

## Case story

Recognising and avoiding  
significant maternal and neonatal  
hyponatraemia



# Early Notification

## Case story guidance

### Background

In [Advise, resolve and learn Our strategy to 2025](#), our second strategic priority is to share data and insights as a catalyst for improvement and our third is to collaborate to improve maternity outcomes. Aligned with these aims we have gathered together learning from our Early Notification Scheme and produced a number of case stories to help support learning from harm identified through claims.

### These resources

Our case stories are illustrative and based on recurring themes from real life events. These experiences have been highlighted and shared with you, to help identify potential risks in your clinical area, promote learning and prevent fewer incidents like these occurring in the future.

### How to use the case stories

There are various ways you may use the case stories, from individual self-directed learning to support continuous professional development to using them in a team environment. The idea is that by learning from the experience of others, maternity unit staff will be able to change their approach to care.

As you read or discuss the examples of incidents that we are sharing we ask you to consider the following:

- Could this happen in my organisation?
- What changes within my organisation or team might I consider after reading the material, including individual practice?
- What information should I share with the team?
- How can I share the learning from this case story?
- Who else needs to know?

### Practical applications

1. Consider the key elements of the case story and through reflection apply the learning to influence your practice in the future.
2. Use this case study as a point of discussion at appropriate multi-disciplinary team meetings, safety huddles, and/or human factor's training.
3. Use this case study to create a multi-disciplinary simulation in the clinical area or on mandatory training.
4. Review your claims scorecard to identify whether there are any themes which relate to this case story and identify where improvements could be made.

**Topic:** Recognising and avoiding significant maternal and neonatal hyponatraemia.

### Key points:

- All women in labour are at increased risk of hyponatraemia (defined as blood serum sodium < 130 mmol/l), especially dilutional hyponatraemia which is sometimes referred to as water intoxication.
- This is a result of lower baseline serum sodium in pregnancy, impaired ability to excrete water in the third trimester and exposure to the anti-diuretic effect of oxytocin (synthetic and/or endogenous). Excessive oral or intravenous fluid intake exacerbates this, with potentially serious complications for mother and baby.
- Complications of hyponatraemia include headache, agitation, confusion, seizures and death. Vigilance, diagnosis and active management is therefore imperative.
- Water freely crosses the placenta, lowering the infant's blood sodium concentration in tandem with its mothers. Seizures secondary to hyponatraemia in the newborn infant are similar to those caused by hypoxic ischaemic encephalopathy (HIE) and they are likely to receive therapeutic cooling as a result.
- In a study, 26% of low-risk mothers who received or ingested more than 2500 millilitres of fluid during labour were hyponatraemic<sup>1</sup>.
- Significant hyponatraemia can be avoided by giving women evidence-based advice on oral fluid intake, careful monitoring of fluid input and output and responding to positive fluid balance.

### Maternity story

Ms K who is in her first pregnancy attended the midwifery-led unit in spontaneous labour at term. The midwife assessing her observes that she has a mild tachycardia on admission and encourages her to drink. The tachycardia settles, however, after several hours in labour she is transferred to the labour ward for management of slow progress in the first stage of labour.

On the labour ward discussions take place regarding the need to have an intravenous (IV) oxytocin infusion to augment contractions. An IV cannula is inserted, and the oxytocin infusion and intravenous fluids were started. Some variable decelerations of the fetal heart are noted on the cardiotocograph (CTG), and the flow of intravenous fluids is increased. The mother progresses to fully dilated, and after active pushing for around 60 minutes, the CTG is pathological and the mother consents for a trial of instrumental birth. In theatre, her behaviour is noted to be unusual, and she appears confused and agitated, but she is tired and exhausted after a prolonged labour. The baby is delivered by forceps in poor condition, the

neonatal team begin resuscitation and transfer the baby to the neonatal intensive care unit for ongoing care including therapeutic cooling for seizures.

In maternity recovery, the mother's behaviour continued to deteriorate and a referral to the liaison psychiatry team is made. Approximately an hour after giving birth, her partner calls for help as she begins to have a tonic clonic seizure. An arterial blood gas taken following the seizure reveals a sodium level of 117 mmol/l that is confirmed on a venous sample sent to the laboratory. She is transferred to the intensive care unit for ongoing care. Her partner is not sure but thinks she may have drunk at least three litres of water while in labour. This is in addition to the two litres of intravenous fluid on the drug chart from labour ward and theatre. The neonatal team are also informed, and a review of the baby's cord gas results reveal a low sodium at birth of 116 mmol/l, but this was not seen previously.

## Learning Points

- This case story highlights the importance of accurately monitoring fluid intake and output during labour to reduce the chance of a mother experiencing hyponatraemia.
- Hyponatremia should be considered as a potential differential diagnosis if a mother appears confused, agitated or has a significant behaviour change during labour and a sodium level should be checked immediately.
- Updated National Institute for Health and Care Excellence Guidance (NICE) guidance advises not to offer intravenous fluids to treat fetal heart rate abnormalities unless the woman is hypotensive or has signs of sepsis.<sup>2</sup>
- Hyponatraemia should be considered as a potential cause for neonatal seizures, particularly if there is no strong evidence of hypoxia during labour or delivery.

## Considerations for your hospital

- Do all birth settings in your trust have up-to-date guidance on fluid intake, monitoring, and fluid balance management in labour?
- Does local guidance cover what is appropriate advice to give to women regarding oral fluid intake? Current evidence suggests a rise in cases of hyponatraemia in labour due to excessive oral intake of hypo or isotonic fluids in addition to the recognised effects of intravenous fluids and oxytocin infusion.
- Do partograms used in all birth settings have a section to record fluid input and output?
- Read the Northern Ireland GAIN guideline on hyponatraemia in labour<sup>3</sup> and consider whether it could be implemented in your trust.

## What has happened as a result?

This case story is illustrative. If a similar case were to occur, then it would be referred to NHS Resolution by the trust, as part of the Early Notification Scheme, as well as the Healthcare Safety Investigation Branch (HSIB). NHS Resolution's in-house, specialist team will review all available information about the care received, to decide whether there is any evidence of substandard care which could potentially result in compensation.

The expertise of NHS Resolution staff is used to proactively assess the legal risk, investigate care, and provide early support to families where liability is established.

NHS Resolution supports an open, transparent discussion between clinicians and families following adverse events<sup>4</sup>. The scheme is also designed to improve the experience for NHS staff by time limiting the need for protracted involvement in the legal process and rapidly sharing learning from avoidable harm.

It is very important to note that no amount of money is comparable with the loss of a child or a child living with lifelong neurological injuries. Where poor outcomes occur as a result of deficiencies in care, NHS Resolution aims to resolve all such claims or cases fairly and as quickly as possible.

The current compensation cost to the NHS for a baby who has long term severe brain injury is on average £13 million. The human costs to the babies, families and clinical teams involved are immeasurable.

## Resources:

1. Moen V, Brudin L, Rundgren M, Irestedt L. Hyponatremia complicating labour-rare or unrecognised? A prospective observational study. BJOG. 2009 116:552-56
2. National Institute for Health and Care Excellence Guidance : [Fetal monitoring in labour \(nice.org.uk\)](https://www.nice.org.uk/guidance/CG136) . December 2022.
3. GAIN Guideline for the Prevention, Diagnosis and Management of Hyponatraemia in Labour and the Immediate Postpartum Period. March 2017. [www.rqia.uk/GAIN](http://www.rqia.uk/GAIN) ISBN:978-1-906805-36-4
4. NHS Resolution Saying Sorry June 2017. [Saying sorry \(duty of candour\)](#)



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