

An audit of post-operative paediatric intravenous maintenance fluids in the Leeds Children's Hospital, against the National Institute for Health and Care Excellence guideline NG29

Rachel Gunnell^a and Rebecca Prince^a supervised by Dr Nalini Malarkkan^b and Dr Rachel Homer^b

Introduction

In 2007, following the deaths of four children in the United Kingdom (UK) and more worldwide, the National Patient Safety Agency (NPSA) issued an alert regarding the risk of hyponatraemia in children receiving Intravenous (IV) fluids¹. They recommended the removal of 0.18% sodium chloride with 4% glucose from general use, alongside the production of clinical guidelines for paediatric fluid management¹. It took a number of years, but in 2015 the National Institute for Health and Care Excellence (NICE) published guideline NG29, "Intravenous fluid therapy in children and young people in hospital"². To the authors' knowledge there have not been any audits published against this guideline, and the current practice of prescribing and monitoring paediatric IV fluids in the UK is unknown.

Aims

This project aimed to determine adherence to NG29, in post-operative paediatric patients, receiving at least 24 hours of IV maintenance fluids in the Leeds Children's Hospital.

Method

The audit followed a prospective cohort study design, with data being collected over three separate periods totalling 35 days, between October 2019 and March 2020. Children on paediatric post-surgical wards and paediatric HDU were identified on the day of their surgery and followed up for 72 hours, or until their IV fluids were stopped if sooner. Neonates, infants weighing less than 3kg and young people aged 16 and above were excluded. The prescribing of fluids, and the monitoring of electrolytes, blood glucose and fluid balance, were audited against NG29². As per the guideline, fluids were expected to not be hypotonic. Electrolytes and blood glucose were expected to be measured when starting fluids (unless the surgery was elective) and at least every 24 hours thereafter. Fluid balance was expected to be assessed when fluids were given and subtotalled every 12 hours. Information was gathered from both electronic and paper patient records.

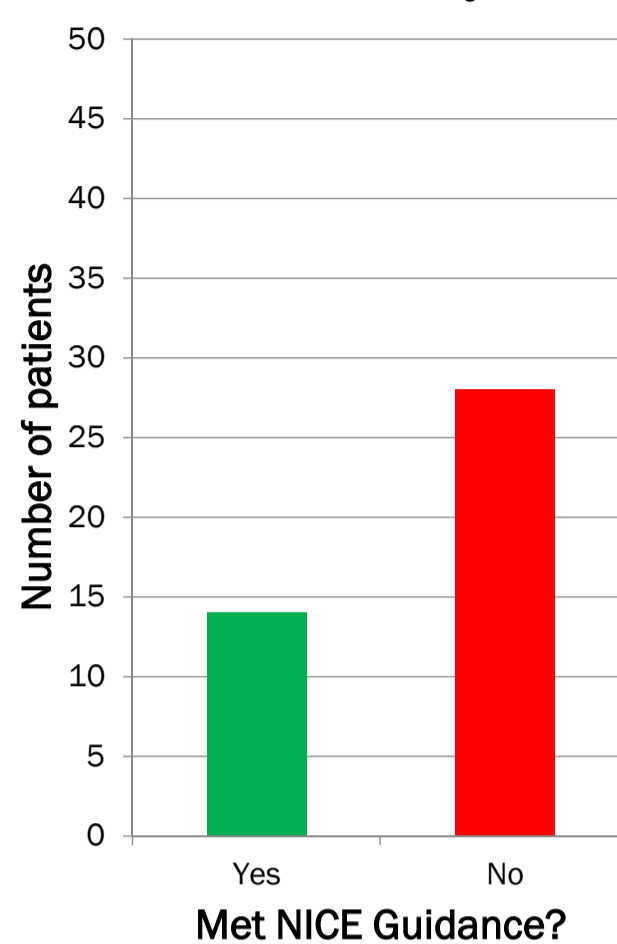
Results

Of a total of 59 patients, 42 received fluids for more than 24 hours (17 males and 25 females). Age ranged from one month to 15 years and weight ranged from 3.61kg to 92.00kg. 62% of surgeries were elective and 76% were major. Hypotonic fluids were not prescribed for any of the patients, but only 33% and 10% met the guidance for monitoring urea and electrolytes and glucose, respectively. Fluid balance charts were in regular use for all patients, however not all of them fully complied with NICE guidance and only 17% had complete fluid balance charts. Overall, only 12% of patients met the NICE guidance.

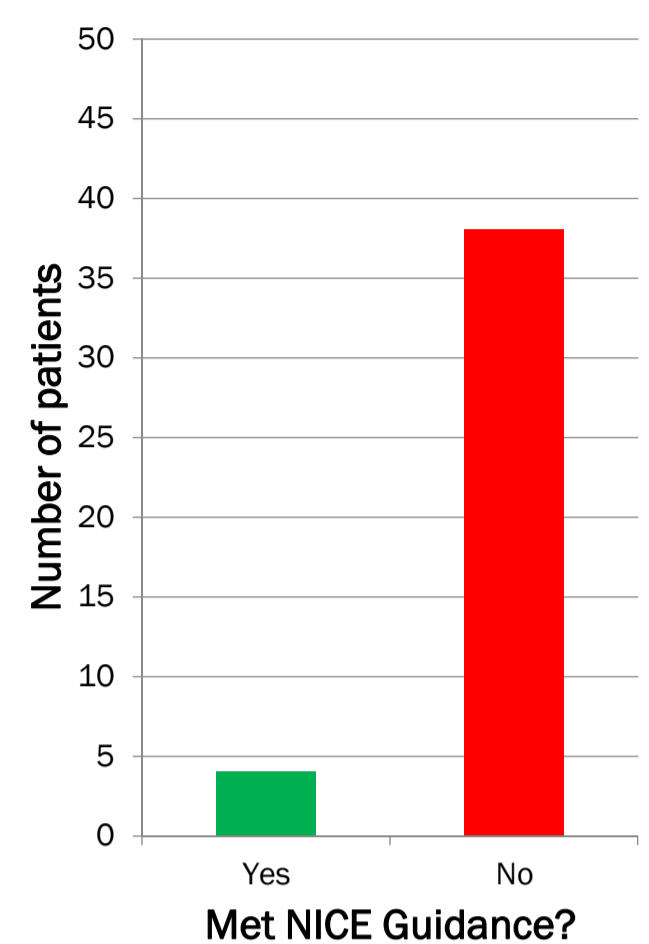
Conclusions

Children receiving post-operative paediatric IV maintenance fluids are no longer being prescribed hypotonic fluids, but are being monitored poorly. Going forward, closer surveillance of children on fluids is required.

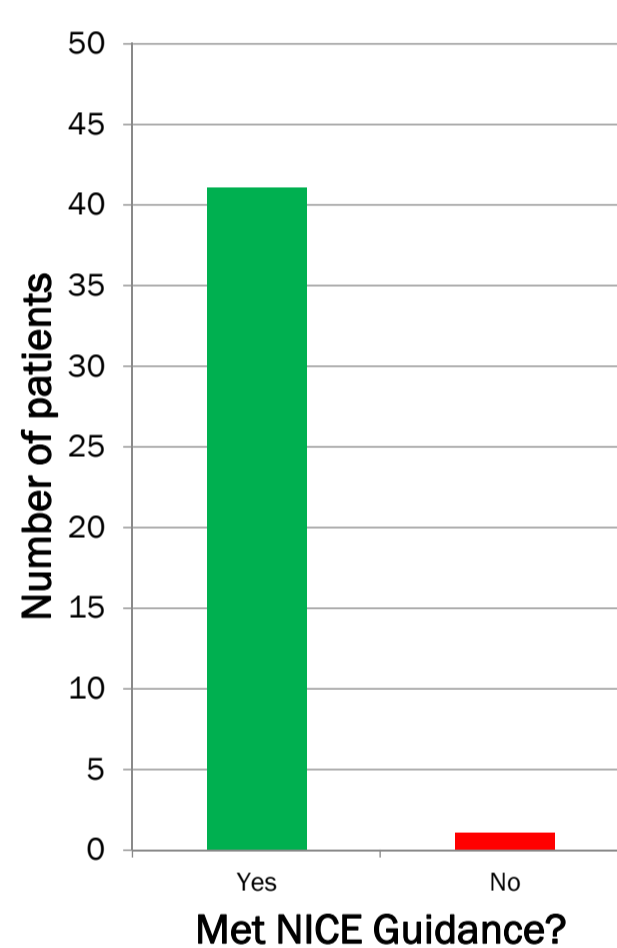
Urea and Electrolytes



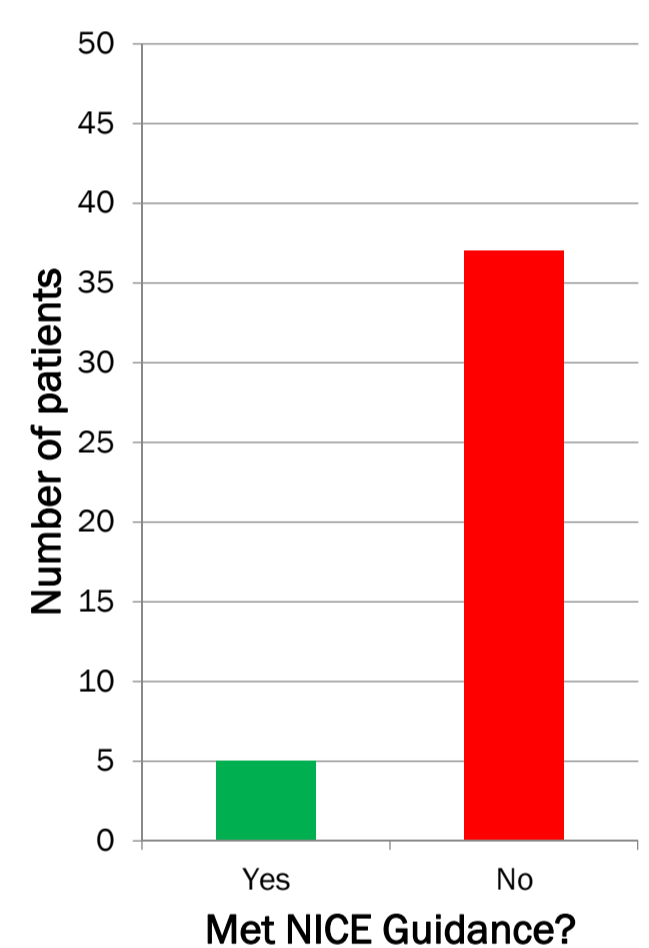
Glucose



Fluid Balance



Overall



Discussion

Considering the risk of hyponatraemia³ and death¹ caused by the use of hypotonic fluids in children, it is positive to note that they are no longer being prescribed. However, the lack of monitoring is concerning, especially when taking into account the length of time for which patients were receiving fluids. This could allow deranged electrolytes and glucose to go unnoticed, resulting in clinicians not responding to abnormalities and unknowingly giving inappropriate fluids. In many cases, fluid balance charts only recorded inputs, meaning that an accurate fluid balance could not be calculated from the information documented. Based on the results of the audit, healthcare professionals in the Leeds Children's Hospital should be educated about how to improve their practice to line up with the NICE guidance, and other trusts should conduct a similar audit to see if the issues are recurring.

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^bResearch supervised at the Paediatric Anaesthetic Department, Leeds Children's Hospital, Leeds General Infirmary, Leeds Teaching Hospitals Trust

¹ National Patient Safety Agency. Patient Safety Alert: Reducing the risk of hyponatraemia when administering intravenous infusions to children. 2007 [26/20/2019]. Available from: <https://www.sps.nhs.uk/wp-content/uploads/2018/02/2007-NRLS-0409-Hyponatraemia-cen-PSA-2007-03-28-v1.pdf>.

² National Institute for Health and Care Excellence. Intravenous fluid therapy in children and young people in hospital. 2015 [19/10/2019]. Available from: <https://www.nice.org.uk/guidance/ng29>.

³ Choong K, Arora S, Cheng J, Farokhyar F, Reddy D, Thabane L, et al. Hypotonic versus isotonic maintenance fluids after surgery for children: a randomized controlled trial. Pediatrics [Internet]. 2011 Nov [26/20/2019]; 128(5):[857-66 pp.]. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/22007013>.

