

Article Type: Brief Communication

Time for global scale-up, not randomized trials, of uterine balloon tamponade for postpartum hemorrhage

Thomas F. Burke^{1,*}, Kusum Thapa², Poonam Shivkumar³, Vincent Tarimo⁴, Monica Oguttu⁵, Lorraine Garg¹, Saroja Pande², Juzar Fidvi⁶, Vidyadhar Bangal⁷, José Ochoa⁸, Archana Amatya², Melody Eckardt¹, Apollinaire Horo⁹, Khama Rogo¹⁰, Kshama Kedar¹¹, Albert Manasyan¹², Pragati Khalatkar¹³, Susana Ku¹⁴, Anders Seim¹⁵, Sebastian Suarez¹, Moytrayee Guha¹, Khadija Abdalla¹⁶, Carlos Fuchtner¹⁷, Maria F. Escobar¹⁸, Sabaratnam Arulkumaran¹⁹

¹Division of Global Health and Human Rights, Department of Emergency Medicine, Massachusetts General Hospital, Boston, MA, USA

²Nepal Society of Obstetricians and Gynaecologists (NESOG), Propokar Maternity and Women's Hospital, Thapathali, Kathmandu, Nepal

³Department of Obstetrics and Gynecology, Mahatma Gandhi Institute for Medical Sciences, Wardha, Maharashtra, India

⁴Department of Obstetrics and Gynecology, Muhimbili National Hospital, Dar es Salaam, Tanzania

⁵Kisumu Medical and Education Trust (KMET), Kisumu, Kenya

⁶Department of Obstetrics and Gynecology, Vidarbha Institute of Medical Sciences, Nagpur, Maharashtra, India

⁷Department of Obstetrics & Gynecology, Rural Medical College, Pravara Institute of Medical Sciences (Deemed University), Maharashtra, India

⁸Department of Obstetrics and Gynecology, Hospital General San Felipe, Tegucigalpa, Honduras

⁹Department of Obstetrics and Gynecology, Teaching Hospital of Yopougon, Abidjan, Côte d'Ivoire

¹⁰African Institute for Health Transformations, Sagam Community Hospital, Luanda, Kenya

¹¹Department of Obstetrics and Gynecology, Indira Gandhi Government Medical College, Nagpur, Maharashtra, India

¹²Division of Pediatric Neonatology, Department of Pediatrics, The University of Alabama at Birmingham Hospital, Birmingham, AL, USA

This article has been accepted for publication and undergone full peer review but has not been through the copyediting, typesetting, pagination and proofreading process, which may lead to differences between this version and the Version of Record. Please cite this article as doi: 10.1002/ijgo.12492

This article is protected by copyright. All rights reserved.

¹³Khalatkar Hospital Paediatric Maternity and Surgical Hospital, Nagpur, Maharashtra, India

¹⁴Midwifery Services of Lambton-Kent, Bluewater Health Hospital, Sarnia, ON, Canada

¹⁵Health & Development International, Fjellstrand, Norway

¹⁶United Nations Children's Fund, UNICEF Kenya Country Office, Nairobi, Kenya

¹⁷International Federation of Gynecology and Obstetrics (FIGO), London, UK

¹⁸Department of Obstetrics and Gynecology, Fundacion Valle del Lili, Cali, Colombia

¹⁹Department of Obstetrics and Gynecology, St. George's University of London, London, UK

*Correspondence

Thomas F. Burke, Division of Global Health and Human Rights, Department of Emergency Medicine, Massachusetts General Hospital, Boston, MA, USA

Email: tfburke@mgh.harvard.edu

KEYWORDS: Clinical equipoise; Global scale-up; Low-resource settings; Maternal mortality; Postpartum hemorrhage; Randomized controlled trial; Uterine balloon tamponade

Maternal death is the greatest health disparity globally, with postpartum hemorrhage the most common cause. As senior leaders in obstetrics and maternal health from Bolivia, Canada, Colombia, Côte d'Ivoire, Honduras, India, Kenya, Nepal, Niger, Norway, Peru, Tanzania, the UK, the USA, and Zambia, we are deeply disturbed by recent calls for randomized controlled trials (RCTs) of uterine balloon tamponade (UBT) in women with uncontrolled postpartum hemorrhage (PPH). Our collective experience, in combination with mounting evidence, unequivocally supports the effectiveness of commercial and condom UBTs in averting death and disability from PPH associated with atonic uterus. We believe it would be highly unethical to embark on an RCT of UBT, now or in the future, unless compared with a proven equivalent intervention.

Uterine balloon tamponade was first described 35 years ago as a method to arrest PPH from an atonic uterus. Since then, a growing body of evidence supports the efficacy of this approach. For example, in a series of women with uncontrolled hemorrhage refractory to all other interventions, 160 (98%) of 163 survived after placement of a pre-packaged condom uterine balloon [1]. Additionally, among 306 consecutive women with uncontrolled PPH across 117 facilities, the survival rate was 99.4% if the UBT device was placed before advanced shock (objective signs of neurological and/or cardiovascular compromise) [2]. Other evidence includes independently performed near-miss surveys, impact and cost-effectiveness studies, and the experiences of senior obstetricians' and midwives' in averting deaths and hysterectomies from their 14 countries and beyond (Table 1). UBT has also

This article is protected by copyright. All rights reserved.

influenced surgeons' behavior by averting emergency hysterectomies [3]. Overall, the evidence supports a high degree of efficacy of UBT use among women with PPH in low-resource settings around the world.

An RCT can only be ethically embarked upon if the condition of equipoise is met. By definition, equipoise is present if and only if science and experience have yet to reveal whether an intervention in question causes more good or more harm than alternative approaches. We stand together in confident solidarity and declare that, based on the current evidence generated from both empirical [4] and hypothesis-driven research, there is no equipoise in the case of UBT for PPH from an atonic uterus. Therefore, global scale-up of UBT and other effective and affordable interventions should be accelerated in an effort to end the scourge of unnecessary death and disability from PPH.

Author contributions

TFB led development of the manuscript. All other authors contributed equally in reviewing and editing the manuscript.

Conflicts of interest

The authors have no conflicts of interests

References

- [1] Burke TF, Ahn R, Nelson BD, et al. A postpartum haemorrhage package with condom uterine balloon tamponade: a prospective multi-centre case series in Kenya, Sierra Leone, Senegal, and Nepal. *BJOG*. 2016;123:1532–1540.
- [2] Burke TF, Danso-Bamfo S, Guha M, Oguttu M, Tarimo V, Nelson BD. Shock progression and survival after use of a condom uterine balloon tamponade package in women with uncontrolled postpartum hemorrhage. *Int J Gynecol Obstet*. 2017;139:34–38.
- [3] Pendleton AA, Natarajan A, Ahn R, Nelson BD, Eckardt MJ, Burke TF. A qualitative assessment of the impact of a uterine balloon tamponade package on decisions regarding the role of emergency hysterectomy in women with uncontrolled postpartum haemorrhage in Kenya and Senegal. *BMJ Open*. 2016;6:e010083.
- [4] Craig P, Dieppe P, Macintyre S, Michie S, Nazareth I, Petticrew M. Developing and evaluating complex interventions: the new Medical Research Council guidance. *BMJ*. 2008;337:a1655.

Table 1 Quotes from 2017 OBGyn meetings

Poonam Shivkumar; Chief of ObGyn, Department of Obstetrics and Gynecology, Mahatma Gandhi Institute for Medical Sciences, India	<p>“My first case of UBT was a sudden massive hemorrhage post C-section. BP was 40 palpable and then no pulse or BP. UBT immediately stopped her bleeding and we brought her back. She was discharged 1 week later.”</p> <p>“MVA was performed for retained placental tissue with associated hemorrhage. Despite MVA and maximum uterotonics, pouring of blood worsened. She collapsed and a UBT was placed. Bleeding stopped instantly and she was discharged in three days.”</p>
Kshama Kedar; Senior ObGyn, Department of Obstetrics and Gynaecology, Indira Gandhi Government Medical College, India	<p>“Sudden hemorrhage 2 hours post C-section. Raced her to the OT and placed a UBT while prepping her. Bleeding arrested and no surgery needed”</p> <p>“In the year before ESM-UBTTM we did eight hysterectomies for PPH. We have done none for 10 months”</p>
Vidyadhar Bangal; Chief of ObGyn, Department of Obstetrics & Gynecology, Rural Medical College, Pravara Institute of Medical Sciences (Deemed University), India	<p>“We have saved 14 women from open procedures with UBT this year”</p> <p>“We did seven or eight hysterectomies for PPH last year, prior to UBT. We have only done one this year”</p>
José Ochoa; Chief of ObGyn, Department of Obstetrics and Gynecology, Hospital General San Felipe, Tegucialpa, Honduras	<p>“Massive hemorrhage soon after delivery, the very evening after we were first trained. Quickly moved her to the OT. Placed a UBT and wow, we did not need to operate.”</p>
Apollinaire Horo; Senior ObGyn, Department of Obstetrics and Gynecology, Teaching Hospital of Yopougon, Côte d'Ivoire	<p>“I was very skeptical. I am a gynecology oncologist but cover deliveries. But, since UBT training I had two severe emergency cases that converted me. They were both too far gone to go to the operating room, but we saved them with the UBT”</p>
Saroja Pande; General Secretary of Nepal Society of Obstetricians and	<p>“I have used the condom UBT over 50 times. It absolutely saves lives and avoids surgery”</p>

Gynaecologists (NESOG), Paropakar Maternity and Women's Hospital, Nepal	
Kusum Thapa; President Nepal Society of Obstetricians and Gynaecologists (NESOG) and Senior Officer for the Jhpiego Maternal & Child Survival Program, WA, DC USA	"I brought UBT to Kathmandu over 10 years ago from Bangladesh. My colleagues and I have saved many many lives with it"
Vincent Tarimo; Chief of ObGyn, Department of Obstetrics and Gynecology, Muhimbili National Hospital, Tanzania	"The UBT has saved so many women since we started in April of 2016. We now have a problem training our residents in emergency hysterectomy because they are not needed very often any longer"
Monica Oguttu, Executive Director of Kisumu Medical and Education Trust (KMET) and senior nurse midwife, Kenya	"You cannot believe the stories of midwives saving the lives of women because of UBT. It is called the magic device"

Abbreviations: ObGyn, obstetrics and gynecology. UBT, uterine balloon tamponade. BP, blood pressure. MVA, manual vacuum evacuation. OT, operating theater. ESM-UBT, Every Second Matters for Mothers and Babies™-UBT. PPH, postpartum hemorrhage.