

Lessons from a serious incident: Intrapartum fluid management and hyponatraemia

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Background and objective

People in labour are susceptible to hyponatraemia (sodium <130mmol/l), which could lead to serious maternal and fetal complications including cerebral oedema and seizures. The commonest cause in the peripartum period is haemodilution from inappropriate fluid intake and/or retention, and the risk of hyponatraemia is strongly linked to fluid balance. A lack of guidance and low awareness among clinicians may be contributing factors to serious incidents such as the case described below. We aimed to audit our current practice of fluid and sodium monitoring on Queen's Hospital labour ward and create a new guideline to prevent further cases of hyponatraemia.

A serious incident of hyponatraemia on labour ward

A woman was admitted at 40 weeks' gestation in her first pregnancy with high blood pressure and proteinuria. She was induced and delivered vaginally two days later. Immediately postnatally, she had an eclamptic seizure with hyponatraemia of 116 mmol/l and required ITU admission. The serious incident review identified several areas of care and service delivery problems, including two areas of key relevance to this project:

1. There was no record of fluid balance monitoring and, contrary to pre-eclampsia guidelines, the woman was not fluid restricted.
2. Pre-eclampsia bloods were done but focused on low platelets and there was no recognition of a low and dropping sodium.

Design and methods

1. A serious incident review into the above case was undertaken to study contributing causes for the severe hyponatraemia on labour ward.
2. An audit was performed on labour ward over the course of a week. A snapshot of clinical activity was captured from the labour ward board and included all intrapartum women at the time of data collection. Handheld and electronic notes were reviewed for fluid balance documentation, risk factors for hyponatraemia and sodium results.
3. We created a trust guideline on fluid balance and hyponatraemia based on our findings and seeking input from multidisciplinary stakeholders, as well as pre-existing international (Northern Ireland, 2017¹) and regional (other London trusts) guidance.

Results

45 women were sampled over a week of 5 discrete episodes of data collection on our labour ward. **Fluid balance monitoring was documented in only 53%**, of which **54% was incompletely or inaccurately done**. A vast majority (89%) of women had risk factors for hyponatraemia, such as being on IV fluids or syntocinon, yet only 53% of these women had their sodium level tested. None of the sodium tests were done within an appropriate timeframe.

Our new guideline introduces a 3-step approach to managing fluid balance in the peripartum period:

1

Appropriate use of IV fluids

1. IV fluids should always be prescribed by doctor with a clear indication.
2. Crystalloids preferred: 1st line Plasmalyte, 2nd line Hartmann's.
3. Avoid routine use of IV fluids for the following common situations:

Situation	Comment
Tachycardia in labour	consider cause, may benefit from oral fluid challenge
Urinary ketones in labour	do not monitor routinely in non-diabetic people. Oral carbohydrates are likely the most suitable management.
Fetal tachycardia/pathological CTG	do NOT treat CTG with fluids. Seek clinical review and give IV fluids only if indicated e.g. suspected dehydration or sepsis.
Epidural	IV fluids are not routinely required. Seek clinical review if hypotension.

2

Adequate fluid balance monitoring

ALL people in labour should have accurate fluid balance monitoring documented.

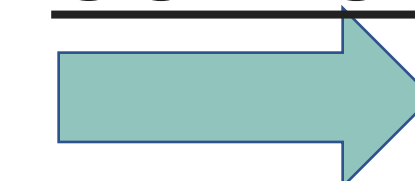
INPUT



IV: hourly
Oral: 4-hourly



OUTPUT



Catheter: hourly
Toilet: 4-hourly

Always record the cumulative fluid balance prior to transfer between clinical areas.

3

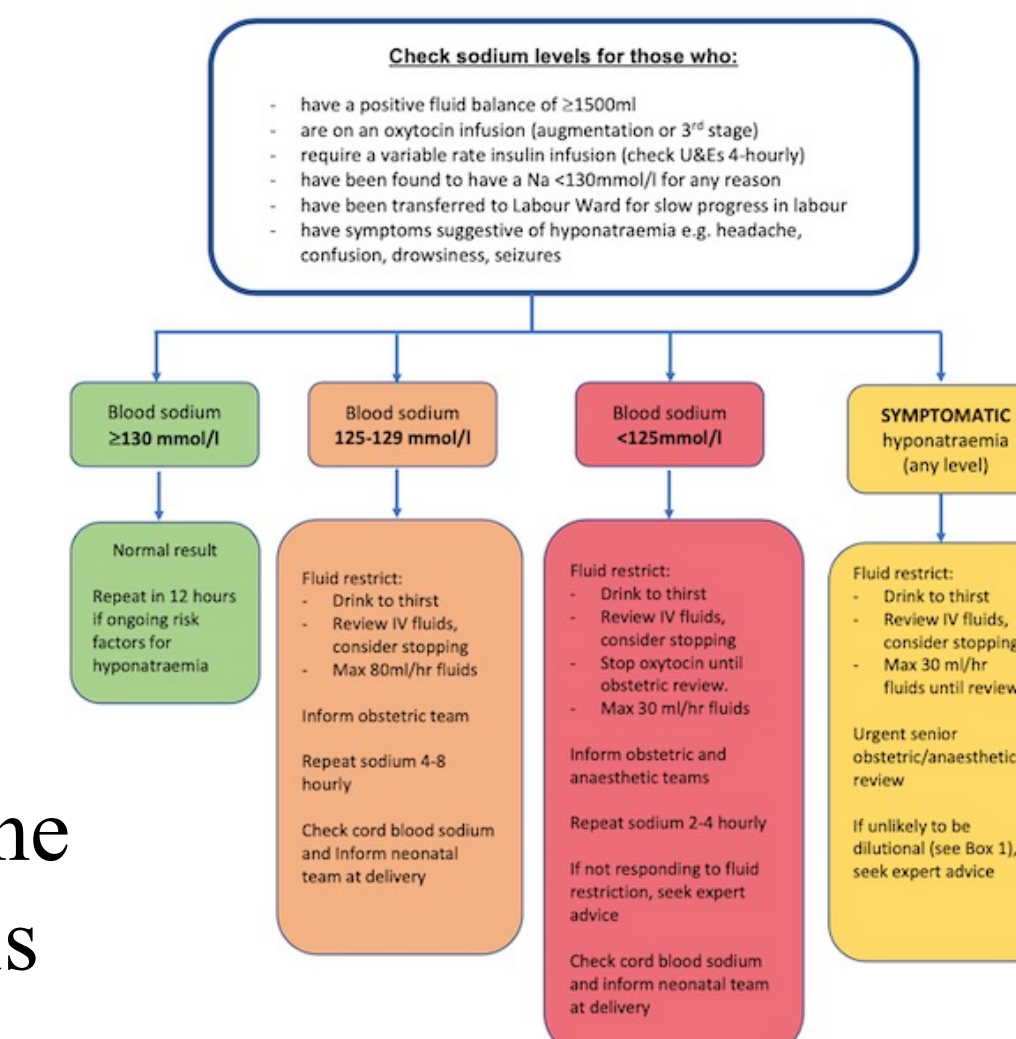
Sodium monitoring in at-risk people

Check sodium levels for the following at-risk groups:

- Positive fluid balance +1500ml or more
- On oxytocin drip (any reason)
- On variable rate insulin intravenous infusion (VRIII)
- Found to have a low sodium (<130mmol/l)
- Transfer from midwife-led unit due to slow labour progress
- Clinical signs or symptoms suggestive of hyponatraemia e.g. headache, drowsiness, seizure

Management of the sodium result follows a flowchart. In summary:

- Normal results do not need routinely need repeating.
- If sodium is low, encourage drinking to thirst and consider stopping IV fluids. Monitor the sodium regularly. Involve obstetric team +/- seek further senior/expert input. Inform neonatal team.
- Have a low threshold to act as above and escalate early if the patient is symptomatic or if non-dilutional hyponatraemia is suspected.



Conclusion

Intrapartum women are predisposed to hyponatraemia which can have significant complications for mother and baby. Current labour ward practice is inadequate for the prevention and detection of hyponatraemia, and simple measures such as fluid balance monitoring and targeted sodium level testing for high-risk women can be introduced to improve this. We are currently in the process of rolling out our guideline and implementing these measures on labour ward, as well as arranging education sessions for staff. We will re-audit performance in 3-6 months.

References

1. <https://www.rqia.org.uk/RQIA/files/df/dfd57ddd-ceb3-4c0d-9719-8e33e179d0ff.pdf>