

# Trends and Outcome of Peripartum Hysterectomy at a Tertiary Care Hospital

Sunita Dubey\*, Alka Sehgal and Rachna

Department of Obstetrics and Gynaecology, University of Government Medical College and Hospital, Chandigarh, India

\*Corresponding author: Sunita Dubey, Department of Obstetrics and Gynaecology, University of Government Medical College and Hospital, Chandigarh, India, Tel: 9646323268; E-mail: sunitas504@gmail.com

**Received date:** April 13, 2022, Manuscript No. IPCCO-22-13129; **Editor assigned date:** April 18, 2022, PreQC No. IPCCO-22-13129 (PQ); **Reviewed date:** May 02, 2022, QC No. IPCCO-22-13129; **Revised date:** June 13, 2022, Manuscript No. IPCCO-22-13129 (R); **Published date:** June 21, 2022, DOI: 10.36648/2471-9803.8.9.085

**Citation:** Dubey S, Sehgal A, Rachna (2022) Trends and Outcome of Peripartum Hysterectomy at a Tertiary Care Hospital. Crit Care Obst Gyne Vol: 8 No:9

## Abstract

**Introduction:** Emergency Peripartum Hysterectomy (EPH) is a lifesaving procedure. Most recently increased incidence is being observed due to rise in caesarean section rate. The aim of our study was to determine incidence and trends over a period of time at a tertiary care institute.

**Materials and methods:** This retrospective cohort study included women who underwent peripartum hysterectomy at our hospital over a period of 5 years. Demographic profile, causes of peripartum hysterectomy and maternal complications were studied.

**Results:** Incidence of peripartum hysterectomy was 1.60 per 1000 deliveries. Majority, 90%, (44/49) were referrals from outside. Mean age and parity were  $29.2 \pm 4.6$  years and  $2.2 \pm 1.05$  respectively. Mean gestational age was  $34 \pm 5.6$  weeks. History of previous 1 or 2 previous caesarean sections was seen in 65% (32/49) of cases. Leading cause of emergency peripartum hysterectomy was atonic Postpartum Hemorrhage (PPH) in 53%, (26/49) followed by morbidly adherent placenta in 29%, (14/49) and uterine rupture in 16%, 8/49 cases. Complications noted were febrile illness (6), bladder injury (5), acute kidney injury (5), DIC (5) and relaparotomy (2). Twenty four out of 49,(49%) required ICU services and Maternal Mortality occurred in 5 (10%) referred cases.

**Conclusion:** Atonic post-partum haemorrhage and adherent placenta were the leading causes for Emergency Peripartum Hysterectomy (EPH). Judicious but timely decision of peripartum hysterectomy, early referral before disseminated intravascular coagulation sets in or shock becomes irreversible is the crux of management in Atonic post-partum haemorrhage cases that is the leading cause of maternal mortality in present study.

**Keywords:** Cesarean section; Haemorrhagic shock; Peripartum hysterectomy; Postpartum hemorrhage; Placenta accrete; Uterine rupture

section, as a last resort to save woman's life. EPH is defined by the World Health Organization as a maternal near miss criterion and used as a proxy for severe postpartum haemorrhage and therefore frequently used as an outcome of interest in obstetric surveillance [1]. In developing countries, the incidence of EPH is still relatively high depicting significant burden with high maternal mortality and morbidity. Apparently with rising rate of caesarean section, the incidence of EPH has also increased, the present study was aimed to determine incidence and change in trends over a period of time at our tertiary care referral institute.

## Materials and Methods

This retrospective cohort study included all women who underwent peripartum hysterectomy in the department of obstetrics and gynaecology, government medical college and hospital, Chandigarh, a tertiary care referral hospital from North India over a span of 5 years from January 2016 to December 2020. Total number of vaginal and cesarean delivery during same duration was also recorded. All details regarding patient's age, gravidity, and previous cesarean section, location of placenta, indication of peripartum hysterectomy, and condition of patient at the time of arrival, intraoperative details, and need of inotropes, ICU care, hospital stay and complications were noted. Data was collected from medical record department after approval of this study from research and ethical committee of our institute.

Statistics analysis using appropriate software for categorical variables was applied and compiled as frequency and percentage. For continuous variables, data was calculated as mean  $\pm$  SD.

## Results

During study period of 5 years, 49 patients underwent Emergency Peripartum Hysterectomy (EPH) amongst 30626 total caesarean and vaginal deliveries, the incidence was 1.59/1000 deliveries. The annual data is reflected in Table 1 of 49 cases, 44/49 (90%) were received as referred whereas only 5 (10%) were regularly supervised at our hospital. Eight (18.0%) out of 44 referrals cases had completely unsupervised pregnancies. Among 49 cases, 10 (20%) cases were referred after delivery, 3 cases of rupture uterus and 7 cases were atonic PPH. The average time delay during referral from peripheral centre to our hospital was  $3.7 \pm 2$  hrs in these 10 cases.

## Introduction

Emergency Peripartum Hysterectomy (EPH) is a life saving procedure performed following vaginal delivery or cesarean

**Table 1:** Incidence of peripartum hysterectomy over a period of 5 years.

Year	Total deliveries	Caesarean deliveries	Vaginal deliveries	EPH	Incidence
2016	7820	3235	4585	12	1.5
2017	7336	3154	4182	12	1.6
2018	6792	2944	3848	6	0.88
2019	5853	2695	3158	15	2.6
2020	2825	1344	1481	4	1.4
Total	30626	13372	17254	49	1.6

Demographic parameters are given in Table 2 of 49 patients, 2 (4%) were primigravida, 10 (20%), second gravida and 37 (76%) multigravida respectively. One (2%) patient had twin pregnancy.

**The distribution of preceding event was following:** vaginal delivery 17/49 (35%) and caesarean section 32/49, (65%). Out of 32, 8 (25%) were following previous 2 caesarean section, 12 (38%) were following previous one caesarean section, 6 (19%) cases followed trial of scar with vaginal delivery post one

caesarean section, Three cases (9%) underwent hysterotomy followed by hysterectomy for adherent placenta between 20 to 24 weeks of gestation. Three (9%) underwent hysterectomy for morbidly adherent placenta at 16 and 17 weeks of gestation including 1 case of Hydatiform mole. Among these, 5 (10%) hysterectomy were done while relaparotomy following caesarean/hysterotomy (Table 2).

**Table 2:** Demographic and clinical profile of patients.

Data	Mean $\pm$ std/n (%)
Mean age in years	29.2 $\pm$ 4.6
Mean parity	2.2 $\pm$ 1.05
Mean gestational age 34 weeks $\pm$ 5.6	
>34 weeks	40 (81.6%)
28-34 weeks	2 (4.08%)
20-28 weeks	5 (10.2%)
<20 weeks	2 (4.08%)
Previous LSCS	
total	28 (57.1%)32
1	22 (44.8%)24
2	6 (12.2%)8
Perioperative haemoglobin in g/dl	8.9 $\pm$ 3.04
Very severe anaemia<3 g/dl	5 (10.2%)
Severe anaemia<3-7 g/dl	5 (10.2%)

Table 3 reveals indications of peripartum hysterectomies. Amongst 11 cases of rupture uterus, hysterectomy was required

in 8 cases due to irreparable damage, in 3 due to atonic postpartum hemorrhage because these are associated with

placenta previa and accrete, 10 of them were referrals and in one followed induction of labour at out institute. Out of these 11

cases, only 7 were observed in previous scarred uterus and rest 4 in unscarred uterus in whom parity varied from 3 to 6.

**Table 3:** Indications of peripartum hysterectomy.

Indications	No of cases (%)
Atonic uterus	26, (53%)
Morbidly adherent placenta	14, (29%)
Rupture uterus	8, (16%,)
Postabortal sepsis	1, (2.04%)
8 (16%) had both atonic and traumatic postpartum hemorrhage (1, colporrhexis, 2, cervical tear, 2, broad ligament hematoma, 3 cases of rupture uterus)	

Preoperatively, 6 (12.2%) patients were hemodynamically unstable and required resuscitation. In most 42 (85.7%) of the patient's surgery was initiated under general anaesthesia (GA) and in rest 7 (14.2%) spinal anaesthesia had to be supplemented with GA.

Table 4 Reflects intraoperative details. Inotropes was required in 18 (36.7%) cases, with single inotrope in 12 (24.4%) cases, double in 5 (10.2%) and triple in 1 (2.04%) case only. Amongst

49, 24 (48.9%) cases were transferred to Intensive Care Unit (ICU) without extubation and of these 5 (10.2%) succumbed to death. In one patient of atonic PPH during prolonged ICU stay of 30 days for Acute Kidney Injury (AKI) underwent dialysis 11 times and for spontaneous hemoperitoneum faced relaparotomy after 14 days of surgery managed by internal iliac artery ligation.

**Table 4:** Intraoperative details.

Operative details	Number of patients
Duration of surgery	2.5 ± 0.4 hrs
Number of packed cell transfused	4.46 ± 2.22
Intraoperative hypotension	32 (65.3%)
Inotropes used in	18 (36.7%)
ICU transfers	24 (48.9%)
Duration of ICU stay	2.04 ± 4.6 days
Duration of hospital stay	10 ± 6 days
Postoperative haemoglobin (g/dl)	9 ± 1.3

Among 49 patients, 28 (57.1%) patients underwent total hysterectomy, 18 (36.7%) patients underwent subtotal hysterectomy and in remaining 3 cases details were missing. In 2 (4.02%) cases bilateral internal iliac artery ligation was done prior to hysterectomy to control intraoperative hemorrhage and in 1 case after 15 days of hysterectomy due to spontaneous intraperitoneal bleed.

41%, 20/49 required more than 5 blood transfusion and 2 (4%) required 12 blood transfusion along with other blood products. 14/40, 35% required ICU care, mean days of ICU and hospital stay was 1.5 ± 1.0 and 15.2 ± 14.5 days whereas maximum ICU and hospital stay was 30 and 36 days respectively.

Table 5 shows post-operative complications and Table 6 shows causes of maternal mortality with mortality in 5 (10%) referred cases, 4 of these for their moribund condition at admission required intubation with resuscitation and had delay in an average time of nearly 4 hrs post onset of hemorrhage. The hospital survival was limited to only 8 hrs in 4 patients and 1 died after 4 days. Leading causes of death was DIC following atonic PPH and or rupture uterus. One referral with respiratory distress in twin pregnancy with ongoing antepartum haemorrhage underwent caesarean section within an hour of admission but had even PPH and multiple cardiac arrests intraoperatively. X-ray of the patient collected Post-mortem revealed massive right sided pleural effusion and cardiomegaly and possibility of undiagnosed heart disease could not be ruled

out. She succumbed despite revival by cardiopulmonary resuscitation on 11 times.

Out of 10 (20.4%, 10/49) stillbirths, 7 were due to rupture uterus, 1 was due to abruptio placenta, one occurred in placenta

accrete and for 1 case, cause is not known. Six of foetuses were treated like abortus those delivered below 24 weeks because of maternal indication (Table 6).

**Table 5:** Postoperative complications.

Postoperative complication	Number (%)
Febrile illness	6 (12.2%)
Bladder injury	5 (10.2%)
Acute kidney injury	5 (10.2%)
Maternal mortality	5 (10.2%)
DIC	4 (8.1%)
Respiratory infection	3 (6.1%)
Multiorgan failure	3 (6.1%)
Tracheostomy	2 (4.08%)
Relaparotomy due to hemoperitoneum	2 (4.08%)
Pelvic collection	2 (4.08%)
Burst abdomen	1 (2.04%)
Dialysis	1 (2.04%)
Covid 19 infection	1 (2.04%)

**Table 6:** Cause of maternal mortality in patients underwent peripartum hysterectomy.

Causes of death
1. Atonic PPH with DIC in shock
2. Atonic PPH with haemorrhagic shock with massive right sided pleural effusion and cardiomegaly suggestive of undiagnosed heart disease
3. Atonic PPH with hypovolemic shock with DIC, AKI and Multiorgan failure
4. Rupture uterus with hypovolemic shock
5. Rupture uterus with hypovolemic shock with ARDS, sepsis and myeloproliferative disorder

## Discussion

Emergency peripartum hysterectomy is a lifesaving procedure that has been used as a last resort to save woman's life from massive obstetrical hemorrhage following abortion, delivery and caesarean section. Wide variation (0.073 to 6.9/1000 deliveries) in its incidence has been reported in India that can be the result of disparity in skilled staff, availability of blood bank, facilities of ICU and intervention radiologist [2,3]. However, incidence from population-based studies across the world is also reported to be variable from 2.6/1000 deliveries in Denmark, 5.4 per 1000

deliveries in Nigeria and 10.7 per 1000 deliveries in Italy [4,5]. In the present study overall incidence of EPH was 1.6/1000 deliveries, with highest in the year 2019 (2.56/10000) followed by declining trend (1.4/1000) in year 2020 when ongoing COVID-19 pandemic led to significant reduction in the number of referral and hospital deliveries at our institute. A decade earlier its incidence was quoted to be 2.21/1000 at the same institute [6,7]. The falling trends of peripartum hysterectomy at our institute may be due to better management of cases at peripherals health care centre or indirectly it may be a hint of rise in maternal mortality during COVID-19 pandemic.

The mean age of peripartum hysterectomy in our population was  $29.2 \pm 4.6$  years that was similar to the study reported by Vidhi et al whereas other studies reported 28 years as mean age of hysterectomy [8]. Most of the women 37 (75%) were multigravidas as seen in other studies to 3 Majority of women had peripartum hysterectomy at or beyond  $34 \pm 5.6$  weeks of gestation as reported in literature [9]. Higher incidence has been reported following cesarean section than normal delivery from 2.4 per 1000 to 0.98 per 1000 respectively like other studies.

In the present study main indications of peripartum hysterectomy was atonic postpartum haemorrhage (53%, 26/49) followed by placenta accrete (14/49, 29%) and rupture uterus (16%, 8/49) whereas a decade earlier main indications of peripartum hysterectomy were rupture uterus and postpartum hemorrhage ( $n=13, 31.7\%$  each) followed by adherent placenta ( $n=9, 21.9\%$ ) [10].

At our institute over the years, incidence of hysterectomy due to rupture uterus has been reduced from 31.7% to 16% and similar trend has been noticed at another institute too. Among rupture uterus, 5 cases were referrals at the level of local Dai (unskilled health care providers). The injudicious use of uterotonic, fundal pressure and their inability to extend intrapartum care to high-risk pregnancies is an established fact and needs intervention by health agencies at the national or state, district levels. This needs a proper feedback system to be established in the country. It is the possibility that in the peripheral health centres, repeat cesarean section in previous scar is getting an established norm, but the probability that the centres are now strengthened to handle rupture uterus better cannot be assessed.

The second most common cause was Morbidly Adherent Placenta (MAP) (24.2%) in this study that is explained by rising percentage of patients with previous cesarean deliveries from 46%, 19/41 to 65%, 32/49 at our institute when compared to the data a decade ago. Therefore, other studies where uterus was scarred in 82% to 85% of the patients, placenta accreta has been quoted as a commonest indication for EPH. MAP was only diagnosed intraoperatively on being taken up for cesarean section under emergency conditions in present study. Hence, every additional cesarean section confers higher risk to an indexed pregnancy as a risk factor for EPH. Therefore, a policy for a mandatory ultrasonography and opinion in a tertiary institute in all previous cesarean section could go a long way in management of this catastrophic condition in all developing countries. With better antenatal detection of morbidly adherent placenta, there is still a scope of early referral for timely intervention at tertiary level institute for further prevention of morbidity and mortality.

In the face of unremitting haemorrhage, obstetricians face a dilemma: perform the procedure (balancing risks of surgery and possible desire of the woman to preserve fertility) or delay while attempting other therapies that may result in severe anaemia as seen in 11 referred patients mainly as a result of catastrophic atonic postpartum haemorrhage than rupture uterus in present study. Hence, timing is critical to optimal outcome. Apparently, the aggressive management in the first golden one-hour period

is very crucial in the onset of DIC and hence the overall response and risk of maternal mortality.

Among 5 (10.2%) mortalities, 4 referrals had delay in an average time of nearly 4 hrs post onset of haemorrhage, these were received in Disseminated Intravascular Coagulation (DIC) with multiorgan failure, fifth case had intractable atonic PPH at our hospital but we could not save her as she went into cardiogenic shock just after delivery of placenta with suspected undiagnosed heart disease. She was not worked up for dyspnoea either at referred centre or at our hospital except chest X ray as she landed up into caesarean section within very short duration of admission. However, 100% hysterectomy were done in emergency in present study when compared to other studies where obstetrician could get some time to plan few elective surgeries especially in patients with placenta accreta.

Hence, delayed referral with uncompensated refractory shock is the reason of high incidence of 5 (10.2%) maternal mortality in this study when compared to other studies where incidence of maternal mortality has been reported from 2.2%, (1/49) to 4.2% (2/50). Similar incidence of maternal mortality has been reported in one of the study. Where atonic postpartum haemorrhages was the second most common cause of hysterectomy but it was the leading cause of maternal mortality like present study. However, the results were quite contrary to the experience in the same institute of only one mortality 1 (2.4%) due to DIC whereas one of the study reported it as high as 19.44% due to delayed referral and varying degree of shock on arrival [11].

Thus, the significance of early aggressive management and early referral is highlighted to prevent both maternal and neonatal mortalities. Still birth rate was also higher than reported in other studies that can be due to higher number of cases presented with rupture uterus in our study as (11/49, 22%). These stillbirths, we feel were preventable if these women had regular antenatal visits and had presented earlier when in labor to our institute [12]. Some of these could have been averted by instituting mandatory critical electronic foetal monitoring.

Most common postoperative complication was febrile morbidity in this study but it has been decreased from 22% (9/41) from a decade ago to 12.2% (6/49) in present study. Similarly, none of the patient had wound infection and sepsis except 1 case of burst abdomen in present study when compared to data from same institute a decade ago (15%, 6/41 and 10%, 4/41) respectively. These changes are explained by less number of PPH due to adherent placenta which subsequently leads to short duration of surgery  $2.5 \pm 0.4$  hrs in present study when compared to other studies.

The rise in rate of bladder injury in present study is explained by increasing number of patient with previous cesarean section and adherent placenta when compared to data from same institute and incidence is higher in studies where adherent placenta was the leading cause of peripartum hysterectomy.

Morbidity and mortality of haemorrhagic shock led to use of Non-Pneumatic Anti-Shock Garment (NASG) as a part of resuscitative management for all patients either at zero hour of



admission or at earliest on recognition of the shock at our institute and application of this garment has been recommended before obtaining definitive treatment for hypovolemic shock in one of the study [13].

Another study revealed role of uterine artery embolization before delivery in 50 patients of placenta previa (23) and invasive placenta (27) where only 36% of patients required blood transfusion and none of them had disseminated intravascular coagulation and ICU admission [14]. None of the patient had access to uterine artery embolization due to nonavailability of expert for this procedure at our institute.

## Conclusion

We conclude that over the year incidence of peripartum hysterectomy has decreased from 2.21/1000 to 1.6/1000 deliveries at the same institute probably due to decrease in referral and institutional deliveries as a result of COVID-19 pandemic. The indications of peripartum hysterectomy have also been changed to uterine atony followed by adherent placenta and rupture uterus in present study. Main cause of maternal mortalities was atonic postpartum hemorrhage and it is felt that antenatal correction of anemia, recognition of risk factors, identification of adherent placenta, referral of scarred uterus for judicious decision for VBAC with intrapartum electronic monitoring in institute with 24 hours emergency operative services with skilled manpower and blood bank backup, active management of third stage of labor, early recognition of complication with aggressive intervention and resuscitation, use of NASG when and where ever possible, early referral before onset of disseminated intravascular coagulation and development of multiorgan failure or irreversible shock are hall marks of prevention of maternal and neonatal morbidity and mortality. Though, EPH causes irreversible sterility its role as a lifesaving procedure cannot be undermined but for optimal outcome timing of decision making is most critical. The causes also highlight the need to audit rate of LSCS at every delivery point to prevent long term morbidity and mortality of the same as also evident from the present study.

## Conflicts of interest statement

The authors (s) have no conflicts of interest relevant to this article.

## References

1. World Health Organization (2011) Evaluating the quality of care for severe pregnancy complications: the WHO near-miss approach

for maternal health. Department of Reproductive Health and Research World Health Organization.

2. Tahmina S, Daniel M, Gunasegaran P (2017) Emergency Peripartum Hysterectomy: A 14-Year Experience at a Tertiary Care Centre in India. *J Clin Diagn Res* 11:08-11
3. Sharma B, Sikka P, Jain V, Jain K, Bagga R, et al. (2017) Peripartum hysterectomy in a tertiary care hospital: Epidemiology and outcomes. *J Anaesthesiol Clin Pharmacol* 33:324-328
4. Kallianidis AF, Maraschini A, Danis J, Colmorn LB, Deneux-Tharaux C, et al. (2020) Epidemiological analysis of peripartum hysterectomy across nine European countries. *Acta ObstetGynecol Scand* 99:1364–1373
5. Umezurike CC, Feyi-Waboso PA, Adisa CA (2008) Peripartum hysterectomy in Aba South-eastern Nigeria. *Aust NZJ Obstet Gynaecol* 48:580-582
6. Pandher DK, Sehgal A, Aggarwal N (2015) Frequency, Indications and Maternal Outcome in Obstetric Hysterectomy in a Tertiary Care Centre in India. *J K Science* 17:8-12
7. Chaudhary V, Singh M, Nain S, Reena F, Aggarwal K, et al. (2021) Incidence, Management and Outcomes in Women Undergoing Peripartum Hysterectomy in a Tertiary Care Centre in India. *Cureus* 13:14171
8. Huque S, Roberts I, Fawole B, Chaudhri R, Arulkumaran S, et al. (2018) Risk factors for peripartum hysterectomy among women with postpartum haemorrhage: analysis of data from the WOMAN trial. *BMC Pregnancy and Childbirth* 18:186
9. Qatawneh A, Fram KM, Thikeralah F, Mhidat N, Fram FK, et al. (2020) Emergency peripartum hysterectomy at Jordan University hospital-a teaching hospital experience. *Prz Menopauzalny* 19:66-71
10. Shirodker SD, Pandey A, Yadav S (2016) Emergency obstetric hysterectomy: review at a tertiary care hospital. *Int J Reprod Contracept Obstet Gynecol* 5:3811-3814
11. Agrawal S, Yadav R, Raghunandan C, Dhingra S, Kaur H (2013) Peripartum hysterectomy in a teaching hospital in India. *Asian J Med Sci* 4:5-9
12. Zhuangji F, Huale Z, Shuisen Z, Lingling W, Jianying Y (2022) A retrospective analysis of emergency hysterectomy intervention strategy in obstetrics. *Pak J Med Sci* 38:645-651
13. Miller S, Bergel EF, El Ayadi AM, Gibbons L, Butrick EA, et al. (2013) Non-Pneumatic Anti-Shock Garment (NASG), a First-Aid Device to Decrease Maternal Mortality from Obstetric Hemorrhage: A Cluster Randomized Trial. *PLoS ONE* 8:76477
14. Niola R, Giurazza F, Nazzaro G, Silvestre M, Nasti G, et al. (2016) Uterine Artery Embolization before Delivery to Prevent Postpartum Hemorrhage. *J Vasc Interv Radiol* 27:376–382