus were considered to have traumatic PPH. Patients were studied on basis of:

Socioeconomic parameters

Age (20-30, 30-40, more than 40), parity (0, 1, 2, 3, more than 3), residence (rural, urban), BMI, Mode of delivery (vaginal, cesarean), history of severe PPH, HB levels (less than 9g/dl or more than 9 g/dl), Birth weight (2.5 to 3.5 or more than 3.5).

Type of treatment

Uterotonics+use of less than 2 blood transfusions, uterotonic+use of more than 2 blood transfusions, perineal tear repair and surgical treatment.

Inclusion criteria

The inclusion criteria taken into account were: Patients with singleton pregnancy with cephalic presentation developing primary PPH, patients developing atonic PPH defined as blood loss (less than 24 hours) after delivery of placenta, patients developing traumatic PPH.

Exclusion criteria

The exclusion criteria were: Patients having coagulopathy, patients with retained placental tissue, patients with high-risk pregnancy (cases of severe anemia (Hb less than 7 g%, hypertension, jaundice, heart disease, epilepsy, renal disease, hypersensitivity to prostaglandins), cases of multiple pregnancies, multigravida, intrauterine deaths, cases of instrumental deliveries and all the referred cases of PPH delivered outside hospital. Maternal outcome of PPH was studied as intraoperative and postoperative outcomes; intraoperative outcomes: Extended tears from incision site during LSCS, hematoma formed along incision, uterine rupture, uterine inversion, degree of perineal laceration, cervical laceration, uterine atony. Postoperative outcomes: Number of blood transfusions, DIC, Pulmonary edema, duration of hospital stay, cardiac arrest, post-operative decrease in hemoglobin, post-operative septicemia, maternal mortality.

Statistical analysis

The recorded data was compiled and entered in a spreadsheet on Microsoft Excel and the analysis was performed on SPSS (SPSS Inc., Chicago, Illinois, USA). Continuous variables were expressed as mean and standard deviation, while the categorical variables were presented as frequencies and percentages. Student's independent *t*-test was employed for comparing continuous variables. Chi-square test or Fisher's exact test, whichever appropriate, was applied for comparing the categorical variables. Statistically significant data was considered when the *p*-value was less than 0.05. All *P*-values were two tailed.

RESULTS

The analysis of 200 cases as depicted in figure1 shows the highest number of cases i.e., 86 out of 200 in 26-30 years age group. 43% in 26-30 years age group followed by 35% in 21-25 years group, 15% were below 20 years and 7% more than 30 years (Figure 1).

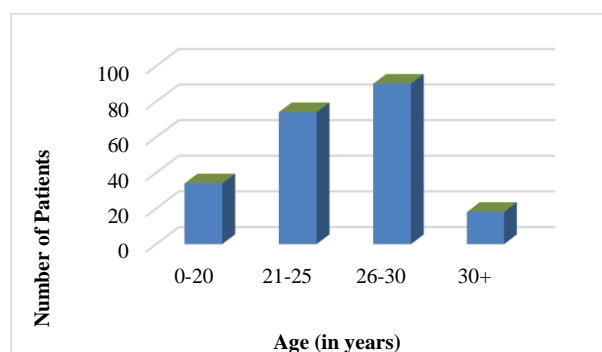


Figure 1: Age wise distribution of cases of primary PPH.

As per (Figure 2) pie chart, majority of the cases of primary PPH belonged to rural areas i.e; 84% as compared to 16% from urban areas. As per (Figure 3) pie chart 75.5% of patients developing primary PPH had hemoglobin levels below 9g%. As per (Figure 4) pie chart above, 89% cases of primary PPH were between 37 to 40 weeks period of gestation and 11% were between 41 to 42 weeks of gestation.

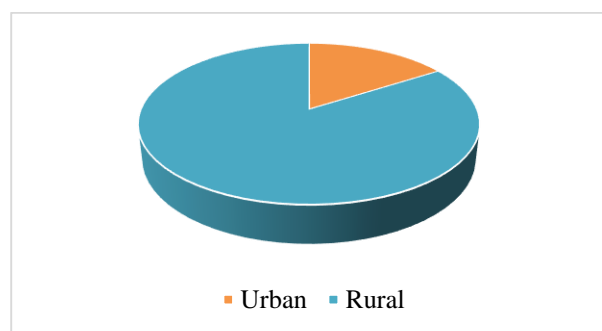


Figure 2: Distribution on basis of residence.

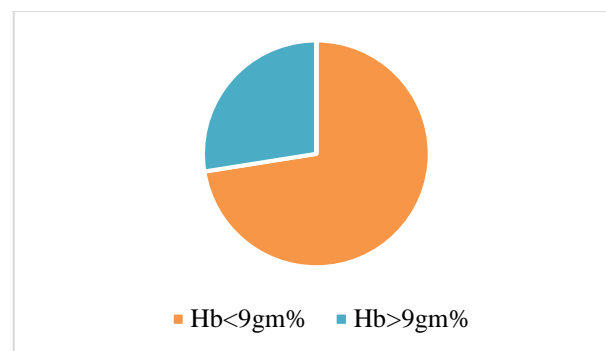


Figure 3: Distribution on basis of hemoglobin levels.

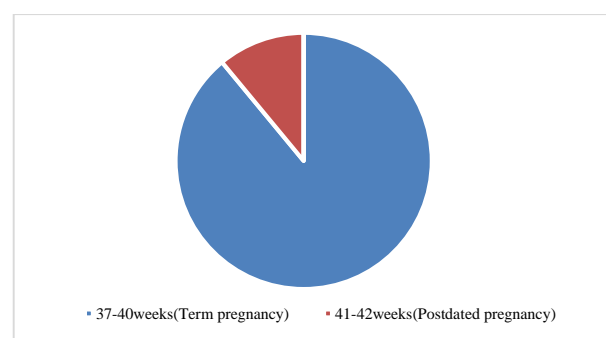


Figure 4: Distribution on basis of period of gestation.

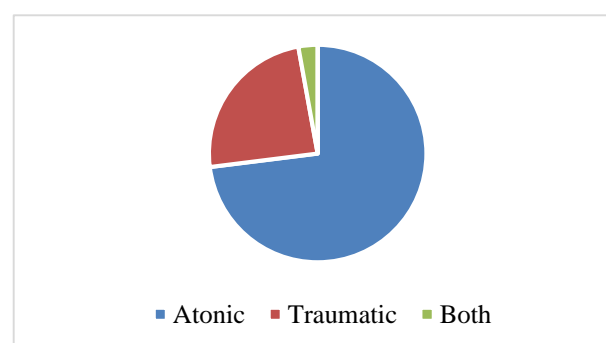


Figure 5: Distribution according to type of primary PPH.

The analysis of (Figure 5) pie chart above shows uterine atony as the most common cause of primary PPH accounting to about 73%. The second most common cause of primary PPH is traumatic PPH accounting to 24%. The analysis of (Figure 7) pie chart depicts that among the patients that delivered vaginally, 54 out of 90 were induced so the incidence of development of PPH was 60% followed by those in which labor was augmented i.e, 26 out of 90, incidence of development of primary PPH was 28.9% and lastly spontaneous vaginal birth seen in 10 patients out of 90 with incidence of development of PPH to be 11.1%. The analysis of (Figure 8) pie chart above depicts that majority of women i.e., 94% received oxytocin as part of active management of third stage of labor (AMTSL). Oxytocin (IV) used with frequency of 56% and oxytocin (IM) with a frequency of

38%, this could be because frequency of cesarean section in our study sample is more than vaginal delivery. Only 6% had expectant or physiological management of third stage of labor.

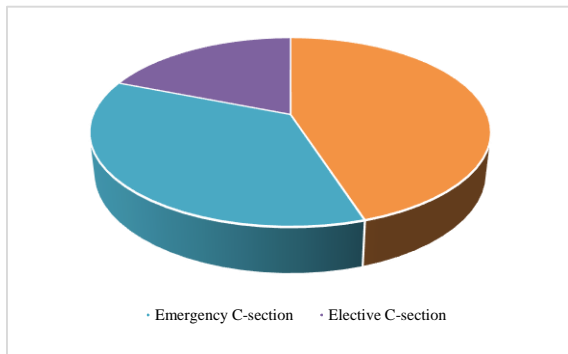


Figure 6: Distribution as per mode of delivery in cases of primary PPH.

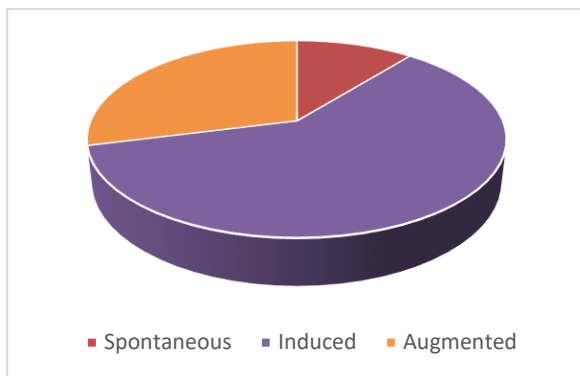


Figure 7: Type of onset of labor in vaginal delivery developing primary PPH.

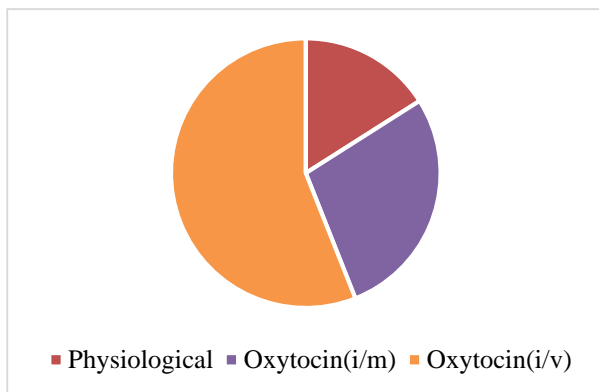


Figure 8: Patient distribution as per management of third stage of labor.

The analysis of (Table 1) above reveals that all the patients having atonic PPH received medical management i.e., uterotonics about 100%. Vessel ligation (uterine, ovarian, internal iliac artery) i.e., 34.3% followed by balloon tamponade i.e., 26% and compression sutures (b-lynch. Hayman) i.e., 26% were the main methods of management of atonic PPH. In

traumatic PPH repair of tears i.e., 87.5% followed by repair of rupture uterus i.e., 8.3% and drainage of hematoma i.e., 4.2% were the main methods of management of traumatic PPH. Peripartum hysterectomy constitutes a frequency of 13.7% in the management.

Table 1: Distribution according to type of management.

Parameters	N	%
Atonic PPH, (N=146)		
Medical management (uterotonics: oxytocin, methergin, misoprostol)	146	100
Balloon tamponade	38	26
Compression sutures (B-Lynch, Hayman)	38	26
Vessel ligation (B/L uterine, ovarian, internal iliac)	50	34.3
Peripartum hysterectomy	20	13.7
Traumatic PPH, (N=48)		
Repair of tears (cervical+vaginal+perineal)	42	87.5
Repair of rupture uterus	4	8.3
Drainage of hematoma	2	4.2

both (atonic+traumatic) PPH: 63%

The analysis of (Table 2) above shows maternal morbidity and mortality associated with PPH. Development of acute severe anemia due to PPH in our study was found to be 46%. Hypovolemic shock and DIC was found in 20% and 2.3% respectively. In 83% of cases blood and blood product transfusion was given. Intensive care was required in 12.3% of cases. 1.5% cases had maternal death due to hemorrhage.

Table 2: Outcome: distribution of maternal morbidity and mortality associated with primary PPH.

Morbidity	N	%
Severe anemia	92	46
Hypovolemic shock	40	20
DIC	4	2.3
Need of blood transfusion	166	83
Need of ICU ventilation	25	12.3
Maternal death	3	1.5

DISCUSSION

Primary PPH continues to be the leading reason for maternal mortality worldwide accounting for about 21% maternal deaths in Asia. So much so, that the 5th millennium development goal aims at reducing maternal mortality by primarily reducing the number of cases of PPH. Reducing avoidable risk factors especially those associated with obstetric interventions like increased cesarean section rate, induction and augmentation of labor with injudicious use of uterotonics. Other risk factors not amenable to vary like age, ethnic origin, residence or preexisting medical disease can be

minimized by extra vigilance and planned conjoined management. A total of 14108 pregnant women delivered in the department of obstetrics and gynaecology of Shri Maharaja Gulab Singh Hospital, Jammu over a period of one year from (1 November 2020 to 31 October 2021). Out of these, 1170 patients developed primary PPH therefore incidence came out to be (8.3%). The incidence is comparable to the reported incidence of (2-10%) by Butwick et al a systematic review reported the highest rate of PPH in Africa 27.5% and lowest in Oceania (7.2%) with an overall rate globally of 10.8%.^{6,7} In the present study, profile of 200 patients developing primary PPH was analysed on basis of socio-demographic parameters (age, residence), period of gestation, birth weight of baby, history of previous PPH, hemoglobin levels, type of PPH, mode of delivery, onset of labor, management of third stage of labor, different treatment modalities received and outcome. In our study 84% of the patients belonged to rural areas with low socio-economic status.

In a hospital based retrospective cross-sectional study by Chong YS et al. 118 cases out of total 161 cases were from rural areas i.e., 73.3% of patients.⁸ In our study 72.5% of patients i.e., 145 out of 200 patients had hemoglobin levels below 9g%. This shows that anemia is a high-risk factor for development of primary PPH. Thawal et al in an observational retrospective study had similar results in which anemia was high risk factor in 70% patients of PPH.⁹ Our study shows 89% cases of primary PPH were in 37-40 weeks period of gestation whereas 11% fall between 41-42 weeks period of gestation. The reason for the same could be biologic or pathologic connections like reduced myometrial contractility (including reduced contractile response to exogenous oxytocin), altered placentation and other etiologies with risk of hemorrhage.⁶ Butwick et al reported higher odds of PPH after 38 weeks especially between 41-42 weeks.^{7,8} In 58% of patients in our study primary PPH was noted after delivery of good size baby i.e., weight was more than 3.5 kg. Gora K et al also had similar results in which attributable risk for development of maternal complications was due to increased birth weight.¹⁰

The main cause of PPH in our study was uterine atony with an incidence of 73% i.e., 146 out of 200 patients developed PPH because of uterine atonicity. Callaghan et al had similar results with uterine atony being the most common cause i.e., 60%.¹¹ Second most common cause of PPH is traumatic PPH that accounts for 24% in our study. Ganesh et al had similar results with uterine atonicity seen in 69% of patients and second common cause being traumatic in 20% of patients.¹² Lower genital tract trauma in the form of tears (cervical, vaginal, perineal) is responsible for majority cases i.e., 87.5% of traumatic PPH in our study. Rupture uterus as a cause of traumatic PPH was noted in 8.3% cases. Kebede BA reported similar results with tears (vaginal, cervical, perineal) constituting 76.9% cases of traumatic PPH,

19.2% by rupture uterus and 3.8% by hematomas.¹³ Cesarean sections including both emergency and elective constitute about 55% cases of primary PPH in our study whereas spontaneous vaginal delivery constitutes 45% cases. Edhi reported similar results in which out of 118 patients that developed PPH 38.1% delivered by cesarean section and 28.8% by spontaneous vaginal delivery.¹⁴ Primary PPH was noted in 60% cases that underwent induction of labor because of postdatism, gestational hypertension, gestational diabetes, Doppler changes etc. followed by 28.9% having augmented labor and 11.1% had spontaneous onset of labor.¹⁵ Sheikh et al concluded in the study that even in low risk women, induction of labor regardless of the method used is associated with a high risk of PPH than spontaneous labor.¹⁶ Kumar et al also had similar results with induced labor being a high risk associated with PPH. The development of acute severe anemia due to PPH in our study was found to be 46% which also indirectly contributed to maternal mortality, as compared to 41.14% in a study by and 90% in a study conducted by Leduc et al.¹⁷ Hypovolemic shock and DIC was present in 20% and 2.3% of our patients with PPH.¹⁸ Disseminated intravascular coagulopathy (DIC) was present in 6% cases of PPH in a study by Begum et al. In our study maternal mortality due to postpartum hemorrhage was 1.5%. In a study conducted by Vidyadhar et al maternal mortality was 6.06%.¹⁹ Difference in percentage mortality reflects the high standards of medical and surgical facilities available and expert care delivered at our institute.¹⁹

Limitations

The limitations of the study include that the diagnosis of PPH was based on estimated rather than measured blood loss methods as it was very difficult to estimate blood loss. In developing countries especially in low-resource countries, this is the only available method which can be used. Also, there may be individual variations as different clinicians with differences in their grade, training, and experience made the diagnosis.

CONCLUSION

PPH is the most common obstetric cause of maternal mortality and morbidity worldwide. To avoid the same, it is essential to find out avoidable factors and to reduce their consequences. The two vital role players in this context are standard antenatal care and skilled birth attendants. PPH can be prevented by risk factor assessment and active management of third stage of labor. It is necessary to take preventable measures and in case of lack of facilities, timely referral to appropriate facility is necessary. Maternal deaths due to PPH are declining as it is 1.5% in our study and that is because of improved socioeconomic status, high standard medical and surgical management and expert care delivered at our institute. Finally, the surest prophylaxis is that the correct management of all stages of labor should be done.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Albina A, Zargar O, Ashraf N, Hak J. Study the incidence, management and outcome of primary postpartum hemorrhage in a tertiary care hospital. *Int J Res Med Sci* 2022;10:2622-7.