THIRD STAGE OF LABOR: MANAGEMENT & WHAT’S NEW?

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• LABOR AND THIRD STAGE EVENT
• ACTIVE VS EXPECTANT MANAGEMENT
• WHAT’S NEW IN 3RD STAGE MANAGEMENT
• RETAINED PLACENTA MANAGEMENT
Labor

• Physiological process
• The products of conception passed from uterus to outside world
• Spontaneous in onset, at term, vertex presentation, natural termination without any complications affecting health of mother &/or newborn
• Three stages of labor
Stages of labour

• **First stage**: onset of true labour pains to full dilatation of cervix

• **Second stage**: full dilatation of cervix to expulsion of fetus from birth canal

• **Third stage**: after expulsion of fetus to expulsion of placenta & membranes (afterbirths)
Third stage: events

- After expulsion of fetus to expulsion of placenta & membranes (afterbirths)
- Duration: 15 min (primigravida & multigravida), maximum – 30 minute
- AMTSL: 5 minutes
  - Placental separation
  - Placental expulsion
Placental separation

- Sudden diminution in uterine size following delivery of fetus
- Limited placental elasticity
- Creates disproportion between two
- Placenta buckles: placental separation
- Spongy layer of decidua basalis
- 2 ways: central, marginal separation
Expulsion of placenta

- Contraction & retraction of Upper Uterine Segment
- Placenta forced to lie in LUS/upper vagina
- Voluntary contraction of abdominal muscles
- Expulsion of placenta
Mechanisms to control bleeding

1. Effective retraction of uterine muscles:
   Living ligatures

2. Thrombosis of torn sinuses

3. Myotamponade:
   apposition of walls of the uterus
Management of third stage

- Most crucial stage
- Strict vigilance
- Follow protocols

- Expectant management
- Active management
Third stage

• Life threatening complications
  – PPH(*postpartum haemorrhage*)
  – *Retained placenta*
  – Inversion of uterus

Classification

1st Degree
- Inverted fundus up to cervix

2nd Degree
- Body of uterus protrudes through cervix into vagina

3rd Degree
- Prolapse of inverted uterus outside vulva
Expectant management

• Allowing the placenta to deliver spontaneously or aiding by gravity or nipple stimulation

• Look for 3 classic signs of placental separation
  – Lengthening of U. cord
  – A gush of blood from vagina signifying separation of placenta from uterine wall
  – Change in shape of uterine fundus from discoid to globular with elevation of fundal height
Expectant management

• Massage the uterus
• Expulsion of placenta: 20 minutes
• Intramuscular Oxytocin: 10 IU if excessive bleeding
• Examination of placenta, membranes, cord
• Inspect vulva, vagina & perineum
Examination of placenta, membranes
Examination of membranes, cord
Active management

• **AMTSL:** **A**ctive **M**anagement of **T**hird **S**tage of **L**abour
  – Prophylactic uterotonic after delivery of baby
    (Syntometrine or Oxytocin 10 IU, IM)
  – Early cord clamping, cutting & Controlled cord traction of Umbilical cord
  – Uterine massage
  – IV pitocin 40 IU infusion

• Excites powerful uterine contractions, aid in early placental separation, minimises blood loss & duration of third stage (5 min.)
Active versus Expectant Management

• Systematic review of five studies
• Compared to expectant management, active management (in the setting of a maternity hospital) was associated with the following reduced risks:
  – maternal blood loss (weighted mean difference -79.33 mls)
  – post partum haemorrhage of more than 500 mls
  – prolonged third stage of labour (weighted mean difference -9.77 minutes).
• Active management was associated with an increased risk of maternal nausea, vomiting and raised blood pressure (probably due to the use of ergometrine)

Active versus expectant management in the third stage of labour.
Prendiville WJ1, Elbourne D, McDonald SJ.(2009) - Cochrane Database Systematic Review
Women at mixed levels of risk of bleeding, AMTSL showed a **reduction** in:

- Average risk of maternal primary haemorrhage at time of birth (more than 1000 mL)
- Maternal haemoglobin (Hb) less than 9 g/dL following birth
- No difference in the incidence in admission of infants to neonatal units
- No difference in the incidence of infant jaundice requiring treatment
WHAT’S NEW IN MANAGEMENT
Carbetocin

• Carbetocin, a newer analogue of oxytocin,
• Carbetocin is an oxytocic that reduces the need for additional oxytocics.
• Has a greater biological effect and longer half-life.
• It is also more heat-stable than oxytocin
• Similar efficacy with syntometrine, but - least side effect
• Given as slow IV bolus 100µg (5mls)
## Carbetocin – Pharmacodynamics

<table>
<thead>
<tr>
<th></th>
<th>Oxytocin</th>
<th>Carbetocin</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>intravenous</td>
<td>intramuscular</td>
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<tr>
<td>Onset of action</td>
<td>&lt; 1 minute</td>
<td>&lt; 2.5 minutes</td>
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<tr>
<td>Duration of rhythmic contractions</td>
<td>8 minutes</td>
<td>15 minutes</td>
</tr>
<tr>
<td>Contraction time</td>
<td>16 minutes</td>
<td>30 minutes</td>
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Table 2. Uterine activity after intramuscular or intravenous injection of oxytocin or Pabal®
Carbetocin Versus Oxytocin For Prevention Of Postpartum Hemorrhage

1. Blood loss exceeding 500mL was lower in women assigned to carbetocin.

2. Mean blood loss was less with carbetocin than with oxytocin (366 mL vs 400, p<0·001)

3. Fewer participants receiving carbetocin than receiving oxytocin required additional uterotonics

4. Frequency of severe PPH did not differ between the two groups

Carbetocin versus oxytocin for prevention of postpartum haemorrhage: a randomised controlled trial
Sergio Rosales-Ortiz et.al, Lancet (2014)
Carbetocin vs other uterotonic agent

- 11 studies (2635 women) in the review – primary prevention PPH
  - 6 studies carbetocin vs oxytocin (4 V, 2 CS)
  - 4 studies carbetocin vs syntometrine.
  - 1 study carbetocin vs placebo.

- Result?

Su L-L et.al, Cochrane Database Systemic Review, 2012
• Carbetocin resulted in a statistically significant reduction in the need for **therapeutic uterotonics**

• Carbetocin was associated with a reduced need for **uterine massage** following both caesarean delivery and vaginal delivery

• There were no statistically significant differences between carbetocin and oxytocin in terms of risk of any PPH (blood loss greater than 500 ml) or in risk of severe PPH (blood loss greater than 1000 ml).

• Comparison between carbetocin and syntometrine showed a lower mean blood loss in women who received **carbetocin** compared to syntometrine.

• The risk of adverse effects such as nausea and vomiting were significantly lower in the carbetocin group

*Su L-L et.al, Cochrane Database Systemic Review, 2012*
Misoprostol

• Misoprostol is a synthetic prostaglandin $E_1$ analogue

• Used off label for:
  – medication abortion,
  – medical management of miscarriage,
  – induction of labor,
  – cervical ripening before surgical procedures, and
  – treatment or prevention of postpartum hemorrhage
Misoprostol

- Oral misoprostol significantly reduces the risk of severe PPH (≥1L) by more than 80% when compared to a placebo, and reduces the risk of moderate PPH (500 mL) by almost 50%.
- Active bleeding is equivalently stopped with misoprostol and with oxytocin.
- Use of misoprostol is associated with a higher risk of using other uterotonics.
- Regarding treatment of PPH, misoprostol (800 µg sublingual) could be an alternative to oxytocin (40 IU intravenous) when the later is not available.

- However, more side effects are recorded with misoprostol, especially diarrhoea, nausea and vomiting but also tremors and fever above 38°C.


Misoprostol

“Evidence suggests sublingual misoprostol should be used for treatment whenever oxytocin is not available”

WHO GUIDELINES 2012
1. The use of uterotonic for the prevention of PPH during the third stage of labour is recommended for all births. (Strong recommendation, moderate-quality evidence)

2. Oxytocin (10 IU, IV/IM) is the recommended uterotonic drug for the prevention of PPH. (Strong recommendation, moderate-quality evidence)

3. In settings where oxytocin is unavailable, the use of other injectable uterotonic if appropriate ergometrine/methylergometrine or the fixed drug combination of oxytocin and ergometrine) or oral misoprostol (600 μg) is recommended. (Strong recommendation, moderate-quality evidence)

4. In settings where skilled birth attendants are not present and oxytocin is unavailable, the administration of misoprostol (600 μg PO) by community health care workers and lay health workers is recommended for the prevention of PPH. (Strong recommendation, moderate-quality evidence)
Tranexamic acid

- Antifibrinolytic agent
- In gynae – used mostly in treatment of menorrhagia
- Used widely in orthopaedic, ORL, Dental and other surgical procedure in treatment of bleeding
- Many trial performed to elicit its usefulness in preventing PPH
Tranexamic acid

- For prevention of PPH – off label use
- 13 randomized controlled trials for PPH prevention after cesarean (n = 10) and vaginal (n = 3) deliveries show that women who received TXA had significantly less postpartum blood loss without any increase in their rate of severe adverse effects
- Studies are mixed in quality thus insufficient evidence to draw conclusion)

Novikova N1, Hofmeyr GJ, Cluver C
(Tranexamic acid for preventing postpartum haemorrhage. Cochrane Database Systematic Review, 2014)
1. TRAAP - TRAnexamic Acid for Preventing postpartum hemorrhage after vaginal delivery: a multicenter randomized, double-blind, placebo-controlled trial (2014)

2. Tranexamic Acid for the Treatment of Postpartum Haemorrhage: an international Randomised, Double Blind, Placebo Controlled Trial (2015)
Delayed cord clamping

“Policies for timing of cord clamping vary, with early cord clamping generally carried out in the first 60 seconds after birth, whereas later cord clamping usually involves clamping the umbilical cord more than one minute after the birth or when cord pulsation has ceased.”
2 minutes

- 33% more blood
- decreased risk of anemia
- more oxygen carrying proteins (hemoglobin)
- more stem cells
- more oxygen to baby’s vital organs during the most important part of birth—when they use their lungs for the first time to breathe.

delayed cord clamping

Will you wait?
Delayed cord clamping

• 15 trials – 3911 women and infant pairs

“Effect of timing of umbilical cord clamping of term infants on maternal and neonatal outcomes”

Susan J McDonald et.al
Hospital for Women, Melbourne, Australia
The University of Adelaide, Australia.
Cochrane Pregnancy and Childbirth Group, Department of Women’s and Children’s Health
The University of Liverpool, Liverpool, UK.
Menzies School of Health Research, Darwin, Australia
Cochrane Systematic Review 2014

• What the study showed?
  – Maternal VS Fetal Outcome
Maternal outcome

- There were no significant differences between early versus late cord clamping groups for the primary outcome of severe postpartum haemorrhage (5 trials, 2066 women).
- No significant differences in primary PPH (>500mls) (5 trials 2206 women).
- No significance changes in hemoglobin value after birth (3 trials, 1345 women).

Susan J McDonald et.al  Cochrane Systematic Review 2014
Fetal outcome

• There were *no significant differences* between early and late clamping for the primary outcome of neonatal mortality or morbidity.

• Fewer infants in the early cord clamping group required phototherapy for jaundice than in the late cord clamping group (7 trials, 2234 infants).

• Haemoglobin concentration in infants at 24 to 48 hours was significantly lower in the early cord clamping group (3 trials, 884 infants).

• Improvement in iron stores appeared to persist, with infants in the early cord clamping over twice as likely to be iron deficient at three to six months compared with infants whose cord clamping was delayed (5 trials, 1152 infants).

Susan J McDonald et.al  Cochrane Systematic Review 2014
NICE GUIDELINES (2014)

• After administering oxytocin, clamp and cut the cord.
• **Do not** clamp the cord earlier than 1 minute from the birth of the baby unless there is concern about the integrity of the cord or the baby has a heartbeat below 60 beats/minute that is not getting faster.
• Clamp the cord before 5 minutes in order to perform controlled cord traction as part of active management.
• If the woman requests that the cord is clamped and cut later than 5 minutes, support her in her choice.

Intrapartum care: care of healthy women and their babies during childbirth
Issued: December 2014; NICE clinical guideline 190; guidance.nice.org.uk/cg190
In healthy term babies, the evidence supports deferring clamping of the umbilical cord, as this appears to improve iron stores in infancy.

Jaundice may be more common after deferred cord clamping but this management is likely to be beneficial as long as phototherapy for jaundice is available.

The administration of intramuscular uterotonic drugs before cord clamping is unlikely to have a substantive effect on placental transfusion.

For preterm births the evidence is less clear than for term births, although data from the trials suggest potential benefit by deferred rather than immediate cord clamping.
CCT vs Spontaneous expulsion

Effect of Routine Controlled Cord Traction as Part of the Active Management of the Third Stage of Labour on Postpartum Haemorrhage

Multicentre Randomised Controlled Trial (TRACOR)

Catherine Deneux-Tharaux; Loic Sentilhes; Françoise Maillard; Emmanuel Closset; Delphine Vardon; Jacques Lepercq; François Goffinet


Controlled cord traction for the third stage of labour.

Hofmeyr GJ1, Mshweshwe NT, Gülmezoglu AM.

Box 2: Recommendations for the prevention of PPH - cord management and uterine massage

5. In settings where skilled birth attendants are available, CCT is recommended for vaginal births if the care provider and the parturient woman regard a small reduction in blood loss and a small reduction in the duration of the third stage of labour as important. (Weak recommendation, high-quality evidence)

6. In settings where skilled birth attendants are unavailable, CCT is not recommended. (Strong recommendation, moderate-quality evidence)
Retained Placenta

• Placenta in utero at least 30 min after birth despite AMTSL
• Complicates around 0.2 – 2% deliveries
• MRP (manual removal of placenta)
  – Ideally in OT
  – Associated with increased risk of infection, genital tract trauma & hemorrhage
• Alternatively – **Umbilical Vein injection (UVI)**
Umbilical Vein Injection (UVI) Procedure

• Cord cleaned and cut and infant feeding tube will be inserted into umbilical vein until resistance is met.
• Add **50 IU oxytocin to 50mls normal saline** and inject up to the tube.
• Cord will be clamped after the injection has been given to prevent backflow.
• Further delivery of placenta by gentle cord traction will be attempted at 30 minutes after UVI if spontaneous placenta delivery not ensued.
• If not successful - MRP.
Umbilical Vein Injection (UVI)

- Our experience ~ 30-50% success rate

Nardin JM et.al (Cochrane Systemic Review, 2012)

- 15 trials (1704 women)
  - UVI of oxytocin solution is an inexpensive and simple intervention that could be performed while placental delivery is awaited.
  - However, high-quality randomized trials show mix result review
  - Further research is warranted
Box 7: Recommendations for the treatment of retained placenta

25. If the placenta is not expelled spontaneously, the use of additional oxytocin (10 IU, IV/IM) in combination with controlled cord traction is recommended. (Weak recommendation, very-low-quality evidence)

26. The use of ergometrine for the management of a retained placenta is not recommended as this may cause tetanic uterine contractions which may delay the expulsion of the placenta. (Weak recommendation, very-low-quality evidence)

27. The use of prostaglandin E2 alpha (dinoprostone or sulprostone) in the management of retained placenta is not recommended. (Weak recommendation, very-low-quality evidence)

28. A single dose of antibiotics (ampicillin or first-generation cephalosporin) is recommended if manual removal of the placenta is practised. (Weak recommendation, very-low-quality evidence)
Prophylaxis of PPH
WHO guidelines for Prevention of PPH (2012)
1. The use of uterotonics for the prevention of PPH during the third stage of labour is recommended for all births. (Strong recommendation, moderate-quality evidence)

2. Oxytocin (10 IU, IV/IM) is the recommended uterotonic drug for the prevention of PPH. (Strong recommendation, moderate-quality evidence)

3. In settings where oxytocin is unavailable, the use of other injectable uterotonics (if appropriate ergometrine/methylergometrine or the fixed drug combination of oxytocin and ergometrine) or oral misoprostol (600 µg) is recommended. (Strong recommendation, moderate-quality evidence)

4. In settings where skilled birth attendants are not present and oxytocin is unavailable, the administration of misoprostol (600 µg PO) by community health care workers and lay health workers is recommended for the prevention of PPH. (Strong recommendation, moderate-quality evidence)
WHO guidelines

5. In settings where skilled birth attendants are available, CCT is recommended for vaginal births if the care provider and the parturient woman regard a small reduction in blood loss and a small reduction in the duration of the third stage of labour as important (Weak recommendation, high-quality evidence)

6. In settings where skilled birth attendants are unavailable, CCT is not recommended. (Strong recommendation, moderate-quality evidence)

7. Late cord clamping (performed after 1 to 3 minutes after birth) is recommended for all births while initiating simultaneous essential newborn care. (Strong recommendation, moderate-quality evidence)

8. Early cord clamping (<1 minute after birth) is not recommended unless the neonate is asphyxiated and needs to be moved immediately for resuscitation. (Strong recommendation, moderate-quality evidence)
9. Sustained uterine massage is not recommended as an intervention to prevent PPH in women who have received prophylactic oxytocin. (Weak recommendation, low-quality evidence)

10. Postpartum abdominal uterine tonus assessment for early identification of uterine atony is recommended for all women. (Strong recommendation, very-low-quality evidence)

11. Oxytocin (IV or IM) is the recommended uterotonic drug for the prevention of PPH in caesarean section. (Strong recommendation, moderate-quality evidence)

12. Controlled cord traction is the recommended method for removal of the placenta in caesarean section. (Strong recommendation, moderate-quality evidence)
thank you