Obstetric Haemorrhage

Jim Bamber
Overview

• What is obstetric haemorrhage?
• How common is it?
• What are the main causes?
• Why is it important?
• How well do we recognise it?
• How should we manage it?
• The importance of team work
Distribution of postpartum blood loss in women according to treatment.

Midwives and doctors underestimate blood loss at delivery by 30 – 50%

What is it? Some definitions

- **WHO (2012)**
  PPH – Blood loss $\geq 500\text{mls}$ within 24 hours of birth
  Severe PPH – Blood loss $\geq 1000\text{mls}$ within 24 hours

- **ACOG (2006)**
  PPH – Blood loss $\geq 1000\text{mls}$ following CS

- **Scottish Confidential Audit of Severe Maternal Morbidity (2007)**
  Major Obstetric Haemorrhage - Blood loss $\geq 2500\text{mls}$ or blood transfusion $\geq 5$ units or treatment for coagulopathy

- **British Committee for Standards in Haematology (2006)**
  Massive blood loss =
  Blood loss at rate of **150ml per minute**
  Loss of **50% Blood Volume** in 3 hrs
  Loss of one Blood Volume in 24hr
How common is it?

Antepartum haemorrhage 2%
Postpartum haemorrhage 13%

NHS Maternity Statistics, England (2011-12)

Massive obstetric haemorrhage 0.6%

Scottish Confidential Audit of Severe Maternal Morbidity 2011
PPH in England 2004-2012

NHS Maternity Statistics, HSCIC
PPH in Australia, Canada and USA

Knight et al 2009
What are the causes of PPH

Tone
- Atony
- Inflammation

Tissue
- Accreta
- Retained products

Trauma
- Lacerations
- Rupture

Thrombin
- Coagulopathy
Causes of PPH

- Tone: 70%
- Tissue: 9%
- Trauma: 20%
- Thrombin: 1%
• Obstetric haemorrhage is common
• Most haemorrhage is post partum
• Most PPH are due to an atonic uterus
• Women can die from PPH
Failings that led to death of woman, 45, after C-section to be laid bare

Lucy Bannerman and Chris Smyth
Last updated at 12:01AM, September 27 2012

Failings in maternity services at a embattled hospital are to be laid bare in court, after a mother bled to death following an elective Caesarean.
What to do

- Prepare
- Recognise
- Resuscitate
- Stop
Be Prepared

Does your unit have:
• A major haemorrhage trolley?
• A major haemorrhage protocol?
• Immediate access to O neg blood?
• Obstetric emergency drills?

Have you risk assessed your patient?
Risk factors for uterine atony

Intrinsic factors
- Age > 35 years
- Obesity
- Previous postpartum haemorrhage
- Antepartum haemorrhage (abruption or praevia)
- Antenatal anaemia

Factors associated with uterine overdistension
- Multiple pregnancy
- Polyhydramnios
- Fetal macrosomia

Labour-related factors
- Induction of labour
- Prolonged labour
- Precipitate labour
- Oxytocin augmentation
- Manual removal of placenta

Use of uterine relaxants
- General anaesthesia with halogenated agents
- Magnesium sulphate

The most important risk factors

- No uterotonic
- Labour augmentation
- Retained placenta
- No cord traction
- Previous PPH
- Antepartum anaemia
- Labour 3-4.9 hours
- Labour 5+ hours

Predicted probability for risk factors significantly associated with PPH
Recognise and Communicate

- Measure – remember EBL underestimated by 50%
- Size matters: Consider EBL relative to body size
- Observation is important
- Communicate – let everyone know
1400mls = 20% EBL in 70kg woman
1000mls = 20% EBL in 50kg woman
Observations

Do
Early
Regularly
Completely
Refer
Act
How to recognise major obstetric haemorrhage

- Capillary refill
- Respiratory rate
- Pulse rate
- Urine output
- Blood pressure
How to recognise massive obstetric haemorrhage

Table 1

<table>
<thead>
<tr>
<th>Classification of hemorrhage</th>
<th>Class</th>
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<tbody>
<tr>
<td>Parameter</td>
<td>I</td>
</tr>
<tr>
<td>Blood loss (ml)</td>
<td>&lt;750</td>
</tr>
<tr>
<td>Blood loss (%)</td>
<td>&lt;15%</td>
</tr>
<tr>
<td>Pulse rate (beats/min)</td>
<td>&lt;100</td>
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<tr>
<td>Blood pressure</td>
<td>Normal</td>
</tr>
<tr>
<td>Respiratory rate (breaths/min)</td>
<td>14–20</td>
</tr>
<tr>
<td>Urine output (ml/hour)</td>
<td>&gt;30</td>
</tr>
<tr>
<td>CNS symptoms</td>
<td>Normal</td>
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Modified from Committee on Trauma [4]. CNS = central nervous system.
How to recognise massive obstetric haemorrhage

At least 20% blood volume loss if:

Pulse rate > 100
Respiratory rate > 20
BP decreased

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<td>Modified from C</td>
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Management of Major Obstetric Haemorrhage

• Be prepared
• Diagnose and declare
• Instigate immediate management
• 4 key simultaneous components
  Communication
  Resuscitation
  Monitoring
  Treatment
Communication

• Get Help
  • Remember patient and partner
  • Senior midwife, obstetrician and anaesthetist
  • Blood transfusion and duty haematologist
  • Theatre Team
  • Portering services
  • Delegate record keeping
Massive Blood Loss in Adults
4 litres in 24 hours  
2 litres in 3 hours  
> 150ml/min

Get help
Contact senior member of clinical team. Contact senior ward nurse. Contact portering services.
Contact Transfusion ext 58405
Ask Transfusion to ‘initiate major blood loss protocol’

Assess ABC
2 large cannulae
Send blood samples, cross-match, Hb, coagulation, biochemistry
Consider arterial blood gas measurement
Send Hb and coagulation samples after every 5 units of blood given

IV access

Resuscitate
IV warm fluids – crystalloid or colloid
Give Oxygen

Give blood
Blood loss >40% blood volume is immediately life-threatening
Give 4 units via fluid warmer. Aim for Hb > 50g/L
Give Group O Rh D negative if immediate need and/or blood group unknown
Blood Transfusion lab will provide group specific/cross-matched red cells as required

Prevent coagulopathy
Primary MH Pack
• Blood 5 units
• FFP 4 units

Secondary MH Pack
• Blood 5 units
• FFP 4 units
• Platelets
• Cryoprecipitate

Anticipate need for platelets and FFP after 6 units blood replacement and continuing bleeding
Give Primary Major Haemorrhage (MH) Pack
Order Secondary Major Haemorrhage (MH) Pack
Correct hypothermia
Correct hypocalcaemia (deep irised Ca < 1.3mmol/L)
Contact Haematologist

Get help to stop bleeding
Reassess and document

Addenbrooke’s Hospital | Rosie Hospital
Resuscitation

- ABC
- Oxygen
- Major Haemorrhage Trolley
- IV access and blood samples
- Near-patient testing
- IV fluids
- O Neg Blood
Near patient testing pitfalls

120 g/L
Haemoglobin count and 40% blood volume loss
No volume replacement vs volume replacement
Fluid replacement

How much blood can you afford to lose?

- Blood is vital for oxygen delivery to organ cells
- Organ cell damage occurs with 50% blood volume loss if **NO** fluid replacement
- Organ cell damage does not occur until 100% blood volume loss if given equivalent fluid replacement

GIVING JUST FLUID CAN SAVE A LIFE
Average blood volume in 3rd trimester = 6L

Haemoglobin = 115 g/L
Blood loss = 50% of blood volume
No fluid replacement

Haemoglobin = 115 g/L
Blood loss = 50% of blood volume

But with fluid replacement

Haemoglobin = 56 g/L
Which Fluid?
Crystalloid vs Colloid
How much fluid?

3 Fluid to 1 Blood
Relative flow rates

- 14G cannula (250-360mls/min)
- 16G (130-220mls/min) × 1.5
- 18G (75-120mls/min) × 3.4
- 20G (40-80mls/min) × 5
What’s in Blood?

• Plasma volume: Replace after 1L loss (fluid replacement)

• Red cells: Replace after 2L loss (e.g. O neg blood)

• Coagulation factors/Platelets: Replace after 5L loss
2000mls crystalloid

plus 0-5 units RCC
plus 4 units FFP

1000 - 2000mls

plus 0-4 units RCC
plus 0-5 units RCC
plus 4 units FFP Platelets Cryoprecipitate

2000mls

2000 - 4000mls

≤1000mls

>4000mls

Blood sampling after every 5 units RCC
Check FBC, fibrinogen, PT/aPTT, blood gases including lactate, Ca and K
How quickly can I get blood

- O negative - should be immediate (local fridge)
- Group specific blood – 15 minutes *after* G&S sample received by lab
- Cross matched blood – 45 minutes *after* G&S sample received by lab

*Remember portering time*
Monitor the resuscitation

- Assess for shock and effectiveness of resuscitation: regular and **repeated** obs
- Respiratory rate and capillary refill useful signs
- Don’t rely on systolic BP as main sign
- Measure and record urine output
- Document resuscitation and treatment
Stop the bleeding

- Treat for atony
  - empty bladder
  - uterine compression
  - commence uterotonic therapy

- Transfer to theatre for EUA
- Continue resuscitation including blood therapy
Treatment prior to a peripartum hysterectomy for a PPH.

Knight et al BJOG 2007

<table>
<thead>
<tr>
<th>Therapy</th>
<th>Uterine atony alone (n = 137), n (%)</th>
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<tbody>
<tr>
<td>Syntocinon infusion</td>
<td>126 (92)</td>
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<tr>
<td>Ergometrine</td>
<td>84 (61)</td>
</tr>
<tr>
<td>Prostaglandin F2α</td>
<td>104 (76)</td>
</tr>
<tr>
<td>Misoprostol</td>
<td>22 (16)</td>
</tr>
<tr>
<td>Bimanual compression</td>
<td>9 (7)</td>
</tr>
<tr>
<td>Intrauterine balloons</td>
<td>43 (31)</td>
</tr>
<tr>
<td>B-Lynch or brace suture</td>
<td>34 (25)</td>
</tr>
<tr>
<td>Uterine or iliac artery ligation</td>
<td>18 (13)</td>
</tr>
<tr>
<td>Factor VIIa</td>
<td>16 (12)</td>
</tr>
<tr>
<td>Intra-abdominal packing</td>
<td>18 (13)</td>
</tr>
<tr>
<td>Uterine artery embolisation</td>
<td>5 (4)</td>
</tr>
<tr>
<td>Other</td>
<td>10 (7)</td>
</tr>
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</table>
All women diagnosed with PPH

Treatment:
1G tranexamic acid IV or placebo, repeat if required after 30 mins or within 24 hours

Outcome
Primary: Death or hysterectomy
Secondary: includes blood transfusion

12,245 women so far (target 20,000)
Success rate 87-91%*

Success rate 80-96%*

*Rath et al 2012
Other interventions
What to consider afterwards

- ICU admission
- Hyperbaric therapy (for JW?)
- Thromboprophylaxis
- Anaemia management
  Erythropoietin 300U/kg x3 per week
  Iron supplementation (IV iron sucrose 200mg x3/week)
- Patient counseling
- Team debriefing
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- Be prepared
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- 4 key simultaneous components
  
  Communication
  Resuscitation
  Monitoring
  Treatment
Management of Massive Obstetric Haemorrhage

- Be prepared – Practise drills, Risk assess
- Diagnose and declare
- Instigate immediate management
- 4 key simultaneous components
  - Communication - Get help
  - Resuscitation - Give fluid early
  - Monitoring - Assess and Reassess
  - Treatment - Treat for atony
Making it work

Skills for multidisciplinary teamwork and communication

Crisis Preparation
Crisis Management
Good Team Work
The Team Leader
Good Communication