

Emergency Peripartum Hysterectomy Research at a Tertiary Care Centre

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Abstract

Objectives: The aim of this study is to assess the occurrence, reasons, and consequences of Emergency Peripartum Hysterectomy (EPH) at a particular institution. It seeks to identify risk factors, examine complications, and offer insights for interventions to enhance maternal and fetal outcomes in obstetric emergencies.

Methods: The study was conducted at a tertiary care centre and the data analysis covered a period of 1 year. This study retrospectively analyzed Emergency Peripartum Hysterectomy (EPH) cases at a specific institution, reviewing patient demographics, obstetric history, booking status, referral patterns, EPH indications, delivery mode, and maternal-fetal outcomes.

Results: The study revealed that the majority of patients (80.3%) belonged to rural backgrounds, with 89.3% being unbooked cases. Furthermore, 64.3% of cases were referred, and 85.7% of patients were in the P2,3,4 group. The most common indication for Emergency Peripartum Hysterectomy (EPH) was uterine rupture (53.6%), with a statistically significant association between the type of hysterectomy and indications for EPH (P value < 0.05). Subtotal hysterectomy was performed in 82.1% of cases, and maternal complications included febrile illness (51.8%) and wound infection (37.5%).

Conclusion: This study highlights the imperative to address the elevated incidence of Emergency Peripartum Hysterectomy (EPH) in rural healthcare in India. The findings stress the pressing need for targeted interventions, including improving female literacy, increasing contraception prevalence, and enhancing antenatal care accessibility and quality. Strengthening peripheral healthcare, ensuring timely referrals for high-risk pregnancies, and proper documentation are essential for mitigating maternal morbidity, mortality, and foetal complications.

Keywords: *Emergency Peripartum Hysterectomy, maternal outcome, obstetric, placenta previa*

Introduction

Emergency peripartum hysterectomy (EPH) is a rare yet critical obstetric procedure primarily employed as a life-saving intervention in cases of uncontrollable obstetric haemorrhage [1]. It is designated as a maternal near-miss criterion by the World Health Organization, serving as a proxy for severe postpartum haemorrhage and consequently attracting considerable attention in obstetric surveillance [2]. The genesis of EPH dates back over a century to Edward Porro's pioneering report in 1876, documenting a successful procedure that saved both the mother and the newborn [3].

Typically performed within 24 hours of delivery, EPH acts as a last resort measure to safeguard parturient mothers facing severe haemorrhage, often stemming from intractable uterine atony, abnormal placentation, or trauma following instrumental delivery [3, 4]. Conservative interventions such as uterotonic drugs, compression sutures, and arterial ligations are initially pursued, ensuring hemodynamic stability before contemplating the more radical option of hysterectomy [5]. The timing of hysterectomy is crucial, as delays can exacerbate haemorrhage, anemia, and contribute to elevated maternal mortality [5, 6].

Risk factors for EPH encompass advanced maternal age, multiparity, previous Caesarean sections, placenta praevia, induced labour, operative vaginal delivery, uterine myoma, and foetal macrosomia. The procedure is associated with notable complications, including the need for extensive blood transfusions, coagulopathy, and potential urinary tract injuries, underscoring the gravity of this life-saving intervention [7-9]. The incidence of EPH varies globally, with developing countries experiencing higher rates, attributed to challenges in accessing modern obstetric services [3, 4, 10].

In contemporary obstetrics, the overall incidence of EPH is relatively low at 0.05%, but significant regional variations exist, influenced by factors such as healthcare infrastructure, antenatal care awareness, and family planning efficacy [11]. The literature reports varying incidence rates, with developed countries exhibiting lower rates compared to developing nations [12-14]. Recent trends suggest an increasing incidence of EPH, particularly in the context of rising rates of Caesarean sections and associated complications like placenta accreta [8, 9].

As the leading indications for EPH shift from uterine atony to placenta accreta, there is a growing concern about the potential rise in EPH cases, necessitating a closer examination of risk factors and preventive strategies [15, 16]. This study aims to contribute valuable insights into the prevalence, risk factors, and outcomes associated with EPH, emphasizing the importance of timely and appropriate obstetric care in mitigating maternal mortality and morbidity.

Materials and Methods

Study design

This study employs a prospective design to identify and analyze cases of Emergency Peripartum Hysterectomy (EPH) at a tertiary care centre, spanning for 1 year.

Inclusion and exclusion criteria

The inclusion criteria for this study encompassed cases of emergency hysterectomy performed within 24 hours following delivery and after reaching 28 weeks of gestation. All the emergency hysterectomies performed after 24 hours of delivery were excluded from this study.

Study size

The study encompasses all instances of Emergency Peripartum Hysterectomy (EPH) conducted within the time frame of 1 year at the Labour Room, Department of Obstetrics & Gynaecology, a tertiary care centre.

Study setting

In the study setting, a comprehensive approach was adopted to collect data either through direct patient interaction, examination, and observation until discharge or through meticulous examination of medical records, duly completing the attached proforma. The history-taking process covered a spectrum of patient details, including personal and socio-economic factors, antenatal care status, and referral information. Presenting complaints, especially in emergency cases, were meticulously noted, encompassing pain duration, membrane rupture, febrile episodes, foetal movements, vaginal discharge, bleeding, and whether interventions occurred outside the hospital.

The history of present illness, present pregnancy, menstrual history, and obstetric history provided detailed insights into the patient's health trajectory. Past medical and surgical histories, family history, and personal habits were also explored. A thorough examination included general, abdominal, and pelvic assessments, with particular attention to factors influencing obstetric conditions. Various investigations, such as blood grouping, complete blood count, urine analysis, and COVID screening, among others, were conducted to gather

comprehensive data. This exhaustive approach aimed to establish a robust foundation for analyzing Emergency Peripartum Hysterectomy cases during the specified period.

Post-surgery management

In the post-hysterectomy phase, comprehensive management strategies were implemented to ensure optimal recovery. Intraoperatively, rigorous vital monitoring was maintained, and various interventions were employed. Intravenous fluids and blood transfusions were administered as necessary, alongside Foley's catheterization and uterine massage, particularly to rule out traumatic postpartum haemorrhage through per speculum examination. Uterotonics such as Methergin, Oxytocin, Tranexamic acid, and Carboprost were judiciously utilized to facilitate uterine contraction.

On the surgical front, tailored approaches were adopted based on the underlying conditions. For atonic uterus, techniques included multiple square sutures, cervico-isthmic sutures, B-Lynch compression sutures, Modified B-Lynch compression sutures, Haymann's sutures, and ligation of bilateral uterine arteries were employed as surgical techniques. Additional surgical interventions encompassed ligation of ovarian and uterine artery anastomosis, bladder repair if necessary, and subtotal or total hysterectomy as deemed appropriate.

Postoperatively, meticulous care was provided, involving intravenous fluids, blood transfusions, and antibiotic administration. The management plan extended to addressing potential complications, including paralytic ileus, urinary tract infections, postpartum psychosis, wound dehiscence, fever, wound sepsis, coagulopathy, the need for relaparotomy, and monitoring both maternal and perinatal mortality. This comprehensive approach aimed to optimize patient outcomes and mitigate postoperative complications effectively.

Statistical Analysis

A dedicated template was created using MS Excel, serving as the platform for data entry. The SPSS Software was employed for the subsequent data analysis. A significance level of 5% was deemed appropriate for this study, guiding the statistical assessments and interpretations.

Results/Outcomes

During the study period spanning for 1 year, a total of 6441 deliveries occurred, among which 56 cases of Emergency Peripartum Hysterectomy (EPH) were identified. Notably, out of 3244 Caesarean Section (CS) cases, 22 underwent EPH, yielding an incidence rate of 6.7 for every 1000 deliveries. Analysis of age distribution revealed that the majority of EPH cases, 78.6 %, were in the age group of 21 to 30 years, with rupture uterus and postpartum hemorrhage (PPH) being the prevalent indications in this age category (Table 1).

Table 1: Age Distribution Across Different Indications of Emergency Peripartum Hysterectomy (EPH)

Age (years)	Indication for hysterectomy					Total
	Placenta accreta	Placenta percreta	PPH	Placenta previa	Rupture uterus	
15 to 20	0	0	0	0	1 (3.33 %)	1
21 to 30	2 (33.33 %)	3 (75 %)	11(84.61 %)	2(66.66 %)	26(86.67 %)	44
31 to 40	4 (66.66 %)	1(25 %)	2(15.39 %)	1(33.33 %)	3(10 %)	11
Total	6	4	13	3	30	56
$X^2=11.440$ $df=8$ $P\text{ value}=0.178$						

Rural residency significantly correlated with EPH cases, as 80.3 % of patients hailed from rural areas, and a substantial proportion, 89.3 %, were unbooked cases. A significant association was observed between booking status and EPH (P = 0.002), with 100% of cases involving placenta

previa and rupture uterus being unbooked. Foetal outcomes displayed a notable association with booking status ($P = 0.012$), as evidenced by a higher incidence of intrauterine demise in unbooked cases. The majority of EPH cases, 64.3%, were referrals, and a predominant percentage, 76.8%, belonged to a low socio-economic status. Most cases were multiparous, with 85.7% falling into the P2-P4 group (Table 2).

Table 2: Analysis of Parity Across Various Indications of Emergency Peripartum

Hysterectomy (EPH)

Parity	Indication for hysterectomy					Total
	Placenta accreta	Placenta percreta	PPH	Placenta previa	Rupture uterus	
P1	0	0	1(7.7 %)	0	1(3.33%)	2
P2, P3, P4	6 (100 %)	4 (100 %)	12(92.3 %)	3 (100 %)	23 (76.66 %)	48
≥P5	0	0	0	0	6(20.01%)	6
Total	6	4	13	3	30	56
$X^2=6.949$ $df=8$ $P\text{ value}=0.542$						

Gestationally, the incidence of EPH was highest (60.7 %) between 37 to 42 weeks, with laparotomy being the predominant mode of delivery (55.4 %). Placenta accreta and placenta percreta cases were predominantly associated with a scarred uterus (83.3 % and 100 %, respectively), while placenta previa cases were mostly seen in unscarred uteri (66.67 %). Subtotal hysterectomy was the preferred surgical intervention, performed in 82.1 % of cases, and was associated with a lower incidence of complications compared to total hysterectomy. Moreover, it was also found that subtotal hysterectomy was predominantly performed in cases

of rupture uterus (93.33%), PPH (84.62%), and placenta previa (66.66%), while a significant association was noted between the type of hysterectomy and indications, with 50% of cases of placenta accreta and placenta percreta undergoing subtotal hysterectomy and the remaining 50% undergoing total hysterectomy (p value = 0.038) (Table 3).

Table 3: Analysis of Hysterectomy Procedures Based on Diverse Indications

Types of hysterectomy	Indication for hysterectomy					Total
	Placenta accreta	Placenta percreta	PPH	Placenta previa	Rupture uterus	
Subtotal	3 (50%)	2 (50%)	11 (84.62%)	2 (66.66%)	28 (93.33%)	46
Total	3 (50%)	2 (50%)	2 (15.38%)	1 (33.33%)	2 (6.67%)	10
Total Cases	6	4	13	3	30	56
$X^2=10.149$ $df=4$ $P\text{ value}=0.038$						

Bladder injuries were most prevalent in cases of rupture uterus (57.1%), placenta percreta (27.57%), and placenta accreta (14.28%), with both cases of maternal death linked to rupture uterus, and severe maternal morbidities, including ureteric injury, associated with placenta accreta, placenta percreta, and rupture uterus (Table 4). Fetal outcomes varied, with intrauterine demise observed in 55.4 % of cases, followed by the delivery of healthy neonates (32.1 %), early neonatal death (8.9 %), and fetal asphyxia (3.6 %) (Table 5). The study underscores the multifaceted factors associated with EPH, emphasizing the importance of timely and appropriate interventions in obstetric emergencies.

Table 4: Analysis of Maternal Morbidity Across Varied Hysterectomy Indications

Maternal Morbidity	Placenta accreta	Placenta percreta	PPH	Placenta previa	Rupture uterus
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1) Fever	3 (10.71%)	1(3.57%)	4(14.28%)	2(7.14%)	18(64.28%)
2) Blood transfusion (>4 units)	3(7.69%)	2(5.13%)	10(25.64%)	3(7.69%)	21(53.84%)
3) Bladder injury	2(14.28%)	4(28.57%)	0	0	8(57.14%)
4) UTI	0	2(22.22%)	0	0	7(77.77%)
5) Wound sepsis	1(8.33%)	0	1(8.33%)	0	10(83.33%)
6) Wound dehiscence	1(11.11%)	1(11.11%)	0	0	7(77.77%)
7) Relaparotomy	1(33.33%)	0	1(33.33%)	0	1(33.33%)
8) Ureteric injury	0	2(100%)	0	0	0
9) Coagulopathy	0	0	0	1(33.33%)	2(66.67%)
10) Endotoxic shock	0	0	0	0	2(100%)
11) Postpartum psychosis	0	0	0	0	1(100%)
12) Paralytic ileus	0	0	0	0	0
13) DVT	0	0	0	0	0
14) Mortality	0	0	0	0	2(100%)

Table 5: Analysis of foetal outcomes

Fetal outcome		Frequency	Percentage (%)
1.	Healthy	18	32.1
2.	Fetal asphyxia	2	3.6
3.	Early neonatal death	5	8.9

4.	IUD	31	55.4
	TOTAL	56	100

Discussion

The overall incidence of Emergency Peripartum Hysterectomy (EPH) in the present study was 8 per 1000 deliveries, slightly higher than reported in the literature, ranging from 0.22 to 2.7 per 1000 deliveries [17-24]. The increased incidence in our study may be attributed to the high prevalence of risk factors for EPH in developing countries, such as multiple pregnancies, grandmultiparity, cephalopelvic disproportion, prolonged labour, previous Caesarean sections, and placenta previa [25-27]. Furthermore, the majority of pregnant women in our study were unbooked and underwent labor and delivery outside health facilities without skilled healthcare providers, reflecting factors like early marriage, low literacy levels, a desire for large families, socio-economic deprivation, and low contraceptive usage.

The incidence of EPH following vaginal delivery in the present study was 0.09 per 1000 deliveries, indicating a relatively lower occurrence compared to EPH following Caesarean sections. This aligns with the observed trend in recent literature, where EPH is more common following Caesarean sections than vaginal deliveries [19, 24]. Notably, the present study found an incidence of 6.7 per 1000 deliveries in cases involving Caesarean sections, with 55.35% of patients having a history of previous 1 or 2 Caesarean sections. This trend is consistent with other studies reporting a range of 18.8% to 60.5% for EPH incidence following Caesarean sections [23, 28].

In terms of age distribution, the majority of patients in the present study (78.6%) fell within the age group of 21-30 years, reflecting a pattern similar to findings by Chaudhary et al., where most women (69%) undergoing EPH were below 30 years [24]. The mean age reported in

various studies ranged from 28.4 to 30.25 years [24, 29-31]. This age distribution could be attributed to the average age of marriage and childbearing typically occurring between 18 to 30 years in the Jharkhand region.

The research conducted in Jharkhand revealed a concerning overall incidence of 8 per 1000 deliveries for Emergency Peripartum Hysterectomy (EPH), surpassing rates reported in developed countries. These findings echo earlier studies, such as the work by Sharma et al., which indicated a similarly elevated incidence of 6.9 per 1000 deliveries [29]. It underscores the persistent challenges in maternal healthcare, particularly in rural areas, where the majority of EPH cases were identified. This highlights the critical need for targeted interventions and heightened awareness campaigns, especially in rural settings, to address the factors contributing to the increased incidence of EPH.

Of notable concern is the significant association between EPH and a history of previous Cesarean sections, aligning with the global trend observed in studies by Mayadeo et al., and Kittur et al. [20, 22]. The study emphasizes the pressing requirement for interventions aimed at reducing the risks associated with repeated Caesarean sections, advocating for comprehensive strategies to promote safer childbirth practices.

Demographic insights from the study revealed that unbooked cases, prevalent in rural populations, contribute significantly to the incidence of EPH. These findings resonate with the work of Singla et al., in Delhi and underline the urgency of improving healthcare infrastructure and awareness programs, particularly in rural areas [30]. Additionally, the study's exploration of socioeconomic status and parity distribution underscores the vulnerability of specific demographics, necessitating tailored interventions to address healthcare disparities and reduce the incidence of EPH. These collective insights offer a foundation for targeted strategies to enhance maternal healthcare outcomes, particularly focusing on scarred uteri and vulnerable populations.

The research findings on the type of hysterectomy in Emergency Peripartum Hysterectomy (EPH) cases underscore a prevalent preference for subtotal hysterectomy, aligning with studies conducted in various regions such as Dubai, South India, and Nigeria [31-33]. This contrasts with observations in Ghana and China, where total hysterectomy was more frequently performed [34, 35]. The study highlights the ongoing debate over the choice between total and subtotal hysterectomy, emphasizing the need for patient-specific considerations, given the potential risks associated with each approach. This echoes the sentiments of previous works, including studies in Italy and Delhi, emphasizing the significance of tailoring the surgical method based on the patient's condition [36, 37].

The investigation into complications arising from EPH reveals a spectrum of maternal morbidities, with febrile illness, wound infection, and urinary tract injuries being predominant. These complications are consistent with findings from prior studies carried out in Delhi, Chandigarh, and South India which revealed a predominance in wound infection [29-31]. The study also brings attention to the noteworthy occurrence of postpartum psychosis, a rare but impactful complication, emphasizing the importance of considering mental health implications, especially in younger patients undergoing hysterectomy. The high incidence of complications, including coagulopathy and the necessity for relaparotomy, underlines the critical and challenging nature of EPH cases.

A crucial aspect of the discussion centres on perinatal outcomes, with the study revealing a significant perinatal mortality rate, primarily attributed to intrauterine fetal demise and early neonatal deaths. This echoes the high rates of antenatal mortality (35.5 % to 64.3%) highlighted in various studies conducted in Nigeria, Kolkata, and Mumbai [21, 22, 33]. Importantly, the association between booking status and fatal outcomes emphasizes the vital role of timely and adequate antenatal care in improving neonatal survival rates, aligning with observations from earlier studies [19, 24, 38]. Overall, the study provides valuable insights into the complexities

surrounding EPH cases, emphasizing the need for targeted interventions and comprehensive maternal healthcare strategies to enhance both maternal and foetal outcomes.

Conclusion

This study holds significant importance in the local context, shedding light on the critical issue of Emergency Peripartum Hysterectomy (EPH) in India by providing insights into the prevalent challenges and associated outcomes, the research emphasizes the urgent need for targeted interventions. The findings underscore the importance of enhancing female literacy, increasing contraception prevalence, and ensuring effective antenatal care to address the high rate of EPH. Furthermore, the study highlights the essential role of institutional delivery with robust facilities and efficient blood transfusion services in mitigating the risks associated with EPH. The detailed exploration of main indications for EPH, such as rupture uterus and placenta-related complications, emphasizes the significance of timely diagnosis and intervention to improve both maternal and foetal outcomes. Overall, this research serves as a valuable resource for shaping targeted strategies and policies aimed at reducing the incidence of EPH and enhancing overall maternal and foetal health in our community.

Limitations

The study's limitations include its retrospective design, reliance on institutional records, and single-center focus, potentially limiting generalizability. Prospective, multicentre research is needed to address these constraints and provide a more comprehensive understanding of Emergency Peripartum Hysterectomy dynamics.

Recommendations

The study recommends targeted interventions in developing countries, emphasizing improved female literacy, increased contraception prevalence, efficient antenatal care, and enhanced blood transfusion services. Strengthening peripheral healthcare systems, facilitating early

referrals for high-risk cases, and monitoring caesarean section rates globally are essential to mitigate Emergency Peripartum Hysterectomy rates and enhance maternal and foetal outcomes.

List of Abbreviations

EPH- Emergency Peripartum Hysterectomy

CS- Caesarean Section

PPH- Postpartum Hemorrhage

Source of funding

None.

Conflict of interest

None.

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