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Original Research Article

Changing trends in incidence, type, indication and maternal outcome of peripartum hysterectomy over 10 years at a tertiary care centre

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ABSTRACT

Background: Peripartum hysterectomy is the most dramatic operation in modern obstetrics and is generally performed when all conservative measures fail to achieve haemostasis in the setting of life threatening haemorrhage. The objective was to review all peripartum hysterectomies performed at a tertiary care centre over a ten-year period from 2007 to 2016 to determine the incidence, types, indications and maternal outcome and also to study the changing trends

Methods: This was a retrospective, observational, analytical study of parturient women requiring peripartum hysterectomy (PH). We looked at data over a ten-year period, from January 2007 to December 2016. Case records were reviewed for socio-demographic characteristics of the patients, type and indications for the hysterectomy performed, booking status of patients, mode of delivery, gestational age at delivery and maternal outcome. Change in trends of the rate and indications of peripartum hysterectomy at the centre was also reviewed.

Results: The overall rate of peripartum hysterectomy was 1/876 deliveries. The rate of peripartum hysterectomy had a 4-fold rise from 2007 to 2016. The primary indication was abnormal placentation which included morbidly adherent placentation 22/59 (37.2%) and placenta praevia 5/59 (8.4%), followed by intractable atonic haemorrhage in 35.6% of cases. Abnormal placentation as an indication for PH increased significantly from 34.6% (2007-2011) to 54.54% (2012-2016). After hysterectomy, 56% cases were admitted to ICU. All patients needed blood transfusion. Maternal mortality was 10.1%.

Conclusions: Peripartum hysterectomy is a most demanding obstetric surgery performed in very trying circumstances of life threatening hemorrhage. The indication for emergency peripartum hysterectomy in recent years has changed from traditional uterine atony to abnormal placentation.

Keywords: Caesarean hysterectomy, Maternal near miss, Peripartum hysterectomy

INTRODUCTION

Peripartum hysterectomy can be defined as a hysterectomy performed at the time, or within 24 hours, of delivery. It is a removal of the corpus uteri or with the cervix at the time of caesarean section or shortly after a vaginal delivery. The removal of the uterus at caesarean section is called caesarean hysterectomy while the removal after vaginal birth is called postpartum hysterectomy. The procedure may be emergent or planned. The most common indication for emergent

procedure is severe uterine haemorrhage that cannot be controlled by conservative measures. Such haemorrhage is most commonly due to abnormal placentation⁴⁵ to 73.3% and uterine atony, accounting for 26.6% to 35.6% percent of peripartum hysterectomies.¹⁻³ Other potential causes of severe intrapartum or postpartum uterine haemorrhage include uterine rupture, leiomyomas, and laceration of uterine vessels. Planned peripartum hysterectomy may be performed in patients with an antepartum diagnosis of placenta accreta or stage IA2 and IB1 cervical carcinoma.

Emergency Peripartum hysterectomy (EPH) has been described as the most dramatic operation in modern obstetric practice and a marker of severe maternal morbidity and near miss. The procedure is also performed when all conservative measures have fail to achieve haemostasis during life threatening obstetric haemorrhage.⁴ The decision to perform an emergency hysterectomy on a young woman especially the one with low parity poses a dilemma for the obstetrician. However, timely decision for this surgical intervention significantly improves maternal outcome.

Though the first operation of caesarean hysterectomy was originally proposed in 1768 by Cavallini J in Florence, the first successful Obstetric hysterectomy was carried out in 1876 by Porro E from Pavia, Italy.⁵ Currently, the incidence of peripartum hysterectomy is reportedly rising all over the world associated with rise in the incidence of caesarean section rates, placenta praevia and morbidly adherent placenta.

This study was conducted in the department of Obstetrics and Gynaecology ESI PGIMS Delhi in order to determine the incidence, types, indications and maternal outcome of peripartum hysterectomy over 10 years and to assess the changing trends.

METHODS

This was a retrospective, observational, analytical study of parturient women requiring peripartum hysterectomy (PH). We looked at data over a ten-year period, from January 2007 to December 2016.

Our hospital is a 600 bedded multispecialty flagship hospital and serves as a referral centre for primary and secondary employee state insurance health facilities. All women who underwent peripartum hysterectomy between 1st January 2007 and 31st December 2016 were identified from labour room records, operation theatre records and ICU notes. The case records were retrieved from the medical records department for in-depth study.

Information abstracted included the socio-demographic characteristics of the patients, type and indications for the hysterectomy performed, booking status of patients, mode of delivery, gestational age at delivery and maternal outcome. The data were analyzed using simple proportion, rates and tables.

RESULTS

During the period of study from January 2007 to December 2016, there were total 51,706 deliveries and 59 peripartum hysterectomies at a rate of 1 in 876 deliveries (0.11 %). However, it ranged from 0.05% in 2007 to 0.2% in 2016 showing a 4-fold rise (Table 1). The patients age ranged from 18-37 years with majority (55.7%) belonging to the 26-30 years' age group. Most (61.5%) of the patients were multiparous, though 13.55 % were primiparous.

Fifty percent (30/59) patients who underwent peripartum hysterectomy were cases with previous caesarean delivery (Table 2). Our hospital mainly caters to patients of low socioeconomic class and in this study all patients belonged to this class only.

Table 1: Year wise incidence, of peripartum hysterectomy (PH).

Year	Total no. of deliveries	Caesarean delivery	Vaginal deliveries	CS Rate	Peripartum hysterectomy	Maternal mortality (PH)
2007	5656	1565	4091	27.6 %	3(0.05%)	NIL
2008	5687	1653	4034	29.06 %	4 (0.07%)	NIL
2009	5646	1572	4074	27.8 %	6 (0.10%)	2
2010	5626	1625	4001	28.8 %	6 (0.10%)	2
2011	5469	1735	3734	31.72 %	7 (0.13%)	2
2012	5715	1832	3883	32.05 %	7 (0.12%)	NIL
2013	4962	1678	3284	33.81 %	6 (0.12%)	NIL
2014	4639	1584	3055	34.1 %	5 (0.11%)	NIL
2015	4477	1466	3011	32.74 %	7 (0.15%)	NIL
2016	3829	1365	2464	35.6 %	8 (0.2%)	NIL
Total	51,706	16075	35631	31.08%	59 (0.11%)	10.1%

Our hospital being a state insurance hospital and a referral centre, 45.7 % of patients in the study population were booked. Majority of patients (93.2%) were in third trimester of pregnancy whereas only 6.7% (4 cases) presented in second trimester (Table 3). Out of four

patients, who underwent hysterectomy in second trimester all were emergency, three had abnormal placentation, (two cases with morbid adherent placenta with placenta previa, one with only placenta previa) and fourth case had abruption with atonic PPH.

Table 2: Peripartum hysterectomy and mode of delivery.

Year	Total no. of cases	Vaginal delivery 47.4%		Abdominal delivery 52.54%		
		Primi	Multi	Primi with LSCS	Prev one LSCS	Prev two LSCS
2007	3	1	2	NIL	NIL	NIL
2008	4	NIL	3	NIL	1	NIL
2009	6	2	3	NIL	NIL	1
2010	6	NIL	3	NIL	1	2
2011	7	1	1	NIL	3	2
2012	7	2	1	1	2	1
2013	6	NIL	2	NIL	2	2
2014	5	NIL	1	NIL	2	2
2015	7	NIL	1	NIL	4	2
2016	8	1	4	NIL	NIL	3
Total	59	7	21	1	15	15

Table 3: Peripartum hysterectomy and period of gestation.

Period of gestation (in weeks)/Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Total
18-26	NIL	1	1	NIL	NIL	NIL	1	NIL	NIL	1	4
27-32	NIL	1	NIL	NIL	NIL	NIL	2	1	3	2	9
33-40	3	2	4	6	7	7	3	4	4	5	45
Total	3	4	5	6	7	7	6	5	7	8	58

Table 4: Antenatal booking status and type of peripartum hysterectomy.

Year	Peripartum hysterectomy		Peripartum hysterectomy		Total
	Booked	Unbooked	Emergency	Elective	
2007	NIL	3	3	NIL	3
2008	1	3	4	NIL	4
2009	1	5	6	NIL	6
2010	1	5	6	NIL	6
2011	2	5	6	1	7
2012	4	3	5	2	7
2013	4	2	5	1	6
2014	3	2	4	1	5
2015	6	1	5	2	7
2016	5	3	6	2	8
Total	27 (45.7%)	32 (54.23%)	50 (84.74%)	9 (15.25%)	59

Emergency peripartum hysterectomy was done in 84.74% of cases and elective procedure was done in 15.25% (Table 4) Elective caesarean hysterectomy was performed in antenatally diagnosed cases of morbidly adherent placenta. Subtotal hysterectomy was done in 30 cases (50.8%), total hysterectomy was done in 29/59 cases (49.1%). In the study, total hysterectomy was done in cases of abnormal placentation including placenta previa and accrete and those with vault tears involving major vessels. Emergency Peripartum hysterectomy followed in 47.4% cases after vaginal delivery and 52.54% cases after abdominal deliveries including previous caesarean

delivery and caesarean in the index pregnancy. The major indication for peripartum hysterectomy was abnormal placentation which included morbidly adherent placenta 22/59 (37.2%) and placenta praevia 5/59 (8.4%), followed by intractable atonic haemorrhage in 35.6% of cases. Other indications were irreparable rupture uterus, major vessel laceration and abruption placenta which accounted for 8.4%, 6.7% and 3.3% each respectively (Table 5).

In major vessel laceration, 2 had vault tear during instrumental delivery and 2 had extension of uterine

incision laterally involving major vessels during caesarean section. In two cases, concealed abruptio placentae was associated with extravasation of blood into and through the full thickness of the myometrium (Couvelaire uterus) to such an extent making it unresponsive to oxytocic drugs, thus necessitating hysterectomy. Bladder repair was done in 4/59 (6.7%) cases. ICU transfer was needed in 56% of cases. Febrile

illness was seen in 38% cases. Postoperative anemia was present in 58% of patients. There were 6 maternal deaths (10.1%) resulting from massive obstetrical haemorrhage leading to hypovolumic shock, DIC and multiorgan failure. Of the six mortality, three cases were undiagnosed morbid adherent placenta and had torrential haemorrhage during surgery.

Table 5: Peripartum hysterectomy and its indications.

Year	Total no. of cases	Atonic	Rupture	APH (Abruptio)	P. P+MAP	Major vessel laceration
2007	3	2	1	-	NIL	NIL
2008	4	1	1	1	1(1+0)	1
2009	6	4	1	NIL	1	NIL
2010	6	1	2	NIL	2	1
2011	7	1	NIL	NIL	5	1
2012	7	4	NIL	NIL	3	NIL
2013	6	2	NIL	1	4 (1+3)	NIL
2014	5	2	NIL	NIL	3	NIL
2015	7	1	NIL	1	5 (2+3)	NIL
2016	8	3	NIL	1	3 (1+2)	1
Total	59	21 (35.6%)	5 (8.4%)	2 (3.38%)	27 (45.7%)	4 (6.7%)

Two cases had severe atonic haemorrhage, one following vaginal delivery and other after caesarean delivery. One case had major vessel laceration. In all these cases though emergency hysterectomy was performed but patients could not be saved. All patients received blood transfusion. The patient with elective hysterectomy (15.25%) received 2-unit packed RBC's while emergency hysterectomy (84.74%) cases received blood and components according to massive transfusion protocol(6PRBC:4FFP:1PRP). All patients of PH except six maternal deaths are under follow up and are doing well. In total 59 cases of PH, 44.06% (26) cases had poor neonatal outcome. Emergency hysterectomies had more neonatal mortality than elective ones. All patients of PH except six maternal deaths are under follow up and doing well.

In the study, total PH cases were 59, maternal deaths were 10.10% (6) near miss were, 74.57% (44). During 2007 to 2011, total PH were 26 and out of them near miss cases were 96.15% (25) and six maternal deaths. During 2012 to 2016 due to increase in elective procedures, out of total 33 PH near miss cases were reduced to 75.75% (25) and there was no maternal death.

DISCUSSION

Incidence of peripartum hysterectomy in current study ranged from 0.05% in 2007 to 0.2% in 2016 showing a 4-fold rise. In 2007, incidence was 0.5/1000 deliveries, in 2011 it was 1.3/1000 and in 2016 it was 2/1000. The

reported incidence of emergency peripartum hysterectomy varies from 0.24 to 5.09/1000 deliveries in the literature.^{1,2} Incidence of present study was comparable with the recent studies, Chawla et al 2015 found the incidence of peripartum hysterectomy 0.83/1000 deliveries.^{6,7} Review of 10 years from developed country on peripartum hysterectomy gave an incidence rate of 0.4/1000 deliveries.⁸ A retrospective cohort study was performed by Flood KM et al from 1966-2005 of patients who had PH (0.4/1000 deliveries), Indications for PH have changed significantly in this time period, with "uterine rupture" as the indication for PH decreasing from 40.5-9.3% (P <.0001) and placenta accreta as the indication increasing significantly from 5.4-46.5%.⁹ But alongside the rising cesarean delivery rate, there has been a marked increase in the incidence of placenta accreta.

Bodelonetal C found an increasing trend in the incidence rates of peripartum hysterectomy from 1987 to 2006.³ Few recent studies have reported trends of peripartum hysterectomy. In present study, the incidence of peripartum hysterectomy during 2007 to 2011 following vaginal deliveries was 0.5/1000 deliveries and was same during 2012 to 2016. In contrast the incidence of peripartum hysterectomy following caesarean section increased significantly from 0.3/1000 deliveries during 2007 to 2011 to 0.8/1000 deliveries in 2012 to 2016. This may be attributed to the proportion of women with previous caesarean with abnormal placentation. From 2007 to 2010 there were only emergency peripartum hysterectomy performed as a lifesaving procedure. From

2011 onwards protocol based approach including elective caesarean hysterectomy for antenatally diagnosed MAP was followed at our institute along with emergency procedure for other cases of obstetrical haemorrhage.

Present results found that the most common indication for peripartum hysterectomy was hemorrhage most notably due to abnormal placentation including placenta accrete and placenta praevia followed by uterine atony. Abnormal placentation as a cause of PH increased significantly from 34.6% (2007 to 2011) to 54.54% (2012 to 2016). Uterine rupture, major vessel laceration and infection are decreasing as a cause for peripartum hysterectomy. Similar results were found in studies by Amudha and TzeYoong.^{6,8} This demonstrates a clear association between the presence of scarred uteri as a result of previous surgery and abnormal placentation in subsequent pregnancies. It is foreseeable that it will be growing concern with increasing rate of caesarean deliveries worldwide. It is therefore emphasized that primary caesarean should be done only for valid reason. Over 10 years of study, uterine atony as a cause of peripartum hysterectomy was 42.8% from 2007 to 2011 and 57% from 2012 to 2016. Rupture uterus as an indication for peripartum hysterectomy significantly decreased. After 2011, none of the peripartum hysterectomy in present study was done for rupture uteri may be because of utilization of better and modern obstetric care.

Chawla et al in a retrospective study reported most common incidence of Emergency Peripartum hysterectomy was Atonic PPH (25%), followed by Placenta Accreta (21%) and uterus rupture (17.5%).⁷ Abbas et al conducted a study conducted between January 2009 and December 2014.¹⁰ A detailed study of cases of EPH including maternal age, parity, gestational age, type of delivery, indications for EPH and outcome of the hysterectomy. Results found that overall incidence of EPH was 1.30 per 1,000 deliveries and main indications for hysterectomies were uterine atony 60 (48.78%), abnormal placentation 27 (21.95%) and rupture uterus 25 (20.32%). The most frequent indication for EPH in their study was postpartum hemorrhage due to uterine atony (60/123) followed by morbidly adherent placenta (27/123). Joana et al records of 13 patients who had undergone EPH, between January 2000 and December 2010, were reviewed retrospectively and found that the most common indication for hysterectomy was uterine atony (10/13), followed by placenta previa (2/13).¹¹

Knight et al estimated the incidence of PH as 0.4/1000 deliveries and maternal mortality was 0.6%.¹² The study concluded that PH is strongly associated with previous caesarean delivery and risk rises with increasing number of previous caesarean delivery, maternal age over 35 years and parity greater than three.

Glaze et al estimated the rate of PH over last 8 years and was 0.8/1000 deliveries.¹³ The primary indication was

uterine atony (37%) and placenta accrete (33%); ICU admission was in 53% of cases. Although the extent of surgical management depends on the extent of the abnormal attachment, attempts to separate the placenta can result in massive hemorrhage, and a prompt decision to proceed to hysterectomy without delay and multidisciplinary approach enhances the likelihood of an optimal outcome.

Subtotal hysterectomy though is safer, faster, easier to perform and less likely to injure bladder and ureters, was performed in 50% of cases. In cases with MAP, placenta previa and major vessel laceration total hysterectomy was necessary to achieve hemostasis. This was contrary to Shetty et al who did subtotal hysterectomy in 83% of cases.¹⁴

The most frequent complication of PH was excessive blood loss and need for Blood transfusion (100% of cases). Bladder repair was done in 4/59 (6.7%) cases. ICU transfer was needed in 56% of cases. Febrile illness was seen in 38% of current cases, Shetty et al reported it as high as 50% and Kant and Wadhvani had in 39.02% cases.¹⁴

Wright et al analyzed morbidity and mortality of peripartum hysterectomy and concluded that it is accompanied by substantial mortality (14.4%) and morbidity in terms of bladder injuries (9%), ureteral injuries (0.7%), postoperative haemorrhage (5%), wound complications (10%), venous thromboembolism (1%).¹⁵ Chawla et al in a retrospective, observational, and analytical study over a period of eight years had 56 cases of emergency obstetric hysterectomy (EOH) and reported maternal mortality (17.7%) and perinatal mortality (37.5%).⁷ Mukherjee et al in a retrospective study of obstetric hysterectomy in a tertiary care hospital reported no maternal mortality but high perinatal mortality (54.5%).¹⁶

In present study, there were 6 maternal deaths in patients who underwent PH from 2007 to 2011, after that there were no death in PH cases inspite of their rising trend. It could be because of antenatal diagnosis of placenta accrete by colour Doppler and MRI and following a protocol for managing such cases with elective caesarean hysterectomy. Furthermore, in cases with atony where conservative management failed, early resort to surgery and use of blood and component therapy before the patient went in irreversible shock might have helped in reducing mortality.

CONCLUSION

Peripartum hysterectomy is a most demanding obstetric surgery performed in very trying circumstances of life threatening hemorrhage. The indication for emergency peripartum hysterectomy in recent years has changed from traditional uterine atony to abnormal placentation. This is due to rising incidence of placenta previa and

placenta accreta associated with the increasing number of women with previous caesarean delivery. Antenatal anticipation of the risk factors, involvement of an experienced obstetrician at an early stage of management, multidisciplinary approach in cases of morbid adherent placenta (MAP) and a prompt hysterectomy after adequate resuscitation should be the protocol to reduce morbidity and mortality.

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