

# Emergency hysterectomy for uncontrolled postpartum hemorrhage may be averted through uterine balloon tamponade in Kenya and Senegal



Anna Alaska Pendleton <sup>a,b</sup>, Abirami Natarajan <sup>a,b</sup>, Roy Ahn <sup>a,b</sup>, Brett D. Nelson <sup>a,b</sup>,  
Melody J. Eckardt <sup>a,c</sup>, Thomas F. Burke <sup>a,b,\*</sup>

<sup>a</sup> Division of Global Health and Human Rights, Department of Emergency Medicine, Massachusetts General Hospital, Boston, MA, USA

<sup>b</sup> Harvard Medical School, Boston, MA, USA

<sup>c</sup> Department of Obstetrics and Gynecology, Boston Medical Center and Boston University, Boston, MA, USA

## ARTICLE INFO

### Article history:

Received 7 June 2015

Received in revised form 17 August 2015

Accepted 26 November 2015

### Keywords:

Emergency hysterectomy

Kenya

Maternal mortality

Senegal

Uterine balloon tamponade

Postpartum hemorrhage

Postpartum hemorrhage (PPH) is responsible for more than one in three maternal deaths in Sub-Saharan Africa [1,2]. The authors previously designed, and have been implementing (since August 2012), a uterine balloon tamponade (UBT) package for uncontrolled PPH called Every Second Matters for Mothers and Babies-UBT (ESM-UBT; Massachusetts General Hospital, Boston, USA) through local partners and ministries of health [3,4]. Multicountry preliminary analysis demonstrated a 98% survival of women with severe uncontrolled PPH if delivery occurred at an ESM-UBT on-line facility [4]. The aim of the present study was to understand the impact of the ESM-UBT package on decisions regarding emergency hysterectomy for severe uncontrolled PPH.

The participants in the study were all medical doctors, identified from the authors' Kenya and Senegal ESM-UBT database, who met the following criteria: (1) the provider had received ESM-UBT training and their facility was "on-line" (checklist wall charts and UBT devices in place); (2) the provider had implemented UBT in a case of uncontrolled PPH since training; and (3) the provider had the capability of performing emergency hysterectomy for PPH at the facility at which he or she inserted a UBT device.

Interviews were conducted between January 19, 2015 and February 5, 2015. Ethical approval was obtained from the Partners Healthcare Human Research Committee (Boston, MA, USA) and the Maseno University Ethics Review Committee (Maseno, Kenya) and informed consent from the participants was obtained. Semistructured interviews were voice-recorded, transcribed, and independently analyzed and coded by two independent researchers using NVivo10 software (QSR International, Doncaster, Victoria, Australia). Researchers used an iterative process of code identification and revision to develop domains and themes.

\* Corresponding author at: Division of Global Health and Human Rights, Massachusetts General Hospital Zero Emerson Place, Suite 104, Boston, MA 02114, USA. Tel.: +1 617 5840064.

E-mail address: [Tfburke@partners.org](mailto:Tfburke@partners.org) (T.F. Burke).

Thirty of the 31 medical doctors who fulfilled the inclusion criteria in the two-country database were interviewed. Twenty-eight of the 30 interviewed providers reported having witnessed at least one (15 had cared for more than five each) PPH-related maternal death in their careers. Twenty-one of the 30 had inserted multiple UBT devices (range, 2–60) since being trained on ESM-UBT.

Twenty-six of the 30 responded that if they had not received ESM-UBT training they would have performed emergency hysterectomies in the cases of uncontrolled PPH that they instead successfully managed with UBT devices. All interviewed providers described that UBT prevented women from undergoing emergency hysterectomy and that they would continue to use UBT devices in future cases of uncontrolled PPH.

This preliminary study suggests that emergency hysterectomy for uncontrolled PPH may be averted by uterine balloon tamponade.

## Acknowledgments

The Every Second Matters for Mothers and Babies Uterine Balloon Tamponade research program (ESM-UBT) is made possible through the generous support of the Izumi Foundation, the Ujenzi Charitable Trust, the Humanitarian Innovation Fund, and the Saving Lives at Birth partners: the United States Agency for International Development (USAID), the Government of Norway, the Bill and Melinda Gates Foundation, Grand Challenges Canada, and the UK Government. This manuscript was prepared by MGH and does not necessarily reflect the views of the funding partners.

## Conflict of interest

The authors have no conflicts of interest.

## References

- [1] World Health Organization, UNICEF, UNFPA, The World Bank. Trends in maternal mortality: 1990 to 2008. Estimates developed by WHO, UNICEF, UNFPA and The World Bank. [https://www.unfpa.org/sites/default/files/pub-pdf/trends\\_matmortality90-08.pdf](https://www.unfpa.org/sites/default/files/pub-pdf/trends_matmortality90-08.pdf). Published 2010.
- [2] Khan KS, Wojdyla D, Say L, Gülmezoglu AM, Van Look PF. WHO analysis of causes of maternal death: a systematic review. *Lancet* 2006;367(9516):1066–74.
- [3] Nelson BD, Stoklosa H, Ahn R, Eckardt MJ, Walton EK, Burke TF. Use of uterine balloon tamponade for control of postpartum hemorrhage by community-based health providers in South Sudan. *Int J Gynecol Obstet* 2013;122(1):27–32.
- [4] Burke TF, Ahn R, Nelson BD, Hines R, Kamara J, Oguttu M, et al. A postpartum hemorrhage package with condom uterine balloon tamponade: a prospective multi-center case series in Kenya, Sierra Leone, Senegal, and Nepal. *BJOG* 2015 [Epub ahead of print].