

# Peripartum hysterectomy in a tertiary care hospital: Epidemiology and outcomes

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## Abstract

**Background and Aims:** Peripartum hysterectomy is associated with significant maternal morbidity and mortality. We reviewed all peripartum hysterectomies at our institute over a 1-year period. The aim of this study was to determine the incidence, surgery and anaesthesia-related issues of peripartum hysterectomies and to compare outcomes of emergency and electively planned peripartum hysterectomies.

**Material and Methods:** This was a retrospective analysis of records of women who underwent emergency or elective peripartum hysterectomy in a tertiary care hospital. The study included all women who underwent peripartum hysterectomy in a teaching hospital and referral institute in North India over a span of 1 year (April 1, 2014, to March 31, 2015). Association of variables was based on Chi-square test, Fisher's exact test, and comparison on "t" statistics (normal distribution) and Mann-Whitney (nonnormal distribution).

**Results:** Forty women underwent peripartum hysterectomy during the study period. The incidence was 6.9/1000 deliveries. In 16 (40%) cases, peripartum hysterectomy was planned electively while emergency hysterectomy was done in 24 (60%) cases. Main indications of peripartum hysterectomies were placenta accreta (60%), atonic postpartum hemorrhage (PPH) (27.5%), and uterine rupture (7.5%). Intensive care management was required in 35% women postoperatively. The common maternal complications were febrile morbidity, bladder injury, disseminated intravascular coagulation, and wound infection. There were 4 maternal deaths following emergency peripartum hysterectomy done for atonic PPH whereas no mortality occurred in elective hysterectomy group.

**Conclusions:** The most common indication for peripartum hysterectomy was placenta accrete. Electively planned peripartum hysterectomies with a multidisciplinary team approach had better outcomes and no mortality as compared to emergency peripartum hysterectomies.

**Keywords:** Near miss event, peripartum hysterectomy, placenta accrete, postpartum hemorrhage

## Introduction

Postpartum hemorrhage (PPH) is a life-threatening condition. Various drugs and surgical techniques have been developed over time, especially to preserve the uterus. However, in some circumstances, an emergency peripartum

hysterectomy has to be performed often as the last resort in saving a woman's life. It is thus an unequivocal marker of severe maternal morbidity and mortality.<sup>[1,2]</sup> We have reviewed all peripartum hysterectomies done at our institute over a period of 1 year with the aim of determining the incidence, surgery, and anaesthesia-related management issues and also to compare emergency and electively planned peripartum hysterectomies for perioperative and postoperative complications.

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## Material and Methods

The present study included all women who underwent peripartum hysterectomy in the Department of Obstetrics and Gynaecology, Postgraduate Institute of Medical Education and Research, Chandigarh, a teaching hospital and referral institute in North India over a span of 1 year (April 1, 2014 to March 31, 2015). Records of all women who underwent peripartum hysterectomy were collected from medical record department. Each case file was studied in detail for demographic profile, clinical characteristics, operative notes for indications, intraoperative findings, duration of surgery and blood loss, anesthesia records, and postoperative events. Ethical approval for the study was obtained from the institute ethics committee.

The data was presented as frequency or mean  $\pm$  standard deviation. Data from emergency group and elective group were compared using Chi-square test or Fisher's exact test. *P* value  $<0.05$  was considered as statistically significant.

## Results

A total of 40 women underwent peripartum hysterectomy during this period. The total numbers of deliveries were 5824. Thus, the incidence of peripartum hysterectomies was 6.9/1000 deliveries. The mean age of women was  $28.4 \pm 3.8$  years. Of these 40 women, 2 (5%) were primigravida, 7 (17.5%) were second gravida, and the remaining 31 (77.5%) were multigravida. Only 2 women were booked in our institute and the other 38 (95%) were referrals. Among booked patients, one had peripartum hysterectomy for atonic PPH following a twin pregnancy and the other was a case of placenta accreta with previous three cesareans.

Thirty (75%) patients had more than 34 weeks of gestation at the time of surgery, 7 (17.5%) had between 28 and 34 weeks, and 3 (7.5%) had  $<28$  weeks. Out of these three patients, one had hysterectomy for cervical pregnancy, one for arteriovenous malformation (postabortal), and one had morbidly adherent placenta at 20 weeks.

Only 6 (15%) women had an unscarred uterus. Thirty-four (85%) women had previous cesarean section/s, of which 10 (29.4%) had previous one cesarean and 24 (70.6%) had undergone 2 or more previous cesareans. The main indications for peripartum hysterectomy in this study were placenta accrete (60%), atonic PPH (27.5%), and rupture uterus (7.5%) [Table 1]. All women who had uterine rupture were referrals from other institutes. Two-thirds of women with uterine rupture were hemodynamically unstable at the time

of admission. Clinical characteristics of all women are shown in Table 2.

In 16 (40%) cases, peripartum hysterectomy was planned electively while emergency hysterectomy was done in 24 (60%) cases. All electively planned hysterectomies were diagnosed as placenta accreta either on magnetic resonance imaging or on Doppler sonography. A classical cesarean was done before proceeding to hysterectomy in these cases.

The maternal characteristics were compared in the two groups (elective/emergency peripartum hysterectomy). Both groups were similar in age and parity [Table 3]. Among all women who underwent electively planned peripartum hysterectomy, 93.7% cases were after 34 weeks of gestation, whereas in emergency group, only 29% were done after 34 weeks of gestation ( $P < 0.001$ ). A good fetal outcome was seen in electively planned group. Women in emergency group had a low preoperative hemoglobin as compared to electively planned group ( $P = 0.01$ ).

Preoperatively, 11 (27.5%) patients were hemodynamically unstable and required resuscitation. Nine (81.1%) patients had atonic PPH and only 2 had bleeding due to placenta accreta. All cases were done under general anesthesia. Five (12.5%) patients were initially taken up in spinal anesthesia, but later converted to general anesthesia. Twenty-two (55%) women required more than 5 units of blood transfusion and maximum amount transfused was 12 units in one patient. Mean duration of surgery was  $2.8 \pm 1$  h. Twenty-three (57.5%) patients were extubated

**Table 1: Indications of peripartum hysterectomy**

Indication	Number of patients (%)
Placenta accrete	24 (60)
Atonic postpartum hemorrhage	11 (27.5)
Rupture uterus	3 (7.5)
Cervical pregnancy	1 (2.5)
Postabortal arteriovenous malformation	1 (2.5)
Total	40 (100)

**Table 2: Clinical characteristics of cases**

Clinical characteristics	Mean $\pm$ SD
Preoperative hemoglobin (g/dl)	9.5 $\pm$ 2.7
Duration of surgery (h)	2.8 $\pm$ 1.0
Intra-operative fluid transfused (L)	6.1 $\pm$ 3.1
Number of intra-operative blood transfusions	4.1 $\pm$ 2.4
ICU stay (days)	1.5 $\pm$ 1.0
Postoperative hemoglobin (g/dl)	8.2 $\pm$ 1.9
Duration of hospital stay (days)	15.2 $\pm$ 14.5

ICU: Intensive Care Unit, SD: Standard deviation

on operation theater table after surgery while 17 (42.5%) had delayed extubation. Among them, 14 (82.3%) patients were shifted to the Intensive Care Unit (ICU). In ICU, the maximum duration of stay was 5 days and minimum was 1 day. Three (21%) out of 14 women who were shifted to ICU died.

Table 4 includes anesthetic and perioperative management of both groups (emergency/electively planned peripartum hysterectomy). Estimated blood loss, intraoperative blood replacement, intraoperative hypotension, and administration of inotropes were similar in the two groups. Fifty percent

of all women who had emergency peripartum hysterectomy required ICU care compared to 12.5% in electively planned group ( $P = 0.02$ ).

Most common maternal complication [Table 5] was febrile morbidity (27.5%). Bladder injury occurred in 20%, disseminated intravascular coagulation in 12.5%, and wound infection in 5% of the women. There were 4 (10%) maternal deaths, all of whom were referrals from outside. Cause of maternal death in all was atonic PPH. There was no mortality in electively planned cases as compared to emergency group ( $P = 0.036$ ).

**Table 3: Maternal characteristics of elective versus emergency surgery**

Maternal characteristics	Elective surgery	Emergency surgery	P value
Age (years)	28.2±3.4	28.6±0.2	0.73
Parity			
Primipara	0	2	0.508
Second para	2	5	0.799
≥3 para	14	17	0.395
Previous cesarean sections			
None	0	6	0.037
1	3	7	0.709
≥2	13	11	0.047
Gestational age (weeks)			
<28	1	3	0.914
28-34	0	14	<0.001
>34	15	7	<0.001
Preoperative hemoglobin (g/dl)	10.7±1.8	8.6±3.0	0.019

**Table 4: Anesthetic and perioperative management of elective versus emergency surgery**

Operative details	Elective surgery	Emergency surgery	P value
Type of anesthesia			
General anesthesia	14	21	1
Spinal to general anesthesia	2	3	
Duration of surgery (h)	2.9±1.1	2.8±1.0	0.868
Estimated blood loss (L)	2.6±1.2	2.8±1.6	0.878
Intraoperative blood pressure (mmHg)			
Systolic	86.5±26.5	76.5±12.6	0.389
Diastolic	51.8±17.2	43.9±10.7	0.173
Inotropes			
None	11	12	0.240
1	3	3	0.928
≥2	2	9	0.170
Base deficit			
<-8	4	7	0.772
-8--12	6	12	0.436
>-12	6	5	0.247
Total IV fluids transfused (L)	6.6±3.0	5.6±3.1	0.254
Number of platelet transfusions	4.1±2.5	4.1±2.4	1
Number of ICU transfers	2	12	0.02
Postoperative hemoglobin (g/dl)	8.9±2.2	7.8±1.6	0.081
Number of deaths	0	4	0.036

ICU: Intensive Care Unit, IV: Intravenous

**Table 5: Postoperative complications**

Complication	Number of patients (%)
Febrile morbidity	11 (27.5)
Bladder injury	8 (20)
Wound infection	6 (15)
Urinary infection	6 (15)
Disseminated intravascular coagulation	5 (12.5)
Renal failure	4 (10)
Maternal deaths	4 (10)
Pelvic collection	2 (5)
Re-laparotomy	1 (2.5)
Resuturing	1 (2.5)

## Discussion

PPH along with sepsis and hypertensive disorders of pregnancy is a major cause of maternal mortality in India. Peripartum hysterectomy is a lifesaving surgery performed on a mother with intractable obstetric hemorrhage. In active management of third stage of labor, drugs such as misoprostol and uterine artery embolization among other measures have markedly reduced maternal deaths from PPH. However, describing a reduction in maternal mortality rate is just describing the tip of an iceberg. The WHO has thus emphasized on the concept of maternal near miss.<sup>[3]</sup> Any pregnant woman who undergoes peripartum hysterectomy thus could have potentially died without timely and proper management.

The incidence of peripartum hysterectomy is increasing in this era not because of improperly managed third stage of labor or obstructed labor but most likely because of increasing incidence of cesarean sections. Chances of repeat cesarean sections thus increase. This ultimately increases the incidence of placenta previa and accreta.

In our analysis, the incidence of peripartum hysterectomy is 6.9/1000 deliveries, which is much higher than reported incidence of 0.2 and 5.4 in 1000 deliveries.<sup>[4,5]</sup> Over the years, the incidence of peripartum hysterectomy has drastically increased from 0.2% to 0.7% in our institute although the indications have changed. This may be explained by our institute being a referral center and women are referred either after a complication or electively for surgery after diagnosing accreta in the antenatal period.

In our study, 85% of women had a history of previous cesarean section, and out of these, 75% had  $\geq 2$  cesareans. In recent studies, the incidence of peripartum hysterectomy was higher in women who had a history of either one or two previous cesarean sections.<sup>[6-9]</sup> Placenta accreta has been the primary

indication in these women and accounts for 38%–50% of all peripartum hysterectomies.<sup>[9-13]</sup>

In our study, the most common indications of peripartum hysterectomy were placenta accrete (60%), atonic PPH (27.6%), and rupture uterus (7.5%). In a similar study from our institute two decades back, the main indications were uterine rupture (62%) followed by atony (18%) and adherent placenta (18%).<sup>[14]</sup>

The incidence of uterine rupture as an indication for peripartum hysterectomy has significantly reduced from 62% to 7.5% in our institute.<sup>[14]</sup> This may be attributed to decreased referrals of women with obstructed labor. In our study, there were 4 maternal deaths (10%). All of these women were referred from outside, and the cause of death was atonic PPH. In previous studies, also, the maternal mortality ranges from 1.2% to 19.4%.<sup>[5,15]</sup> Although the incidence of atonic PPH as an indication of peripartum hysterectomy has reduced, it is still important and was the only cause of maternal deaths in our study.

In our study, 40% peripartum hysterectomies were electively planned and rest were done in emergency. All electively planned hysterectomies were done for placenta accrete. To prevent hemorrhage, classical cesarean was immediately followed by peripartum hysterectomy. Both groups required large number of perioperative blood transfusions. The perioperative morbidity and postoperative complications were significantly less in electively planned group. Only 12.5% of electively planned group required ICU care, whereas in emergency group, 50% were shifted to ICU ( $P = 0.02$ ). There was no mortality in electively planned cases ( $P = 0.036$ ). A study by Chestnut *et al.* had reported that there was significantly more hemorrhage with emergency hysterectomy as compared to an electively planned procedure.<sup>[16]</sup>

## Conclusion

We conclude that the incidence of peripartum hysterectomy in our institute has increased from 2/1000 to 6.9/1000 deliveries. There is also a change in the indications of peripartum hysterectomy in the past two decades with placenta accrete being the commonest in our study. This is because of rising number of cesareans and early diagnosis by imaging. Patients who underwent emergency peripartum hysterectomy due to atonic PPH had a higher mortality. Elective peripartum hysterectomies with multidisciplinary approach and ICU backup for diagnosed cases of placenta accrete had better outcomes with less morbidity.

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### Conflicts of interest

There are no conflicts of interest.

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