

Prevalence and Characteristics of Emergency Peripartum Hysterectomy (Eph) in A Tertiary Hospital, South-East Nigeria

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Abstract Background: Post partum hemorrhage is an important cause of maternal mortality globally. Emergency peripartum hysterectomy is a life saving surgery performed to control bleeding in patients with post partum hemorrhage in whom all other conventional methods have failed. Previous studies done in our centre over a decade ago, reported higher prevalence of EPH compared to developed world. **Objectives:** This study was conducted to determine the current prevalence and indications for EPH in our environment. **Methods:** This was a cross sectional retrospective study of all the patient that had EPH between January 2016 to December 2025 in University of Nigeria Teaching Hospital, Enugu. The demographic data, risk factors, indications and outcome including (blood transfusion, bladder injuries, bowel injuries, febrile morbidity, ICU admission, and maternal mortality, were recorded. Patients who had EPH at delivery or within 24 hours after delivery, and at gestational age of 28 weeks and above were included in the study. All patients who had EPH after 24 hours of delivery or before 28 weeks gestation were excluded. Descriptive statistics were used to analyze the data. **Results:** A total of 6115 deliveries were recorded during the period of study out of which 22 had EPH, giving a prevalence of 0.36% of all deliveries (3.6/1000 deliveries). Of the 22 EPH recorded, 20(90.9%) were performed for caesarean delivery while 2(9.1%) were performed for vaginal delivery. Majority of the patients belong to the age group 31-40 year (63.64%) and the mean age of patients was 35.4 ± 7.1 years. Of the 22 patients that had EPH, only 8(36.4%) booked for antenatal care in our hospital, while 14(63.6%) were unbooked. Most of the women 16(72.10%) had parity between 1-3. Thirteen women (59.10%) had no previous scar, while 8(36.40%) had only one previous scar. The most common indication for EPH/ was ruptured uterus 8(36.4%), closely followed by uterine atony 7(31.8%). Placenta accreta and presence of multiple uterine fibroids accounted for 6(27.3%) and 1(4.5%) respectively. All the patients that had EPH received blood transfusion, 19(86.36%) had febrile morbidity, 6(27.22%) had ICU admission, 3(13.64%) had bladder injuries, 3(13.64%) had DIC, while 4(18.18%) had bowel injury. **Conclusion:** The prevalence of EPH is still unacceptably high in our environment, compared to developed countries of the world from this study. Uterine rupture was the most common indication for EPH in this study and most of the patient that had uterine rupture were unbooked patient. Therefore, all measures should be adopted to ensure that all pregnant women book for antenatal care.

Keywords: EPH, Prevalence, Characteristics, Tertiary, Enugu, Nigeria

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1. Introduction

Post partum hemorrhage is an important cause of maternal mortality globally. Emergency peripartum hysterectomy is a life saving surgery performed to control bleeding in patients with post partum hemorrhage in whom all other conventional methods have failed. EPH refers to surgical removal of the uterus within 24 hours of delivery, following an unexpected and sudden event that must be dealt with urgently by carrying out the procedure

[1]. It is often performed as a procedure of last resort in life-threatening or intractable obstetric haemorrhage [2,3,4,5]. EPH has remained a challenging procedure for both the patient and the obstetrician [6,7]. For the patient it is a life changing procedure because of the morbidities and mortality associated with the procedure. And for the obstetrician, it requires skill, expertise, and good judgment [8,9]. This is because if performed too early without giving full recourse to conservative measures may bring a woman's obstetric career to an abrupt end, however if left too late can lead to death of a woman [10].

In modern obstetrics, the prevalence is 0.05% but there

are considerable differences in prevalence in different parts of the world depending on modern obstetric services, standards, and awareness of antenatal care and the effectiveness of family planning activities in a given community [11]. In the USA, the incidence ranges between 0.12% and 0.27% [12,13]. Lower prevalence of 0.02% and 0.03% has been recorded in Norway and Netherlands respectively [12]. Ashraf and Madhura reported prevalence of 0.25% and 0.32% in Kashmir and India respectively [11,14]. In Nigeria, prevalence of 0.51%, 0.62%, 0.54% were reported in Sokoto, Nnewi, and Aba respectively [2,4,7]. In UNTH, Ozumba et al and Ezegwui et al, reported incidences of 0.19% [5] and 0.23% [15] respectively. The higher prevalence noted in developing world may be due to the phenomenon of unbooked emergencies and the earlier recourse to hysterectomy due to the lack of adequate cross matched blood and other blood products which limit the time available for examining the effectiveness of other conservative procedures [6]. Prevalence was also noted to increase with caesarean delivery when compared with vaginal delivery [2,13]. Kwee et al recorded a prevalence of 0.1 to 0.3 per 1000 deliveries and 0.17 to 8.7 per 1000 deliveries for vaginal and caesarean deliveries respectively [13]. This has been attributed to the proportion of women with previous caesarean section and concomitant risk of placenta praevia and accreta [2].

EPH has been described as an obstetric catastrophe [12], for both the obstetrician and the patient. On the part of the obstetrician, the decision to perform hysterectomy is difficult especially in nulliparous women as this brings an abrupt and unwelcomed end to their reproductive career [6]. The decision to go ahead with the procedure oftentimes may not be well justified in the mind of the obstetrician. On the part of the patient, it is life-changing because of the associated morbidities. There is also a psychosocial aspect as the patient is unable to menstruate. This is worsened by the fact that in Africa women attach strong importance to their monthly cycle as well as having all their organs intact [4,7]. The mean age range at EPH is between 23-42 years [15], this implies that such women are at the peak of their reproductive career and hence shutting the door of procreation at such a time is a distressing event for the woman. She may also be relegated to the background in the family as she may be replaced by a second wife for the purpose of child bearing.

The major indications for EPH include uterine atony, uterine rupture, morbidly adherent placenta, placenta praevia, uterine infection and extension of caesarean section incision at delivery [1,3,5,7-9]. Uterine atony and rupture was found by previous studies to be the most common indications for EPH [4,5,7,8]. However emerging evidence suggests abnormal placentation viz placenta praevia and accreta to be the most common indications [9,16,19]. The increasing rate of caesarean section worldwide and the concomitant rise in placenta praevia and accreta have resulted in ever increasing incidence of EPH worldwide [13,16,19].

The combination of prior caesarean section and placenta praevia is said to be an ominous risk factor for life-threatening hemorrhage and EPH [7,19]. Other risk factors include advanced maternal age, increasing parity, multiple gestation, sepsis, unbooked status, retained

placenta, previous endometrial curettage, abruption placenta and thrombocytopenia [1,3,4,5,6,12]. The association of increasing maternal age and parity to EPH is related to them being risk factors for placenta praevia and uterine atony [4,5,9]. Carvalho et al found a mean maternal age at time of delivery of 32 years with majority of the patients being ≥ 35 years [10]. Obiechina et al reported a mean age of 28 years [4]. Nwobodo et al in Sokoto noted an increasing rate of EPH with advancing maternal age and increasing parity with a mean maternal age of 30 years and mean parity of six [3]. Multiple gestation has also been reported to have a six fold risk of EPH and with increasing rate in assisted reproductive technology may provide a further contribution to rising EPH rates [16].

EPH though a life-saving procedure is an obstetrician's nightmare as it has been described as one of the catastrophes of modern obstetrics [7]. It is associated with high complication rates, mainly due to the need for massive blood transfusions, coagulopathy, injury to the surrounding viscera and the need for re-exploration [9]. The difficulties associated with the procedure are not necessarily the surgical technique but the anatomical and physiological changes associated with late pregnancy and indications for the surgery as well as the support for such ill patient [16]. These difficulties make the complications more common especially in developing countries where patient present late and the facilities for intensive care are lacking [15,16]. Obiechina et al recorded a case fatality rate and perinatal mortality rate of 31% and 44.8% respectively [4]; while Nwobodo recorded a case fatality rate of 12.1% in sokoto [2]. Febrile morbidity was recorded in some studies as the most common complication [3,6,9]; while anemia and blood transfusion was noted by Machado [3] and Nwobodo [2] to be the most common complications associated with EPH. Other complications include hemorrhage and the need for re-exploration, bladder and ureteric injury, coagulopathy, urinary tract infection, wound infection, renal failure and septicaemia [2,3,4,5,6,9].

EPH is mostly performed for obstetric hemorrhage which accounts for 25.98% of maternal mortality [17] and 11.2% of emergency obstetric referral in our centre [18]. Studies in Europe and America has recorded a downward trend in the prevalence and changing indications of EPH [14,16,17]. Previous study in our center over a decade ago recorded high prevalence of EPH. Therefore it has become necessary to audit of our performance in the last decade. This study was conducted to determine the current prevalence and indications for EPH in our environment.

2. Materials and Method

Study site 2.1

Enugu state is one of the five states in south-east geopolitical zone of Nigeria. It was created in 1991 from the old Anambra state. Its capital is Enugu. The state lies partly within the semi-tropical rain forest belt of the south and spreads towards the north through a land area of approximately 8727.1km², it shares borders with Abia state to the south, Ebonyi state to the East, Benue state to the north-east and Anambra state to the west. The state has

17 local government areas, most of which are predominantly rural except those within Enugu metropolis and some parts of Oji-River and Nsukka. The major occupation ranges from trading and civil service in the urban areas to subsistent farming and animal husbandry in the rural areas. Its population of about 3.2 million is predominantly Igbo with pockets of other tribes. The major religion is Christianity.

Study centre 2.2

The study centre is University of Nigeria Teaching Hospital Enugu, a tertiary health institution situated in Ituku-Ozalla in the outskirts of Enugu town. The hospital provides both general and specialist services to the people of Enugu states. It also serves as a referral centre for the rest of Enugu, Ebonyi, Anambra, Abia, Imo, and Benue states. It is a training and research centre. The hospital has a total of eight hundred beds. Thirty five beds were reserves for Gynecological admissions, while one hundred and eighteen beds were reserved for obstetric cases. It attends to 2000 – 2500 deliveries annually. The incidence of EPH in the study centre from previous studies were 0.19% and 0.23% in 1991 and 2010 respectively [5,15].

Study design 2.3

This was a cross sectional retrospective study of all the patients that had undergone EPH following vaginal or caesarean delivery due to various indications between January 2016 to December 2025 in University of Nigeria Teaching Hospital, Enugu

Study population and sample 2.4

All the patients that EPH during the period of the study were ascertained via a review of the hospital obstetric database including labor ward register, theatre records, post-natal ward records. All the Emergency Peripartum Hysterectomy performed after 28weeks of gestation and within 24 hours of delivery were included in the study. Those that had EPH before 28 weeks of gestation and after 24 hours of delivery were excluded.

Data collection instrument 2.5

Data were extracted using a profoma. Information obtained from the records include the demographic data, risk factors, indications and outcome including (blood transfusion, bladder injuries, bowel injuries, febrile morbidity, ICU admission, and maternal mortality.

Data analysis 2.6

All statistical analysis were done using SPSS version 25(IBM Corp, Armonk, New York). Socio-demographic characteristics and prevalence of EPH were analyzed using frequencies, percentages, and means. Discrete variables were summarized using frequency tables and percentages, while quantitative variables were analyzed using the mean and standard deviation. Chi-square tests and Fisher's exact were used where applicable. All tests were two-tailed and statistical significance was set at $p < 0.05$. Results were presented in tables.

Ethical consideration 2.7

Approval was obtained from the Ethical Review committee of the Teaching Hospital and Confidentiality was ensured.

3. Results

During the 10-year study period from January 2016 to December 2025, there were a total of 6115 deliveries. Of this number, 3,347 were vaginal deliveries while 2768 were caesarean deliveries. There were a total of 22 EPH performed during the period of the study giving a prevalence of 0.36% of all deliveries (3.6/1000 deliveries). Of the 22 EPH recorded during the study 20(90.9%) were performed for caesarean delivery while 2(9.1%) were performed for vaginal delivery. The prevalence of EPH for all Caesarean deliveries (2768 caesarean sections) was 0.7% during the study period.

Table 1, showed the socio-demographics variables of the study group. Majority of the patients belong to the age group 31-40 year(63.64%) and the mean age of patients was 35.4 ± 7.1 years. All the patients that had EPH in this study were of Ibo tribe. House wife accounted for 7(31.82%) while professionals accounted for 6(27.27%) of the study group. All the women had formal education with 9(40.9%) having tertiary education.

Table 2 showed the Obstetrics history of the women that had EPH in this study. Of the 22 patients that had EPH, only 8(36.4%) booked for antenatal care in our hospital, while 14(63.6%) were unbooked. Most of the women 16(72.10%) had parity between 1-3. Thirteen women (59.10%) had no previous scar, while 8(36.40%) had only one previous scar. Six (31.82%) women had post-partum hemorrhage due to placenta accreta. Twenty patients had EPH at term and two presented at 29 and 36 weeks.

Table 3 showed the indications for EPH. The most common indication for EPH was ruptured uterus 8 (36.4%), closely followed by uterine atony 7 (31.8%). Placenta accreta and presence of multiple uterine fibroids accounted for 6(27.3%) and 1(4.5%) respectively.

All the patients had subtotal hysterectomy with majority of the patients, 18 (81.8%) receiving general anesthesia while 3(13.6%) and 1(4.5%) received spinal and epidural anesthesia respectively. Anesthesia was provided by the senior registrar (81.8%) in most of the cases. The surgery was performed by the consultant obstetrician (45.5%) and senior registrar (54.5%).

All the patients (22) received blood transfusion, 19(86.36%) had febrile morbidity, 3(13.64%) had bladder injury, 4(18.18%) had bowel injury, 9(40.91%) had paralytic ileus, 5(22.73%) had wound sepsis, 6(27.22%) had ICU admission and 9(40.91%) had neonatal death. Complications were as shown in Table 4.

Table 1. social demographic variables of participants

Parameters	Frequency	Percentage (%)
Age groups		
21-30 years	5	22.72
31-40 years	14	63.64
>40 years	3	13.64
Tribes		

Parameters	Frequency	Percentage (%)
Ibos	22	100.00
Others	0.00	0.00
Occupations		
House wife	7	31.82
Professionals	6	27.27
Traders	6	27.27
Others	3	13.63
Education level		
Primary school	4	18.20
Secondary school	9	40.90
Tertiary school	9	40.90

Table 2. Obstetrics History of patient with EPH

Parameters	Frequency	Percentage (%)
Booking status	8	36.40
	14	63.60
Booked	22	100.00
Unbooked		
Total	2	9.10
Parity	16	72.70
1	4	18.20
2-3	22	100.00
4 and above		
Total		
Previous scars	13	59.10
	8	36.40
Nil	1	18.20
1	22	100.00
2 or more		
Total	20	90.91
Gestational age at presentation	2	09.09
Term	22	100.00
Preterm		
Total		

Table 3. Indications for EPH

Parameters	Frequency	Percentage (%)
Uterine rupture	8	36.40
Uterine atony	7	31.80
Placenta accreta	6	27.30
Co-existing uterine fibroid	1	04.50
Total	22	100.00

Table 4. Complications of EPH

Parameters	Frequency	Percentage (%)
Febrile morbidity		
Anemia	19	86.36
Blood transfusion	22	100.00
Bladder injury	22	100.00
Bowel injury	3	13.64
Paralytic ileus	4	18.18
Urinary tract infection	9	40.91
Wound sepsis	2	09.09
Disseminated intra-vascular coagulopathy	5	22.73
Intensive care unit admission	3	13.64
Re-exploration	6	27.22
Renal failure	3	13.64
Neonatal death	1	04.54
Maternal death	9	40.91
>1 week admission	1	04.54
	20	90.90

4. Discussion

Emergency peripartum hysterectomy is a life saving surgery performed to control bleeding in patients with post partum hemorrhage in whom all other conventional methods have failed. This study was conducted to determine the mean age at EPH, the prevalence, the common indications, the associated risk factors and complications associated with Emergency Peripartum Hysterectomy.

The mean age of patient as recorded in this study was 35.4 ± 7.1 years. This is in agreement with the mean age range of 23-42 years at EPH as reported in previous studies. [15] The implication of this finding is that such women are at the peak of their reproductive career and hence shutting the door of procreation at such a time is a distressing event for the woman. She may also be relegated to the background in the family as she may be replaced by a second wife for the purpose of child bearing. There is also a psychosocial aspect as the patient is unable to menstruate following EPH. This is worsened by the fact that in Africa women attach strong importance to their monthly cycle as well as having all their organs intact [4,7].

The study also recorded a prevalence rate of 0.36% for Emergency peri-partum Hysterectomy. This prevalence rate of 0.36% is higher than the prevalence of 0.02% and 0.03% recorded in Norway and Netherlands respectively^[12], and lower than the prevalence rates of 0.51%, 0.62%, 0.54% reported in previous studies in other centers in Nigeria (Sokoto, Nnewi, and Aba) respectively [2,4,7]. However, it is similar to the prevalence rate of 0.23% recorded in a previous study in our center by Ezegwui et al [15]. The higher prevalence noted in this study compared to developed countries may be due to the phenomenon of unbooked emergencies and the earlier recourse to hysterectomy due to the lack of adequate cross matched blood and other blood products which limit the time available for examining the effectiveness of other conservative procedures [6] in developing world. The lower prevalence in this study compared to other previous studies in Nigeria may be due to improved antenatal care services and improved availability of blood/blood products over a time period.

Another key finding in this study is that the prevalence of Emergency Peripartum Hysterectomy for caesarean delivery was 0.7% when compared with vaginal delivery(0.06%). This result is similar to finding by Kwee et al who recorded prevalence of 0.1 to 0.3 per 1000 deliveries and 0.17 to 8.7 per 1000 deliveries for vaginal and caesarean deliveries respectively [13]. The high prevalence of Emergency peripartum Hysterectomy in women who had caesarean delivery has been attributed to the proportion of women with previous caesarean section and concomitant risk of placenta praevia and accreta [2].

The major cause of uncontrollable hemorrhage leading to EPH has changed from uterine atony to abnormal placentation. Uterine atony still remains the most common cause of post partum hemorrhage, however, use of uterotonics has reduced the hemorrhage related morbidity. B lynch suture is a surgical technique used to control post partum hemorrhage and has a success rate of 75%, [20] when this is combined with bilateral internal iliac ligation the success rate increases to 94.4%. [20,21] Also, use of

Bakri Balloon tamponade is effective and safe in managing post partum hemorrhage. [22] These techniques are effective to control hemorrhage due to uterine atony. [10,22] The most common indication for EPH in the present study was ruptured uterus (36.4%), closely followed by uterine atony (31.8%). This finding is similar to the results of previous studies that found uterine rupture as the most common indications for EPH [10,22] However, this is not in agreement with the report of other previous studies that reported abnormal placentation viz placenta praevia and accreta to be the most common indications [9,16,19].

Placenta accreta and presence of multiple uterine fibroids accounted for 27.3% and 4.5% respectively in this present study.

All the patients with ruptured uterus were unbooked, and had previous caesarean section and were brought from peripheral hospitals in unstable condition with uterine rupture. The patients had emergency hysterectomies following ruptured uterus. The increasing rate of caesarean section worldwide has resulted in ever increasing incidence of EPH worldwide [13,16,19].

The combination of prior caesarean section and unbooked status is the commonest risk factor for life-threatening hemorrhage and EPH in this present study. Other risk factors include advanced maternal age, increasing parity, multiple gestation, sepsis, placenta praevia, unbooked status, retained placenta, previous endometrial curettage, abruption placenta and thrombocytopenia. These findings are in keeping with the results of previous studies [1,3,4,5,6,12,19]. The association of increasing maternal age and parity to EPH is related to them being risk factors for placenta praevia and uterine atony [4,5,9].

EPH is associated with increased risk of maternal morbidity and mortality. All our patient that had EPH received blood transfusion. This is similar to the result of a previous study. [19] EPH is associated with extensive blood loss and then blood transfusion. our patients received average of 4 units of blood. Nineteen patients (86.36%) had febrile morbidity. The febrile morbidity may be due to massive blood transfusion and extensive surgery. This finding is in agreement with report of previous studies. [4,5,9] Intensive care unit (ICU) admission after such an extensive surgery is associated with increased economic burden, as well as mental and psychological stress to the patients and their relatives. Six patient(27.22%) were admitted into the intensive care unit for monitoring following EPH. ICU admission was reported in previous study. [10,19] Three patient (13.64%) had bladder injury, 4(18.18%) had bowel injury,3(13.64%) had DIC, while 5(22.73%) had wound sepsis, these findings are in keeping with the reports of previous studies. [10,19] we recorded one maternal death among the patients that had EPH.

The role of multidisciplinary approach to prevent maternal morbidity and mortality associated with managing a patient undergoing EPH can be over emphasized. This team should involve senior obstetrician, anesthetist , hematologist, ICU specialist, and Nurse. This team will ensure effective resuscitation of patients with intravenous fluids, availability of blood and blood products for transfusion, efficient surgical execution by

experienced Obstetrician, and provision of intensive care monitoring. All our patients that had EPH were managed using the multidisciplinary approach and this helped to reduce maternal mortality.

EPH has been described as an obstetric catastrophe [12], for both the obstetrician and the patient. On the part of the obstetrician, the decision to perform hysterectomy is difficult especially in nulliparous women as this brings an abrupt and unwelcomed end to their reproductive career [6]. The decision to go ahead with the procedure oftentimes may not be well justified in the mind of the obstetrician. On the part of the patient, it is life-changing because of the associated morbidities. There is also a psychosocial aspect as the patient is unable to menstruate. This is worsened by the fact that in Africa women attach strong importance to their monthly cycle as well as having all their organs intact [4,7]. All our patients that had EPH were adequately counseled on the above morbidities associated with EPH.

limitation of this study. The major challenge was lack of blood products and facility to perform uterine artery embolization for our patient that had EPH.

5. Conclusion

The prevalence of EPH is still unacceptably high in our environment, compared to developed countries of the world. Uterine rupture was the most common indication for EPH in this study and combination of previous caesarean section and unbooked status are the commonest risk factor for EPH in this study. Therefore, we recommended that there should be adequate policy by authorities and health agencies to make antenatal care and family planning services accessible, and affordable to all pregnant mothers in our environment. We also recommend that any woman delivered via caesarean section should be properly counseled to register for antenatal care in her subsequent pregnancies for adequate monitoring especially when in labor.

Statement Section

1. There was no conflict of interest of any sort
2. Ethical clearance was obtained from the Hospital Ethical committee
3. This research was funded by the Authors
4. All the Authors contributed to the different aspects of the research

Adiri Charles O; conceptualization, data curation, formal analysis, writing original draft, investigation, validation, methodology, writing review

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