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Original Research Article

Clinical study of emergency obstetric hysterectomy in tertiary care center

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ABSTRACT

Background: The aim of study was to assess the frequency, demographic features, reasons, and outcomes for both the mother and fetus linked to emergency obstetric hysterectomy.

Methods: We conducted a hospital based retrospective cohort study, between January 2016 to November 2023. A comprehensive study was conducted on 36 instances of emergency obstetric hysterectomy (EOH) at Sri Ramachandra institute of Higher Education and Research (SRIHER), Chennai, within the Department of Obstetrics and Gynecology. The study encompassed pregnant women delivering from 28 completed weeks of gestation to term, specifically those who underwent hysterectomy either during the intrapartum period or within the puerperium due to complications arising during childbirth.

Results: The incidence of EOH in our study was 22 per 1,00,000 following vaginal delivery and 196 per 1,00,000 following caesarean section. The overall incidence was 106 per 1,00,000 deliveries. Morbidly adherent placenta (39%) was the most common indication followed by Atonic postpartum hemorrhage (36%) and Placenta previa with placenta accreta (20%). Anemia (67%) emerged as the most prevalent maternal complication, with fever (30%) following closely behind.

Conclusions: In situations where traditional surgical methods prove ineffective and immediate access to interventional radiology is unavailable, a well-balanced approach to EOH can be life-saving. Our study underscores the significance of EOH in the coming years, given the increasing probability of both cesarean sections and multiple pregnancies.

Keywords: Complications, Emergency, Hysterectomy, Last resort, Life threatening, Pregnancy

INTRODUCTION

Emergency Obstetric Hysterectomy involves the removal of the uterus due to critical conditions during Intrapartum and within the puerperal period. It is typically performed in response to life-threatening obstetric hemorrhage, as it serves as a crucial intervention bridging the gap between life-threatening postpartum hemorrhage and mortality.¹ The procedure poses a dilemma, requiring a choice

between saving a life and sacrificing fertility. EOH is employed as a last-resort intervention when all conservative methods prove ineffective in managing extensive obstetric hemorrhage or life-threatening sepsis.¹ Therefore, prevention is essential. Patients who undergo Emergency Obstetric Hysterectomy (EOH) need close monitoring to avert potential complications like wound infection, renal failure, disseminated intravascular coagulation (DIC), shock, sepsis and mortality. In resource-limited settings, various conservative

approaches, including the community-based application of misoprostol, the use of oxytocin in prefilled auto-disable drug delivery systems, the implementation of condom catheter balloons, and the utilization of non-inflatable anti-shock garments, have all been recommended for the effective management of hypovolemic shock associated with obstetric hemorrhage.¹

METHODS

This was a retrospective cohort study involving women who required EOH for a period of 5 years between January 2016 to November 2023, within the department of Obstetrics and Gynecology, Sri Ramachandra institute of Higher Education and Research (SRIHER), Chennai. The inclusion criteria encompassed women who gave birth after 28 weeks of gestation and underwent hysterectomy due to obstetric reasons either during intra-partum or

subsequently within the specified puerperium period of 42 days. The study excluded women who gave birth prior to 28 weeks of gestation, those who underwent hysterectomy for reasons unrelated to obstetrics, or had the procedure performed beyond the designated 42-day post-delivery period.

RESULTS

Among 33,807 deliveries in our study period from January 2016 to November 2023, the occurrence of emergency obstetric hysterectomy was 0.022% (22 hysterectomies per 100,000 deliveries) after normal vaginal delivery and 0.1% (196 hysterectomies per 100,000 deliveries) after caesarean section. The comprehensive occurrence rate was 0.106% (106 hysterectomies per 100,000 deliveries). Table 1 illustrates the frequency of EOH after both normal vaginal delivery and caesarean section.

Table 1: Incidence of emergency obstetric hysterectomies (EOH) following vaginal delivery and caesarean section.

	Number of patients	Emergency obstetric hysterectomy	Incidence (%)
Normal vaginal delivery	17541	4	0.022
Caesarean section	16266	32	0.196
Total	33807	36	0.106

Table 2: Distribution of age and parity among the women included in the study.

Age (years)	Parity					Total
	P1	P2	P3	P4	>=P5	
20-25	0	0	1	0	0	1
26-30	1	6	5	2	0	14
31-35	2	7	2	7	0	18
>35	2	0	0	1	0	3
Total	5	13	8	10	0	36

The age of the women who underwent EOH ranged from 20 to 40 years, with the youngest being 23 and the oldest being 40 years old. Over 89% of cases involved women in the age group of 25 to 35 years, and 86% of the instances pertained to women who had experienced multiple pregnancies. The distribution of age and parity among the women included in the study is presented in Table 2.

The primary reasons for emergency obstetric hysterectomy were Morbidly Adherent Placenta, Atonic Postpartum Hemorrhage (PPH) and Placenta previa with placenta accreta in our study as depicted in Table 3. Fourteen cases underwent emergency obstetric hysterectomy due to morbidly adherent placenta, with eleven cases having a history of one or more previous caesarean sections and five cases involving prior curettage. EOH was performed in thirteen cases due to atonic postpartum hemorrhage, seven cases due to Placenta previa with placenta accreta and two cases due to uterine rupture.

Table 4 shows the incidence of fetomaternal complications, with anemia contributing to 67% of the study population followed by fever and bladder injury. 55% of the mothers in our study required ICU admission following the procedure. With respect to the fetal complications following EOH, 11% of the new-borns required NICU stay for a short period. There was no maternal and fetal mortality in our study.

Patients were transfused with blood and blood products based on their individual needs. All patients in our study group required blood transfusion, as anemia (67%) was the most common complication associated with emergency obstetric hysterectomy. Table 5 represents the overall administration of blood and blood products in patients who underwent EOH.

Prior performing emergency obstetric hysterectomy, other preventive mechanical procedures were attempted in our study group, which are depicted in Table 6. Due to failure of these interventions, emergency obstetric hysterectomy

was performed as a lifesaving procedure in our study population.

Table 3: Indications of EOH in the study cohort.

Indications	Frequency	Percentage (%)
Morbidly adherent placenta	14	39
Atonic postpartum hemorrhage	13	36
Placenta previa with placenta accreta	7	20
Uterine rupture	2	5
Total	36	100

Table 4: Feto-maternal complications associated with EOH.

Complications	Frequency	Percentage (%)
Maternal		
Anemia	24	67
Fever	11	30
Wound sepsis	5	14
Bladder injury	9	25
Psychological disturbance	3	8
ICU admission	20	55
Mortality	0	0
Fetal		
NICU admission	4	11
Mortality	0	0

Table 5: Overall administration of blood and blood products.

Indication	Number	Packed cell units	Fresh frozen plasma	Platelets
Atonic PPH	13	45	27	22
Morbidly adherent placenta	14	50	31	24
Uterine rupture	2	11	9	7
Placenta previa with placenta accreta	7	24	17	5
Total	36	130	84	58

Table 6: Preventive mechanical interventions done prior EOH.

Measures	Frequency	Percentage (%)
Uterine artery embolization	23	64
Bakri balloon	5	14
Harman's sutures	2	5

DISCUSSION

In 1869, Storer conducted the inaugural caesarean hysterectomy in the United States. Shortly after, Porro of Milan documented the initial obstetric hysterectomy in which both the infant and mother survived. In recognition of this milestone, the procedure is commonly known as the Porro operation.² Even with progress in medical and surgical practices, postpartum hemorrhage persists as a prominent contributor to maternal morbidity and mortality. In light of contemporary evidence and evolving practices, the significance of the first two indications appears to have diminished. Nevertheless, there has been a notable increase in instances of postpartum hemorrhage necessitating hysterectomy, mainly attributed to the altered scenarios in which postpartum hemorrhage manifests in contemporary obstetrics.³

In our study, the incidence of Emergency obstetric hysterectomy is 0.106%, which is more or less similar to the study reported by Chawla et al (0.08%) and Dani et al (0.17%).^{1,4} The documented incidence is significantly beneath the rates reported in Nigeria (0.51%) and a separate study conducted in India (0.52%).^{5,6} This can be ascribed to the fact that our investigation focused on a centrally situated urban center, which predominantly handles a greater proportion of scheduled cases involving institutional deliveries rather than cases referred from elsewhere.

In our study, the higher correlation of emergency obstetric hysterectomy with caesarean delivery in contrast to normal vaginal delivery (0.196% vs. 0.022%) aligns with findings from studies in China (90.1% vs. 6.5%) and another investigation in India (0.79% vs. 0.24%).^{6,7} This seemingly evident connection holds significant social implications. Enhancing public knowledge about the enduring health challenges linked to caesarean sections could diminish the demand for elective procedures and potentially safeguard the well-being of numerous women in the future.

In our research, a significant majority of patients who underwent emergency obstetric hysterectomy fell within the age range of 31 to 35 years and had experienced multiple pregnancies. Yet, in research conducted by Chawla et al, Dani et al, and Barclay et al, the predominant

age group for women undergoing emergency obstetric hysterectomy was 25 to 30 years.^{1,4,8}

The predominant reason for emergency obstetric hysterectomy in our investigation was morbidly adherent placenta (39%), succeeded by atonic post-partum hemorrhage (36%) and placenta previa with placenta accreta (20%). A similar trend was observed in a study conducted by Dani et al, Saeed et al and Lau et al, where morbidly adherent placenta was the most common indication for emergency obstetric hysterectomy.^{4,9,10}

In our study, 24 patients had a prior history of caesarean section and 9 patients had undergone Dilatation and Curettage (D&C) in the past. Both these procedures are associated with increased risk of developing morbidly adherent placenta, which is the most common indication for emergency obstetric hysterectomy in our study. Globally, emergency peripartum hysterectomy was most frequently necessitated by placental pathology. This is probably a consequence of the rising prevalence of caesarean deliveries.^{4,11} Therefore, it is advisable to use ultrasound Doppler and MRI during the antenatal period for the identification of an adherent placenta.⁴

In a study conducted by Kallianidis et al, the reasons for indications showed variations across different income settings.¹¹²¹ In lower middle-income settings, uterine rupture emerged as the most common indication, while in high-income settings, placental pathology was the predominant observation.¹² The variation can be explained by elevated rates of obstructed labor, inadequate monitoring of labor progression, and limited accessibility and availability of maternity care in lower-income settings.^{12,13} When contrasting our study with those conducted by Rabiou et al and Varras et al, it was found that uterine atony emerged as the most frequent indication for emergency obstetric hysterectomy.^{14,15}

It has been observed that the rates of emergency obstetric hysterectomy (EOH) attributed to uterine atony have declined as a result of scientific advancements and the widespread utilization of interventions such as B Lynch and balloon tamponade.⁴

Based on this data, it can be inferred that there is significant diversity in the indications for emergency obstetric hysterectomy (EOH) globally, and these indications vary according to obstetric practices in each center.¹⁶ Recent research suggests that abnormal placentation is becoming the predominant indication for emergency obstetric hysterectomy (EOH), gradually supplanting uterine atony.^{16,17}

Obstetric hysterectomy is linked to elevated complication rates, primarily stemming from the necessity for extensive blood transfusions, coagulopathy, urinary tract injuries, and the requirement for re-exploration due to persistent bleeding and febrile morbidity.¹⁷⁻¹⁹

In our study, anemia stood out as the primary maternal complication following emergency obstetric hysterectomy, followed by admissions to the intensive care unit (ICU), febrile morbidity and bladder injury. A significant portion of the study population received blood transfusions and blood products due to anemia and coagulopathy.

ICU admission was required for 55% of patients, primarily for sepsis, coagulopathy and additional monitoring. Bladder injury was seen in 9 patients (25%), of which all the patients had a previous history of caesarean section. Therefore, urological injuries seem to be associated with scarring and secondary adhesion of the vesico-uterine space resulting from a prior caesarean section.¹⁶

In contrast to studies by Zeteroglu et al (12.5%) and Kwee et al (15%), our study reported a higher incidence of bladder injury following emergency obstetric hysterectomy.^{2,18} Our study reported a higher incidence of fever (30%) and wound sepsis (14%) compared to the study conducted by Chawla et al, which documented rates of 25% and 11%, respectively.¹

There was no maternal and neonatal mortality following the procedure in our study. The effectiveness of obstetric intervention in emergency obstetric hysterectomy cases within our department likely contributes to the low mortality rate. Compared to our study, the incidence of maternal mortality was higher when contrasted with research by Chawla et al (17.9%), Dani et al (15.4%), and Umezurike et al (23.8%).^{1,4,20}

All patients in our study group required blood transfusion. This aligns with findings from other studies indicating that obstetric hysterectomy is linked to significant blood loss and the requirement for transfusion.²⁰⁻²²

Our study had certain limitations, such as the collection of data from a single center. However, a notable strength lies in presenting the findings within the context of a rapidly developing country with convenient hospital access, scheduled cases, and a prevalence of institutional deliveries.

CONCLUSION

Emergency obstetric hysterectomy should be done only when there is unavoidable situation in obstetrics. While it limits the woman's potential for future childbearing, in numerous instances, it becomes a crucial measure for preserving the mother's life. The majority of its adverse effects can be attributed to the underlying disorders and indications, rather than the procedure itself. The increasing prevalence of caesarean sections and multiple pregnancies is likely to contribute to a rise in the occurrence of emergency obstetric hysterectomy in the future. The well-being of the mother is contingent upon prompt decision-making, timely intervention, and sound clinical judgment.

Unnecessary delays may jeopardize life, while undue haste can lead to morbidity.

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