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Analysis of Indications and outcome of emergency obstetric hysterectomy

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Abstract
Introduction: Emergency hysterectomy is the surgical removal of the uterus following an unexpected and sudden event, which must be dealt with urgently by carrying out the procedure. When it is carried out in a woman with a pregnant uterus less than 24 hours after delivery, it is termed emergency peripartum hysterectomy. Peripartum Hysterectomy is an essential part of the obstetricians armamentarium. On one hand, it is the last resort to save a woman's life and on the other hand, her reproductive capability is sacrificed. Many times it is a very difficult decision and requires good clinical judgment.
Objectives: To evaluate the indications, outcome and complications associated with peripartum hysterectomy procedures.
Methods: A retrospective study of all cases of caesarean and postpartum hysterectomy between July 2019 and December 2020. Maternal characteristics, indications for hysterectomy and complications were reviewed.
Results: The rate of peripartum hysterectomy was 1.32:1000 deliveries. Most were operative deliveries. The main indications were placenta accrete (36%), massive atonic PPH (32%) and uterine rupture (18%). Maternal morbidity was high and there were four maternal deaths (8%). All deaths were in patients brought in a critical condition to the hospital after massive blood loss.
Conclusion: Peripartum hysterectomy is potentially a life saving procedure but the mortality and morbidity is high, especially if performed late when the hemodynamic instability has already set in.

Keywords: Atonic PPH, rupture uterus, placenta accrete, peripartum hysterectomy, maternal mortality

Introduction

Emergency hysterectomy is defined as the surgical removal of the uterus after an unexpected and sudden event that must be dealt with urgently by carrying out the procedure [1-4]. And it is termed emergency peripartum hysterectomy when it is carried out in a women with a pregnant uterus less than 24 hours after delivery [1, 2]. For more than 100 years, this procedure has been in use. The first case report of a successful procedure was published by Edward Porro in 1876 in which both mother and baby survived [1].

Emergency Peripartum Hysterectomy is an essential part of the obstetricians' armamentarium [5]. The surgeon is in much dilemma before performing this procedure as on one hand, it is the last resort to save a mother's life and on the other hand, there is permanent loss of her reproductive capability. So, a good clinical judgment is required for taking this decision [6].

The reported rate in Pakistan is 5.6 per 1000 births [1], in India 2.6 per 1000 births [3], and in the United. States between 1.2 and 2.7 per 1000 births [7]. Peripartum hysterectomy being associated with a high rate of morbidity and mortality, represents a major operation in modern obstetrics, although its incidence is low [2].

In 19th century, first peripartum hysterectomy was done to prevent maternal mortality resulting from uterine haemorrhage and sepsis caused by prolonged labor [8]. The risk factors associated with postpartum haemorrhage are uterine atony, abnormal placentation, precipitate or prolonged labor, bleeding due to coagulopathy, fetal macrosomia, multiparity, maternal obesity, and the previous history of primary postpartum haemorrhage [9]. The number of cases of peripartum hysterectomy have increased owing to the increasing rates of cesarean deliveries and uterine rupture, placenta previa, placenta accreta, increta, and percreta are the main risk factors [2].

Abnormal placentation is associated with factors like scarred uterus owing to previous caesarean section, myomectomy and dilatation and curettage [10].

Although uterine rupture rarely results in maternal death in developed countries but may result in significant morbidity including hypovolemic shock, acute renal failure, complications of massive blood transfusion, peripartum hysterectomy, ARDS, DIC, urologic injury and post-op complications like infections and thromboembolism. But in less developed countries, uterine rupture is an important cause of maternal mortality [11, 12].

Aims and Objectives

The objective of our study was to evaluate the indications, outcome and complications associated with peripartum hysterectomy procedures.

Material and Methods

It was retrospective study. The study was conducted on cases of peripartum emergency hysterectomy performed at SMGS Hospital, GMC Jammu, during the period from 1st July 2019 to 31st December 2020. A total of 50 patients were included in the study. The data was obtained from medical records and files.

Inclusion criteria

- Patients who underwent peripartum hysterectomy either immediately or within forty- two days of vaginal or caessarean delivery.
- Peripartum hysterectomy performed after 28 weeks of gestational age were taken.

Exclusion criteria

- Cases of hysterectomy performed before 28 weeks of gestational age.
- Hysterectomy performed for any gynaecological conditions like leiomyomas and carcinoma cervix were not included in the study.

Data such as age, parity, booking status, previous mode of delivery, indications of emergency hysterectomy, complications following the procedure, maternal mortality, hospital stay were studied.

Ethical clearance: this study is approved by Institution ethics committee with registration no. IEC/GMC/2021/567.

Statistical analysis

Analysis of results were done by using Epi info version 6. Numerical data were presented as Mean±SD and categorical data were presented as percentage and results were tabulated.

Results

The following observations are based on a study of 50 cases of peripartum hysterectomy treated in SMGS Hospital, GMC Jammu during the period from 1st July 2019 to 31st December 2020. The total number of deliveries were 37,800 during the study period (July 2019 to December 2020), so the overall incidence of peripartum hysterectomy was 1.32 per 1000 deliveries. The demographic and clinical characteristics of women with peripartum hysterectomy are shown in table 1. Age of the patients ranged from 21 to 40 years in our study and about 62% of the patients were in the age group of 26-30 years. Most of the patients (76%) were para 2 and para 3. Only one patient in our study was primipara and 11(22%) were grand multipara. Out of 50 patients, only 28% were booked cases of our hospital, while 72% were unbooked.

Table 1: Baseline characteristics of the patients who had emergency hysterectomy

Variables	No. (%)
Age (years)	
21-25	9(18)
26-30	31(62)
31-35	8(16)
>36	2(4)
Parity	
P1	1(2)
P2-P3	38(76)
P4 and more	11(22)
Booking status	
Booked	14(28)
Unbooked	36(72)

Table 2 shows the most common indications for peripartum hysterectomy in our study. Placental pathology (46%) was the primary indication of peripartum hysterectomy in our study, in which 30% had Placental accrete, 6% had placenta percreta and 10% had placenta previa. Atonic PPH (32%) was the second most common indication followed by uterine rupture (18%). In one case hysterectomy was done because of uterine sepsis.

Table 2: Indications of Emergency Hysterectomy

Indications	No. (%)
Placenta accrete	15(30)
Placenta percreta	3(6)
Placenta previa	6(12)
Atonic PPH	16(32)
Uterine rupture	9(18)
Uterine sepsis	1(2)

Table 3 shows the causes of rupture uterus. Out of 9 cases of rupture uterus, 3 cases were due to scar dehiscence of previous caesarean sections which was unrepairable, 3 cases occurred in grand multipara women, and 2 cases occurred due to prolonged labour. One case was due to fetal anamoly (hydrocephalus).

Table 3: Causes of rupture uterus

Causes	No. (%)
Grand multipara	3(33.33)
Prolonged labour	2(22.22)
Non repairable scar due to previous caessarean	3(33.33)
Fetal anomalies	1(11.11)

Table 4 shows postoperative complications in patients who undergone peripartum hysterectomy. In present study, wound sepsis occurred in 6 patients (12%), post operative fever occurred in 4 (8%) patients, ileus in 5 (10%). Acute renal failure occurred in 3 (6%) patients because of excessive haemorrhage, 2 (4%) patients developed ARDS, 1 patient went into DIC. Six patients had bladder injury during hysterectomy and same was repaired during surgery. About 88% patients required more than two units of blood transfusion. In present study, 4 maternal death occurred.

Table 4: Post-operative complications

Complications	No. (%)
Febrile morbidity	4(8)
Paralytic ileus	5(10)
Wound sepsis	6(12)
Acute renal failure	3(6)
Bladder injury	6(12)
ARDS	2(4)
DIC	1(2)
Blood transfusion > 4 units	34(68)
Maternal death	4(8)

Table 5 shows the duration of hospital stay. About 62% patients stayed in hospital for less than 10 days. Six patients stayed in hospital for more than 20 days because of bladder repair.

Table 5: Duration of Hospital stay

Duration	No. (%)
<10 days	31(62)
10-20 days	9(18)
Above 20 days	6(12)

Discussion

It was observed that majority of our patients were in the age group of 26-30 years. Mean age was 29.4 years. Our results were consistent with Agarwal *et al.* [13] the mean age in their study was 27.61 years. The lower mean age in our study is probably due to the practice of early marriage and frequent child bearing without proper birth spacing.

In our study commonest parity (62%) was para 2 and para 3, the main cause of peripartum hysterectomy in these patients was atonic PPH. Similar observation was seen in study by Varalakshmi K *et al.* [14], where 18% were primipara, 68% were para 2 and para3 and 14% were grand multipara. Agarwal *et al.* [13] also reported similar results, 17.2% were primipara and 72.4% were multipara in their study. Majority of our patients (72%) were unbooked and were referred late from the periphery in unstable conditions to our tertiary institution. Remaining 28% patients were booked cases of our institution, and majority of these patients were previous LSCS with placenta praevia/ accreta.

The incidence of peripartum hysterectomy in literature varies from 0.2-0.85 per 1000 deliveries [15, 16]. In our study, its incidence was 1.32 per 1000 deliveries. Almost similar incidence was reported by Sarojini A *et al.* [17], 1.01 in their study. While in the study conducted by Abiodum O *et al.* [9] in Nigeria, the rate of peripartum hysterectomy was 4 per 1000. The incidence of peripartum hysterectomy occurring with a history of previous caesarean section has increased significantly over the last few decades. In the present study, 66% of patients had a history of either one or two previous caesarean sections. Our finding is consistent with study done by Agarwal *et al.* [13], 44.44% patients had a history of either one or two caesarean. Knight M *et al.* [18] and Rahman J *et al.* [19] also reported similar results. The association between the incidences of peripartum hysterectomy with a history of previous caesarean is mainly because of the occurrence of morbidly adherent placenta. In our study placental pathology was the principle indication of peripartum hysterectomy, accounted for 48% of our cases of peripartum hysterectomy. Out of 50 cases, 18 cases (36%) were due to morbidly adherent placenta. 15 patients had placenta accrete and 3 cases were done because of placenta percreta. And 6 patients (12%) had placenta praevia. In patients with placenta previa, severe PPH occurred, the bleeding continued inspite of oxytocin, ergometrine, prostaglandin, blood transfusion, so decision for hysterectomy was undertaken. Similar observation was made by Agarwal *et al.* [13] in their study placenta accrete was the most common indication of peripartum hysterectomy in their study, accounted for 38.88%. Dobroslawa *et al.* [20] also found placental pathology as the main indication accounted for 44.4%. Placenta accrete has been the most common indication for peripartum hysterectomy in study done by Razia *et al.* [21]. The prominence of placenta previa or placenta accrete as an indication for peripartum hysterectomy has been reported globally [1-4]. This has been attributed to the increasing caessarean rate and the concomitant rise in the prevalence of placenta previa and placenta accrete worldwide [22-26].

Atonic PPH was the second most common indication for peripartum hysterectomy in our study accounting for 32% of all cases. Due to the increased success of treatment with uterotonic agents, embolization and better surgical procedures, the incidence of PPH has declined relatively over the decades. However, this largely preventable indication for peripartum hysterectomy continues to predominate in developing countries due to lack of proper facilities and delayed patient admission from distant areas. PPH is unpredictable in onset, duration and etiology and it remains a major life- threatening complication of any delivery [14]. Agarwal *et al.* [13] also found atonic PPH as the second most frequent indication for hysterectomy in their study, accounted for 36.11% of cases. In studies done by Michelet D *et al.* [27] and Marshall AL *et al.* [28], the most common cause of peripartum hysterectomy was uterine atony, which complicates 1 in 40 births in the United States and is responsible for at least 75% of cases of peripartum hysterectomy. Chawla J *et al.* [29] and Rathod *et al.* [30] also found atonic PPH common indication for peripartum hysterectomy.

Uterine rupture accounted for 18% of all cases of peripartum hysterectomy in our study. In developed countries, there has been a significant decrease in the incidence of uterine rupture as the indication for peripartum hysterectomy, where it accounts for only 4% of cases of peripartum hysterectomy[31]. But in developing countries like India condition are entirely different due to grand multiparity, lack of antenatal care and unsupervised labour at home and woman in labour are brought to hospital from miles away after hours of prolonged labour, hence rupture of uterus is still a live problem for us. In study by Agarwal *et al.* [13], uterine rupture was accounted for 22.22% of all the cases. While Varalakshmi *et al.* [14] and Nooren *et al.* [32] reported rupture uterus as the primary indication for peripartum hysterectomy in their study responsible for 46% and 50% of all cases respectively.

The most common post operative complications were bladder injury (12%), wound sepsis (12%), febrile morbidity (8%), ileus (10), acute renal failure (6%), ARDS (4%), DIC (2%). 88% patients required more than 2 units of blood. Varalakshmi *et al.* [14] and Agarwal *et al.* [13] also reported similar observation.

Bladder damage was seen in 12% of cases in our study. Most of these patients had placenta accrete, which was an independent risk factor for the further surgery. In western countries like Dobroslwa *et al*. [20] study complications of the lowere urinary tract during hysterectomy were observed in 13.5% patients. Agarwal *et al*. [13] reported bladder injury in 16.6% cases of subtotal hysterectomy and 5.5% cases of total hysterectomy.

In present study, 62% of the patients stayed in hospital for < 10 days, prolonged stay in hospital was mainly due to wound sepsis, febrile illness. 6 patients had stayed in hospital for more than 20 days because of bladder repair. In study by Varalakshmi *et al*. [14], about half of the patients stayed in hospital for < 10 days and 6 patients had stayed for more than 20 days because of bladder repair.

There were four maternal death in the present study giving a mortality rate of 8%. Agarwal *et al*. [13] observed maternal mortality rate of 19.44% and Varalakshmi *et al*. [14] reported 14.28%. All the maternal deaths were in unbooked or referred patients who were brought in a haemodynamically unstable condition with varying degrees of shock. There is a relationship between the decisions to perform the hysterectomy, the amount of blood loss and the likelihood that the hysterectomy will be complicated by coagulopathy, severe hypovolemia, tissue hypoxia, hypothermia and acidosis which further compromises the patient status. Proper timing and meticulous care may reduce or prevent maternal complications [7].

Conclusion

Peripartum hysterectomy is a life saving obstetric emergency that has potentially devastating consequences. The worldwide increase in caesarean section rates may lead to a rise in the number of peripartum hysterectomies required in the future because of morbidly adherent placenta. Thus, there is a need for institutions to monitor and reassess the indication of caesarean section to reduce the caesarean section rates. Due to the complexity of the surgery and life threatening complication involvement of an experienced obstetrician/pediatrician/ anesthetist at an early stage is desirable. Also, there is a need for more effective implementation of family welfare and reproductive health measures in the developing nations to reduce the incidence of life threatening obstetric haemorrhage and uterine rupture.

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