

Peripartum hysterectomy: lessons learnt over a decade in a tertiary care center

Gynaecology

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ABSTRACT

Introduction: Peripartum hysterectomy (PH) is generally performed at the time or within 24 hours of delivery. The aim of the study is to study the setting, risk factors, outcomes in women who had PH in a tertiary care hospital in India, and to assess the resource preparation needed to manage the maternal morbidity in these women.

Material and Methods: All women who had peripartum hysterectomy (PH) in the Institution from January 1, 2004 to December 31, 2013 were identified and data abstracted. Demographics, obstetric, surgical details of women who had PH, and details of the estimated blood loss, the quantity of blood and products transfused and other outcomes including involvement of organ systems were collected.

Results: 21 women out of 1,03,420 deliveries in the Institution, underwent PH, giving an incidence of 0.04% (1 in 2000 deliveries). The number of PH's performed, increased from 6, between 2004 and 2007, to 31 between 2008 and 2013, a 70% rise. Caesarian delivery (CD) resulting in PH was common with scar dehiscence/rupture 5 (13.9%). Two common indications for PH were atonic uterus 15 (41.7%) and adherent placenta 7 (19.4%). An estimated blood loss of >4000ml occurred in one third of them, 12 (33.3%). All the women had hematologic complications, liver and renal complications occurred in 1/3rd. Blood and blood products were transfused in 31 (86.1%) and 66% respectively.

Conclusion: CD rates should be strictly brought down. In women with previous CD and abnormal placentation, the risk of PH should be anticipated and adequately prepared for.

KEYWORDS:

Peripartum hysterectomy, emergent and elective, lessons learnt.

Introduction:

Peripartum hysterectomy (PH) is generally performed at the time or within 24 hours of delivery, or at any time from delivery to discharge from the same hospitalization and may be emergent or elective. It is most commonly done for severe obstetrical haemorrhage that cannot be controlled by conservative measures. Hemorrhage due to abnormal placentation and uterine atony, each accounts for 30 to 50 percent of peripartum hysterectomies¹⁻⁴. Uterine rupture, presence of coincidental leiomyomas, laceration of uterine vessels, severe postpartum infection are the other indications for the procedure. In emergency situations, a sequence of conservative measures should be used in quick succession, and preparation for hysterectomy should begin promptly in cases of massive haemorrhage or maternal instability⁵.

Elective PH may be performed in patients with an ante partum diagnosis of morbidly adherent placenta or stage IA2 and IB1 cervical carcinoma. Most women (around 60%) with adherent placenta will need to undergo hysterectomy at delivery⁶, especially those with placenta accreta⁷. The frequency of abnormal placentation rises substantially as the number of prior Caesarean deliveries (CD) increases, as well as with maternal age⁸⁻¹⁰.

Unlike Gynecologic surgery, in obstetric cases, supracervical hysterectomy may be preferable because removal of the cervix can be particularly challenging when the cervix is significantly dilated. In addition, supra-cervical hysterectomy may decrease total blood loss and operative time^{11,12}.

The incidence of PH shows fifty-fold variation worldwide (0.2–10.5

per 1000 deliveries) and risk factors include advancing maternal age and parity, previous caesarean delivery (CD) and abnormal placentation¹³. Although an increasing trend is seen worldwide, there is a significant difference in the incidence of PH in developing when compared to developed countries. For example, in Pakistan¹⁰, the reported incidence of emergency PH is 10.52 per 1000 deliveries and in the United States, it ranges between 1.2 and 2.7 per 1000 births. In India, the reported incidence is 2.6 per 1000 births. This increased incidence in developing countries could be because of lack of structured antenatal care, standardized protocols for management of postpartum haemorrhage (PPH), difficult access to health care facilities, delayed referral to a higher centre and probably due to indiscriminate use of CD.

Operational definitions:

Adherent placenta: encompassed all cases of increta, percreta and accreta.

Estimated blood loss: included the total blood loss assessed by a combination of visual estimation of blood spills, number of blood soaked surgical mops, weight of blood clots from the time of delivery to the completion of the hysterectomy.

Blood and blood products: Includes transfusion of whole blood and blood components like packed red cells, plasma rich concentrates (PRC), fresh frozen plasma (FFP), fibrinogen and cryoprecipitate.

Total and sub-total hysterectomy: Total hysterectomy refers to removal of the uterus along with the cervix and sub-total

hysterectomy where the cervix alone is left behind.

Duration of surgery: Includes the time from commencement of Caesarian or hysterectomy until completion of hysterectomy.

Length of hospital stay: includes the day of admission for delivery or following delivery until discharge from hospital.

Aim of the study: To study the setting, risk factors, outcomes in women who had PH in a tertiary care hospital in India, and to assess the resource preparation needed to manage the maternal morbidity in these women.

Materials & Methods

A retrospective, descriptive study was performed to analyse all cases of PH that were performed on women in Christian Medical College and Hospital in South India from January 1, 2004 to December 31, 2013. Women were identified from the Birth Register in which all deliveries were registered by a qualified midwife and counterchecked by the Doctor in charge of the Perinatal Audit. Those women who had delivered elsewhere and referred to this Hospital were identified from the Operation Theatre Register, which was maintained and checked by the Senior Doctor in each Unit. Individual case records of those who underwent PH were identified and reviewed by the first two authors.

Details that were collected included the total number of births during the period of the study, demographics, obstetric details like gestational age, previous CD, presence of placenta previa /morbidity adherent placenta, primary indication and type of operation performed. Pertinent details regarding the neonate like Apgar score, birthweight, and admission to neonatal intensive care unit (NICU), neonatal health until discharge were collected as well.

Primary indications for PH were recorded under the following headings: uterine atony, uncontrolled haemorrhage, adherent placenta, placenta previa, uterine infection, uterine scar dehiscence or rupture, uterine ischemia/gangrene, and cancer.

Primary outcomes included the trend of PH over the study period, the estimated blood loss, the amount of blood and products transfused the time duration from delivery to completion of hysterectomy and the length of stay in the hospital.

Secondary outcomes considered were involvement of organ systems, hematologic complications such as disseminated intravascular coagulation (DIC), infectious complications such as fever, pulmonary complications including pulmonary oedema, effusion, and emboli; genitourinary complications included urinary retention, hydronephrosis, and acute tubular necrosis, cardiovascular complications included cardiomyopathy and pericardial effusion. Psychiatric complications and surgical reoperations were also noted. Based on the above results, a protocol for adequate preparation is suggested so as to avoid or decrease maternal morbidity and mortality. Statistical analysis was done by SPSS version ¹⁸.

Results:

Demographics:

The demographic data for mothers and neonates are presented in Table 1. There were 1, 03,420 deliveries in the Institution during the study period during which time a total of 36 cases of PH were performed. Only 21 of these had their delivery in the Institution, the remaining 15 were brought in following delivery elsewhere. This gives an incidence of 0.04% or a 1 in 2000 deliveries occurrence for the Institution.

Most of the women who had PH were from the same state (State of Tamil Nadu), 28 (77.8%) while the remaining 8 (22.2%) were from the neighbouring state. All of the women who had PH were above 32 years of age and the majority 25 (71%) were more than 37 years of age. Majority of the women who had PH were less than 35 (86.1%) years.

There were 8 (22.2%) primigravidae and 11 (30.6%) second gravidae and 17 (47.2%) were above third gravidae who had PH. There were only two women with twin pregnancies who underwent PH, all the rest were singleton deliveries. Only 16 (44.6%) women were booked for delivery in the Institution whereas the majority 20 (55.6%) had antenatal care elsewhere.

All except one PH was emergent, 31 women had Cesarean hysterectomy, and the remaining 5 had postpartum hysterectomy. Among the 31 women who had Caesarian hysterectomy, 22 (61.1%) had term deliveries, one had a hysterotomy (less than 28 weeks of gestation) and one CD was done for the second of twins and the rest had preterm deliveries. Only one woman had an elective Classical Caesarean hysterectomy for early stage carcinoma of the cervix. Two of the women underwent PH a month following delivery for gangrenous uterus/sepsis. Total and subtotal hysterectomy was performed with equal frequency, 50% each.

Trends in PH:

The number of PH's totalled only 6 over the first 4 years, from 2004 until 2007, whereas the number of PHs increased rapidly to 30 in number from 2008 until 2013.

Association of medical conditions:

Medical conditions of Diabetes and Hypertension were present in 4 (11.18%) and 2 (5.6%) women respectively and 16 (44.4%) women were found to be anaemic using the W.H.O. definition. As the immediate pre delivery haemoglobin level was not available for most women, and the majority had Haemoglobin estimation after some blood loss, the significance of the presence of anaemia could not be commented upon.

Results of Risk factors and Obstetric Interventions:

Twenty nine (80.6%) of the women who had PH had spontaneous labour, the rest had cervical ripening with vaginal prostaglandin E1, 25 micrograms repeated to a maximum of 3 doses, 6 to 12 hours apart. The most common indications for PH were atonic uterus which constituted 15 (41.7%, $p=0.41$), followed by adherent placenta 7 (19.4%, $p=0.0004$), uterine scar rupture 5 (13.9%), 4 (11.1%) for sepsis/gangrene. There were 12 (33.3%) women with previous CD and this was the single most common reason for CD in women who underwent PH. Traumatic PPH, abruptio placenta, and lacerations of the genital tract were the other indications.

Standard W.H.O. protocol for management of PPH was followed ¹⁴. All women with atonic PPH were medically managed with oxytocin, 33 (91.7%) of them received methergine, in addition, 29 (80.6%) received PgF2 alpha, and 5 (13.9%) received misoprostol per rectally. In addition, 6 (16.7%) were administered intramyometrial prostaglandin and balloon tamponade was carried out in one woman. Of the surgical measures, B Lynch suture was applied in 6 (16.7%), uterine artery ligation in 9 (25%) and internal artery ligation in 3 (8.3%). None of them underwent uterine artery embolization mainly because of disseminated intravascular coagulation (DIC) in the mother or maternal instability.

16 (44.4%) women were brought to the hospital in shock, 5 (13.9 %) had cardiac arrest after admission to the Institution and 6 were brought to the hospital intubated from other facilities.

Neonatal Outcomes:

The birth weights ranged from 1800 grams to 5200 grams and there was only one macrosomic baby.

Regarding outcomes for the babies, 25 (69.4%) of them were alive and well at birth. There were 4 macerated, 4 fresh stillborn babies and one early neonatal death. The fates of two babies were unknown. Only one baby was admitted to the neonatal intensive care unit (NICU) with asphyxia and this baby died.

Primary maternal outcomes:

The estimated blood loss ranged from 1500 ml to 6000ml. Blood loss of 4000 ml or more occurred in one third of them, 12 (33.3%). Sixteen of them lost upto 3000 ml. Whole blood was transfused in 21 (58.3%), packed red cells in 31(86.1%), PRCs in 19(52.7%) FFPs 24(66.6%), cryoprecipitate in 24 and factor 7 was used in one woman.

Operating time ranged from a minimum of 90 minutes to a maximum of 320 minutes. Most 25 (75.8%) of the PHs took less than 130 minutes, while 5 of them took more than 180 minutes.

During the postoperative period, 25(69.4%) of them were observed in the surgical Intensive care unit (SICU) for 24 to 72 hours, while the remaining 11 were observed in labour room (required less intensive monitoring) and transferred to the ward 24 hours later.

The duration of hospital stay was less than 2 weeks for most 28 (77.8%) of them.

Secondary outcomes in the mother:

All the 36 women had hematologic complications, mainly DIC in 23(63.9%). Liver and renal complications were present in 12 each (33.3%), pulmonary in 3(8.3%) women, 3 (5.6%) women had cardiovascular and 1(2.8%) had neurological complication.

Surgical complications of bladder and ureteric injury were found in 6(16.7%) and 3(8.3%) women respectively. Relaparotomy was performed in 8(22.2%). The majority of the women had febrile illness 26(72.2%).

The mean (sd) hospital bill was 101109(106,657) INR, the maximum being 475,970 INR. As India's per capita income reported for 2013-2014 was 93,231 INR, this hospital bill amount could be seen as a huge setback to an average Indian¹⁹.

Discussion:

As evidenced in the figure 1., the rapidly increasing trend in PH is seen in the present study from 2008 onwards, rising from 6% in 2004 to 26% in 2013, a 20% rise. In the U.S. study by Brian et al, the overall rate of increase was 15 percent¹⁴, where PH for abnormal placentation increased by 1-2fold and previous CD explained nearly all of this increase¹⁵. PH for uterine atony following CD, increased nearly four fold, PH following primary CD increased approximately 2.5fold and following vaginal delivery 1.5 fold. In the study by Campbell et al, the PH rate was 50 times higher when the 2 periods from 1999-2013 and 2005-2013 were compared.

When considering the risk factors associated with PH, atonic postpartum haemorrhage and adherent placenta (in women with previous CD) were found to be the most significant (p=0.0004), and was comparable to the studies reported^{9,13}. This reveals an urgent need to reduce the new trend of liberal CD for trivial reasons (p<0.001).

Most of the older (more than 37 years) and parous women (second gravida and more) had PH, which was similar to Campbell's recent study from Ireland.

The successful management of postpartum hemorrhage by staff education and following accepted protocols for management has been evidenced by the study^{16,17}. The low incidence of PH for the Institution in the present study (0.02%) could be attributed to strict adherence to stepwise use of medical, conservative surgical and definitive surgery protocols for PPH and peer review audit of all CD.

The estimated blood loss in the present study revealed a minimum 1500 ml blood loss. Most of them 28(77.8%) lost 3000 to 4000 ml. In the article by Knight et.al.⁽⁵⁾, averages of 8-10 pints of blood were transfused for each woman. The requirement for blood and products in the present study necessitates that a minimum of 6-8 pints of blood along with recommended blood products be available for each PH¹⁸. The minimum operating theatre time required was 130 minutes

and the average was 180 minutes.

In the present study, the fact that DIC was present in 23(63.9%) of the study women, reveals that Hematology expertise and adequate availability and correction with blood products and fibrinogen is mandatory. Liver and renal complications occurred in 1/3 rd of the women, making the services of the Hepatologist and Nephrologist essential.

Pulmonary complications ranking third, occurring in (8.3%) in frequency requires that ventilators and Respiratory Physicians are available.

The fact that 12(33.3%) PHs were done at LSCS, following a previous CD, involving a scar rupture / dehiscence, or an adherent placenta should make the Obstetrician alert to the high possibility of PH with a prior CD.

Last, but not the least, the financial implications in a developing country, is crippling.

Drawback of study:

As the study was a retrospective one, some important data like the haemoglobin status prior to delivery, details of risk factors and deliveries that were conducted elsewhere were missing from the records.

Besides, as women who delivered elsewhere were included in the study, the management protocols for prevention and management of PPH may not have been adhered to as strictly as it should have been and the baseline investigations were not available, hence making conclusions difficult.

Conclusion:

The rapidly rising trend of PH with its attendant complications, morbidity and mortality is alarming, requiring that, the rising CD rate should be strictly audited.

Previous CD, an important risk factor, along with abnormal placentation and adherent placenta should be adequately anticipated and prepared for with a minimum of 8 pints of blood and required blood products. An experienced Obstetrician, a Hematologist, Hepatologist, Nephrologist, Respiratory Physician and a well equipped Intensive Care Unit is mandatory for successfully managing a woman who requires PH.

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Competing interest:

The authors declare that they have no competing interests.

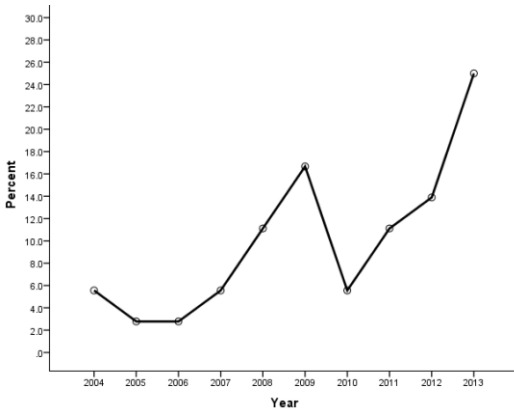
Table 1: Distribution of peripartum hysterectomy

Variable	Number	Percentage
Booked:	16	44.4
Inside	20	55.6
Outside		
Baby Weight:	2910 ± 659	
Mean ± SD	2840 (2500, 3300)	
Median (IQR)	1800	
Minimum	5200	
Maximum		
Gestational age:	14	38.9
<37	22	61.1
>=37		
Parity:	8	22.2
Primi	11	30.6
Second	17	47.2
Multi		

Fetus Number:	34	94.4
Singleton	2	5.6
Induction mode:	7	19.4
Pharmacology	29	80.6
Spontaneous		
Delivery type:	4	11.1
Normal	1	2.8
Instrumental	29	80.6
LSCS	1	2.2
Hysterectomy	1	2.8
Classical CS		
LSCS indication:	6	16.7
APH	12	33.3
Previous LSCS	1	2.8
Ca/Cervical	10	27.8
dysfunction labor	7	19.4
NRFS		
Medical Complication:	4	11.1
DM	2	5.6
HTN	16	44.4
Anemia	14	38.9
Others		
Baby Status:	25	69.4
Alive	4	11.1
MSB	4	11.1
FSB	1	2.8
END	2	5.6
Unknown		
Baby Sex:	14	41.2
Boy	19	55.9
Girl		
Hysterectomy indication:	15	41.7
PPH	2	5.6
Traumatic PPH	7	19.4
Adherent placenta	1	2.8
Abruption	5	13.9
Rupture uterus	2	5.6
Lacerations	4	11.1
Sepsis/Gangrene		
Types of hysterectomy:	18	50.0
Subtotal	18	50.0
Total		
NICU admission:	1	2.8
Yes	34	94.4
No		
SICU admission:	25	69.4
Yes	11	30.6
No		
ICU days:	22	61.1
<=72 hrs	14	38.9
>72 hrs		
Medical before hysterectomy:		
Oxytocin	36	100.0
Yes		
Methergin:	33	91.7
Yes	3	8.3
No		
Prostadin:	29	80.6
Yes	7	19.4
No		
PR Misoprostol	5	13.9
Yes	31	86.1
No		
Myometrial Prostadin:	6	16.7
Yes	30	83.3
No		
Balloon tamponade:	1	2.8
Yes	35	97.2
No		

Blynch:	6	16.7
Yes	30	83.3
No		
Tranexemic acid:	2	5.6
Yes	34	94.4
No		
Uterine artery ligation:	9	25.0
Yes	27	75.0
No		
Intenal iliac artery ligation:	3	8.3
Yes	33	91.7
No		
Bimanual Compression:	1	2.8
Yes	35	97.2
No		
Uterine artery embolisation:	36	100.0
No		
Blood transfusion:		
Packed Red Cell:	31	86.1
Yes	5	13.9
No		
Platelet rich concentrate:	19	52.8
Yes	17	47.2
No		
FFP:	24	66.7
Yes	12	33.3
No		
Cryoprecipitate:	24	66.7
Yes	12	33.3
No		
Factor 7& 8:	1	2.8
Yes	35	97.2
No		
Whole blood:	21	58.3
Yes	15	41.7
No		
Complications:		
Hematology:	36	100
Yes		
Pulmonary:	3	8.3
Yes	33	91.7
No		
Hepatology:	12	33.3
Yes	24	66.7
No		
Renal:	12	33.3
Yes	24	66.7
No		
Neurology:	1	2.8
Yes	35	97.2
No		
CVS:	2	5.6
Yes	34	94.4
No		
DIC:	23	63.9
Yes	13	36.1
No		
Oophorectomy:	4	11.1
Yes	32	88.9
No		
Bladder injury:	6	16.7
Yes	30	83.3
No		
Ureter injury:	3	8.3
Yes	33	91.7
No		

Relaparotomy:	8	22.2
Yes	28	77.8
No		
Febrile illness:	26	72.2
Yes	10	27.8
No		
Condition of mother at arrival:		
Alive	35	97.2
Yes	1	2.8
No		
DIC:	13	36.1
Yes	23	63.9
No		
Shock:	16	44.4
Yes	20	55.6
No		
Cardiac arrest:	5	13.9
Yes	31	86.1
No		
Intubated:	6	16.7
Yes	30	83.3
No		
Hospital Bill:	101109 ± 106657	
Mean ± SD	65323 (35467, 123036)	
Median (IQR)	7246	
Minimum	475970	
Maximum		



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