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LETTER

Fatal iatrogenic hyponatraemia

RF - FAMILY

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We recently cared for a 13 month old girl admitted to hospital following a short history of diarrhoea and vomiting. Clinical examination revealed lethargy and moderate dehydration. Initial serum sodium was 137 mmol/l and she was commenced on intravenous fluids using 4% dextrose/0.18% saline.

Twelve hours after admission the child suffered a generalised tonic-clonic seizure at which time the serum sodium was found to be 120 mmol/l. Unfortunately, the child went on to have a respiratory arrest, developed fixed dilated pupils, and died despite full intensive care. An extensive postmortem examination revealed only diffuse cerebral swelling with necrosis of the cerebellar tonsils.

It is well recognised that symptomatic hyponatraemia can result in significant morbidity and mortality in previously healthy children^{1,2} and adults.³ The administration of hypotonic intravenous fluids to children can be fatal and the reasons for this have been well documented for several years. Many physiological stimuli encountered during acute illness result in the non-osmotic release of antidiuretic hormone; these include pyrexia, nausea, pain, reduced circulating volume, and the postoperative state. The administration of hypotonic intravenous fluids in these circumstances results in the excretion of hypertonic urine, the retention of free water, and the development of hyponatraemia.⁴

Despite clear and repeated warnings over the past few years,⁵⁻⁷ the routine administration of 4% dextrose/0.18% saline remains standard practice in many paediatric units. This practice is based on formulas developed for calculating maintenance fluid and electrolytes in healthy children over 40 years ago and there seems little understanding of the potential risks associated with their use during acute illness.

A global change of clinical practice is required to prevent these needless deaths. This is a challenge that the RCPCH should face up to, together with the Medicines Control Agency and the National Patient Safety Agency. A useful first step would be to label bags of 4% dextrose/0.18% saline with the warning that severe hyponatraemia may be associated with its use.

References

1. Arieff AI, Ayus JC, Fraser CL. Hyponatraemia and death or permanent brain damage in healthy children. *BMJ* 1992;304:1218-22.[Medline]
2. Bhalla P, Eaton FE, Coulter JBS, *et al.* Lesson of the week: hyponatraemic seizures and excessive intake of hypotonic fluids in young children. *BMJ*

1999; 319:1554-7.[\[Free Full Text\]](#)

3. **Sjoblom E**, Hojer J, Ludwigs U, *et al*. Fatal hyponatraemic brain oedema due to common gastroenteritis with accidental water intoxication. *Intensive Care Med* 1997;23:348-50.[\[CrossRef\]](#)[\[Medline\]](#)
4. **Halberthal M**, Halperin ML, Bohn D. Acute hyponatraemia in children admitted to hospital: retrospective analysis of factors contributing to its development and resolution. *BMJ* 2001;322:780-2.[\[Free Full Text\]](#)
5. **Bohn D**. Children are another group at risk of hyponatraemia perioperatively. *BMJ* 1999;319:1269.[\[Free Full Text\]](#)
6. **Durward A**, Tibby SM, Murdoch IA. Hyponatraemia can be caused by standard fluid regimens. *BMJ* 2000;320:943.[\[Free Full Text\]](#)
7. **Moritz ML**, Ayus JC. La Crosse encephalitis in children. *N Engl J Med* 2001;345:148-9.[\[Free Full Text\]](#)

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