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Intravenous rehydration of children with gastroenteritis: which solution is better?

Recent publications have suggested that hyponatraemia may develop in children with gastroenteritis treated with intravenous hypotonic saline.¹⁻³

Even though we believe these papers have been well designed and developed, we cannot agree with their results for we are carrying out a similar study in our centre (81 cases up to now) that is leading to the opposite conclusion: our children with gastroenteritis did not develop hyponatraemia even though they were all treated with hypotonic intravenous solutions (0.3% saline with 5% glucose), while isotonic fluids were only used in "pre-shock" situations.

The incidence of hyponatraemia at the time of diagnosis is lower in our study (9%) than in those published previously (range 30-50%); this could be due to differences in climate or diet.

In the analysis, we separated children according to whether they were hyponatraemic, normonatraemic, or hypernatraemic at presentation. In the first group, hypotonic intravenous saline increased mean plasma sodium (from 132.4 (SD 2.07) to 135.3 (SD 2.21) mEq/l); it was decreased slightly in the second group, without leading to hyponatraemia (139.2 (SD 2.9) to 137.3 (SD 2.9) mEq/l), and also in the third group (150.4 (SD 4.12) to 140.6 (SD 3.6) mEq/l). No cases of hyponatraemia post-infusion were seen. Hoorn and colleagues,⁴ in a sample of 1586 children, showed that the cases of hyponatraemia in their study were due to incorrect treatment, with higher volumes of fluid than needed.

In our study, 10 children (16.3%) presented with glucose levels lower than 70 mg/dl (40 mg/dl in one case). If these children were treated with isotonic fluids without adequate glucose, levels would never increase, with serious consequences.

These data are not definitive, but should be taken into consideration before selecting an appropriate solution in these patients. Further studies with different designs are required.

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Prediction of vesicoureteral reflux: sibilla or more?

The study of Leroy and colleagues¹ about the predictive value of some simple clinical parameters on the presence of vesicoureteral reflux (VUR) in children with previous pyelonephritis, seems to disclaim previous results of Oostenbrink.² All protocols now recommend that micturating cystourethrography (MCUG) is carried out in children after pyelonephritis.

Some years ago we performed a prospective study which showed that the number of cystourethrographies can be significantly reduced in these children.³ In children (0-4 years of age) without VUR, fever is preceded by symptoms such as low fever, anorexia, irritability, drowsiness, diarrhoea, or foul smelling urine. At least one of these was present in the clinical history of 114 of 218 children with fever >38.5°C; of these children, only 16 later showed VUR. However, 85 of the 104 children without symptoms preceding fever had VUR ($p < 0.001$). If MCUG had been performed only in children with no other symptoms before fever onset (104 of 218 febrile children), VUR would have been detected in 85 of 101 (84.1%), with 16 patients being undiagnosed (most of the undiagnosed VURs were low grade).

The reduction in MCUGs performed would have been considerable (114 instead of 218). Greater sensitivity could be also obtained by performing MCUG in all children <4 months (only nine undiagnosed VUR). Prediction of VUR after a first febrile urinary tract infection in children is possible. Our strategy therefore improves the cost-benefit relationship in children with urinary tract infection by significantly reducing the need for invasive and expensive radiological procedures.⁴

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Scope for improvement: hospital wide sedation practice at a children's hospital

Procedural sedation by non-anaesthesia staff is frequently required in children, yet even "safe" agents can be associated with serious adverse events.¹ Professional societies and professional bodies have published sedation guidelines in a number of countries.² However, no data exist about the characteristics of sedation practice from a hospital wide perspective. We set out to determine the spectrum and quality of procedural sedation performed by non-anaesthesia staff at a tertiary paediatric hospital.

All episodes of procedural sedation by non-anaesthesia staff outside intensive care units were prospectively tracked over three weeks in 2004 at a tertiary children's hospital (Royal Children's Hospital, Melbourne, Australia). Sedations were identified by twice daily hospital "walk through" by the authors. Data collected included patient demographics and circumstances of the sedations.

Table 1 Procedural sedation at a tertiary children's hospital: indications, agents used, and locations (n = 120)

	n (%)
Indications	
Suture placement	14 (11.7)
Drain removal (wound, chest)	14 (11.7)
EEG	13 (10.8)
IV insertion/venepuncture	13 (10.8)
Echocardiography	9 (7.5)
Reduction of fracture/dislocation	8 (6.7)
Bone scan	6 (5.0)
Lumbar puncture	6 (5.0)
Other*	37 (30.8)
Agents	
Midazolam	49 (40.8)
Nitrous oxide	32 (26.7)
Chloral hydrate	15 (12.5)
Trimeprazine	12 (10.0)
Ketamine	5 (4.2)
Other†	7 (5.8)
Location	
Inpatient wards (multiple)	41 (34.2)
Emergency department	35 (29.2)
EEG department	13 (10.8)
Radiology department (x ray, ultrasound, nuclear medicine, CT, MRI)	9 (7.5)
Cardiology (electrocardiogram, echocardiogram)	8 (6.7)
Day surgical and medical units	6 (5.0)
Dental	4 (3.3)
Other	5 (4.2)

*Includes 16 other types of procedures.

†Includes three other sedative agents.