National Patient Safety Alert

Risk of oxytocin overdose during labour and childbirth

Date of issue:	24 September 2024	Reference no:	NatPSA/2024/010/NHSPS

This alert is for action by: Organisations providing maternity services.

This is a safety critical and complex National Patient Safety Alert. Implementation should be co-ordinated by an executive lead (or equivalent role in organisations without executive boards) and supported by clinical leads in maternity, anaesthetics, theatres, and pharmacy.

Explanation of identified safety issue:

Oxytocin can be given in low dose infusions to induce labour or to augment contractions during labour (intrapartum), and in significantly higher doses following birth (postpartum) to manage a postpartum haemorrhage (PPH).

Midwives need to complete several tasks immediately and simultaneously following birth to ensure the safety of both the mother and baby. To support this, postpartum oxytocin infusions have been prepared in advance of being required.

If a pre-prepared oxytocin infusion is unintentionally given before the baby is born, for example if it is confused with standard fluids or the intrapartum and postpartum infusions are confused, the woman's contractions will increase in frequency and strength. This can lower the baby's oxygen levels and alter their heart rate, increasing the risk of placental abruption (where the placenta prematurely separates from the uterus and deprives the baby of oxygen).

A review of the National Reporting and Learning Systems over a 5 year period identified 25 incidents including one report of a woman receiving a pre-prepared postpartum oxytocin infusion in place of IV fluids while in labour. The baby's heart rate slowed, and the woman required an emergency caesarean section due to a placental abruption. The baby was born in poor condition and admitted to the neonatal intensive care unit (NICU) for close monitoring.

Other reports described:

- postpartum oxytocin regimens accidentally given during labour or in theatre pre caesarean section
- oxytocin infusions and IV fluids being confused, leading to oxytocin infusions running through freely or at a significantly increased rate during labour.

This alert seeks to balance the benefit of ensuring an oxytocin infusion can be started immediately after a woman (at high-risk of PPH) has given birth and mitigate the risk of preparing the oxytocin infusion in advance.

Actions required

Actions to be completed as soon as possible but no later than 31 March 2025

Review and update local clinical procedures (or equivalent documents) to ensure:

1. Oxytocin infusions for any indication are **not** pre-prepared at ward level in any clinical area (including delivery suites and theatres). NOTES A, B, C
2. Post-partum haemorrhage (PPH) kits/ trolleys are immediately available in all clinical areas/theatres where it may be required. NOTE D
3. Where a woman is identified to be at high risk of PPH:
   a. the PPH kit/trolley should be brought into the labour/delivery room/theatre during the second stage of labour
   b. the postpartum oxytocin infusion should be prepared at the time of birth and not before NOTE E
   c. a second midwife should be available to support the administration of the postpartum oxytocin infusion.
4. Roles and responsibilities of staff groups in the labour setting, including theatres, are clearly defined in terms of prescribing, preparation, administration and disposal of oxytocin infusions. NOTE F

   Including:

   - intrapartum oxytocin infusions
   - postpartum oxytocin infusions
   - unused, pre-prepared oxytocin infusions.

Additional information:

NOTES

A. Oxytocin can also be administered as a bolus injection. The alert does not impact on this method of administration.[1]

B. Preferably, ready-to-administer oxytocin infusions should be available to further reduce the associated risks. Pharmacy services have been asked to consider producing oxytocin infusions and supplying these in a sealed, clearly labelled bag. If such products are used, they should remain sealed and stored outside of the delivery room/theatre until time of birth. Organisations should discuss this option with their pharmacy department or alternatively seek to buy ready-to-administer infusions from a commercial manufacturer.

C. Consideration should be given to the use of carbetocin[2] as this is given by bolus injection and negates the need to prepare an infusion.

D. Current best practice recommends all maternity units should have a PPH emergency kit/trolley.[3,4] The kit/trolley should contain all consumables, treatment algorithms and medication (where possible) and should be checked regularly. The PPH kit/trolley does not necessarily have to be in each delivery room, but should be immediately available. Work is ongoing to standardise PPH kits/trolleys.[5]

E. Organisational medicines policies must reflect good labelling guidance, including the need for visible and consistent labelling of all infusions to clearly differentiate all those being administered.

F. It is not always possible to specify roles and responsibilities for every clinical scenario, especially when oxytocin may be administered in an emergency. However, local clinical procedures should clearly articulate roles and responsibilities in planned situations and in complex situations where there are handovers of care, for example if the woman is transferred to theatre and within the theatre environment.

Patient safety incident data

The NRLS and StEIS were searched on two separate occasions using a combination of keywords to identify relevant incidents (ref: 5255/5431). Incidents were thematically reviewed and the combined searches over a five year period identified a total of 25 incidents in which oxytocin infusions were administered in error during labour or postpartum, leading to oxytocin overdose. In all incidents staff recognised the error and acted rapidly to prevent more serious consequences, for example death or brain damage. Identified concerns/themes included:

- oxytocin infused at too high a rate due to confusion between oxytocin in 500mL or 1000mL bags and IV fluids, or confusion between IV lines running simultaneously for oxytocin and IV fluids
- pre-prepared postpartum oxytocin infusion readily available in the labour room and in theatre, increasing the risk of it being administered at the wrong time.

Two national reports[6,7] highlight the potential significant risk to babies following oxytocin overdose if there are issues with interpretation of their fetal heart rate and timely escalation of concerns.

References

1. Royal College of Obstetricians and Gynaecologists. Prevention and management of postpartum haemorrhage (Green-top Guideline No. 52). December 2016.
2. Day A, Barclay P, Page L. Is there a role for carbetocin in the prophylaxis of postpartum obstetric haemorrhage? Drug Ther Bull 2022;60(9):136-140.
3. PROMPT Maternity Foundation. Practical obstetric multi-professional training.
4. WHO Recommendations on the assessment of postpartum blood loss and use of treatment bundle for postpartum haemorrhage. 2023
5. Woodward M, Ansari A, Draycott T, et al. Characterising and describing postpartum haemorrhage emergency kits in context: a protocol for a mixed-methods study. BMJ Open 2021;11:e044310.
6. NHS Resolution. Five years of cerebral palsy claims. 2017.
7. Royal College of Obstetricians and Gynaecologists. Each Baby Counts 2020 final progress report.
8. Specialist Pharmacy Service. Managing risks associated with oxytocin infusions during labour.

Stakeholder engagement

- Royal College of Obstetricians & Gynaecologists
- Royal College of Anaesthetists
- Specialist Pharmacy Service
- NHS England Chief Midwifery Officer
- The Royal College of Midwives
- Obstetric Anaesthetists' Association
- National Clinical Director (Maternity)
- National Patient Safety Response Advisory Panel

Advice for Central Alerting System (CAS) officers and risk managers

This is a safety critical and complex National Patient Safety Alert. In response to CHT/2019/001 your organisation should have developed new processes to ensure appropriate oversight and co-ordination of all NatPSAs. CAS officers should send this Alert to the executive lead nominated in their new process to coordinate implementation of safety critical and complex National Patient Safety Alerts, copying in the leads identified on page 1.