

## Anaesthetic challenges in emergency peripartum hysterectomy in West Africa: a Nigerian perspective

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### Abstract

**Background:** To determine the foeto-maternal outcome and the anaesthetic challenges in emergency peripartum hysterectomy at the University of Nigeria Teaching Hospital (UNTH), Enugu, Nigeria.

**Method:** A retrospective study was carried out on parturients that had had emergency peripartum hysterectomy at UNTH in Nigeria, from July 1998 to June 2006. Data collected included demographics, anaesthetic and obstetric records, foeto-maternal outcomes and the need for critical care management.

**Results:** There were a total of 6 798 deliveries and 6 485 live births, with 16 emergency peripartum hysterectomies. The incidence of emergency peripartum hysterectomy was 0.23% of all deliveries (2.3/1 000 deliveries). The causes of emergency hysterectomies were ruptured uterus (11 patients or 69%), placenta accreta/morbidly adherent placenta (4 patients or 25%) and uncontrollable postpartum haemorrhage following vaginal delivery (1 patient or 6%). Eight patients had subtotal hysterectomy, while eight had total abdominal hysterectomy (TAH).

All the patients received general anaesthesia and blood transfusion. There were two postoperative admissions to the intensive care unit (ICU) and two procedure-related deaths due to hypovolaemic shock. There were nine stillbirths but no documented neonatal deaths.

**Conclusion:** Emergency peripartum hysterectomies challenge the anaesthetist and the obstetrician who have to maintain haemodynamic stability in patients who may have lost volumes of blood, in a setting where blood and colloid availability is often limited. The maternal mortality was higher than that of most of the studies reviewed.

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### Introduction

Obstetric haemorrhage is responsible for about 30% of maternal deaths in sub-Saharan Africa<sup>1</sup> and is the leading cause of maternal death worldwide.<sup>2-4</sup> Significant maternal morbidity is also caused by obstetric haemorrhage.<sup>5</sup>

One way of controlling significant obstetric haemorrhage is an emergency peripartum hysterectomy, especially when it is accompanied by a ragged uterine rupture. This is usually undertaken as a last resort to save the mother's life.<sup>6-8</sup> There is sometimes a dilemma concerning the preservation of future fertility, especially in women of low parity who desire more children.<sup>5</sup>

Because this procedure is usually performed as a last resort and as an emergency, patients are already compromised when they present for surgery. In some cases, peripartum hysterectomies are performed when massive haemorrhage occurs during Caesarean delivery. Ruptured uterus, placenta praevia and any other cause of postpartum haemorrhage can result in emergency hysterectomy to stop bleeding and prevent severe maternal morbidity/mortality.<sup>5</sup> This is especially challenging for the anaesthetist who has to maintain maternal haemodynamic stability during the perioperative period.

A review of literature revealed little on the anaesthetic challenges in emergency peripartum hysterectomy in West Africa. This study was

undertaken to determine the causes of this, and anaesthetic management of patients presenting for emergency peripartum hysterectomy at UNTH, Ituku-Ozalla, Enugu, Nigeria.

## Methods

An observational retrospective study of parturients that received anaesthesia for peripartum hysterectomy was carried out at UNTH in Nigeria from July 1998 to June 2006. Obstetric theatre records were examined for consecutive cases of emergency peripartum hysterectomy and relevant patient folders were obtained from the records department. The records were reviewed for demographic, obstetric and anaesthetic data. Foeto-maternal outcome and admissions into the ICU were also noted. In our centre, the obstetric theatre and labour ward records document patients' demographics, parity, gestational age, indications for surgery, Apgar score (one- and five-minute scores), birth weight, incision-to-delivery time, anaesthetic technique, names of anaesthetists/obstetricians/scrub nurses, major intraoperative complications and foeto-maternal outcomes. This has helped in audits where some patient folders may have been unavailable.

## Results

There were a total of 6 798 deliveries and 6 485 live births, with 16 emergency peripartum hysterectomies. The incidence of emergency peripartum hysterectomy was 0.23% of all deliveries (2.3/1 000 deliveries) and 1% of all Caesarean deliveries during the study period (1 579 Caesarean sections).

There were eight patients booked for antenatal care in our hospital, and eight unbooked patients. The patients had emergency hysterectomies following ruptured uterus (11/6 798 deliveries or 0.16%), placenta accreta/morbidly adherent placenta (4/6 798 deliveries or 0.06%). The only vaginal delivery patient had a hysterectomy following uncontrollable postpartum haemorrhage. The mean age of the patients was 32.8 years with a range of 23 to 42 years. Tables I and II show the age range and parity of the patients. Eleven patients were at term and two presented at 35 and 36 weeks, respectively. The duration of gestation of three of the patients is unknown. Eight patients had subtotal hysterectomy, while eight had total abdominal hysterectomy (TAH).

All the patients received volatile anaesthesia using a muscle relaxant and endotracheal intubation, except one patient in whom failure to intubate resulted in the use of volatile anaesthesia and a

**Table I:** Age range of the patients

Age range (years)	Number: n = 16
< 23	nil
23–29	5
30–35	7
36–40	3
> 40	1

**Table II:** Parity of the patients

Parity	Number: n = 16
Nulliparous	nil
1–3	5
4–6	7
7–9	4
> 9	nil

facemask. All patients received blood transfusion with the estimated blood loss and volume transfused shown in Table III. The mean intraoperative blood loss and units of blood transfused were 1.9 litres (range 800–4 000 ml) and 3 units (range 1–4 units), respectively. All the patients received crystalloids.

**Table III:** Estimated blood loss and volume of blood transfused

Number of patients n = 16	Estimated blood loss in litres (includes haemoperitoneum)	Mean volume transfused intraoperatively (units) including the standard deviation	Range of blood units transfused
11	1–2 litres	2.6 ± 1.6	1–4
5	2.1–4 litres	3.75 ± 1.1	2–4

Two patients were admitted to ICU for postoperative management and there were two procedure-related deaths (death within 24 hours of the procedure) in the ICU and postnatal ward. Both were due to hypovolaemic shock, including acute renal failure in one of the patients.

There were nine stillbirths, including a pair of twins in a patient with rupture of the uterus at 35 weeks gestational age. There were no documented neonatal deaths.

## Discussion

The incidence of patients that had peripartum hysterectomy in our centre was 2.3/1 000 deliveries

(0.23%), which was lower than another study in Lagos, Nigeria, with 3.3/1 000 deliveries or 0.33%.<sup>8</sup> It is, however, similar to an earlier study in our centre, by Ozumba et al.<sup>7</sup> However, our numbers were higher than those from studies in Saudi Arabia (0.5/1 000 deliveries),<sup>9</sup> Norway (0.2/1 000 deliveries),<sup>10</sup> the United Kingdom (0.48/1 000 deliveries),<sup>11</sup> and lower than the figure reported from a study in India (2.6/1 000 deliveries).<sup>12</sup>

The major indications for peripartum hysterectomy were ruptured uterus (69%), followed by placenta accreta/morbidly adherent placenta (25%), and uterine atony (6%).

In Enugu, Nigeria, avoidable factors are still prevalent in maternal deaths. The maternal mortality ratio of 2 397.3 maternal deaths per 100 000 live births was reported in Enugu between January 2003 and December 2005.<sup>13</sup>

Nigeria is a developing country with limited facilities and a poor transport system. Women in labour are usually monitored with a partograph and intermittent auscultation using the Pinnard Stethoscope. During the period of the study, the cardiotocograph in the hospital broke down and was neither repaired nor replaced.

The majority of the women in Nigeria do not book into the hospital and hence do not have formal antenatal care. Many register with traditional birth attendants and deliver at home. This is apparently because many have no formal education and are not empowered.

This is somewhat similar to a study by Ozumba et al,<sup>7</sup> in which ruptured uterus accounted for 72% of the hysterectomies. While it differs from another Nigerian study in which uterine atony was the major cause of peripartum hysterectomy at 45%,<sup>8</sup> it was similar to studies from Saudi Arabia (64.7%),<sup>9</sup> and Norway (64%).<sup>10</sup> In a report from the Netherlands, placenta accreta was the major indication for peripartum hysterectomy at 50%, followed by uterine atony at 27%.<sup>14</sup> This is similar to another study from Croatia in which abnormal placentation was the major indication for hysterectomy.<sup>15</sup>

General anaesthesia was used in all the patients because of the potential risk of haemodynamic instability with regional anaesthesia in patients who may have lost or may lose a lot of blood. In elective surgery for placenta praevia, there is increasing evidence to support the safety of regional anaesthesia and a combined spinal/epidural allows time for surgery.<sup>5</sup> Ketamine was often the induction agent of choice, and suxamethonium was used for laryngoscopy and endotracheal intubation. Pancuronium was the

non-depolarising muscle relaxant of choice. All the patients received crystalloids and blood transfusion to maintain haemodynamic stability. The blood losses in these cases are often underestimated, making close monitoring very important.<sup>5</sup> Non-invasive blood pressure monitoring was used in all the patients and in a minority of patients, pulse oximetry. There was a relative lack of monitors, or accessories like the pulse oximeter, due to budgetary constraints during the study period.

Eight patients had total abdominal hysterectomy and the rest had subtotal hysterectomy. The estimated blood loss associated with each procedure depended much on the time of presentation, but patients with a ruptured uterus lost more blood than those with abnormal placentation. Two patients were managed postoperatively in the ICU.

There were two maternal deaths and nine stillbirths, including a pair of twins. There were no neonatal deaths.

Both maternal fatalities were due to hypovolaemic shock (with acute renal failure in one patient), and occurred within 24 hours of surgery.

In both fatalities, anaesthesia was administered by trainee specialist doctors, while hysterectomy was performed by a consultant obstetrician in one of the deceased patients. On the whole, more than 60% of the cases were done by trainee specialists. The case mortality rate was 12.5%. This is lower than the earlier reported figure of 29.8% from our centre<sup>7</sup> and the 13.6% mortality rate from Lagos, Nigeria.<sup>8</sup> It is, however, higher than those reported by studies from the Netherlands (4%),<sup>14</sup> Croatia (0%),<sup>15</sup> Damman in Saudi Arabia (11.6%),<sup>16</sup> Norway (0%)<sup>10</sup> and India (3%).<sup>12</sup>

The risk factors for severe morbidity and mortality in this study were unbooked status, late presentation, ruptured uterus, previous Caesarean section, limited blood availability, and surgery by trainee specialists.

Limited blood availability was another challenge for the anaesthetist who had to maintain tissue perfusion in compromised patients without blood products like fresh frozen plasma, cryoprecipitate and occasionally fresh, whole blood. Blood availability may still remain a problem, as people are averse to donating blood for various reasons, including fear of being tested for HIV, and their blood being used for witchcraft.<sup>17</sup>

Since 1–3% of a nation's population can supply the blood needed for medical services, there should be

an awareness campaign to increase the voluntary donor base.<sup>18</sup>

A study in the United Kingdom reported that the use of interventional radiology to reduce blood loss in patients with placenta accreta, undergoing Caesarean section, did not reduce the need for Caesarean hysterectomy.<sup>19</sup>

It was difficult to estimate the number of women that died outside the hospital following untreated peripartum haemorrhage, due to lack of a reliable data base, and estimates might be imprecise.

### Conclusion

Emergency peripartum hysterectomy tasks the anaesthetists and obstetricians who have to maintain haemodynamic stability in patients who may lose volumes of blood in a setting where blood and colloid availability is often limited. The major cause for emergency peripartum hysterectomy in this study was ruptured uterus, which is avoidable with proper counselling of the patient, especially those with a history of previous Caesarean section. The roles of poverty, poor transport logistics and illiteracy should be addressed. The recent acquisition of pulse oximeters should help in reducing future morbidity and mortality in this high-risk group. The maternal mortality was higher than those from most of the studies reviewed.

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