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## **Assessment of quality of care in the management of postpartum haemorrhage: A review of selected maternal death cases**

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### **Abstract**

Obstetric haemorrhage was the third most common cause of maternal death in South Africa for the triennium 2008 to 2010, increasing from the rate in 2005 to 2007. The major causes of death from haemorrhage remained similar during 2005 to 2010. Provincial assessments assert that 80.1% of these deaths were avoidable. Patient-related avoidable factors, mostly delay in seeking care, were present for only a third of the total deaths. A worrying 30.7% of deaths were due to lack of appropriately trained doctors or nurses. At least at the primary care level, midwives are expected to be able to recognise, manage and refer cases of postpartum haemorrhage (PPH). National management protocols inform practice in this area, since professional regulations are lacking. The primary objective of this study was to assess the clinical practices of midwives in managing postpartum haemorrhage and to report on the quality of care during this process. A quantitative design was utilised in this exploratory, descriptive study. The results of the analysis showed that the general quality of care was poor and basic lifesaving measures were only performed in half of the cases. In view of the maternal deaths caused by postpartum haemorrhage, poor quality of care by midwives should be urgently addressed.

**Keywords:** Primary care, clinical, obstetric, bleeding, midwives, morbidity, mortality.

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### **Introduction**

PPH is a major cause of maternal deaths around the world; an overwhelming number of these deaths occur in developing countries and it is amongst the top causes of maternal death in South Africa, even though it is the most preventable (Jansen, Van Rhenen, Steegers & Duvekot, 2005; Oyelese, Scorza, Mastroliia & Smulia, 2007; Ajenifuja, Adepiti & Ogunniyi, 2010). The 2012 South African National Confidential Enquiries into Maternal Deaths Report states that 14.1% of total deaths are due to obstetric haemorrhage (Saving Mothers Report, 2012). This report also emphasises that the majority of deaths (94.2%) occur at public hospitals, at all levels of care.

Although PPH is recognised as one of the main causes of maternal deaths, it occurs during the time when women are likely to receive the least care (Nangalia

& Thaddeus, 2004; World Health Organisation, 2009). PPH may also cause serious maternal morbidity, such as adult respiratory distress syndrome, coagulopathy, renal failure, shock, and loss of fertility in the case of a hysterectomy as a final measure to stop blood loss (American College of Obstetricians & Gynaecologists, 2006). Patients who suffer from PPH often do not survive to be referred to another level of care (Fawcus & Moodley, 2011). Although some risk factors can be identified, often PPH occurs silently and without warning (ACOG, 2006; Mathai, Gulmezoglu & Hill, 2007). To compound this issue, the floor plan of primary healthcare obstetric units in South Africa necessitates the regulated recovery of postpartum patients behind the facility, while personnel often are dealing with mothers in labour at the admissions area of the facility.

The World Health Organisation (WHO) defines PPH as a loss of more than 500ml of blood during the 24 hours after delivery. Therefore, it is assumed that the diagnosis of PPH occurs as a response to the volume of blood loss (WHO, 2009). However, studies about the visual estimation of blood loss after delivery indicate that this diagnostic measure is inadequate when used in isolation; it might result in either loss of consciousness, or unnecessary blood transfusions (Larsson, Saltvedt, Wiklund, Pahlen & Andolf, 2006). Other methods of establishing blood loss include adding measurement bags to bedding and using laboratorial means to establish haematocrit levels; neither of these methods is suitable for low resource settings. Not being able to accurately diagnose PPH is one of the confining factors of health provider error for this condition (Larsson *et al.*, 2006).

It is clear that PPH is a complex clinical issue that is compounded by a lack of resources, inadequate training, and inaccurate methods of diagnosis. Research identifies substandard care as one of the primary reasons why women are dying from postpartum haemorrhage (Lombaard & Pattinson, 2006). The Saving Mothers Report (2012) confirms these findings by revealing that 30.7% of the PPH related deaths are due to the lack of appropriately trained doctors or nurses, especially at the primary level of care. In addition, half of deaths due to haemorrhage are due to general health worker related avoidable factors (Saving Mothers Report, 2012).

Maternal mortality continues to be adversely affected by PPH. Deaths due to PPH were recorded as steadily increasing between the years 2002 and 2008 in South Africa, despite national interventions, such as the Essential Steps in the Management of Common Conditions associated with Maternal Mortality (National Department of Health, South Africa, 2007). In addition, there is a lack of appropriate training and diagnosis of PPH amongst health professionals at the facilities. Apart from the mortality, serious morbidity results from substandard care of this condition.

The aim of this study, therefore, was to assess the quality of care in selected maternal death cases in relation to the management of postpartum haemorrhage.

### **Methodology**

An exploratory, descriptive, quantitative research design was selected as an objective, rigorous, systematic process of collecting information (Burns & Grove, 2003). In addition, aspects of the study were based on a case survey design, as described by Jurisch, Wolf and Kremar (2013). This method lends itself to obtaining quantitative data from qualitative case studies. Patient records were used as the qualitative case studies. There are five stages outlined in this method. These stages were applied in order to ensure rigour of this study. Stage one focuses on obtaining clarity of the research question. This was ensured by conducting a literature search and identifying the gaps in practice. Stage two requires case studies to be sourced from the literature. A different application of this method was used in this study, since purposefully selected patient case records were utilised (Jurisch *et al.*, 2013).

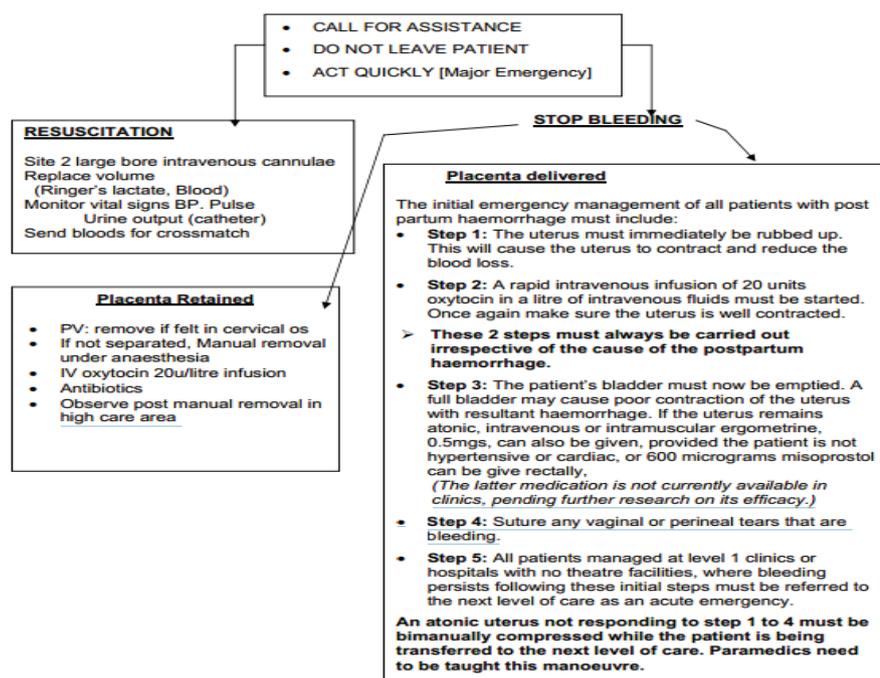
According to step three outlined by Jurisch *et al.* (2013), variables should be identified and pre-tested. A checklist was developed, based on the national clinical management algorithm (Figure 1), and piloted by an external expert in maternal and child health, with the assistance of a statistician to ensure that the checklist was quantifiable. The checking of the questionnaire by the external expert to assess whether the questions asked were based on the algorithm, was step one of the validation process. The piloting, whereby the maternal expert applied the questionnaire to a random sample of folders, was also part of the validation process and, finally, between the statistician and researcher, the data was entered and cleaned. Revisions were made to the checklist based on the recommendations from the pilot study.

Step four of the case survey method outlines the translation of the qualitative to quantitative data (Jurisch *et al.*, 2013). This was accomplished by applying the checklist to the patient case records. The checklist was applied to the purposefully selected sample of folders from a selected province in South Africa from February to June 2013. Items in the checklist were grouped according to the five main steps in the management of post-partum haemorrhage, documented in the Essential Steps in the Management of Conditions Associated with Maternal Mortality (National Department of Health, South Africa, 2007).

There were 19 items in the checklist and items were based on whether a specific clinical action was performed or not, on a scale of 1 = yes (full adherence to steps indicated in the guideline), 2 = no (nil adherence to steps indicated in the guideline). Although later versions of these management algorithms do exist, the

records of the patients reviewed were dated between 2009 and 2010 when the national guidelines of 2007 informed practice.

The first group of questions tested whether immediate action was taken and whether the PPH was recognised as an emergency. Actions that were required in this section were whether the midwives called for assistance, did not leave patient unattended, and acted swiftly. The second set of questions sought to obtain an answer to whether general resuscitation measures were adequately followed, namely: insert two large bore IV cannulae, replace volume, monitor vital signs, as well as insert urinary catheter and monitor output. The third section interrogated the initial emergency management steps specific to treatment of PPH after the placenta has been delivered, including rubbing up the uterus, rapid IV infusion of 20 IU oxytocin in one litre of IV fluid, emptying the bladder, and establishing the cause of bleeding. The fourth group of questions examined the actions following a retained placenta. The fifth set of questions investigated midwifery actions during referral, mainly bimanual compression during transport.



**Figure 1:** Management of postpartum haemorrhage algorithm (National Department of Health South Africa, 2007)

Inclusion criteria for the study were purposefully selected maternal death cases due to PPH. Patient records that did not include maternal deaths due to PPH were excluded from the study. A total of 43 patient records were initially reviewed for inclusion; 12 were discarded, since they were concerned with cases of

antepartum haemorrhage and did not meet the requirements for analysis. Folders were gathered for the period of one year (2009 – 2010). One more record was discarded from analysis on the basis that there were no midwifery notes attached to the folder. A total of 30 records were selected. In agreement with step five of the case survey method, the data from the 30 records were analysed by using basic descriptive statistics with the assistance of the SPSS version 21 software (Jurisch *et al.*, 2013). The small sample size merely made the application of basic descriptive statistics possible.

The University of the Western Cape Ethics Committee had approved the study that was part of a larger study about the 'Best practices in maternal health in Africa'. Permission to use the documents was obtained from a member of the National Confidential Enquiries into Maternal Deaths, on condition that patient data, province, hospital, and staff data remained confidential. All the conditions set out for approval were met in this study.

## **Results**

The 'call for help' has been the first step in many resuscitation protocols, as it initiates the emergency protocol for resuscitation in most hospital settings (Sheikh, Najmi, Khalid & Saleem, 2011). Although only 70% (21) of the midwives acted quickly upon recognising the haemorrhage, 90% (27) of the same amount of midwives realised that they were unable to manage the haemorrhage alone; they either called for assistance from a medical doctor at the facility, or sought telephonic advice from another facility. At the same time, 73.3% (22) of those midwives did not leave the patient unattended. All nurses and midwives should be able to execute at least basic resuscitation measures, since it is an expected outcome of basic health professional training. Nurses and midwives are usually the first point of contact; they are best suited to discover patients who require some form of resuscitation (Hamilton, 2005). Monitoring of haemodynamic status through vital signs and urine output are among the first means of assessing circulatory function and system compromise due to loss of blood (Wilson, Davis & Coimbra, 2003).

Some basic resuscitation measures were better adhered to than others. Most midwives (28, 93.3%) were able to monitor vital signs, as well as replace the fluid volume (25, 83.3%). In the management of PPH, the rapid loss of blood volume requires inserting two large bore intravenous cannulae; this procedure might be effective for initial replacement of blood volume. It is worrisome, however, that in slightly more than half (18, 60.0%) of the cases, two large bore intravenous (IV) cannulae were inserted and in less than half of the cases urinary catheters were inserted and output monitored (14, 46.7%).

ergometrine 0. Lifesaving measures require massaging the uterus to expel clots and to encourage contractility, administering an oxytocic via IV rapidly, emptying the bladder, and establishing the cause of bleeding. Adherence to PPH-specific emergency management by midwives was more poorly performed than basic resuscitation measures. Most midwives tried to establish the cause of the bleeding (21, 70.0 %), but it was alarming that less than a fifth (5, 16.7 %) of the midwives sutured vaginal or perineal tears that were still bleeding. Equally concerning is the fact that only half of the midwives performed treatment measures specific to emergency management of PPH. Less than half of the midwives (12, 43.3%) did not rub up the uterus, slightly more than half (16, 53.3%) administered 20IU oxytocin in one litre of IV fluid, while half of the midwives emptied the bladder of the patient (15, 50.0%). Latest evidence indicates that 600 – 800mcg of misoprostol orally, sublingually, or per rectum is effective in reducing bleeding (Rushwan, 2011). A majority of 20 of the 30 records reviewed represented cases where the placenta was already delivered. In the event that the postpartum haemorrhage occurred after the placenta was delivered, only seven (35.0%) administered a further oxytocic, such as 5mcg IMI or, more currently, 600mcg misoprostol per rectum.

The management guideline expects that midwives should perform a vaginal examination, remove the placenta when it is found in the cervical ostium, rapidly infuse 20 IU of oxytocin intravenously, and then make sure that the placenta is manually removed under general anaesthetic (National Department of Health South Africa, 2007). Cases that cannot be managed at primary level should be stabilised and bimanual compression performed during transfer (National Department of Health South Africa, 2007). In this study, retained placenta was reported in 10 out of the 30 cases reviewed (33.0%). A vaginal examination was only performed in one of these 10 cases of retained placenta. It came as no surprise that none of the cases reported the need to remove the placenta from the cervical ostium. Again, it was alarming that in only two of these 10 cases (20%) a rapid IV infusion of 20 IU oxytocin in one litre of IV fluid had commenced. Manual removal under general anaesthetic was only performed in one (10%) of the cases. Although there were 10 cases of retained placenta, only three cases were referred to the next level of care and bimanual compression was not performed in any of these cases.

## **Discussion**

The literature indicates that postpartum haemorrhage is a complex clinical issue. Nurses and midwives are often the first professionals who have to diagnose and treat a patient presenting with these symptoms; they are required to initiate resuscitation (Hamilton, 2005). Obstetric emergency management skills amongst nurses and midwives exclude a contextual understanding and generally are substandard, compared to what is expected of a basic midwife. Contributing

factors include the integrated training of nurse-midwives in South Africa that leads to professionals trained in maternal care who do not value an improvement in maternal outcomes, as well as medical practitioner-led care that causes other professionals not to be held accountable for their actions (Schoon & Motlolometsi, 2012).

In this study, most midwives realised that they required assistance with the management of a postpartum haemorrhage. It was not clear whether this was due to either a lack of skills, a lack of self-realised competence in the management of the situation, actual fear of dealing with the PPH, or lack of accountability due to medical practitioner-led care. An Australian study rated 'missing something that causes harm', as well as obstetric emergencies (PPH or shoulder dystocia), as two of the top professional anxieties experienced by midwives in their daily practice (Dahlen & Caplice, 2014). However, the realisation that further assistance is required in an emergency situation is a positive sign. This is confirmed by the findings of Sheikh *et al.* (2011) that assistance is required in 100% of PPH cases reviewed.

Primary resuscitation measures primarily focus on observing the vital signs. While these signs are important indicators to provide baseline information and monitor progress, further measures are required to stabilise the haemorrhage. Early recognition and treatment of shock is not based on measurement of vital signs alone (Wilson *et al.*, 2003). Even though monitoring of fluid balance was one of the first steps to ensure successful management of haemorrhagic shock, it was alarming that most of the midwives in this study lacked basic skills to maintain haemostasis (Sheikh *et al.*, 2011). In this study, midwives did not recognise the need for the insertion of a urinary catheter, two IV lines, or to monitor intake and output. Monitoring of the internal homeostasis of the patient with PPH may provide an early indication of PPH-associated morbidities, such as renal failure, disseminated intravascular coagulation, and hypovolemic shock (Sheikh *et al.*, 2011). Another advantage of urinary catheterisation is an empty bladder, which is one of the most basic measures to promote a contracted uterus (National Department of Health South Africa, 2007).

In addition, the midwives in this study poorly executed emergency management steps specific to management of PPH, management of retained placenta, and measures to ensure the safety of a patient during referral. It was not clear whether these steps were executed and not recorded, or neglected, as well as whether the PPH was not regarded as an emergency situation. All these measures do not require much equipment and all the equipment required should be available at all levels of care. The reasons for this lack of proper management might be unique to the South African clinical setting. There is a perception that all registered nurses (also trained as midwives) have enough skills and experience in maternal health to be competent in managing obstetric

emergencies. However, continuing poor maternal health outcomes and reports show that a third of PPH related deaths are due to poorly trained doctors and nurses (Schoon & Motlolometsi, 2012; Saving Mothers Report, 2012).

### **Recommendations**

Training of health professionals needs to be addressed. Those health professionals who have an interest in maternal care should further their studies in the field of midwifery, with the purpose of nurturing a base of interested professionals who have a passion for maternal care. Developing a scope of practice that is regularly updated, current, and specific to midwifery could emphasise personal and professional accountability. Continual professional development may assist maternal healthcare providers with ensuring that their skills are evidence-based and updated. Further studies may need to explore the role of professional values of midwives in practice. This study identifies that further studies into maternal healthcare are required in order to eventually improve maternal health outcomes with regard to postpartum haemorrhage.

### **Conclusion**

Although this was only an exploratory study, it was evident that the quality of care by midwives to manage postpartum haemorrhage was poor, even at a primary care level. This finding raised the issue whether further knowledge, skills, and training of midwives may be advantageous in preventing maternal deaths relating to postpartum haemorrhage.

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