South Australian Paediatric Clinical Guidelines

Oxytocin: prophylaxis for third stage of labour and PPH

Introduction

- Oxytocin is a hormone released from the posterior pituitary. As it stimulates rhythmic contractions of uterine smooth muscle, it can be used to induce or augment labour (MIMS Syntocinon® full prescribing information 2009) and to prevent or treat postpartum haemorrhage

Oxytocin

- Oxytocin is a synthetic nonapeptide identical with oxytocin
- In the doses used it has only a very slight pressor and anti-diuretic activity (MIMS Syntocinon® full prescribing information 2009)
- The preferred uterotonic for prophylaxis for active management of the third stage is oxytocin because of its rapid onset of action and minimal side effects
    - Intravenous onset of action < 1 minute and lasts < 30 minutes
    - Intramuscular onset of action within 2-4 minutes and lasts 30-60 minutes (preferred route)
    - **Side effects:** IV bolus may cause transient hypotension; prolonged high dose infusion increases risk of water intoxication
- Oxytocin is also given as a single repeat intramuscular or intravenous dose for first line management of postpartum haemorrhage
- Alternatively, Syntometrine® (oxytocin and ergometrine) may be given for prophylaxis of the third stage of labour or first line management of postpartum haemorrhage (see PPG, ergot derivatives: prophylaxis for third stage management and pph)
- Postpartum, oxytocin infusion regimens may be administered in the following:
    - Prophylaxis of postpartum haemorrhage
    - Post partum haemorrhage due to atony after delivery of the placenta
- There is no hard evidence to recommend a particular dosage of oxytocin for either prophylaxis in the third stage of labour or postpartum haemorrhage infusion regimens. Oxytocin bolus doses and infusion regimens in this guideline are based on medical expert consensus
- Prolonged use of oxytocin induces oxytocin receptor desensitisation and larger doses of oxytocin may be required to prevent or treat uterine atony and PPH (Dyer, Butwick, Carvalho 2011; Grotegut et al. 2011)

Contraindications

- Hypersensitivity to oxytocin (Syntocinon®)

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Precautions

- In women who have **diabetes mellitus** or **abnormal glucose tolerance in pregnancy**, oxytocin should be administered with 0.9 % sodium chloride to prevent hyponatraemia
- In women with **cardiovascular disorders** the infusion volume should be kept low by using a more concentrated oxytocin solution (for more information on prophylaxis management of the third stage of labour in volume critical patients, see PPG, Cardiac disease in pregnancy, Postpartum)
- **Avoid** large volumes of oral and IV fluids with oxytocin administration

Water intoxication (Hyponatraemia)

- High doses of oxytocin or prolonged periods of infusion of oxytocin in electrolyte-free fluids may interfere with vasopressin receptors. This can result in **water intoxication**

Symptoms and signs of water intoxication:

- Headache, nausea, vomiting and abdominal pain, lethargy, drowsiness, unconsciousness, grand mal type seizures , low blood electrolyte concentration

Treatment

- Discontinue oxytocin infusion
- Restrict fluid intake
- Promote diuresis
- Correct electrolyte imbalance
- Control convulsions
- If coma is present: maintain a free airway, and carry out the routine measures for care of an unconscious patient

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Prophylaxis for the third stage of labour (oxytocin)	
Vaginal birth	> Give oxytocin 10 I.U. intramuscular (preferred route) > OR 5-10 I.U. slowly intravenous
Elective Caesarean section	> Give oxytocin 1-3 I.U. slowly intravenous (over 30 seconds) > If uterine atony develops, repeat the dose of 1-3 I.U. AND > Commence a prophylactic 40 units oxytocin infusion (link to postpartum haemorrhage guideline)
Caesarean section and known risk factors for PPH (see risk factors in postpartum haemorrhage guideline) Last reviewed: 14/01/13	> Give oxytocin 3-5 I.U. slowly intravenous > Consider a prophylactic 40 units oxytocin infusion

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Postpartum haemorrhage (PPH)

> Due to the structural similarity with antidiuretic hormone, oxytocin can cause fluid retention and hyponatraemia. Careful fluid management is particularly important in women with pre-eclampsia, cardiac conditions or following a postpartum haemorrhage to minimise the risk of fluid overload and subsequent pulmonary oedema

NOTE: The 40 units oxytocin infusion regimen has been based on medical expert consensus

Postpartum haemorrhage (PPH) infusion regimen		
Standard 40 units PPH regimen	**Preparation**	> Check that prophylactic uterotonic (oxytocin or Syntometrine®) has been given for third stage management > Add 40 units of oxytocin to 500 mL of Hartmanns' or sodium chloride 0.9 % > Use an appropriate volumetric infusion pump > Infuse as a separate line piggybacked into the mainline
	Infusion rate	> Run at 125 mL / hour (over 4 hours)
Low volume 40 units PPH regimen **(suitable for women at risk of fluid overload)**	**Preparation**	> Check that prophylactic uterotonic (Syntocinon® or Syntometrine®) has been given for third stage management > Add 40 units of oxytocin to 100 mL of sodium chloride 0.9 % > Use an appropriate volumetric infusion pump > Infuse as a separate line piggybacked into the mainline > The mainline should be turned off to minimise risk of fluid overload (unless additional resuscitation required)
	Infusion rate	> Run at 25 mL / hour (over 4 hours)
Last reviewed: 14/01/13		

Observations

Prophylaxis (third stage management)

> Routine postpartum care

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PPH

- The first sign of diminishing blood volume and mild shock is tachycardia, which often precedes a fall in blood pressure
- Ensure an indwelling urinary catheter is in place for the duration of the Syntocinon® infusion regimen
- Regularly observe for response to the Syntocinon infusion
- Once response is achieved:
  - Observe for vaginal blood loss, fundal tone, blood pressure and pulse half hourly for four hours or as clinically indicated

Carbetocin (Duratocin®)

- Carbetocin (Duratocin®) is a synthetic analogue of oxytocin, with a rapid onset of action (< 2 minutes) and a longer half-life (41 minutes after IV injection) than oxytocin (1-5 minutes after IV injection)
- Carbetocin (Duratocin®) stimulates a prolonged uterotonic effect lasting about an hour (Dansereau et al. 1999; Borruto, Treisser, Comparetto 2009)
- For women who undergo caesarean section, carbetocin (Duratocin®) reduces the need for additional uterotonic agents, and uterine massage when compared with oxytocin (Su et al. 2012)
- Carbetocin (Duratocin®) is associated with less blood loss compared to Syntometrine® in the prevention of PPH in women who have vaginal deliveries with significantly fewer side effects. Further research is needed to assess the cost-effectiveness of carbetocin as a uterotonic agent (Su et al. 2012)

Indication

- Prevent uterine atony and postpartum haemorrhage at elective caesarean section (MIMS Duratocin® prescribing information 2008)

Side effects

- Side effects are very similar to those of oxytocin, including: abdominal pain, nausea, flushing and headache. Nearly half the patients may complain of itching.

Dosage

- Give a single IV dose of Carbetocin (Duratocin®) 100 micrograms (1 mL) slowly over one minute (MIMS Duratocin® prescribing information 2008)

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Useful web site:

RANZCOG: Management of the third stage of labour
http://www.ranzcog.edu.au/publications/statements/C-obs21.pdf

Abbreviations

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CTG	Cardiotocograph
e.g.	For example
et al.	And others
IOL	Induction of labour
IU	International units
IV	Intravenous
mg	Milligram(s)
mL	Millilitre(s)
mU	Millunit(s)
%	Percent
RANZCOG	Royal Australian and New Zealand College of Obstetricians and Gynaecologists
RCOG	Royal College of Obstetricians and Gynaecologists
®	Registered trademark

Version control and change history

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