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"Prevalence of peripartum hysterectomy in A Tertiary care centre, at Hassan, Karnataka – A retrospective study"

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Abstract
Obstetric haemorrhage complicates 27% of maternal mortality in India, many cases are preventable by universal Active management of labour and optimal pregnancy and labour care. Peripartum Hysterectomy is a live saving surgery performed when conservative medical and surgical modality of treatment failes. The present retrospective study was conducted at HIMS, Hassan, Karnataka by analysis of data collected from case records of women delivering at the hospital from financial years 2018 to 2020, to study the prevalence and clinical profile of peripartum hysterectomy in the tertiary care centre over a period of 3 years.

Observation: Out of total deliveries of 23,249 during the study period, 12985(55.9%) were normal vaginal delivery, 10264(44.1%) were caesarean delivery, 30(0.13%) women underwent peripartum hysterectomy for uncontrolled PPH. All the women in the study group were of age <30years, 23% were primi gravida, 53% were second gravid, and 23% were multigravida. 60% women had undergone LSCS in previous delivery, 23% had predisposing factors pre-eclampsia and severe anaemia, indication for peripartum hysterectomy were Atonic PPH-60%, Adherent placenta-34%, traumatic PPH-3% and sepsis-3%,Average blood loss was 2500 ml, average packed blood product replacement rate was RBC 5.34± 2.8 units, FFP -4 ± 3.34, platelet infusion 4±2.38. Post-operative morbidity observed were- fever-5, ARDS-1, DIC-2, ARF-2, TRALI-1, UTI-3, intraoperative bladder injury-1, wound dehiscence-4, and spontaneous bowel perforation-1 and maternal death in referred cases-6.6% due to Atonic PPH.

Conclusion: Atonic PPH and placental complications are preventable indications for peripartum hysterectomy which may be reduced by prevention of risk factors, reduction of primary caesarean delivery and prenatal risk assessment for adherent placenta. Elective caesarean delivery may reduce the maternal morbidity and mortality. A change in universal practice of active management of labour at low resource settings with oxytocin injection by use of an alternative, effective, thermo stable oxytocic may reduce incidence of atonic PPH and related maternal morbidity and mortality.

Keywords: Emergency Peripartum Hysterectomy (EPH), Adherent placenta, Lower segment caesarean section (LSCS), Post partum haemorrhage (PPH), Oxytocin, placenta Accreta

1. Introduction

Obstetric Haemorrhage complicates 27% of maternal morbidity in India and post partum haemorrhage is most common type which is a major maternal near miss event leading to maternal mortality. Massive Obstetric haemorrhage following delivery may be prevented by universal practice of Active management of labour, prediction of haemorrhage, treatment of Anaemia and adequate Antenatal care and strengthening the transfer to tertiary care centres. Severe Atonic PPH may end in emergency Peripartum Hysterectomy which is a lifesaving procedure in cases of uncontrolled post partum haemorrhage, a life threatening Nearmiss event. When conservative methods using misoprostol, oxytocin, injectable prostaglandins and conservative surgeries such us stepwise devascurization of uterine blood vessels, B lynch operations failed in control of PPH in low resource settings, Peripartum Hysterectomy is a lifesaving procedure.

A meta-analysis showed that incidence of peripartum hysterectomy has been raising at the rate of 8% annually [4, 5]. Risk factors for peripartum hysterectomy are advanced maternal age, multiparty, previous caesarean scar, uterine myoma and previous myomectomy scar with pregnancy, major placenta previa, raising rate of induced labour, reduced operative vaginal delivery, increased caesarean delivery and fetal microsomal and early detection of intra uterine complications and restricted growth. Prenatal detection of invasive, morbidly adherent

Placenta, placenta Accreta in subsequent pregnancy. Decision to perform caesarean Hysterectomy is a critical decision for above indications by the obstetrician in low resource settings is a lifesaving emergency procedure. Many published research articles on Peripartum Hysterectomy reported from developed countries observed, that placental site pathology was a major indication for Peripartum Hysterectomy [11, 12, 13]. In India, Atonic postpartum Haemorrhage (PPH) is the major indication for Peripartum Hysterectomy and adherent placenta in developed countries, where as in 1980's indication was Atonic PPH and rupture uterus. The most common indication for obstetric hysterectomy in developed countries at present is morbidly adherent placenta. Kastner *et al*. found placenta accreta to be the most common indication for peripartum hysterectomy while Clark *et al*. found uterine atony to be the common indication in 1984, whereas in 1993 Stanco *et al*. reported placenta accreta to be the most common indication followed by uterine atony [10, 11]. The indication for Emergency peripartum hysterectomy (EPH) is changing recently, hence indicating an analysis of current trends in changing indication for peripartum Hysterectomy cases.

The present study is a retrospective, cross sectional, Descriptive analysis of the prevalence and clinical profile of Peripartum Hysterectomy in 2018-2020, at Sri Chamarajendra Government MCH Hospital, Hassan Institute of Medical Sciences, Hassan, Karnataka, India

Materials & Methodology

Data were taken retrospectively from the case sheets of the patients who had undergone peripartum hysterectomy in our hospital from 2018 to 2020, after Institutional ethical committee approval. The following information were compiled on Ms Excel data sheet, including demographic details-age, parity, socioeconomic status, parity index, obstetric status, indications of peripartum hysterectomy and outcome of pregnancy management. A retrospective analysis of prevalence, post-operative complication, length of hospital stay, ICU transfer rate, average blood loss, blood transfusion rate, maternal morbidity, death and neonatal outcome was done. The data was compiled on MS excel and analysed by descriptive statistics in percentages of occurrence.

Observation

1) Demographic profile

a) Prevalence of peripartum hysterectomy: There were total deliveries of 23,249 during the study period, of those 12,985 were normal vaginal delivery, 10,264 (44.14%) were caesarean delivery. Among them 30 cases (0.13%) underwent peripartum hysterectomy.

b) Age distribution of cases: Table 1 shows the distribution of peripartum hysterectomy among different age group of pregnant women. *70% observed pregnant women were of age <30 years.* Mean age at the time of childbirth being 30 years, youngest women observed was aged 19 years and the eldest was aged 40 years.

Table 1: Age distribution of observed population

Age	Number (n=30)	%
18 to 24yrs	12	12
25 to 29yrs	9	9
Above 30yrs	9	9
Total	30	100

b) Parity Index: In this study 7 were primi gravida. 16 were gravid 2, 6 were gravida3, only one was gravida 4. Among observed population 27 were full term pregnancies, one was iatrogenic preterm induction of labour done for eclampsia, one had late second trimester illegal abortion with retained fetal skeleton/bones with septic shock.

2) Type of childbirth: Out of 30 observed women who underwent EPH hysterectomy, 11(35%) had antecedent Normal vaginal delivery, 18-caesarean delivery 60% (LSCS) and 1-septic, incomplete, late second trimester Abortion with retained fetal bones.

3) Fetal Outcome: Most of new born baby were full term with average weight at birth 3.1kgs as shown in table2 with no in-born perinatal mortality.

Table 2: Fetal Outcome

Age	Term		Preterm	Still Birth
	Male	Female		
Mother 18-24yrs	10	2	1 male	--------
Mother 25-29yrs	4	4	---------	-------
Mother >30yrs	3	4	----------	1 male 1 Abortion

4) Maternal Risk factors and co morbidities: Most observed population were full term pregnancy, 5(16.6%) women had severe pre-eclampsia, 2(6.7%) gestational Diabetes Mellitus, 1 (3.33%)- hypothyroidism as maternal associated conditions as co-morbidities and predisposing maternal risk factors as shown in table 3, most among those (60%) with repeat caesarean delivery.

Table 3: Maternal Risk factors

Maternal Risk factors	Number	Percentage %
PIH	05	16.6
Anemia	10	33.3
Previous LSCS	18	60
Obstructed labour	1	3.3
Induced labour	1	3.3

5) Indications for peripartum hysterectomy: As shown in table 4, most common indication was for Atonic Post-Partum Haemorrhage (60%), the second major indication was abnormal placentation due to previous LSCS.one case had traumatic PPH with D-I-C. Who was admitted with poor general condition and after failed conservative treatment and surgery underwent peripartum hysterectomy. In broad ligament haematoma,, and injury to urinary bladder the evacuation of haematoma and repair of bladder, followed by attempted Internal ileac artery ligation, due to failed control of bleeding, the hysterectomy was quickly performed to save her life.

Table 4: Showing indications for hysterectomy

Indication for hysterectomy	Number	Percentage %
Atonic PPH	18	60
Adherent placenta	10	33.3
Trauma to genital organs	1	3.3
Broad ligament haematoma	1	3.3
total	30	100

In 5 cases we had PIH, all five had ANC elsewhere and came for delivery Out of 2cases of anaemia one had normal delivery and other had caesarean delivery both had intractable Atonic PPH. Despite attempted correction of haemodynamic their life could not be saved. Pregnancy with Obstructed Labour was referred from peripheral primary health centre, after prolonged vaginal delivery in haemorrhagic shock, who inspite of medical

and conservative surgery failed to control bleeding and underwent subtotal-Hysterectomy. one was post-dated pregnancy whose labour was induced with prostaglandins followed with oxytocin infusion and had atonic PPH. out of 18 cases of previous caesarean section delivery admitted in Labour, Placental abnormality was observed among 10 women(33.3%). 5cases had central placenta praevia, with severe APH and 5cases had placenta accreta. All cases after delivery were treated with AMTSL, oxytocics and blood transfusions and later underwent peripartum Hysterectomy.

6) Role of Conservative surgical management: All observed women were treated with medical methods with various oxytocics for PPH and blood products. On failed medical management in controlling haemorrhage, among vaginal delivery cases, laparotomy and conservative surgical procedures were tried and then after its failure peripartum hysterectomy was done. In cases where caesarean delivery was done, Atony was treated with medical management failing which, stepwise devascularisation of uterus and Haemostatic BLynch uterine ligatures were done. In placenta praevia, ascending branch of uterine artery ligation and square stitches and were applied for occlusion of vessels in placental bed, failing which caesarean hysterectomy was done. Hysterectomy was performed with placenta adherent densely to the scar, as bladder invasion was seen in one case.

7) Time interval 0f delivery to hysterectomy: After normal vaginal delivery PPH can occur immediately or after shifting patient to the ward. Hence the time interval between delivery to hysterectomy was 3-6hrs.In case of caesarean section with Atonic PPH, time required for vascular ligation, haemostatic sutures and later hysterectomy needed a total of 2-2.5 hrs from induction of anaesthesia.

8) Blood loss among observed women undergoing peripartum hysterectomy: An average blood loss in observed cases was 2500 + -430 ml. After emergency hysterectomy all cases were shifted to ICU for observation and treatment. All cases needed Oxygen inhalation for 24hours and 6 needed ventilator support. 28 women recovered and were shifted towards, 2 patients died. Most women were discharged on 7th day, while 4 were discharged on 10th day.

9) Transfusion of blood & blood products: as shown in Table 5. Total 158 PRBCs were Transfused for 30 cases of EPH, on an average of 5.34±2.8 units of PRBCS, 119 units of FFP an average of 4±3.34 units, and 106 units of Platelets, an average of 4±2.08 units

Table 5: Shows blood components no of transfusion average

Sr. No	Blood components	No of Transfusion	Average
1	PRBC	158	5.34±2.8
2	FFP	119	4± 3.34,
3	Platelets	106	4±2.08

10) Post-Operative Complications after hysterectomy: are as shown in table 6. There were two maternal deaths in this study. Two women were anaemic before delivery and had atonic PPH, followed by emergency hysterectomy, with massive blood transfusions. One women had TRALI and other case had acute renal failure.

Table 6: Shows complications no percentage

S No	Complications	No	Percentage
1	Febrile morbidity	3	10
2	UTI	3	10
3	ARDS	1	3.33
4	DIC	1	3.33
5	ARF	2	6.66
6	Maternal deaths	2	6.66
7	TRALI	1	3.33
8	intraoperative Bladder injuries	1	3.33
9	Wound Infections	2	6.66

In our Study complications were fever 10%, and ARDS3.33%, Disseminated Intravascular Coagulation 3.3% & Acute Renal Failure 6.6%, all recovered by the treatment. Intraoperative urinary bladder injury was observed in one EPH case with previous LSCS as there was bladder and placenta adherent to lower segment, bladder injury was immediately repaired in layers with no post-operative complications.

11) Histo pathology report: All the specimens after hysterectomy were sent for the histopathological study. Microscopic study of specimen showed the involvement of myometrium in accreta, multiple sections studied showed myometrium with decidual changes and chorionic villi. Adjacent area showed haemorrhage. In specimen of uterus with atonic PPH showed chorionic villi embedded with in endometrium surrounded by haemorrhagic tissue and placental and small bits of membrane, myometrium appeared unremarkable. Septic abortion uterus specimen was filled with Pus, necrosed placental bits and fetal long bones with inflammation and necrosis in endo-myometrial junction.

Discussion

Emergency peripartum hysterectomy (EPH) is a demanding lifesaving obstetric surgery performed in emergency situation of life threatening hemorrhage. The indication for emergency peripartum hysterectomy in recent years has changed from uncontrolled bleeding due to uterine atony to abnormal placentation. Raising incidence and women preferring elective caesarean delivery has been observed with late sequelae in subsequent caesarean delivery and abnormal and adherent placenta. Antenatal assessment of the risk factors, Ultra sound diagnosis of placenta Increta and invasion of LSCS scar, involvement of an experienced obstetrician at an early stage of management and a timely Emergency peripartum hysterectomy after adequate resuscitation, helps in reducing maternal morbidity and mortality.

The reported prevalence of EPH is 0.24 to8.9 per 1000 deliveries, occurrence being different in vaginal and caesarean delivery. In developed countries, abnormal placentation following previous LSCS was the cause for raising trend of Emergency Peripartum hysterectomy (EPH). Peripartum hysterectomy was less in vaginal deliveries compared with caesarean delivery as reported by Whiteman *et al* [5]. A meta-analysis by Tuncapo *et al* showed that incidence of obstetric hysterectomy has been increasing at the rate of 8% annually [BJOG2012]. Subtotal hysterectomy was done in 61.9% and total hysterectomy in 38% as observed by Hoblidhar *et al* [11]. Louna *et al* in 2011 analysed outcome of emergency peripartum hysterectomy and reported the incidence of emergency peripartum hysterectomy ranged from 0.24 to 8.7 per 1000 deliveries.

In Indian Studies, published by Bharthi *et al.* [13], Hoblidaar *et al* [11], and Chawla *et al* [10] observed that the prevalence of

peripartum hysterectomies was 6.9-7/1000 deliveries. In comparison of incidence quoted by Surya jayaram, A.P verghese [14], was 1.7%. In our study prevalence was 2/1000 deliveries that is in par with study by Surya jayram *et al*. Mean age of the women was 30.3 years. Mean parity was two. 1.75% of cases were unbooked. 37% of cases underwent obstetric hysterectomy following vaginal delivery and 60% of cases had the procedure following abdominal route of delivery.

The mean age of women undergoing peripartum hysterectomy was 28.4±3.8 years. Most women undergoing peripartal hysterectomy were of age >30yrs Whiteman *et al* [5]. In our study 12 [40%] were in age group of 18 to 24yrs 9 [30%], 25to29yrs and 9 [30%] in women with age group >30yrs. Hoblidhar observed that maternal age -mean being 27.6±3.7 years. Of these 40 women, 2 (5%) were primigravida, 7(17.5%) were second gravida, and the remaining 31(77.5%) were multigravida [10, 11, 13] Hoblikar *et al.* observed that 36% of patients were gravida 3 and above. In previous studies, women were multiparous in 61% (Suchith Bodh *et al.* l), 72.3% in kastner *et al*, which are similarly observed in our study among 76% of multiparous women. The mean gestational age at which EPH was performed was 36.6±4.2 weeks, Mean maternal age (years) 27.6±3.7, Mean parity 1.7, and Mean gestational age (weeks) 36.6±4.2.

Chawla reported that emergency hysterectomy was done in 0.030 of vaginal delivery and 0.270 per 1,00,000 total deliveries following Cesarean section. Morbidly adherent placenta was the indication for EPH in 21.4% cases and was associated with one or more cesarean sections previously in 71% cases, previous curettage in 7.1% cases, placenta previa in 6% cases, and with a history of manual removal of the placenta and fibroid uterus in one case each. More than one factor was associated in many cases. In present study, previous LSCS was a predominant risk factor in 60%, Pre Eclampsia in 16.6%. The Risk Factors for PPH were uterine atony, anemia, induced labour, prolonged labour, multi parity and coagulopathies.

The most common indication of EPH was PPH, followed by morbidly adherent placenta in our study. Abnormal placentation is major cause for PH in developed countries. In developing countries uterine atony, rupture uterus were major indications earlier, but rising trend in caesarean sections, abnormal placentation has changed the major indication for Peripartum hysterectomy. This is because of vigilant care given during labour to prevent prolonged labor and prevention of post-delivery excess blood loss by active management of atonic PPH (postpartum haemorrhage) with uterotonic agents [7]. Louina *et al* reported EPH in abnormal placentation (placenta previa/accreta) in 45 to 73.3%, uterine atony in 20.6 to 43% and uterine rupture in 11.4 to 45.5 %. The risk factors included previous caesarean section, scarred uterus, multiparity, older age group. Bharthi Sharma.*et al* reported that 6 (15%) women had unscarred uterus, Thirty-four (85%) women had previous cesarean sections, of which 10 (29.4%) had previous one caesrean and 24 (70.6%) had undergone 2 or more previous cesareans. The indications for peripartum hysterectomy were placenta accrete (60%), atonic PPH (27.5%), and rupture uterus (7.5%) [13]. Intensive care management was required in 35% women postoperatively. Hoblikar, and Rathnamala reported emergency obstetric hysterectomy for atonic PPH in 8(38.0%), followed by uterine rupture in 5(23.8%) and morbidly adherent placenta in 4 (19.0%). Chawla.*et al* observed that Atonic Postpartum Hemorrhage (25%) was the most common indication followed by placenta accreta (21%) that was similar in present study and uterine rupture (17.5%) and secondary PPH in 3 (14.3%) and for traumatic PPH in 1 (4.8%) [11]. Hoblidar, Rathnamala desai *et al* [11] reported 21 emergency peripartum hysterectomies, and the rate of EPH was 0.7 per 1000 deliveries. Most common indication for EPH was uterine atony (38%), followed by uterine rupture (23.8%) and morbidly adherent placenta (19%). Most of the patients (47.6%) had previous cesarean deliveries. A clinical review of obstetric hysterectomies done in medical college, Kottayam for a period of six years reported atonic PPH 58.6%, Rupture uterus 16.7%, adherent Placenta 16.7%, secondary PPH 8.3% as indication for Emergency peripartum hysterectomy [12]. A.P verghese and suryakala reported 56.14% of cases underwent obstetric hysterectomy for postpartum Hemorrhage, 36.84% for morbidly adherent placenta, and 90.5% of morbidly adherent placenta had previous caesarean section as a major risk factor. In present study, indication for peripartum hysterectomy were Atonic PPH-60%, Adherent placenta-34%, traumatic PPH-3% and septic Abortion-3%. Our observational study differs from some of the earlier Indian studies that emphasises the need for a strong and effective oxytocic which is stable at room temperature in medical management of Atonic PPH.

In our study all cases were institutionally delivered, and Rupture uterus was not seen in present series. Most cases of placenta accreta had history of previous caesarean delivery. Whiteman *et al* reported that the rate of EPH was lowest with vaginal delivery, increasing with vaginal birth after caesarean and repeat cesarean deliveries and opined that the highest risk was with repeat cesarean deliveries [5, 11]. In our study gravida2 were common as they had previous caesarean section delivery with ultrasound diagnosis of placenta praevia or placenta accrete, and 18% of women undergoing primary LSCS underwent EPH for uncontrolled PPH. In our study all women in study group came in labour except one patient who underwent Elective caesarean delivery for placenta percreta with invasion of bladder. Prevalence of caesarean hysterectomy is 60% in our study in comparison with other studies 85% by Bharath Sharma *et al*, 47% by Hoblidhar *et al*, 71.4% following previous caesarean delivery by Ratnamala [11], and all over the world. In present study, One women came with septic abortion in septicaemia with excess vaginal bleeding and shock, underwent Hysterectomy to save her life, after resuscitation for retained necrotic placental Bits, Pyometra, perforation of uterus, peritonitis and foreign body in uterus.Retained fetal long bones, skull bone pieces with perforation of uterus and pus collected inside pelvis were aspirated. This women recovered after surgery.

S. Tahmina *et al* observed that the average requirement of blood and products was 7.64±5.8 units. In present study it was 5.34±2.8 units. One patient had transfusion related acute Lung injury (TRALI).

Many complications were seen following EPH. Chawla *et al* reported Peripartum hysterectomy following caesarean in 66.6%, Intra-operative urinary bladder injury was seen in 14.2% of the patients,and most frequent sequelae were febrile morbidity (19.2%), and disseminated intravascular coagulation (13.5%). Maternal mortality was 17.7% whereas perinatal mortality was 37.5%. Most common maternal complication as reported by Bharthi Sharma *et al* was febrile morbidity (27.5%), Bladder injury in 20%, disseminated intravascular coagulation in 12.5%, and wound infection in 5% of the women. Louina [9] observed the maternal morbidity ranged from 26.5 to 31.5% and the maternal mortality 4.8%. In present study post-operative morbidity observed were fever-20%,ARDS-3.33%,DIC-6.7%, ARF-6.7%, TRALI-3.33%, Intraoperative bladder injury-3.33%, wound dehiscence-415%, UTI-20%, and spontaneous bowel perforation-3.3% and maternal death due to Atonic PPH in

referred case-6.7%.,which was similar in studies by chawla, Hoblikar etc. Urinary bladder injury in caesarean hysterectomy was-3.3% that is comparable with study by Suchith *et al*. and Chawala *et al*. Traumatic PPH and broad ligament haematoma in one women had undergone EPH and this repeat LSCS was done by junior staff.

One patient developed Adult Respiratory Distress Syndrome (ARDS) and renal failure and could not be saved. Out of 30 cases, 2cases died inspite of emergency hysterectomy. Both were anemic on admission and had Atonic PPH. Maternal deaths among all referrals from outside. Chawla reported 17.7%, S Tahmina-12.2%, Bharthi Sharma *et al* (10%) of maternal deaths postoperatively [10], in comparison with 6.66%maternal mortality in our study, that is less compared to other studies [10, 12].

Reduction in primary caesarean delivery, and Antenatal diagnosis of placenta increta and percreta followed by elective caesarean delivery may prevent Obstetric catastrophe of uncontrolled haemorrhage. Skill training of service providers – obstetricians to perform Peripartum Hysterectomy and conservative surgery for atonic PPH, internal iliac artery ligation, may Avert maternal deaths as observed in our study and MMR has decreased due to timely intervention and decision on Emergency Peripartum Hysterectomy.

Conclusion

Peripartum hysterectomy is emergency lifesaving surgery in low resource surgery with facility for performing caesarean operations. The indication for peripartum hysterectomy continues to be Atonic PPH in our study that necessitates the use of a potent oxytocic that is stable at room temperature. Women's preferential caesarean delivery followed by repeat LSCS has increased the abnormal and adherent placentae as emerging raising, indication for paripartum Hysterectomy. When caesarean section is planned for repeat LSCS, a senior doctor should observe the surgery and antenatal watchful detection of placental invasion of scar, pre-operative counselling and readiness to manage the situation can be undertaken. In low resource settings, the art of obstetric judgement for alternative procedures to save uterus or resort to hysterectomy V/S decision to save life of the patient may be practiced as an important intervention in preventing maternal mortality. In medical colleges training post graduates, emphasis should give for skill training of young obstetricians to perform conservative surgery and emergency peripartum hysterectomy along with Multi-disciplinary approach to avert maternal deaths.

Adequate MCH services, identification of risk factors, institutional delivery, antenatal correction of anaemia, timely referral, easy availability of transport, anticipating PPH in high risk groups, good post-operative care, wide availability of blood and components transfusion facilities, use of efficient oxytocic drugs which are stable at room temperature, provision of post-operative intensive care at community level Hospitals, reduction of primary caesarean delivery rate can reduce maternal morbidity and maternal mortality.

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