We observed hyponatraemia in several pre-hydrocephalus after posthaemorrhagic punctures in preterm infants. Hyponatraemia as a consequence of serial liquor punctures in preterm infants with a ventricular access device after posthaemorrhagic hydrocephalus

We observed hyponatraemia in several preterm children treated with a ventricular access device (Rickham reservoir) after intraventricular haemorrhage (IVH) and serial liquor puncture to drain liquor. To rule out a correlation, we prospectively investigated the data of all preterm children (23–32 weeks of gestational age) treated at the University Children’s Hospital of Cologne with a ventricular access device during 1996–1999 (n = 16).

Sixteen of 480 preterm infants (3.3%) of less than 1500 g birth weight (430–1500 g) developed an IVH and required treatment with a ventricular access device. The mean gestational age of these children was 27 weeks (range 23–32).

Twelve of them (75%) developed hyponatraemia (< 130 mmol/l). The minimum serum sodium of all patients was 110–136 mmol/l (mean SD 125.8 ± 6.3 mmol/l). The maximum amount of liquor tapped a day was 3–34 ml (mean 15.6 ml). The resulting daily sodium loss in the tapped liquor was 0.4–3.7 mmol/kg/day (mean 1.98 ± 0.94 mmol/kg/day). The extent of the hyponatraemia (minimal serum sodium) correlated significantly with the maximum daily sodium loss in liquor (r = 0.78, p < 0.001, fig 1).

Further analysis of the use of drugs—for example, thiocyanates—did not contribute to this correlation. Two children with hyponatraemia developed general hypotonia with poor feeding; this prompted further diagnostic measures to exclude syndrome of inappropriate antidiuretic hormone (SIADH) or excessive sodium loss in urine. The investigations were negative. Both children showed normal neurology after adequate replacement of the sodium lost. No child with hyponatraemia developed other acute neurological symptoms such as seizures.

This is the first report of hyponatraemia as a consequence of serial liquor punctures with a ventricular access device in children. The sodium loss was sometimes as high as the normal sodium requirement per day (3–5 mmol/kg/day).

Hyponatraemia in children caused by the use of a ventricular access device should be managed carefully and the sodium replaced promptly. Loss of sodium by serial liquor tapping must be taken into the differential diagnosis of hyponatraemia in preterm infants.

K Tenbrock, A Kribs, B Roth
Department of Neonatology and Pediatric Intensive Care, University Children’s Hospital of Cologne, Cologne, Germany

B Speder
Neurosurgical Department, University Hospital of Cologne

Correspondence to: Dr Tenbrock, Walter Reed Army Institute of Research, MCR, Washington DC 20037-5100, USA; klaus.tenbrock@na.amedd.army.mil

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Use of animal surfactant: should we seek consent?

Animal derived surfactants such as Curosurf (porcine) and Survanta (bovine) are the commonly used surfactants in the United Kingdom. Involvement in a trial of a new artificial surfactant, and the specific information on the origins of the surfactant in the patient information leaflet led us to review our practice. Two families declined to participate in the trial. A Hindu family wished to avoid use of Survanta, as cows are considered sacred in Hindu religion. A Moslem family preferred to avoid porcine products. Having reviewed our own practice, we were unsure as to the practice of other units.

We telephoned the second on call doctors in 42 teams providing newborn resuscitation and initial surfactant therapy to preterm infants in England and Wales. Respondents were asked about which surfactant was available and whether the constituents were usually discussed with parents.

Only nine of 42 respondents said that they would routinely discuss the constituents of the surfactant with the families and could remember having done so in the recent past.

Twenty two respondents in England said that their units only stocked Curosurf, two units stocked Survanta, and three units stocked Curosurf and Survanta. One did not know which surfactant was available. In Wales, 13 units had only Curosurf and one unit stocked both Curosurf and Survanta.

We were surprised by the number of people who had thought about this being a possible problem. With many units choosing to stock only one surfactant, we think that it is important to keep all parents fully informed both of the importance of early administration and the nature of the available surfactants.

We suspect that, with sufficiently informed, most parents would agree to a life saving medicine. However, we are not sure if this consent should be presumed where there are grounds to wonder if this may be a problem. Individual families will still need to make their own decisions to avoid the perception that the medical profession has a patronising attitude.

We hope to generate a discussion to see if a consensus can be evolved.

R Adappa, R Benson
Department of Paediatrics, Ysbyty Gwynedd, Bangor, N Wales, UK
S Oddie, J Wylie
Neonatal Intensive Care Unit, James Cook University Hospital, Middlesbrough, UK

Correspondence to: Dr Adappa; tushanadappa@aol.com

Intravenous propacetamol overdose in a term newborn

Following a prescribing error, a term female infant was given two intravenous doses of 900 mg propacetamol (307 mg/kg/dose) at 6 hour intervals, which is 10 times the routine dose used in our unit (120 mg/kg/day). When the error was noted, immediately after the second dose, the plasma paracetamol level was 163.8 mg/l. N-Acetylcysteine was given as follows: 150 mg/kg (430 mg) after 15 minutes, 90 mg/kg (145 mg) after four hours, and 100 mg/kg (290 mg) after 16 hours. Plasma paracetamol levels were checked: 119.9 mg/l five hours later, 61.4 mg/l 11 hours later, 28.8 mg/l 16 hours later, and finally 1 mg/l 24 hours after the second dose (fig 1). Liver function and clotting factors were normal. The infant was discharged on day 7.

Paracetamol poisoning in newborn babies is usually due to either maternal absorption of high doses of the drug just before birth or oral absorption of an inappropriate dose. Reports of propacetamol overdose are unusual, and so far the overdose has only been by intramuscular injection. As far as we know, this is the first report of intravenous propacetamol poisoning in a newborn. This reason may be the rare use of this drug during the neonatal period, the pharmacokinetics having been
published in only one study for this stage of life. However, as with other routes of administration described in the literature, no adverse effects were seen in this case. The administration of N-acetylcysteine following guidelines given for older patients proved efficient. The elimination of the drug seems to be linear. Although drug overdose should be carefully avoided, intravenous propacetamol is probably safe in term newborn babies.

A de la Pintière, A Beuchée, P E Bétrémieux
Unité de réanimation néonatals et pédiatrique, Pavillon Lechartier CHU Pontchaillou, Rennes 35033, France; pierre.betremieux@chu-rennes.fr

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Endotracheal tube fixation in neonates
A stitch in time saves nine. But not all neonatal units believe in this saying and use different methods to secure oral endotracheal tubes in neonates who require ventilatory support. Success in stabilising a premature infant is best achieved by least intervention and good ventilatory support. A stable oral endotracheal tube will help. A naso-oral endotracheal tube is extremely easy to stabilise; however, stabilisation is not routinely performed in the United Kingdom.

Three commonly used methods are: (a) stitching the tube to a plastic flange; (b) fixing a premeasured and cut tube in a flange with adhesive tape; (c) fixing a premeasured and cut tube into a tight fitting flange. In all three methods, the tube is secured by tying it to the baby's hat.

Normally, weight or foot length is used to determine endotracheal tube size, and this is quite reliable. However, head movement, suctioning, and patient care can all cause instability and displacement of the tube. If the tube is too short, there will be ineffective ventilation. If the tube is too long, it may collapse resulting in selective ventilation. A precut tube is difficult to manipulate if the positioning is not satisfactory. This is not a major problem in a stitched tube. There are pros and cons to each method. There are no comparative studies from the United Kingdom to evaluate the benefits and disadvantages of each method. A search through the databases found no randomised trials comparing various techniques, except one study which compared an umbilical clamp with the routine fixing method.

Accidental extubation or unsatisfactory positioning of the tube may influence the reintubation rate. Securing and properly stabilising an endotracheal tube can solve this problem to a large extent.

A prospective randomised trial evaluating each method against reintubation criteria will help neonatal units to adopt the correct policy for their own situation.

V A Pai
Southmead Hospital, Bristol, UK
B V Pai
Royal united Hospital, Bath, UK; binapai@hotmail.com

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