



The Analysis Study of Incidence, Indications, Risk Factor, Management and Outcomes of Emergency Hysterectomy: A Comprehensive Systematic Review

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ABSTRACT

Background: Extirpation of the uterus during the puerperium, after vaginal delivery, or after a caesarean section is known as an emergency obstetric hysterectomy (EOH). It is typically carried out when obstetric haemorrhage is severe and life-threatening. A woman who almost died but survived a pregnancy-related or childbirth-related issue, or within 42 days of the pregnancy ending, is said to have experienced a near-miss episode. The aim: The aim of this study to show about incident, indications, risk factor, management and outcomes of emergency hysterectomy. **Methods:** By the Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) 2020, this study was able to show that it met all of the requirements. This search approach, publications that came out between 2014 and 2024 were taken into account. Several different online reference sources, like Pubmed, SagePub, and Sciencedirect were used to do this. It was decided not to take into account review pieces, works that had already been published, or works that were only half done. **Result:** Eight publications were found to be directly related to our ongoing systematic examination after a rigorous three-level screening approach. Subsequently, a comprehensive analysis of the complete text was conducted, and additional scrutiny was given to these articles. **Conclusion:** In obstetrics, emergency obstetric hysterectomy (EOH) is a necessary evil. In many instances, it saves the mother's life, even though it limits the woman's future ability to bear children. Rather than the treatment itself, the majority of its morbidity is caused by its indications and underlying illnesses.

Keywords: Emergency obstetric hysterectomy (EOH), indications, management, risk factor, incident.

INTRODUCTION

A hysterectomy involves the removal of the uterus, either in its entirety or in its component components. One of the most common major gynaecological surgeries done on women globally is a hysterectomy. By the time they are 60 years old, 33% of American women are thought to have undergone a hysterectomy. Nevertheless, Central Asian nations do not have comparable data. Hysterectomy is recommended in obstetric practice to treat uterine sepsis and potentially fatal obstetric haemorrhage. Porro developed this method of treating postpartum haemorrhage and successfully used it for the first time in 1871. These days, only in cases of severe peripartum haemorrhage associated with vaginal delivery or caesarean section is an emergency peripartum hysterectomy performed as a life-saving procedure. The World Health Organisation (WHO) defines peripartum hysterectomy as a maternal near-miss criterion that is used to analyse obstetric outcomes.¹⁻³

A hysterectomy can be done during childbirth or at any point between childbirth and the patient's release from the hospital. When conservative methods are insufficient to manage significant uterine haemorrhage, peripartum hysterectomy is the primary indication. A "near-miss" maternal event, peripartum hysterectomy is an intervention used to save lives in life-threatening obstetric conditions. It causes a decline in fertility and is linked to high rates of maternal illness and death. Peripartum hysterectomy rates vary greatly around the globe. Peripartum hysterectomy complicates fewer than one out of every 1000 pregnancies in high-income nations, although it occurs in Nigeria and Pakistan at rates of 4 and 11 per 1000 delivery, respectively. Over time, the number of emergency peripartum hysterectomy procedures has been rising. It rose by 15% between 1995 and 2007 and by 12% between 1998 and 2003 in the USA.^{4,5}

Postpartum haemorrhage is one of the main causes of maternal morbidity and mortality worldwide,

according to an increasing amount of data. Emergency peripartum hysterectomy (EPH) has been considered the gold standard and a life-saving operation in cases of severe postpartum obstetric haemorrhage when all other therapeutic options have failed. These days, it has been demonstrated that uterine atony, rupture, and invasive placental disorders of pregnancy are the leading causes of EPH. The patient profile in modern obstetric practice has undergone significant change, with most of the patients having advanced maternal age and a history of prior caesarean sections. These risk factors raise the prevalence of uterine atony and invasive placental disorders, which are recognised as the primary reasons for performing EPH.⁶⁻⁸

METHODS

Protocol

By following the rules provided by Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) 2020, the author of this study made certain that it was up to par with the requirements. This

is done to ensure that the conclusions drawn from the inquiry are accurate.

Criteria for Eligibility

For the purpose of this literature review, we compare and contrast incident, indications, risk factor, management and outcomes of emergency hysterectomy. It is possible to accomplish this by researching of the incident, indications, risk factor, management and outcomes of emergency hysterectomy. As the primary purpose of this piece of writing, demonstrating the relevance of the difficulties that have been identified will take place throughout its entirety.

In order for researchers to take part in the study, it was necessary for them to fulfil the following requirements: 1) The paper needs to be written in English, and it needs to determine about the incident, indications, risk factor, management and outcomes of emergency hysterectomy. In order for the manuscript to be considered for publication, it needs to meet both of these requirements. 2) The studied papers include several that were

published after 2014, but before the time period that this systematic review deems to be relevant. Examples of studies that are not permitted include editorials, submissions that do not have a DOI, review articles that have already been published, and entries that are essentially identical to journal papers that have already been published.

Search Strategy

We used "Incident, indications, risk factor, management and outcomes of emergency hysterectomy." as keywords. The search for studies to be included in the systematic review was carried out using the PubMed, SagePub, and Sciencedirect databases.

Data retrieval

After reading the abstract and the title of each study, the writers performed an examination to determine whether or not the study satisfied the inclusion criteria. The writers then decided which previous research they wanted to utilise as sources for their article and selected those studies. After looking at a number of different research, which all seemed to point to

the same trend, this conclusion was drawn. All submissions need to be written in English and cannot have been seen anywhere else.

Only those papers that were able to satisfy all of the inclusion criteria were taken into consideration for the systematic review. This reduces the number of results to only those that are pertinent to the search. We do not take into consideration the conclusions of any study that does not satisfy our requirements. After this, the findings of the research will be analysed in great detail. The following pieces of information were uncovered as a result of the inquiry that was carried out for the purpose of this study: names, authors, publication dates, location, study activities, and parameters.

Quality Assessment and Data Synthesis

Each author did their own study on the research that was included in the publication's title and abstract before making a decision about which publications to explore further. The next step will be to evaluate all of the articles that are suitable for inclusion

in the review because they match the criteria set forth for that purpose in the review. After that, we'll determine which articles to include in the review depending on the findings that we've uncovered. This criteria is utilised in the process of selecting papers for further assessment. in order to simplify the process as much as feasible when selecting papers to evaluate. Which earlier investigations were carried out, and what elements of those studies made it appropriate to include them in the review, are being discussed here.

Table 1. Search Strategy

Database	Search Strategy	Hits
Pubmed	((("Hysterectomy"[MeSH Subheading] OR "Emergency"[All Fields] OR "Indications" [All Fields]) AND ("Management"[All Fields] OR "Oucomes"[All Fields]) AND ("Incident"[All Fields]) OR ("Risk factor" [All Fields]))	
Science Direct	((("Hysterectomy"[MeSH Subheading] OR "Emergency"[All Fields] OR "Indications" [All Fields]) AND ("Management"[All Fields] OR "Oucomes"[All Fields]) AND ("Incident"[All Fields]) OR ("Risk factor" [All Fields]))	
Sagepub	((("Hysterectomy"[MeSH Subheading] OR "Emergency"[All Fields] OR "Indications" [All Fields]) AND ("Management"[All Fields] OR "Oucomes"[All Fields]) AND ("Incident"[All Fields]) OR ("Risk factor" [All Fields]))	

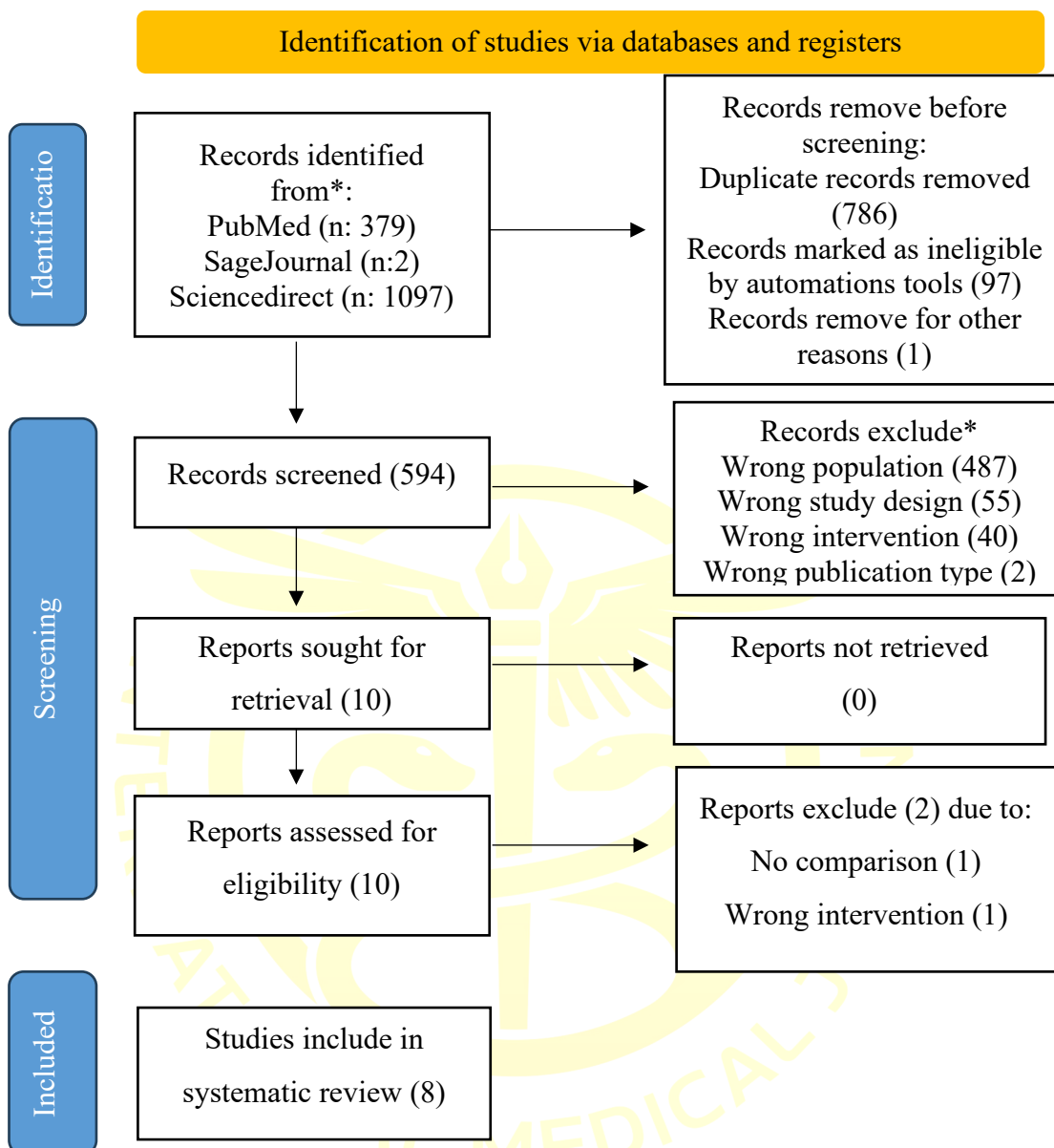


Figure 1. Article search flowchart

Table 2. Critical appraisal of Study

Parameters	(Zhang, Y et al., 2017)	(Vural, T et al., 2023)	(Mbakwa, MR et al., 2021)	(Chawla, J et al., 2015)	(Gica, N et al., 2022)	(Wani, RV et al., 2014)	(Verm a, A et al., 2023)	(Annan , JJK et al., 2020)
1. Bias related to temporal precedence								
Is it clear in the study what is the “cause” and what is the “effect” (ie, there is no confusion about which variable comes first)?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2. Bias related to selection and allocation								
Was there a control group?	No	Yes	No	No	No	No	No	No
3. Bias related to confounding factors								
Were participants included in any comparisons similar?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
4. Bias related to administration of intervention/exposure								
Were the participants included in any comparisons receiving similar treatment/care, other than the exposure or intervention of interest?	No	No	No	No	No	No	No	No
5. Bias related to assessment, detection, and measurement of the outcome								
Were there multiple measurements of the outcome, both pre and post the intervention/exposure?	No	No	No	No	No	No	No	No
Were the outcomes of participants included in any comparisons measured in the same way?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Were outcomes measured in a reliable way?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
6. Bias related to participant retention								
Was follow-up complete and, if not, were differences between groups in terms of their follow-up adequately described and analyzed?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
7. Statistical conclusion validity								
Was appropriate statistical analysis used?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

RESULT

Our research team first gathered publications from reputable sources such as Science Direct, PubMed, and SagePub. After a thorough three-level screening procedure, only eight papers were determined to be directly relevant to our ongoing systematic evaluation. Following that, these sections were picked for additional research and a close reading of the entire manuscript. The material that was evaluated for this analysis is compiled in Table 3 for ease of view.

Table 3. The literature include in this study

Author	Origin	Method	Sample	Result
Zhang, Y et al., 2017 ⁹	China	This retrospective descriptive analysis included all women who had hysterectomy surgeries performed for PPH at Fujian Provincial Maternity and Children's Hospital between January 2004 and June 2016.	152023	There were 152,023 deliveries of women in all. Emergency postpartum hysterectomy was performed on 0.63 out of 1000 deliveries: 96 patients had a hysterectomy for uncontrolled PPH, 19 patients had a hysterectomy after vaginal delivery, and 77 patients had a hysterectomy after caesarean delivery (P<.001). Grand multiparity > 6 (32.3%), placenta accreta (43.76%), uterine atony (37.5%), uterine rupture (17.5%), and postpartum prothrombin activity ≤ 50% (61.5%) were common risk factors. Subtotal abdominal hysterectomy (STH) was performed on 41 patients, whereas total abdominal hysterectomy (TH) was performed on 55 patients. TH's mean operation time (193.59±83.41 minutes)

				was substantially shorter than STH's (142.86 ± 78.32 minutes; $P = .002$). TH experienced a considerably higher mean blood loss (6832 ± 787 mL) than STH (6329 ± 893 mL; $P = .003$).
Vural, T et al., 2023¹⁰	Turkey	In a retrospective research, we examined 71 EPH cases at a tertiary hospital between 2012 and 2019. The control group consisted of 142 patients.	213	The overall incidence was 1.02 per 1000 births, with 71 EPH out of 69,504 deliveries. Abnormal placentation was the primary reason for peripartum hysterectomy (67.6%), followed by uterine rupture (4.2%) and uterine atony (28.1%). Two important risk factors for EPH are prior caesarean sections (CS) and CS. Multiparity and advanced maternal age (≥ 35 years) are additional risk factors. A prior CS was present in every case with aberrant placentation. EPH was carried out 7% after vaginal delivery and 93% during and/or after CS. 31% of EPH were subtotal, whereas 69% of EPH were manufactured overall. The three most prevalent maternal morbidities were disseminated intravascular coagulopathy (11.2%), bladder damage (16.9%), and wound infection with febrile morbidity (26.7%). Perinatal mortality was 4%, but there were no maternal deaths.
Mbakwa, MR et al., 2021¹¹	Cameroon	The Bafoussam Regional Hospital	30	The prevalence rate was 3.75 per 1000 deliveries, with 30 occurrences of emergency obstetric

		(BRH) conducted a 5-year hospital-based retrospective cohort analysis from February 1, 2020, to April 30, 2020, using the medical records of patients who had emergency obstetric hysterectomies between January 1, 2015, and December 31, 2019.		hysterectomy (24 caesarean hysterectomies and 6 postpartum hysterectomies). Intractable postpartum haemorrhage and uterine rupture (33.33% each) were the most prevalent indications for CH, whereas aberrant placentation (50%) was the most common indication for PH. The most statistically significant side effects of EOH were sepsis (PH group only, 33.33%) ($p = 0.03$) and anaemia (both groups, $p = 0.013$). A poor clinical outcome was substantially linked to both protracted surgery lasting two or more hours ($p = 0.04$) and the lack of a blood transfusion before surgery ($p = 0.013$).
Chawla, J et al., 2015¹²	India	From August 2006 to July 2014, we carried out an eight-year retrospective, observational, and analytical investigation.	56	In our study, the incidence of EOH was 270 per 100,000 after a caesarean section and 30 per 100,000 after a vaginal delivery. There were 83 cases for every 100,000 deliveries. The most frequent indication was atonic postpartum haemorrhage (25%), which was followed by placenta accreta (21%), and uterine rupture (17.5%). Disseminated intravascular coagulation (13.5%) and febrile morbidity (19.2%) were the most common consequences. The perinatal mortality rate was

				37.5%, while the maternal mortality rate was 17.7%.
Gica, N et al., 2022¹³	Romania	a retrospective cohort research that included every EPH case treated at Bucharest's Filantropia Clinical Hospital from January 2012 to May 2021.	36	Out of the 36,099 registered births, 36 EPH were found. The prevalence of EPH was 0.99 per 1000 deliveries overall, with uterine atony and placenta accreta spectrum disorder accounting for the majority of cases.
Wani, RV et al., 2014¹⁴	Kuwait	After receiving ethics committee approval, this retrospective case series entails a detailed review of the records of every woman who underwent EPH in the Obstetrics and Gynaecology department at Al-Jahra Hospital in Kuwait between January 2000 and December 2012.	63337	Of the 63,337 deliveries, 70.3% were made vaginally, while 29.6% were delivered via caesarean section (CS). An overall incidence of one case per 1,000 deliveries was represented by the sixty-eight women who underwent EPH. Abnormal placentation (77.3%), uterine atony (14.5%), and uterine rupture (8.1%) were among the criteria for EPH. One mother died. Maternal morbidity was present in 25 women (40.3%). Mild to severe coagulopathy (19.35%) and urinary tract damage (17.74%) were the most frequent consequences. Preoperative ureteric stent placement prevented ureteric injury. The higher rates of CS births (91.9%), women with a history of CS (83.87%), and high parity (mean 5.8%) were

				noteworthy among our cohort.
Verma, A et al., 2023¹⁵	India	Between March 2021 and February 2023, the current hospital-based retrospective analytical study was carried out in the Obstetrics and Gynaecology Department of L.L.R.M. Medical College in Meerut.	46	Out of 7743 deliveries during the course of the two-year study period, 46 EOH were done, yielding an incidence of 0.504 EOH per 100 deliveries. Multiparous women between the ages of 25 and 35 accounted for 78% of the cases. Placenta accreta spectrum (PAS) accounted for 43.5% of cases, with ruptured uterus (30.5%) and postpartum haemorrhage (PPH) (26%), following in order. Severe anaemia was the most common preoperative consequence observed in EOH (29, 63%). Four incidences of intraoperative bladder injury and one case of ureteric injury were observed. Acute hemorrhagic shock (54.3%), disseminated intravascular coagulation (DIC), septicaemia, wound infection, acute renal failure (ARF), hepatic encephalopathy, and psychosis were observed in the cases after surgery. In our investigation, we found four maternal mortalities.
Annan, JJK et al., 2020¹⁶	Ghana	A retrospective descriptive cross-sectional study that was ethically approved	146	Over the course of the two years, there were 146 EHs. Participants were between the ages of 19 and 59, with a mean age of 34.3 years (SD = 6.06). SD stands for standard deviation.principal

		was carried out on all EHs performed at a tertiary hospital between January 1, 2018, and December 31, 2019.	postpartum haemorrhage (PPH) accounted for 73.28% of the principal indications for EH (n = 110/146). The remaining indications included pelvic abscess and choriocarcinoma: 2.74% (n = 4/146) each, subsequent postpartum haemorrhage: 4.8% (n = 7/146), uterine perforation with necrosis: 8.9% (n = 13/146), and wide ligament haemorrhage: 2.06% (n = 3/146). Two cases of ovarian cyst torsion, one placental site tumour, one partial septic abortion, and one case of a large multinodular fibroid uterus with excruciating, persistent lower abdominal pain made up 3.42% (n = 5/146) of the total, which were categorised as "others **."The subgroup with hysterectomy owing to PPH most frequently had uterine atony (54.20%; n = 60/110), ruptured uterus (20.56%; n = 23/110), and morbidly adherent placenta (14.95%; n = 16/110). Of the morbidly adherent placenta, 62.5% (n = 10/16) was made up of placenta accreta. There were 8.22% (n = 12/146) partial hysterectomies and 91.78% (n = 134/146) complete abdominal hysterectomies.
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DISCUSSION

In order to prevent deaths, peripartum hysterectomy is frequently performed. To enhance the standard of obstetric care and, consequently, maternal health, more knowledge about the causes, treatment, and complications of peripartum hysterectomies is required. A peripartum hysterectomy, which is primarily caused by postpartum haemorrhage (PPH), is the removal of the uterus within a predetermined time frame following the delivery of the baby. The prevalence of peripartum hysterectomies varies greatly around the globe. These rates, which range from 0.26/1000 deliveries in Denmark to 1.07/1000 deliveries in Italy, are typically low in high-income nations. Two earlier Norwegian investigations calculated rates that were comparable to those seen in Denmark. Several high-income nations, including Norway, have seen rising PPH trends in recent decades. As a result, an increase in peripartum hysterectomies has been reported in a number of studies.¹⁷⁻¹⁹

The life-threatening condition known as intractable obstetric haemorrhage is brought on by uterine pathology, which includes aberrant placentation, uterine rupture, and uterine atony. Uterine atony used to be the main cause of persistent obstetric haemorrhage, but more recently, reports have indicated that, thanks to advancements in prostaglandin therapy, uterine atony is now a rare cause of such situations. However, in contemporary obstetrics, aberrant placentation is the primary cause of potentially fatal postpartum haemorrhage. Numerous reports have shown a perfect correlation between improper placentation and caesarean sections (CSs), and there is also a substantial correlation between incorrect placental position and repeated caesarean deliveries. For example, placenta previa was found to be 1.9/1000 in women who had had one prior CS and 91/1000 in women who had had four prior CS. This indicates a 47-fold increase, which is concerning given the prevalence of full EPH. Notably, women with placenta previa accreta required EPH at a significantly higher rate than

those with placenta previa per se. High parity, prior uterine curettage, and advanced maternal age are additional risk factors for aberrant placentation.^{20,21}

Peripartum hysterectomy rates vary greatly around the globe. Peripartum hysterectomy complicates fewer than one out of every 1000 pregnancies in high-income nations, although it occurs in Nigeria and Pakistan at rates of 4 and 11 per 1000 delivery, respectively. Over time, the number of emergency peripartum hysterectomy procedures has been rising. It rose by 15% between 1995 and 2007 and by 12% between 1998 and 2003 in the USA. Increased parity, aberrant placentation, advanced mother age, and caesarean birth in a prior or current pregnancy are risk factors for peripartum hysterectomy.

Numerous investigations have found a link between placental diseases and caesarean sections and an increased incidence of hysterectomy.^{22,23}

A hysterectomy is typically linked to a high rate of death and morbidity when used to treat obstetric haemorrhage. Prompt intervention to

include peripartum hysterectomy may likely reduce some of the maternal mortality and significant maternal morbidity in this population, even if the Kingdom of Saudi Arabia's societal background of preferring big families is a crucial element to take into account.^{24,25}

CONCLUSION

In conclusion, in obstetrics, emergency obstetric hysterectomy (EOH) is a necessary evil. In many instances, it saves the mother's life, even though it limits the woman's future ability to bear children. Rather than the treatment itself, the majority of its morbidity is caused by its indications and underlying illnesses. In circumstances where facilities or competence for more recent therapeutic methods, like uterine artery embolisation, are lacking or ineffective, teaching postgraduate students this uncommon talent can save lives.

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