Hyponatraemia-related death after paediatric surgery still exists in France

Editor—Guidelines related to maintenance fluids in children have been recently implemented in the UK by the National Patient Safety Agency (NPSA)\(^1\) and a recent editorial commenting on these changes included comparison with the French situation.\(^2\) Although 'safe' fluids have been available in France for a while, deaths still occur as a consequence of hyponatraemia as shown by this example extracted from the recent French survey on perioperative deaths.\(^3\)

A 4-yr-old, 15 kg, female child with no medical history (ASA I) was admitted for dental extraction. The anaesthetist in charge was trained to anaesthetize children. Anaesthesia was started at 10:30 a.m. using sevoflurane and sufentanil and tracheal intubation was performed. A peripheral venous access was maintained with dextrose 5%. At 1:00 p.m., the child vomited swallowed blood, cried, and complained of headache. Because vomiting continued, the nurse decided to continue infusion of dextrose 5% solution to counterbalance the effects of fasting. On the next morning (10:00 a.m. and 1:00 p.m.), the child was again examined by two anaesthetists because of persisting sedation. From surgery to the next day, the child had received 1200 ml of dextrose 5% and had had 12 episodes of vomiting. The child was then admitted to the paediatric medical unit at 2:00 p.m. and the child was said to be comatose (Glasgow coma score 6). A blood sample revealed hyponatraemia at 120 mmol litre\(^{-1}\) and haemoglobin concentration at 10.9 g dl\(^{-1}\). The infusion was modified to dextrose 5% +60 mmol litre\(^{-1}\) of sodium chloride over 24 h. In the evening, respiratory distress, a worsening coma, and unilateral mydriasis led to tracheal intubation and transfer in a paediatric ICU. A cerebral CT scan showed diffuse oedema while echocardiography disclosed a very dilated and hypokinetic left ventricle. The patient died several hours after arrival in the ICU.

Search of contributory factors showed that local guidelines on fluid administration in children did not exist in this institution and prescription rules were not clear. Many decisions were also left to the nurse. Apart from these system failures, it is of note that none of the physicians or nurses involved evoked that symptoms could have been related to hypotonic infusion.

We have found that the rate of deaths totally or partially related to anaesthesia for the age range 0–7 yr is 0.6 per 100 000 anaesthetics (95% CI: 0.12–3.2 per 10 000).\(^4\) This translates into a rate of three deaths each year for this age group in our country, of which one is related to hyponatraemia-induced complications. Although the number of accidents is small, their impact is huge and unacceptable. This cannot be considered as a residual small number because the deficiencies observed are amenable to improvement. A solution containing Ringer’s lactate and dextrose 1% also known as B66 is available in France, but was not used. This solution is now commercially available from several industrial manufacturers which should facilitate implementation of its use of such solutions in the UK. Although this wide availability should have also facilitated its use in France, a number of institutions and physicians are not aware of the risk associated with infusion of hypotonic solutions in children. The prescribing of i.v. fluids should be as rigorous as the prescribing of drugs.\(^4\) This suggests that actions such as the one driven by the NPSA are to be commended and are also necessary in France.

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Nitrous oxide and postoperative cardiovascular morbidity

Editor—I read with interest Professor Myles’ article on the effect of nitrous oxide on plasma homocysteine and folate in patients undergoing major surgery.\(^1\) I would like to query the conclusion with respect to cardiovascular morbidity in this cohort. In the patient characteristic data in