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## International Journal of Gynecology and Obstetrics

journal homepage: www.elsevier.com/locate/ijgo



## CLINICAL ARTICLE

## A mixed-methods study of barriers and facilitators to the implementation of postpartum hemorrhage guidelines in Uganda



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## ARTICLE INFO

## Article history:

Received 7 January 2015

Received in revised form 8 June 2015

Accepted 16 September 2015

## Keywords:

Evidence-based practice

Guideline adherence

Low-income countries

Maternal mortality

Postpartum hemorrhage

Qualitative research

Uganda

## ABSTRACT

**Objective:** To determine the level of adherence to postpartum hemorrhage clinical guideline recommendations and to explore context-specific barriers and facilitators to evidence-based obstetric care. **Methods:** Using direct observation of deliveries at a Ugandan healthcare facility, a mixed-methods study was conducted between February and March 2014 to document practices related to the active management of the third stage of labor (AMTSL). The degree to which practice concurred with WHO postpartum hemorrhage guidelines was determined. Semi-structured interviews were conducted with maternal healthcare practitioners. **Results:** Of 154 women, individual AMTSL, in the form of administering a uterotonic during the third stage of labor, controlled cord traction, or delayed cord clamping, occurred in 105 (68.2%), 119 (77.3%), and, of a subset of 60 patients, 37 (61.7%) individuals, respectively. However, only 18 of 53 (34.0%) individuals observed for receipt of all of the three AMTSL components received all of the essential elements of AMTSL. Three major themes influencing the uptake of evidence-based practice were identified through 18 interviews: healthcare system issues; current knowledge, awareness, and use of clinical guidelines; and healthcare practitioner attitudes to updating their clinical practice. **Conclusion:** Overall guideline adherence was low. There is a need to address context-specific barriers to uptake, ensuring guideline implementation to reduce maternal mortality in low-resource settings.

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## 1. Introduction

Postpartum hemorrhage (PPH) is a major cause of maternal mortality and morbidity in low-income countries and the primary cause of nearly one-quarter of all maternal deaths globally. Clinically effective interventions exist to prevent and manage PPH [1].

A key strategy to incorporate effective interventions into routine clinical practice is to develop and implement evidence-based clinical-practice guidelines [2]. Such guidelines exist for PPH [3,4], which recommend the active management of the third stage of labor (AMTSL) as a key intervention to reduce PPH-associated mortality and morbidity. A range of guideline-implementation strategies (e.g., clinical audit and feedback) have been shown to be effective [2,5], although the evidence base for low- and middle-income countries is limited [6]. A key finding is that implementation will be most effective when it is tailored to address the likely context-specific barriers and facilitators to guideline use [7].

Uganda has high levels of maternal mortality (353 per 100 000 live births) [8] and morbidity [9]. Although the Ugandan Ministry of Health published updated national PPH guidelines in 2010 [10], the extent to which the key recommendation of AMTSL is being used to prevent PPH in Uganda is unknown. However, the use of AMTSL is low in other east Sub-Saharan countries [11]. Therefore, a mixed-methods study in Ugandan obstetric facilities was conducted with the aim of describing adherence to WHO PPH-guideline [3] AMTSL recommendations and to explore the context-specific barriers and facilitators to evidence-based practice.

## 2. Materials and Methods

The mixed-methods study was conducted between February 1 and March 31, 2014 in three government-funded healthcare facilities in Uganda. One facility was an urban regional referral hospital, serving an area with a population of over 5 million. The obstetric unit provides 24-hour emergency care and, in 2013, performed 7932 vaginal deliveries. In this facility, midwives were responsible for assisting in the majority of vaginal deliveries with the obstetricians' and other medical officers' roles focused on surgical obstetric care. Both the quantitative

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and qualitative study components were conducted in this setting. Additionally, the qualitative component was staged in two community health facilities: a health subdistrict level IV facility with inpatient beds and an on-call medical officer, and a subcounty level III facility under the care of a senior clinical officer. The present study was approved by both the Institutional Review committee accredited by the Uganda National Council for Science and Technology and the University of Birmingham Intercolated BMedSc Population Sciences and Humanities Internal Ethics Review Committee. Written informed consent was obtained from every healthcare professional participant and assurances of confidentiality and anonymity were given. Verbal consent was obtained from each recruited woman to allow researchers to collect demographic data and information concerning their delivery. The obstetric healthcare facilities in the present study remain anonymous in accordance with conditions of the ethical approval.

The descriptive observational study measured adherence to the key components of the AMTSL, which is defined by the 2012 WHO guidelines [3] as the use of a uterotonic drug during the third stage of labor, appropriate dose and route of administration (if applicable), and the use of controlled cord traction. Following an interim review of study progress, it was decided to collect additional data relating to the timing of cord clamping and whether patients received all three of the components of AMTSL recommended by WHO guidelines. The sample-size calculation assumed that prophylactic oxytocin was administered in 85% of women (based on Nigerian data [12]). The minimum required sample size was estimated to be 189, assuming a hypothesized frequency of outcome of  $85\% \pm 5\%$  and a 95% confidence interval. The study team (L.B., V.T., Z.A.) directly observed all women delivering in the labor suite during working hours, approximately 8:30 AM–8:00 PM, 5 days each week. The exclusion criteria encompassed women for whom the delivery was not observed by a researcher. All eligible women who met the inclusion criteria were successfully recruited into the study. The maternal healthcare staff who conducted the observed deliveries all consented to participate in the study, (nine midwives, one nurse-midwife and one doctor). Delivering mothers were followed to the point of discharge from the labor suite, which may have been less than 24 hours after delivery. SPSS version 21.0 (IBM, Armonk, NY, USA) was used to calculate descriptive statistics.

The qualitative component of the study was conducted concurrently. The sampling frame included all obstetric healthcare staff involved in the prevention and management of PPH at each of the healthcare facilities. Sampling was purposive, with the aim of recruiting medical practitioners and midwives with a range of job roles and clinical experience. Semi-structured face-to-face interviews were conducted in English (all interviewees spoke good English) by L.B. with participants at their healthcare facilities. Participants were recruited to the study until theoretical saturation (additional interviews failing to generate new information) [13] was achieved. The interview topic guide covered current practice in relation to PPH, the use of evidence-based guidelines, and perceived barriers and facilitators to their implementation in routine clinical practice. The interviews were audio-recorded and transcribed verbatim. Data collection and analysis occurred concurrently. A thematic analysis [14] was conducted by L.B. utilizing NVivo version 10 (QSR International, Melbourne, VIC, Australia). An experienced qualitative researcher (T.S.) independently assessed the explanatory value of the developing categories against the transcripts.

### 3. Results

A total of 154 deliveries, resulting in the birth of 157 neonates, were observed during the study period in the emergency obstetric suite of a regional referral hospital. Following an interim review of the study, a subset of these deliveries was observed for the timing of cord clamping ( $n = 60$ ) and for whether all three components of AMTSL were employed ( $n = 53$ ). Table 1 displays the demographic characteristics of the 154 participating mothers. There were three clinically diagnosed

**Table 1**  
Characteristics of delivering women ( $n = 154$ ).<sup>a</sup>

Characteristic	Value
Maternal age, y	23.7 $\pm$ 5.2 (15–39)
Parity	
Primiparous	65 (42.2)
Multiparous	57 (37.0)
Grand multiparous <sup>b</sup>	21 (13.6)
Great-grand multiparous <sup>c</sup>	11 (7.1)
Gestational age at delivery, d	
Preterm (<259)	6 (3.9)
Term (259–294)	142 (92.2)
Post-term (>294)	1 (0.7)
Unknown	5 (3.2)
PPH clinically diagnosed	
Minor	2 (1.3)
Major	1 (0.6)
Total	3 (1.9)

Abbreviation: PPH, postpartum hemorrhage.

<sup>a</sup> Values given as mean  $\pm$  SD (range) or number (percentage).

<sup>b</sup> Parity of  $\geq 5$ .

<sup>c</sup> Parity  $\geq 10$ .

cases of PPH (1.9% of all deliveries) during the study period, two minor and one major case. Table 2 presents data on adherence to AMTSL guidelines according to WHO PPH recommendations. In accordance with WHO recommendations, oxytocin was administered during the third stage of labor in 105 (68.2%) deliveries, but it was used in varying doses and by differing routes. Of the ten women who did not receive oxytocin at any stage, six were primiparous. Controlled cord traction was performed during the delivery of the placenta in 119 (77.3%) deliveries. In accordance with WHO recommendations, cord clamping occurred between 1–3 minutes after delivery in 37 of the 60 (61.7%) deliveries where this was monitored. Whilst relatively high compliance with the individual components of the WHO guidelines amongst observed deliveries was observed, the proportion of women who received all three components of the AMTSL intervention (provision of uterotonics, controlled cord traction, and delayed cord clamping) was low. Of the 53 women for whom use, or not, of all three components

**Table 2**  
Use of each component of WHO PPH-prevention guidelines.<sup>a</sup>

Component of WHO guideline	Value
Use of oxytocin for PPH prophylaxis in the third stage of labor ( $n = 154$ )	
Yes	105 (68.2, 60.8–75.6)
No	30 (19.5, 14.0–26.4)
No data available	19 (12.3)
Dose of oxytocin ( $n = 154$ )	
Not given	10 (6.5, 3.6–11.5)
10 IU <sup>b</sup>	136 (88.3, 82.3–92.5)
20 IU	6 (3.9, 1.8–8.2)
No data available	2 (1.3)
Route of oxytocin delivery <sup>c</sup> ( $n = 144$ )	
Intramuscular injection	101 (70.1, 57.8–72.6)
Intravenous bolus	13 (9.0, 5.0–13.9)
Intravenous infusion	18 (12.5, 7.5–17.7)
Intravenous bolus and infusion combination	8 (5.6, 2.7–9.9)
No data available	4 (2.8)
Cord clamping time in vaginal births, min ( $n = 60$ )	
<1	9 (15.0, 8.1–26.1)
1–3 <sup>b</sup>	37 (61.7, 49.0–72.9)
>3	7 (11.7, 5.8–22.2)
No data available	7 (11.7)
Controlled cord traction performed ( $n = 154$ )	
Yes <sup>b</sup>	119 (77.3, 70.0–83.2)
No	24 (15.6, 10.7–22.1)
No data available	11 (7.1)

Abbreviations: PPH, postpartum hemorrhage.

<sup>a</sup> Values given as number (percentage) or number (percentage, 95% confidence interval).

<sup>b</sup> WHO-guideline recommended practice.

<sup>c</sup> No preferential recommended route of administration.

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