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# Emergency Peripartum Hysterectomy

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## 1. Introduction

The most common indication for emergency peripartum hysterectomy is severe uterine hemorrhage, which cannot be controlled by conservative measures. Such hemorrhage may be due to abnormal placentation (eg, placenta praevia and placenta praevia accreta), uterine atony, uterine rupture, leiomyomas, coagulopathy, over distension of the uterus (multiple pregnancy, polyhydramnios), or laceration of the uterine vessel(s), which is not treatable by conservative measures. The relative frequency of these conditions varies among series, and is dependent upon the patient's population and practice patterns. Emergency peripartum hysterectomy is a life saving surgical procedure, which is usually carried out for postpartum haemorrhage, after a sequence of interventions are not successful. Advent of newer medical /conservative surgical methods of controlling postpartum haemorrhage, have reduced the incidence and indications of emergency peripartum hysterectomy. Sophistication in obstetric care and blood transfusion services has improved the outcome, especially in developed countries.

### 1.1 Emergency Peripartum Hysterectomy

Emergency hysterectomy refers to the surgical removal of the uterus, following an unexpected and sudden event that must be dealt with urgently by carrying out the procedure. When it is carried out on a pregnant uterus within 24 hours after delivery, it is termed emergency peripartum hysterectomy. This life saving obstetric procedure has been in use for more than 200 years, but it was in 1876 that Edward Porro published the first successful case report of this procedure, in which the mother and baby survived.

In developing countries, a variable incidence of 2 to 6 per 1000 births has been reported, compared to 0.2 to 2.7 per 1000 births from developed countries. In Nigeria, the incidence of emergency peripartum hysterectomy ranges from 1.8 to 5.4 per 1000 births. In Pakistan, an incidence of 5.6 per 1000 births was reported, in India 2.6 per 1000 births, and in the United States of America (USA) 1.2 to 2.7 per 1000 births. Lower incidence was reported in European countries like Norway, where 0.2 per 1000 births was reported, in Ireland and Netherlands 0.3 per 1000 births was reported from both countries.

The increasing incidence of the procedure in developed countries like USA and Canada, despite proper utilization of effective antenatal and delivery facilities, has been attributed to the increasing caesarean section rate, which predisposes to placenta praevia and placenta praevia accreta, which are now the leading indications for emergency peripartum

hysterectomy in developed countries. Placenta praevia predisposes to primary postpartum haemorrhage, because of inefficient contraction and retraction of the lower uterine segment, following delivery of the baby or the placenta, while in addition, placenta praevia accreta may predispose to partial separation of the placenta, and with partial separation of the placenta, emergency peripartum hysterectomy is usually required to control haemorrhage. This may explain why placenta praevia accreta, is presently the commonest indication for emergency peripartum hysterectomy in developed countries, because most of their patients are booked and deliver in health facilities, assisted by skilled providers, which may have reduced the incidence of ruptured uterus in their obstetric practice, and uterine atony among the indications for emergency peripartum hysterectomy.

The preeminence of placenta praevia/placenta praevia accreta, as an indication for emergency peripartum hysterectomy, has been reported globally. This may be because of the increasing caesarean section rate worldwide, and the concomitant rise in the incidence of placenta praevia and placenta praevia accreta. In developed countries like The United States of America, the caesarean section rate is at a record high of 31.1% of all births, representing an increase of 30% in the past decade, probably because litigation and request caesareans are becoming commoner. In Aminu Kano Teaching Hospital, Kano, Nigeria, there has been an increase of 12% in the caesarean section rate over the past decade, because of increasing awareness by the obstetricians, about reduction in maternal and perinatal morbidity, in order to ensure good quality of life.

The association between placenta praevia/placenta praevia accreta and previous caesarean delivery has been reported. Placenta praevia was recorded in 4.4 per 1000 second-birth singletons, whose first births were delivered by caesarean section, and 2.7 per 1000 second-birth singletons, whose first births were delivered vaginally. In The United States of America, caesarean section for live birth is associated with a 47% increased risk of placenta praevia, in second pregnancy with a singleton. Placenta praevia accreta occurs in up to 15% of women with placenta praevia, and more in cases with previous lower segment caesarean section scar, because of decidual deficiency.

The higher incidence of emergency peripartum hysterectomy, in developing countries compared to developed countries, is because of the higher prevalence of risk factors of primary postpartum haemorrhage like, uterine fibroids in pregnancy, multiple pregnancy, grandmultiparity, cephalo-pelvic disproportion and prolonged obstructed labour/uterine rupture, previous caesarean section/myomectomy scar, and placenta praevia in developing countries, where majority of the maternity patients are unbooked, and deliver outside the health facilities unsupervised or poorly supervised.

Essential obstetric care facilities are poorly developed in developing countries. Most of the rural public hospitals and health centres are not functional 24 hours of the day, coupled with poor road network and transportation systems to the cities, which result in delay in getting appropriate care in labour, with the result that 70% of deliveries are conducted outside the hospitals, by unskilled birth attendants or quacks, Traditional Birth Attendants (TBAs), Traditional Priests, Herbalists or Prophets. In Nigeria 16.9% of women delivered on their own without assistance from anyone. In Pakistan 89% of women deliver at home, of these 80% are delivered by TBAs.

The high prevalence of unbooked patients, who labour and deliver outside the health facility poorly supervised in developing countries, has been attributed to socio-cultural

barriers and aversion to western oriented programs like antenatal care and hospital delivery, as well as low literacy levels, female socioeconomic disadvantage from male gender dominance, poverty, poor access to available health facilities that are not free or subsidized, and upsurge in the use of spiritual homes as maternity centres, because of the belief that pregnancy complications are a result of spiritual attacks.

The likelihood that mothers will consult a health professional for antenatal care, increase as the mother's educational level rises, increasing from 44% among women with no education, to 97% among those with college education, while the proportion of births that took place in health facilities, varies from 6% among uneducated women, to 73% among women with college education.

The high prevalence of low adult literacy levels in developing countries, may account for the high prevalence of unbooked patients, who labour and deliver outside the health facility poorly supervised. Adult literacy rate, which is the share of literate persons in the population aged 15 years and older, is 57.1% in Nigeria, in a Demographic and Health Survey 2005-2008. This may explain why in Nigeria, 58% of the pregnant women received antenatal care from a skilled provider, 39% of births are assisted by a skilled provider, and 35% of births are delivered in a health facility. This calls for increasing female education and socioeconomic empowerment, if utilization of available antenatal care and delivery facilities is to improve, and the incidence of emergency peripartum hysterectomy is to reduce in developing countries.

In developed countries, where the adult literacy levels approach 100%, 9 out of 10 patients (91%) are booked, and deliver in adequately equipped health facilities, with the assistance of a skilled provider. This, in addition to the higher sophistication of their populace, socioeconomic empowerment of the women, provision of adequate essential obstetric care facilities, high contraceptive prevalence rate and desire for small family size, may explain the lower incidence of emergency peripartum hysterectomy in developed countries.

The amalgamation of closely related risk factors of emergency peripartum hysterectomy, that contributes significantly to the high maternal mortality in developing countries, like grandmultiparity, low socioeconomic class and unbooked status, is because grandmultiparity is associated with low socioeconomic class and unbooked status. The protective effect of primigravidity, may be because, risk factors of emergency peripartum hysterectomy like uterine rupture, uterine atony and placenta praevia/placenta praevia accreta are less common among them, and where primary postpartum haemorrhage occur, obstetricians will prefer the application of other techniques, that can be both life saving and uterus preserving to arrest haemorrhage.

The high prevalence of grandmultiparity in developing countries is attributed to early girl marriage/childbearing, male gender dominance, low literacy level, poverty and low contraceptive prevalence rate. Early girl marriage/childbearing refers to adolescents less than 18 years at first marriage/pregnancy. In Nigeria, the median age at first marriage is 18.3 years, and 23% of women age 15-19 years are mothers or presently pregnant.

Contraceptive prevalence rate (CPR), which refers to the percentage of women of reproductive age (15 to 49 years), married or in a stable union, currently using, or whose partner is using any method of contraception at a given point in time, is low in developing countries, because the contraceptive prevalence in a community, has direct correlation with level of education.

In Nigeria, where the adult literacy level is 57.1%, 15% of married women aged 15–49 years use any form of family planning, and 10% use modern methods of family planning, the

mean ideal number of children for women age 15 to 49 is 6.1. In the Philippines, where 98.8% of the populace is exposed to one level of education, with 78.9% having secondary or tertiary education, the number of women using the modern methods increased from 28% in 1998 to 34% in 2008, the family size is 3.3 per women. In most European countries, where literacy level approach 100%, the contraceptive prevalence rate approximate the optimal level of 80 to 85%, which corresponds to a family size of 2 children per women, which is the replacement level (i.e. replacement of the couples). This may explain the desire for small family size, and the low prevalence of grandmultiparity in developed countries.

The leading indications for emergency peripartum hysterectomy in developing countries are uterine rupture and placenta praevia accreta, because grandmultiparity, uterine fibroids and previous myomectomy scar, contracted pelvis and previous caesarean section scars are common, and most of the women deliver outside the health facilities poorly supervised, with high incidence of mismanaged labour. This may be because uterine rupture and placenta praevia accreta, tend to be relatively less amenable to medical and conservative surgical treatments, and sometimes necessitate radical surgical intervention, such as hysterectomy. Uterine rupture being a rare feature of their practice in developed countries, may explain why placenta praevia/placenta praevia accreta, is the leading indication for emergency peripartum hysterectomy in developed countries, despite the sophistication of their populace and obstetric practice.

The prominence of uterine rupture, which is a reflection of poor level of obstetric care and/or utilization in any community, and placenta praevia/placenta praevia accreta, in which complications are usually secondary to mismanagement of the third stage of labour, as the leading indications for emergency peripartum hysterectomy in developing countries, may be because majority of the women labour/deliver without the assistance of a skilled provider. Studies from developing countries have shown that 74.7% of case referrals to tertiary centres were mismanaged, and such mismanagement contributed significantly to mortality and long term morbidity.

Booked status and delivery that is assisted by a skilled provider in a health facility, and efficient transfer system from peripheral to specialist hospital, will ensure that avoidable risk factors like ruptured uterus remain avoidable, and where they accidentally occur, it will take place in the hospital, with better chance of success of conservative treatments, as there will be no delay in instituting appropriate management. In Conakry, Guinea, there was a decrease in the prevalence of uterine rupture from 0.20% to 0.12%, and associated maternal mortality from 28% to 21%, after 6 months of implementation of a program of consultation, feedback and integration (effective transfer system) between peripheral delivery units and two hospitals. This shows that building relationships with the various levels of health facilities, can promote early and prompt referral, and reduce the prevalence of uterine rupture and emergency peripartum hysterectomy.

Uterine atony, which accounts for the highest incidence of primary postpartum haemorrhage in most communities of world, is responsible for 75 to 90% of the cases. In developing countries, this may be explained by the high prevalence of grandmultiparity, uterine fibroids in pregnancy, multiple pregnancies, unbooked status and prolonged labour from poorly supervised labour/deliveries. Uterine atony is less prominent as an indication for emergency peripartum hysterectomy worldwide, because, recent advances in the of sequence of medical and conservative surgical measures to control primary postpartum haemorrhage, like rectal misoprostol, intramyometrial prostaglandins, carboprost, manual compression of the uterus,

uterine packing with catheters, internal iliac/uterine artery ligation, uterine artery embolism and insertion of B-lymph node suture, in addition to oxytocin and ergometrine, will control most cases of primary postpartum haemorrhage from uterine atony.

Studies have shown that over 80% of the patients who had emergency peripartum hysterectomy had blood transfusion, which shows the importance of efficient blood transfusion services, in the management of primary postpartum haemorrhage and emergency peripartum hysterectomy. Involvement of governmental and non-governmental agencies like Safe Blood for Africa (SBFA) is needed, especially in developing countries, where the health budget is poor, and there is aversion to free blood donations.

SBFA, whose strategies are to ensure a safe, adequate and accessible supply of blood and blood products continent-wide, is recognized and approved by international organizations and agencies. In conjunction with the Federal Government of Nigeria, SBFA commissioned the Nigerian National Blood Transfusion Services (NNBTS) in Abuja, Nigeria, in 2005, a program which is administered by SBFA, has expanded to the current 12 zonal blood centres, with additional centres to become operational soon. SBFA has been providing technical assistance to the Botswana National Blood Transfusion Service since 2000, and has assisted with increasing the quality and quantity of safe blood in Botswana, by providing the required training. Since SBFA came into Botswana, the blood supply has increased by over 100%, and the Human Immunodeficiency Virus infection rate among donors has decreased from 9% to less than 2%.

In the management of primary postpartum haemorrhage, a sequence of conservative measures to control uterine hemorrhage, should be attempted before resorting to more radical surgical procedures. If an intervention does not succeed, the next treatment in the sequence should be swiftly instituted. Hysterectomy should not be performed too early or too late. The skills that are necessary for its performance are best acquired, under an experienced mentor during scheduled non-emergency cases.

Timing is critical to an optimal outcome. The obstetrician will have to strike a balance, between spending excessive time on alternative techniques that are proving ineffective, and moving to the definitive and life saving hysterectomy, because delay will lead to further haemorrhage, and probably disseminated intravascular coagulation. The moribund state of the patients at the time of hysterectomy, rather than the operative procedure, is said to be responsible for the high maternal mortality, because delay in instituting therapy, is associated with the likelihood that the hysterectomy will be seriously complicated by coagulopathy, severe hypovolaemia, tissue hypoxia, hypothermia, and acidosis, which further compromise the patient's status.

This calls for not only campaign for utilization of adequately equipped antenatal care, and hospital delivery facilities that is supervised by a skilled provider, but also, proper training and retraining of the health workers on the management of obstetric emergencies, in-order to improve not only the skill, but also the art of obstetric judgments during these circumstances, and avoid delay in instituting appropriate treatment, so as to ensure consistent near perfect performance, because consistency is the key to sustained success.

The high maternal mortality rate, that is associated with emergency peripartum hysterectomy, is usually attributed to delay in carrying out the life saving hysterectomy. Delay, is the inability of the patient to get treatment in time, in the event of an obstetric emergency. Type I delay, is delay in making decision to seek care, when experiencing an

obstetric complication. Type II, is delay in reaching an appropriate health facility, once the decision has been made to go, and Type III, is delay in receiving adequate and appropriate care, once the facility has been reached. In studies from Nigeria, 77.8% of maternal deaths were attributed to Types I and III delay.

The importance of avoiding delay, can be appreciated in developing countries, where primary postpartum haemorrhage remain one of the leading causes of maternal deaths, because of delay in getting appropriate treatment, while in developed countries, because of proper utilization of high quality maternity services, which has eliminated delay in getting appropriate treatment in the United Kingdom over the past 50 years, the number of maternal deaths from haemorrhage has fallen from 40 to 3 per annum. This has resulted in the emergence of the concept of *severe adverse maternal morbidity* (SAMM), as a sensitive marker of the quality of obstetric care, as maternal death from postpartum haemorrhage is becoming too rare for adequate surveillance of services.

The high perinatal mortality rate, among patients who had emergency peripartum hysterectomy in studies from developing countries, is probably because uterine rupture, which occurred among women who laboured outside the hospital poorly supervised, is one of the leading indications for emergency peripartum hysterectomy. With uterine rupture, immediate laparotomy is necessary in order to salvage the fetus, which is not usually feasible among patients who laboured outside the hospital.

Wound sepsis, post-operative pyrexia, anaemia and urinary tract infection, are usually the commonest morbidities following emergency peripartum hysterectomy, especially in developing countries. This may be because uterine rupture is a leading indication for emergency peripartum hysterectomy, and the combination of trauma, sepsis from aseptic techniques of traditional midwives, anaemia from primary postpartum haemorrhage, and urethral catheterization for 14 days post delivery to prevent vesico-vaginal fistula formation, may predispose to these morbidities. Also, some of the manipulations and conservative procedures, which were carried out before resorting to emergency peripartum hysterectomy, may carry the risk of intrauterine infections, besides being associated with delay and further bleeding, with worsening anaemia.

Subtotal hysterectomy is more commonly performed, compared to total abdominal hysterectomy, in the management of emergency peripartum hysterectomy, because the patients are usually not fit for surgery and anaesthesia. This is because hysterectomy is usually resorted to after failure of conservative management, and the cervix and paracolpos are usually not involved as the source of haemorrhage, which make subtotal hysterectomy to be adequate to achieve haemostasis. It is safer, faster and easier to perform than total hysterectomy, especially in the hands of Senior Resident Doctors, who encounter most of the cases during call hours. The future risk of cervical stump carcinoma which is 0.1% - 0.15% is low, and can be prevented by regular cytological screening.

## 2. Conclusion and recommendations

The incidence of emergency peripartum hysterectomy is increasing globally, and fetomaternal outcome is poor, especially in developing countries. Improvement in literacy level and socioeconomic status of the women, as well as contraceptive acceptance, utilization of antenatal care and hospital delivery that is supervised by skilled providers, provision of adequate facilities and trained manpower to carry out medical/conservative surgical

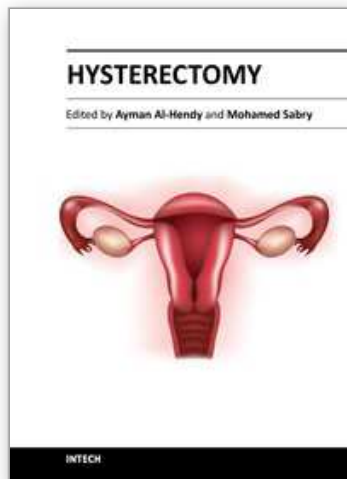
treatments of primary postpartum haemorrhage, and efficient blood transfusion services are urgently needed, especially in developing countries, in order to reduce the incidence of emergency peripartum hysterectomy, and improve the outcome. Women who are high risk for primary postpartum haemorrhage, should book for antenatal care and deliver in specialized health facilities. Governmental interventions that will improve the utilization of antenatal care, and hospital delivery that is supervised by skilled providers, like the recent launching of the National Health Insurance Scheme in Nigeria, is needed, especially in developing countries, where health budget is poor and governmental policies are erratic.

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## **Hysterectomy**

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This book is intended for the general and family practitioners, as well as for gynecologists, specialists in gynecological surgery, general surgeons, urologists and all other surgical specialists that perform procedures in or around the female pelvis, in addition to intensivists and all other specialties and health care professionals who care for women before, during or after hysterectomy. The aim of this book is to review the recent achievements of the research community regarding the field of gynecologic surgery and hysterectomy as well as highlight future directions and where this field is heading. While no single volume can adequately cover the diversity of issues and facets in relation to such a common and important procedure such as hysterectomy, this book will attempt to address the pivotal topics especially in regards to safety, risk management as well as pre- and post-operative care.

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