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Introduction

In March 2007, the National Patient Safety Agency (NPSA) published a Patient Safety Alert highlighting the risk of hyponatraemia associated with the use of hypotonic intravenous fluids for children. Local audits conducted in 2006 and 2008 were followed by the introduction of a local peri-operative fluid management guideline in 2009.

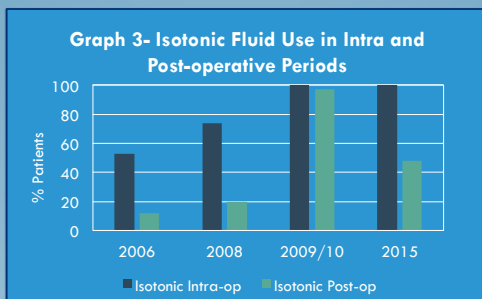
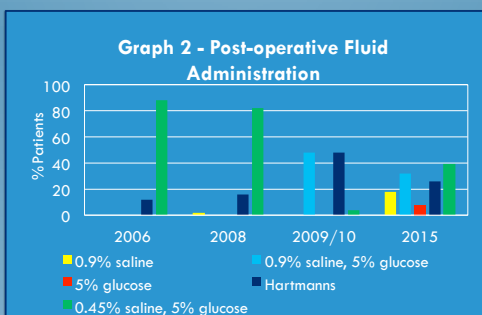
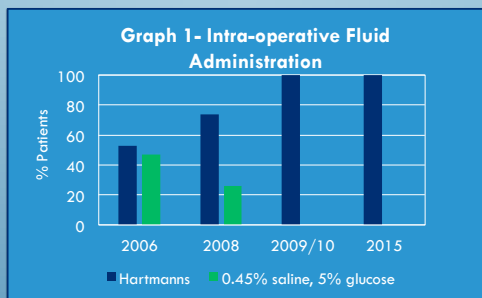
Repeat audit in 2009/10 demonstrated increased compliance with pre-, intra- and post-operative isotonic fluid prescription.

We repeated this audit in 2015 to monitor adherence to local and NPSA guidelines.

Methods

Paediatric (0-15 years) patients undergoing laparoscopic or open appendicectomy between January – July 2015 were identified from a theatre management system (Opera).

A detailed case note review was undertaken, and information regarding peri-operative fluid prescription and biochemical monitoring was recorded. Data was compared statistically using chi-squared 2x2 contingency tables to that obtained from previous audits.



Results

Results of the 2015 data re-audit showed intra-operative isotonic fluid prescription remained 100% (Graph 1). Pre-operative isotonic fluid use remained static but post-operative use decreased significantly (Graph 2).

Compliance with NSPA recommendations regarding post-operative biochemical monitoring also fell significantly.

2 children developed hyponatraemia (Na<135) in the post-operative period compared with no incidences in 2009/10 audit period. No child was symptomatic.

Discussion

The work done in 2009/10 improved peri-operative fluid management of children undergoing appendectomies in Ninewells Hospital. By 2015 some of these improvements had been maintained (e.g. the use of isotonic fluids pre and intra-operatively) but some practice had changed, with the prescription of hypotonic fluids increasing post-operatively (Graph 3), which had biochemical consequences for the children involved. A decrease in daily post-operative biochemical monitoring suggests potentially even more children were at risk of hyponatraemia.

Conclusions

Educational strategies have previously been successful in changing local practice regarding peri-operative fluid prescription. We plan to hold a joint local paediatric and anaesthetic meeting to present our findings and discuss ways in which practice can be improved and sustained in line with local and national recommendations.

References

1. NPSA Patient Safety Alert 22. Reducing the risk of hyponatraemia when administering intravenous infusions to children. www.npsa.nhs.uk/health/alerts.
2. APA Consensus Guideline on perioperative fluid management in children v 1.1 Sept 2007
3. Nice Guideline [NG29]. Intravenous fluid therapy in children and young people in hospital.

| RESULTS | 2006 | 2008 | 2009/10 | 2015 |
|-----------------------------|------|------|---------|--------------|
| Number of patients | 51 | 61 | 27 | 38 |
| Admission U&Es | 98% | 97% | 100% | 95% |
| Admission Na <135 | 5 | 8 | 1 | 5 |
| Na <135 on hypotonic fluids | 4 | 6 | 1 | 0 |
| Iatrogenic Na <135 | 4 | 0 | 0 | 2 |
| Pre-op hypotonic fluid | 62% | 75% | 44% | 59% |
| Intra-op hypotonic fluid | 47% | 26% | 0% | 0% |
| Post-op hypotonic fluid | 88% | 80% | 3% | 42% (p<0.05) |
| Compliance NSPA monitoring | 62% | 69% | 82% | 50% (p<0.05) |