Postpartum Hemorrhage Community of Practice Special Topic Deeper Dive Series
PPH at Caesarean Section: Prevention and Management

PPH Community of Practice Special Topic Deeper Dive
August 27, 2020
Agenda

• Postpartum hemorrhage at caesarean section
• Tanzania country experience/lessons learned
• Q&A
• Open discussion/shared learning
Logistics

• Please **mute** and keep **video off when not talking**
  • **Note**: As you enter the meeting you will be muted. You can choose to have your video on or off. If leaving video on, please avoid distracting movements or actions

• Use the **Public Chat** for **general comments** or contribute to the chat discussion

• **Raise your hand** when you want **to ask a question or to share your experiences/lessons learned**

• **Unmute** and turn **video on when speaking** (and mute when finished)

• Before speaking, **please introduce yourself** by stating:
  ▪ Your name and title/role
  ▪ Country
  ▪ Organization/facility

• **This webinar is a safe place** - a place for respectful discussion. Do not use offensive language or comments
Postpartum Hemorrhage at Caesarean Section: Prevention and Management

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PPH Community of Practice Special Topic Deeper Dive
August 27, 2020
Outline

- Epidemiology
- Detection and diagnosis
- Management
  - Prevention at Caesarean Section (CS)
  - Treatment during and after CS
- Tanzania country experience/lessons learned
- Discussion: sharing experiences and lessons learned
Epidemiology

- Definition at CS: $\geq 500$ mL, 750 mL, **1000 mL**
- Severe PPH: $\geq 1500$ mL; Massive PPH: $\geq 2500$ mL
- $\geq 1000$ mL
  - Elective CS: 5% (approximately 3x higher than at vaginal birth)
  - Emergency CS: 7%
- $\geq 1500$ mL
  - Emergency CS: 3%

Source:
# Epidemiology: Average blood loss

<table>
<thead>
<tr>
<th>Category</th>
<th>Studies</th>
<th>Participants (n)</th>
<th>Average Blood Loss (ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td>All CS</td>
<td>38</td>
<td>5512</td>
<td>607</td>
</tr>
<tr>
<td>Elective CS</td>
<td>17</td>
<td>2044</td>
<td>606</td>
</tr>
<tr>
<td>Emergency CS</td>
<td>6</td>
<td>1073</td>
<td>700</td>
</tr>
</tbody>
</table>
Epidemiology: CS Mortality

Source:
Epidemiology: CS Mortality

- Maternal death after cesarean delivery is 50 -100x more in LMICs than in high-income countries\textsuperscript{3,4}
- 25% of all women who died in LMICs had undergone a CS
- 32% of all maternal deaths following CS was attributed to PPH; 19% to pre-eclampsia/eclampsia and 22% to infection/sepsis

Source:
Common Causes of Severe PPH at CS

- **Tone - Atony** (due to, e.g., prolonged/obstructed labor, overdistended uterus, chorioamnionitis, placental abruption)
- **Tissue - Abnormal placentation** (e.g., placenta previa, placental abruption, placenta accreta/increta/percreta)
- **Trauma** (e.g., lacerations/tears, uterine rupture); impacted head
- **Thrombin - Abnormal coagulation** (e.g., severe preeclampsia/eclampsia, placental abruption, hypofibrinogemia, DIC)
Challenges with detection of hemorrhage at CS

- **Intra-op vs Post-op**

- **Measures and outcomes for detection vary** and may include: estimated or measured volume of blood loss, physiological changes and the need for intervention.\(^5\)

- **Visual method** of estimating blood loss is **imprecise** and hindered by **subjectivity** and **does not always match** the **clinical status** of patients.\(^6\)

- **Objective methods** such as measured blood loss by the use of graduated collecting drapes and weighing of swabs are increasingly being used.\(^7\) Evidence on their use is evolving.

**Source:**
Developing algorithms for managing haemorrhage at CS

• Building the evidence
• Bringing all the pieces together
• Currently better evidence for preventing and managing PPH at vaginal birth than at CS
Bleeding At Caesarean Section

Management

- Call for more senior help (if available or telephonic advice)

Diagnosis
- Visual estimation
- Blood loss in suction bottles >500ml
- LBP & ↑HR as detected by anaesthetist

Prevention intra-op
- 2.5iu oxytocin IV over 30 seconds after delivery of baby, + 7.5 IU in drip.
- Repeat 2.5iu IV if poor uterine contraction
- Delivery of placenta by cord traction
- Good surgical technique

NB: alternatives for intra-op prevention would be im oxytocin 10iu im or 1 amp syntometrine im

Prevention post-op
- Run oxytocin infusion (20IU per litre for 8hours) and/or im syntometrine (at risk for PPH)

RESUS / early Rx (anaesthetist)
- Second IV line
- Maintain BP with fluids and blood
- 20iu oxytocin in 1 litre infusion
- Tranexamic acid 1 gm IV
- Convert to GA

ARREST
- HAEMORRHAGE**
  - (surgeon)

Atonic Uterus
- Continue Oxytocin infusion
- Ergometrine 0.2mg IV (not hypertensive/cardiac); not x1
  - (or i.m. 0.5mgs
ergometrine or im / amp syntometrine)
- Repeat tranexamic acid x1
- Misoprostol 400 to 600ugm sublingually
- Uterine compression suture +/- balloon tamponade
- Subtotal hysterectomy (STAH)

Tears
- Lateral tears
- Uterine artery ligation
- Inferior tears
- Secure apex & suture (check ureters are lateral to tear)
- Rupture
- Repair or Subtotal Hysterectomy (STAH)*

Placental Site Bleeding
- Mattress suture
- Compression sutures
- Balloon tamponade
- Stepwise uterine devascularisation
- Subtotal Hysterectomy*

*** Proceed immediately to STAH it:
- Uterine rupture (impossible)
- Placenta percreta

* If still for STAH not available, apply uterine tourniquets and refer
And shock garment (NASG) if available

S. Fawcus, 2013 & 2018
And LSTM
Importance of Anticipation, Early Recognition and Active Management of Haemorrhage

Prevention of haemorrhage/PPH at CS

• **Incision:** Joel-Cohen (Misgav Ladich) incision in preference to midline incision or Pfannenstiel\(^8,9\)
  - Shorter operating time, less use of suture, less blood loss, less post-operative pain, less wound complications

• **Delivery of deeply impacted head,** e.g. reverse breech extraction in preference to vaginal elevation of fetal head\(^10\)

• **Placenta delivery:** Controlled cord traction or spontaneous delivery in preference to manual removal of placenta
  - Decreased incidence of endometritis, decreased blood loss\(^10\)

**Source:**
10. Jeve YB, Navti OB, Konje JC. Comparison of techniques used to deliver a deeply impacted fetal head at full dilation: a systematic review and meta-analysis. *BJOG.* 2016; 123:337-345
11. Cochrane 2008: Methods of delivering the placenta at caesarean section
Prevention of PPH at CS

Uterotonics for prevention of PPH at CS.\textsuperscript{12,13}

- Oxytocin
- Ergometrine + Oxytocin
- Consideration for \textbf{Carbetocin}, especially where quality of oxytocin is a concern
  - some evidence it is more effective than oxytocin

In some contexts using: Oxytocin + Misoprostol (600 mcg SL or oral)

Is there a role for \textbf{prophylactic TXA}? For all CS or for those at high risk?

- Blood loss, massive hemorrhage, transfusion requirements, and need for additional uterotonics all markedly reduced\textsuperscript{14}

Source:
Surgical Management of PPH at CS

- When medical management of uterine atony fails
- When other causes are present (e.g., trauma - ruptured uterus/tears; abnormal placentation)

Note: Evidence for medical management of PPH at CS tends to be of higher quality than that for surgical management
PPH at CS due to Uterine Atony

Assess and Resuscitate
• Monitor vital signs
• Measure blood loss
• IV fluids (3:1 ratio)
• Blood transfusion as needed

Medical Treatment
• Uterotonics
• TXA – 1 gm IV
• Uterine massage

Surgical Management
- Uterine compression sutures (e.g., B-Lynch)
- Uterine devascularization
  • Utero-ovarian artery
  • Uterine artery (O’Leary stitch)
  • Hypogastric artery
- Hysterectomy (Subtotal)

Uterotonics:
Continue **Oxytocin**: 40 IU/L over 8 hrs
**Methergine**: 0.2 mg IM every 2-4 hrs (or oxytocin-ergometrine)
**Misoprostol**: 800 mcg (range 600 - 1000 mcg) SL, oral, PR
Keys to Successful Surgical Management of PPH at CS

- Teamwork and communication
- Anticipation and planning
- Use of CS adapted WHO Surgical Safety Checklist
- Early identification and management according to cause
- Situation awareness in the OT (teamwork and communication)
  - These non-technical skills have been shown to be essential for improved team performance and improved outcomes\(^\text{15,16}\)
- Early decision to use compression sutures (e.g. B-Lynch) for uterine atony PPH
- Post-op care and monitoring – preventing the ‘failure to rescue’\(^\text{17}\), as well as use of modified early warning systems (MEWS).

Source:
Why B-Lynch Suture?

- Fast to perform: < 2 minutes
- Easy to learn – easy to practice on simulator
- Does not require special equipment or supplies
- Effectiveness: generally 75 – 90%\textsuperscript{18,19}
- Most studied method (compare to Cho, Hayman, other modifications)
- No apparent impact on infertility

Considerations:

- Do not use permanent suture – risk of bowel herniation/strangulation
- Some concerns regarding risk of uterine necrosis if combined with devascularization sutures

Source:
Key points

- CS is a significant risk for hemorrhage and maternal mortality
- It is essential that PPH programs include surgical management of PPH and managing hemorrhage at CS
- Evidence is building for the most appropriate CS PPH bundles and algorithms, but more research is needed
  - current research efforts on risk stratification, package of evidence-based interventions, targeted post-op monitoring, and making difficult deliveries safer (e.g., ASOS-2, ASOS-3, CSAFE).
- Successful implementation requires non-technical competencies
- B-Lynch uterine compression suture is an attractive surgical method to include in any program that provides CS services, especially where non-specialists work
Tanzania Country Experience with PPH at CS

Leopold Tibyehabwa, MD, MMed – OBGYN
Augustino Hellar, MD, MMed - Surgery, MBA
Joseph Massenga, MD, MPH
Background

- **Tanzania MMR**
  - Is high and stagnant
  - At 524 with annual rate reduction (ARR) 2.9%
    (WHO, UNICEF 2019)
  - PPH is the leading cause of maternal deaths at 29%
- Proportion of facility births received uterotonics **89.6%** (DHIS2 2015)
- PPH incidence **0.8%** (DHIS2 2015)
- The national RMNCAH strategic plan indicates improving Quality of Care (QoC) for obstetric emergencies
Background cont...

Dr Joseph Massenga
Improving Access to Safe CS Services in Mara and Kagera

• 2016: National strategy - upgrade public Health Centres to provide CEmONC services by non-specialists

• USAID Boresha Afya: expand CEmONC services in Kagera and Mara starting 2016.

• Safe Surgery program: 40 sites in Mara and Kagera
  ▪ non-specialist surgical and anesthesia providers

Challenges

• Workforce density issues Non-standardized skills, e.g., surgical technique, IP bundles, management of PPH at CS

• Team cohesion/teamwork and communication

• Uterotonic quality/availability; TXA availability and use
Safe Surgery/Safer Cesarean Birth Program

- **Project dates**: Feb 2018 – Current
- **Focus on** Team Performance
- **Build non-technical skills**, such as teamwork and communication
- **Evidence-based surgical skills updates**
  - Joel-Cohen incision
  - Spontaneous/controlled cord traction placenta delivery
- **Implement** WHO Surgical Safety Checklist
- **Incorporate an infection prevention bundle** (prophylactic antibiotics, vaginal cleansing, abdominal surgical prep)
- **Integrate medical and surgical management of PPH**, e.g. B-Lynch suture
Integrating B-Lynch Suture

- Both medical and surgical management of PPH are part of Safer Caesarean Births (SCB) training in the Safe Surgery program
- B-Lynch uterine compression suture-simulation done in class sessions and coaching on clinical cases during practicum sessions and going mentorship at health facilities
- Easy to learn and do even by non-specialist doctors.
- Can use improvised simulators
- Ongoing mentorship support provided
Findings

• Teamwork and communication improved
• Anticipation/discussion of potential complications improved
• Surgical Safety Checklist adherence rates improved from near 0% to >90%
• Perioperative Mortality Rate (POMR) decreased from 0.42% to 0.21% (50% decrease)

“The patient doesn’t belong to one person.”

“The Surgical Safety Checklist is changing practice and culture in surgery.”

Teamwork and Communication Indicators
• Improved between 39% and 59% from baseline
e.g. Risk of blood loss/anticipated difficulties discussed – increased 56%

“We work as a TEAM.”

“We now have the skills to deal with conflicts.”

“Every individual knows their role to play in the OR.”
Findings: B-Lynch procedures

- Since training-practitioners have reported reduced incidences of subtotal hysterectomies for PPH unresponsive to medical management following SVD or CS
- Total of **57 B-Lynch procedures** were performed in 2 regions under safe surgery program
  - **Kagera region** -33
  - **Mara region** -24
- Done at both Health Centres and Hospitals – vast majority done by non-specialist Doctors.
- **53/57 (93%)** success rate
- No complications
Tanzania key lessons

Successes

• Non-technical skills, e.g., teamwork and communication, are essential for team building and improving team performance

• The Surgical Safety Checklist is an important patient safety tool to improve surgical outcomes, and can be successfully implemented in different contexts in Tanzania, and can help build a culture of patient safety

• The B-Lynch suture is an easy and effective procedure to integrate into a Safe CS program

• Demonstrated improvement in maternal/surgical outcomes
Tanzania key lessons

Challenges

• HMIS lack data element for PPH at cesarean section, creating challenges in tracking PPH outcomes

• Inadequate dissemination of guidelines on TXA

• Shortage of TXA particularly at lower level facilities, i.e., District Hospitals and Health Centres

• Lack of competency on surgical management of PPH among health care providers especially B-Lynch uterine suture
Tanzania key lessons

Recommendations

• Improve availability and use of TXA to improve the quality of care in prevention, detection and management of PPH

• Introduce PPH data capture into HMIS-(For both vaginal birth and CS)

• Strengthen provider skills on surgical management of PPH

• Strengthen practical skills on surgical management of PPH during preservice training

• Improvement in maternal/surgical outcomes requires a multicomponent intervention, and programs should be designed and implemented that way
Experience from a Tertiary-level Hospital in Tanzania

Dr. Albert Kihunrwa
Obstetrician/Gynaecologist
Head of Department, Bugando Medical Center, Mwanza
Lecturer, Catholic University of Health and Allied Sciences, Mwanza
Thank You/Asante Sana!

Questions?
Open Discussion
Sharing of experiences and lessons learned

Questions for consideration
• Do guidelines or protocols exist for PPH at CS? If YES, are they followed?
• What uterotonics or combination of uterotonics is used for prevention of PPH at CS and treatment of PPH at CS
• Is TXA readily available in facilities that provide CS? If YES, is it used according to guidelines/protocols?

Also share experiences and lessons learned (challenges and successes) around:
• Prevention of PPH at CS
• Early identification and medical management of PPH at CS
• Surgical management of PPH at CS
• Tracking and use of data for PPH at CS