

Original article:

Risk, management and maternal outcome in postpartum haemorrhage

Shirish.S.Dulewad¹, Sruthy.R. Sudarsan*²

¹Associate Professor, Department of Obstetrics and Gynecology, GMC – Nanded, Maharashtra. India.

²Resident, Department of Obstetrics and Gynecology, GMC – Nanded, Maharashtra. India.

*Correspondence: Dr. Sruthy .R. Sudarsan ,Resident, Department of Obstetrics and Gynecology, GMC – Nanded, Maharashtra. India

Correspondence*



This work is licensed under a Creative Commons Attribution-NonCommercial 4.0 International License

Date of Publication: 25 December 2023

ABSTRACT:

Background: Postpartum haemorrhage (PPH) is a major cause of maternal morbidity and mortality. Timely recognition of PPH, determining the cause, and initiating treatment is critical, as almost 90 percent of deaths due to PPH occur within four hours following delivery.

Methods: This is a observational study over the period of 18 months. This study includes all cases of postpartum hemorrhage.

Results and conclusion: : incidence of PPH in our study was 1.03% main type of PPH was atonic, seen in total 125 out of 151 cases (90.1%) , while traumatic PPH was second most common cause noted among total 21 cases (7.9%) . Mortality was observed in those mothers who were having high risk factors like DIC, hepatic disease, severe anaemia and abnormal placentation. Prompt diagnosis and expertise and skillful intervention by senior obstetrician by performing internal iliac ligation and uterine compression sutures could save the mother from Postpartum haemorrhage (PPH) is a major cause of maternal morbidity and mortality.

Keywords: Postpartum haemorrhage, maternal mortality, uterine atony

Introduction:

It has been defined as greater than 500 mL estimated blood loss in a vaginal delivery or greater than 1000 mL estimated blood loss at the time of cesarean delivery or bleeding associated with signs or symptoms of hypovolemia within 24 hours of delivery regardless of delivery route. Primary postpartum hemorrhage is bleeding that occurs in the first 24 hours after delivery, while secondary postpartum hemorrhage is characterized as bleeding that occurs 24 hours to 12 weeks postpartum^{1,2,3}.

Primary causes of PPH mainly include uterine atony, genital tract laceration, retained placenta , lack of thrombin etc. Uterine atony or lack of effective uterine contraction is the most common cause of primary PPH. Secondary causes of postpartum hemorrhage include retained products of conception, infection, sub-involution of the placental site^{4,5,6}. Risk factors for uterine atony include high maternal parity , and conditions that cause increased

distention of the uterus such as multiple gestation, polyhydramnios, fetal macrosomia and alsochorioamnionitis, epidural anesthesia etc . The risk factors for trauma of genital tract include operative vaginal delivery and precipitous delivery.

The treatment and management of postpartum hemorrhage are focused on resuscitation of the patient while identifying and treating the specific cause⁷. Rapid identification of the cause of postpartum hemorrhage and the initiation of treatment should be made simultaneously. If the postpartum hemorrhage is due to uterine atony , treatment modalities include medical management with uterotonic agents, uterine tamponade, and surgical management. Genital tract lacerations should be repaired or pressure/packing used. Severe morbidities associated with PPH include anaemia, disseminated intravascular coagulation, blood transfusion, hysterectomy, and renal failure^{8,9}.

Despite with the availability of excellent uterotonics and active management of third stage of labour still PPH dominates as the major cause of maternal mortality, even in tertiary care centres hence the aim of the study is to explore the clinical practices, risks, and maternal outcomes associated with PPH.

Methodology:

Study area

Department of obstetrics and gynaecology in a tertiary care centre

Study duration

18 months

Study population

Patients admitted with PPH in OBGY labour room and postnatal ward

Study design

Prospective observational study

Sample size

151 cases of PPH from our institute were included

Inclusion criteria

All women with postpartum bleeding who were willing to give consent

Exclusion criteria

A. Women with bleeding disorders.

Initial assessment of the patient which includes patients status and risk factors. Continuous assessment of vitals and on going assessment of blood loss by using visual aid . A rapid assessment of genital tract for laceration, hematoma or signs of uterine rupture. Manual examination and extraction of retained placenta with curettage. If atony of the uterus detected managed by uterotonic and bimanual uterine massage and if found insufficient uterine tamponade with intrauterine balloon by filling 250-500mL of normal saline is considered among them. Exploratory laparotomy will be considered among those patient with uterine atony and doesn't respond to above treatment and procedures like bilateral uterine artery ligation ((O'Leary sutures) ,uterine compression sutures (B-Lynch, Cho sutures), internal iliac ligation will be considered. The definitive treatment for postpartum hemorrhage is a hysterectomy for unresponsive cases

RESULTS:

1. Incidence of PPH

In this study, the incidence of PPH was found to be 1.

Variables	No of subjects	Incidence of PPH
Total number of deliveries	14675	1.03%
Total number of PPH cases	151	

2. Age distribution

Agegroup(Years)	No of subjects	%
Less than 25 years	98	64.9
26 – 35 years	51	33.8
More than 35 years	2	1.3
Total	151	100.

Majority of the study subject belonged to the age group of less than 25 years ,i.e 98 out of 151 cases (64.9%).33.8 % of study subject belonged to the age group of 26-35 years

3. Socioeconomic status-

Majority of study subjects belonged to lower middle class family ie. 101 out of 151 cases (66.9%)and 33.1% of subjects belonged to upper middle class family

4. ANC status

Majority of case subjects were registered outside and was referred to our hospital for further management ie, 111 out of 151 cases (73.5%), 21 out of 151 cases were registered in our hospital (13.9%)and 18 out of 150

cases were unregistered (11.8%). The number of subjects registered outside and referred to our institute was significantly high as ours is a tertiary care institute.

5. Parity status

Majority of my study subjects were primigravida ie 79 out of 151 cases (52.3%), 33 out 151 cases were second gravid (21.9%), 16 out of 151 cases were third gravida (10.6%), 23 out of 151 cases were more than 3 gravida status (15.2%).

6. Gestational age

Majority of study subjects belonged to more than 37 weeks 101 out of 151 cases belonged to more than 37 weeks of gestation (66.9%), 29 out of 151cases(19.2%)belonged to 34 to 37 weeks of gestation ,19 out of 151 cases belonged to 28 to 33 weeks(12.6%) and 2 out of 151 cases belonged to less than 28 weeks (1.3%).

7. Number of visits

majority of study subjects were referred to our hospital visiting for the first time ie 111 out of 151 cases (73.5%). Only 9 out of 151 cases (6%) belonged to our booked cases and had regular ANC visits. The number of subjects registered outside and referred to our institute was significantly high as ours is a tertiary care institute

8. Number of days of hospitalisation

Majority of case subjects had to stay for 7 days ie 55 out of 151 cases(36.4%)and those cases that underwent surgical interventions like B-Lynch, internal iliac ligation etc were discharged after 7 days of procedure

9. Associated high risk factors

The most common high risk factor associated with postpartum heamorrhage was anaemia ie 21 out of 151 cases(13.9%),followed by pregnancy induced hypertension ie 19 out of 151 cases(12.6%). There were 18 cases of abruptio placenta , 16 cases of multigravida,14 cases of previous LSCS,11 cases of multiple gestation,10 cases of prolonged labour ,8 cases of vaginal wall heamatoma,7 cases of placenta preavia,5 cases of thrombocytopenia , 5 cases of prolonged labour,4 cases of polyhydramnios,4 cases of HELLP syndrome, 4 cases of fever,3 cases each of macrosomic baby, retained placenta, and gestational diabetes mellitus, 1 cases each of adherent placenta, ruptured uterus, instrumental delivery, and inversion of uterus.

There were few cases with more than one risk factor. So total is more than number of cases.

*PIH- pregnancy induced hypertension

1. Mode of delivery

In the present study , it was observed that 68.2% study subjects i.e 102 out of 151 delivered vaginally, out of which 36 subjects were preterm , while 31.1% study subjects i.e.47 out of 151cases required LSCS out of which 33 were term LSCS and 14 were preterm LSCS

2. Types of PPH

In this study, main type of PPH was atonic, seen in total 125 out of 151 cases (90.1%) , while traumatic PPH was second most common cause noted among total 21 cases (7.9%) .Mixed causes of postpartum hemorrhage included those with DIC , Hyperbilirubinemia , dengue , malaria and retained placenta and was seen in total 3 cases

3. Maternal complications

Most common complication due to PPH in this study was anaemia ie 81 out of 151 cases (53.6%). There were no maternal morbidities at the time of discharge. Out of 23 cases admitted in intensive care unit , 11

cases required ventilatory support and 6 cases had prolonged hospital stay. 3 cases had obstetric hysterectomy, 1 case developed acute renal injury requiring dialysis and mortality was observed in 3 cases. Mortality was observed in those mothers who were having high risk factors like DIC, hepatic disease, severe anaemia and abnormal placentation

4. Interventions

Majority of the patients were managed by blood transfusion for correcting anaemia, ie 139 out of 151 cases (92.1%), followed by pharmacological agents 142 cases out of 151 (94%) ie with 20-40 units of pitocin, and other uterotonic drugs like carboprost and methergin, and 39 cases out of 151 cases (25.8%) were managed conservatively with balloon tamponade. out of 22 surgically managed cases, 15 cases underwent internal iliac ligation, 6 cases underwent B-Lynch compression sutures, and 3 cases underwent obstetric hysterectomy as all other procedures failed. out of 3 obstetric hysterectomy done, 2 cases were of placenta accreta, and 3rd case was of retained placenta with DIC where all other methods failed. Among 21 cases of traumatic PPH, 8 cases underwent vaginal exploration with hematoma drainage, 8 cases underwent cervical tear repair, 5 cases were managed by pressure packing with vaginal pack. Among the 5 cases with mixed PPH that included hyperbilirubinaemia, DIC, retained placenta and fever, 4 managed conservatively with balloon tamponade and 1 case required obstetric hysterectomy as all other methods failed.

Discussion:

There were total 14675 deliveries in study period of 18 months and there were total 151 cases of Postpartum hemorrhage. Incidence of Postpartum hemorrhage is 1.03%. A clinical study done by Dr. Fasiha et al reported that Out of 37515 deliveries over the period of 3 years (2014-2016), there were 1333 cases of PPH out of which accounted for an incidence of 3.55%.

Mean age group of my study subjects were 24.66 ± 4.60 . The study of Solwayo Ngwenya et al and study of Sam Ononge et al. observed that the mean age of the participants with PPH was 27.7 ± 6.9 years and 24.4 ± 6 years respectively. The reason for this difference perhaps lies in the younger age of marriage in our country in general is associated with the relatively increased gravidity and parity at younger ages.

In the present study, majority of the subjects were primigravida 79 out of 151 cases (52.3%), 33 out of 151 cases (21.9%) were second gravida, 16 out of 151 cases (10.6%) were gravida 3 and 23 out of 151 cases (15.2%) were more than gravid 3 status. The reason for increased incidence of PPH in primigravida is due to the association of several predisposing factors like teenage pregnancy, preeclampsia, eclampsia, abruption, anemia, dysfunctional labour, uterine overactivity

The study of Sam Ononge et al⁽⁴⁸⁾ had consistent findings with our study

In the present study, out of 132 out of 151 cases were total registered cases, out of which, the cases registered in our hospital were 21 (13.9%), 111 cases (73.5%) were registered outside and was referred to our hospital for further management and 18 out of 151 cases (11.9%) were unregistered cases. Being a tertiary care centre, most of the subjects from my study were registered outside and referred to our hospital from peripheries as those cases were associated with high risk factors like pregnancy induced hypertension, anaemia, gestational diabetic mellitus, abnormal placentation, previous c-section scars, etc due to non-availability of blood and blood products, non-availability of multidisciplinary team, and obstetric ICU services.

Ganesh Tondge et al⁽⁴⁹⁾ in their study observed that, 40% cases were unregistered belonging to rural area and

low socioeconomic status . In this study, 22.32% of the patients were unregistered belonging to the rural areas with lower socio-economic status reflecting the lack of proper antenatal care, illiteracy and ignorance among such population, as is also mentioned in other studies.

In our study, it was observed that majority of cases delivered at 37 weeks , total 101 cases (i.e 66.8%). Out of 151cases , there were total total 50 preterm deliveries out of which 29 cases delivered between 34-37 weeks and 21 cases delivered before 34 weeks.

In our study , it was observed that 68.2% study subjects i.e 102 out of 151 delivered vaginally, out of which 36 subjects were preterm , while 31.1% study subjects i.e.47 out of 151cases required LSCS out of which 33 were term LSCS and 14 were preterm LSCS. Mohoni Nanani et al in their study observed that Majority of pregnant women had normal vaginal delivery 138 (69%) while LSCS was mode of delivery among 62 (31%) pregnant woIn the present study, the most common high risk factor associated with postpartum heamorrhage was anaemia ie 21 out of 151 cases(13.9%),followed by pregnancy induced hypertension ie 19 out of 151 cases(12.6%). There were 18 cases of abruptio placenta , 16 cases of multigravida,14 cases of previous LSCS,11 cases of multiple gestation,10 cases of prolonged labour ,8 cases of vaginal wall heamatoma,7 cases of placenta preavia,5 cases of thrombocytopenia , 5 cases of prolonged labour,4 cases of polyhydramnios,4 cases of HELLP syndrome, 4 cases of fever,3 cases each of macrosomic baby, retained placenta, and gestational diabetes mellitus, 1 cases each of adherent placenta, ruptured uterus, instrumental delivery, and inversion of uterus. Yogesh Thawal et al , in their study observed that, 28 (35.0) cases had PIH/Preeclampsia, 21 (26.3) cases had Prolonged labour, 20 (25.0) cases had anemia, 14 (17.5) cases had previous LSCS, 8 (10.0) cases had Large for gestational age, 5 (6.3) cases had Twin pregnancy and 4 (5.0) cases had APH/IUD.

In this study, main type of PPH was atonic, seen in total 125 out of 151 cases (90.1%) , while traumatic PPH was second most common cause noted among total 21 cases (7.9%) .Mixed causes of postpartum hemorrhage included those with DIC , Hyperbilirubinemia , dengue , malaria and retained placenta and was seen in total 5 cases. Similar findings were reported in a study conducted by FasihaTasneem et al among 1333 cases of postpartum hemorrhage and found the overall prevalence of PPH reported was 3.55%. The most common cause for PPH was found to be atonicity among 86% cases.

Majority of the patients were managed by blood transfusion for correcting anaemia , ie 139 out of 151 cases (92.1%), followed by pharmacological agents 142 cases out of 151 (94%) , and 39 cases out of 151 cases(25.8%) were managed conservatively with ballon tamponade . In majority of cases of PPH , a combination of pharmacological, hematological and surgical interventions were done and were successful. Most commonly used pharmacological agents in our institute were 20-40 IU of pitocin, 10 units were given intramuscularly and 20 IU pitocin given intravenously as infusion, if not successful we used injection carboprost 250mg and injection 0.2 mg intramuscularly,800-1000 mcg of T. Misoprostol per rectally.

out of 22 surgically managed cases,15 cases underwent internal iliac ligation,6 cases underwent B-Lynch compression sutures, and 3 cases underwent obstetric hysterectomy as all other procedures failed. out of 3 obstetric hysterectomy done, 2 cases were of placenta accreta, and 3rd case was of retained placenta with DIC where all other methods failed. Among 21 cases of traumatic PPH, 8 cases underwent vaginal exploration with heamatoma drainage, 8 cases underwent cervical tear repair , 5 cases were managed by pressure packing with vaginal pack. Among the 5 cases with mixed PPH that included hyperbilirubinaemia, DIC, retained placenta

and fever, 4 managed conservatively with balloon tamponade and 1 case required obstetric hysterectomy as all other methods failed. In the study by Y Thawal et al, it was observed 56 (70.0) cases had medical management and 24 (30.0) cases had surgical management. Among the medical management, 34 (42.5) cases had used uterotonic drugs used and 22 (27.5) cases had bimanual uterine compression. Among the Surgical management, 12 (15.0) cases had repair of cervical and vaginal laceration, 4 (5.0) cases had removal of retained placenta, 4 (5.0) cases had uterine artery ligation, 4 (5.0) cases had internal iliac artery ligation and 2 (2.5) cases had hysterectomy done.

The most common complication due to PPH in this study was anaemia ie 81 out of 151 cases (53.6%). There were no maternal morbidities at the time of discharge. Out of 23 cases admitted in intensive care unit, 11 cases required ventilatory support and 6 cases had prolonged hospital stay more than 21 days. 3 cases had obstetric hysterectomy, mortality was observed in 3 cases and 1 case developed acute renal injury requiring dialysis. Mortality was observed in those mothers who were having high risk factors like DIC, hepatic disease, severe anaemia and abnormal placentation.

Conclusion:

Postpartum hemorrhage continues to be the leading cause of maternal mortality worldwide. Postpartum hemorrhage can be managed effectively by active management of third stage of labour with use of uterotonics and blood transfusions while in some cases surgical intervention may be required. If effective measures are taken to ensure provision of antenatal care to all pregnant women, safe hospital deliveries, creating awareness, training of health professionals, proper anticipation and skilled management along with timely referral of high risk pregnancies from peripheral health care centres after initial management to tertiary care centres where round the clock multidisciplinary team are available for further management will lead to significant reduction in maternal morbidity and mortality.

Every pregnancy should culminate in healthy mother and healthy baby and for that all women should have access to high quality essential and emergency obstetric service. The frequency and impact of severe hemorrhage can be reduced by reducing avoidable risk factors. Other risk factors not amenable to change can be minimized by extra vigilance and planned management.

It is essential to assess the risk factors and blood loss during delivery and strictly follow the authorized management plan in order to prevent the complication and death. Postpartum hemorrhage is multifactorial and no identifiable risk factor is found in many cases. Most common cause of PPH is atony. In patients of PPH associated with high risk factors like DIC, hepatic diseases, severe anaemia,

References:

- 1.Oliveira MI, da Costa VS, Mer S, Osório J, Martins AP. Thrombocytopenia in pregnancy, a challenge in the intensive care unit (ICU). *Rev Esp Anestesiol Reanim.* 2019 Aug - Sep;66(7):385-389.
- 2.Arnold MJ, Keung JJ, McCarragher B. Interventional Radiology: Indications and Best Practices. *Am Fam Physician.* 2019 May 01;99(9):547-556.
- 3.Alemu FM, Fuchs MC, Martin Vitale T, Abdalla Mohamed Salih M. Severe maternal morbidity (near-miss) and its correlates in the world's newest nation: South Sudan. *Int J Womens Health.* 2019;11:177-190.

- 4.Lin L, Chen YH, Sun W, Gong JJ, Li P, Chen JJ, Yan H, Ren LW, Chen DJ. Risk factors of obstetric admissions to the intensive care unit: An 8-year retrospective study. *Medicine (Baltimore)*. 2019 Mar;98(11):e14835.
- 5.Changede P, Chavan N, Raj N, Gupta P. An Observational Study to Evaluate the Maternal and Foetal Outcomes in Pregnancies Complicated with Jaundice. *J ObstetGynaecol India*. 2019 Feb;69(1):31-36.
- 6.Joseph CM, Bhatia G, Abraham V, Dhar T. Obstetric admissions to tertiary level intensive care unit - Prevalence, clinical characteristics and outcomes. *Indian J Anaesth*. 2018 Dec;62(12):940-944.
- 7.Maswime S, Buchmann E. A systematic review of maternal near miss and mortality due to postpartum hemorrhage. *Int J Gynaecol Obstet*. 2017 Apr;137(1):1-7.
- 8'McDonald S. Management of the third stage of labor. *J Midwifery Womens Health* 2007;52:254–61.
9. ACOG Practice Bulletin. Clinical management guidelines for obstetrician-gynecologists number 76, October 2006: postpartum haemorrhage. *ObstetGynecol*2006;108:1039–
- 10.Literature Review: Physiological Management for Preventing Postpartum Hemorrhage Wedad M. Almutairi Masafumi Koshiyama, Academic Editor
- 11.prevalences of PPH, www.nhp.gov.in/disease/gynaecology-and-obstetrics/postpartum-haemorrhage
- 12.ClinicalstudyofpostpartumhaemorrhagefromateachinghospitalinMaharashtra,IndiaFasiha Tasneem1*, Shyam Sirsam2, Vijayalakshmi Shanbhag1International Journal of Reproduction, Contraception, Obstetrics and GynecologyTasneemF et al. *Int J Reprod Contracept Obstet Gynecol*. 2017 Jun;6(6):2366-23691
- 13.Singh, N., Pandey, K., Sharma, B., Mehta, G. & Chandanan, A. Medical Science A Study of Referral Cases of Post Partum Hemorrhage- Still An Obstetrical Tragedy which is Largely Preventable Assistant Professor , Department of Obstetrics and Gynaecology Head Of Department and Professor , Department of Obstetrics. *Medical Science* 3, 149–152 (2014).
- 14.Ngwenya, S. Postpartum hemorrhage: Incidence, risk factors, and outcomes in a low-resource setting. *International Journal of Women's Health* 8, 647– 650 (2016)
- 15.Ononge, S., Mirembe, F., Wandabwa, J. & Campbell, O. M. R. Incidence and risk factors for postpartum hemorrhage in Uganda. *Reproductive Health* 13, 1–7 (2016).
- 16.Ganesh Tondge, A. B. A retrospective study of cases of postpartum hemorrhage at tertiary health care center.
- 17.Assessment of risk factors of post-partum hemorrhage. 6, 17–20 (2019).
- 18.Nakagawa, K. et al. Independent Risk Factors for Postpartum Haemorrhage. *Critical Care Obstetrics and Gynecology* 2, 1–7 (2016).
- 19.Thawal, Yogesh & Jindal, Shikha & Deshpande, Hemant & Bhola, Amrita. (2019). Study of management of postpartum hemorrhage and its complications. *International Journal of Reproduction, Contraception, Obstetrics and Gynecology*. 8. 10.18203/2320-1770.ijrcog2.