LETTERS TO THE EDITOR

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A national review of neonatal resuscitation programmes for midwives

Editor,—A considerable number of babies with no obstetric or neonatal risk factors require help in establishing respiration at birth.

This may range from tactile stimulation to bag and mask ventilation to endotracheal intubation. Midwives in the United Kingdom are primarily involved in the initial resuscitation of newborn babies in delivery units and at home.

There is a national lack of neonatal resuscitation training in the United Kingdom, with inadequate provision of neonatal life support skills remaining an acknowledged contributory factor to perinatal death.

Adequate provision of neonatal life support training in the United Kingdom, with inadequate provision of neonatal life support skills remaining an acknowledged contributory factor to perinatal death.

There are pronounced structural differences between the available resuscitation programmes. Those in 100 (58%) units currently not following the UK Resuscitation Council guidelines expressed a desire to change accordingly.

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Hypernatraemia: why bother weighing breast fed babies?

Editor,—Hypernatraemic dehydration is associated with cerebral oedema, intracranial haemorrhage, hydrocephalus, gangrene, and death, but is notoriously difficult to detect clinically. It is accepted in paediatric practice that weighing is an essential part of the assessment of an infant’s hydration.

In Bristol, one neonate a month is admitted with hypernatraemic dehydration secondary to delayed recognition of inadequate lactation.

We believe that this is a result of the reluctance of midwives to weigh breast fed infants.

Five neonates admitted after they became unwell from dehydration secondary to lactation failure were described (table 1). Assessment of lactation and hydration had raised no concern. Four of five of these mothers were primigravidas and four of five gave up breast feeding despite encouragement to continue.

The weighing practices of midwifery teams and the opinion of neonatologists throughout the South West Region were compared by telephone survey. Four of 13 community midwifery units always or often weighed babies on day 3, 4, or 5, and the other nine routinely weighed for the first time since birth on day 7 or 10. Twelve of 14 consultant neonatologists thought that breast care would be provided by routinely weighing on day 3, 4, or 5 after birth (midwifery practice v consultant opinion, χ² 0.006; χ² test).

Hypernatraemic dehydration as the result of failure to establish lactation is well described, although not recently in this country. Associated factors include first time motherhood, poor support of lactation, and failure to monitor early feeding. Identification of excessive weight loss can swiftly identify breast feeding problems, enabling appropriate lactation support to be given and prevention of hospital admission.

In common with the American Academy of Pediatrics and others, we recommend that breast fed infants should be weighed between 72 and 96 hours after birth when normal weight loss is at its maximum.

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Table 1 Clinical details of five neonates presenting with hypernatraemic dehydration

<table>
<thead>
<tr>
<th>Infant</th>
<th>Maternal parity</th>
<th>Birth weight (kg)</th>
<th>Day 1 and 2 weighed</th>
<th>Weight loss (%)</th>
<th>Plasma sodium (mmol/L)</th>
<th>Plasma urea (mg/dL)</th>
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<tbody>
<tr>
<td>1</td>
<td>0</td>
<td>3.430</td>
<td>8</td>
<td>25</td>
<td>168</td>
<td>6.1</td>
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<tr>
<td>2</td>
<td>0</td>
<td>2.120</td>
<td>7</td>
<td>24</td>
<td>172</td>
<td>34.8</td>
</tr>
<tr>
<td>4</td>
<td>0</td>
<td>3.799</td>
<td>6</td>
<td>19</td>
<td>158</td>
<td>46.3</td>
</tr>
<tr>
<td>5</td>
<td>3</td>
<td>3.630</td>
<td>6</td>
<td>20</td>
<td>150</td>
<td>10</td>
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<tr>
<td>6</td>
<td>3</td>
<td>2.420</td>
<td>4</td>
<td>13</td>
<td>157</td>
<td>6.1</td>
</tr>
</tbody>
</table>

Placement of neonatal central venous catheter tips in the right atrium: a practice to be avoided?

EDITOR,—Following the recent media interest in pericardial tamponade complicating the use of percutaneous central venous catheters in neonatal patients, we wish to alert readers to our experience. Our previous policy was to accept right atrial placement of percutaneous central venous catheter tips. This was in line with published recommendations and is still considered acceptable practice in some units in the United Kingdom, in contrast with practice in the United States. Between 1992 and 1997, we had five cases of neonatal pericardial tamponade, three of which resulted in death. All were associated with right atrial tip position, determined by angiography, or looping of the line. We have now changed our unit policy to avoid placement of catheter tips in the right atrium, and instead place them in the superior or inferior vena cava. In addition, to allow for the possibility of catheter migration, we recommend that catheter tips should lie at least 0.5 cm outside the cardiac outline on chest radiograph in small infants, or 1.0 cm outside in larger infants. Although a right atrial tip position carries a small risk of thrombosis or hydrothorax,1 these complications are more benign than pericardial tamponade, which has a mortality of 65%.2,3 We recommend that placement of a percutaneous central venous catheter tip in the right atrium should no longer be accepted. In addition, we suggest that catheters that display angulation, curvature, or looping within the right atrium carry a particularly high risk of pericardial tamponade and demand urgent action. Although this issue has been the subject of correspondence in the RCPECH email discussion list, where the consensus was to avoid right atrial tip position, we believe there is a pressing need for a wider debate about current practice in the United Kingdom.

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Newborns have unique confounding factors regarding the TfR-F ratio

EDITOR,—Sweet et al investigated the serum transferrin receptor (STIR) and, for the first time in neonates, transferrin receptor-log ferritin (TfR-F) ratio in a prospective series of cord blood taken from term infants and their mothers. They are to be congratulated on completing another piece of the complex jigsaw that is fetal and neonatal iron metabolism.

STIR and TfR-F were increased in iron deficient mothers, but not in their infants. The authors discussed some length the translational (not transcriptional as stated in the discussion) control of intracellular ferritin synthesis. They measured serum ferritin, which is a glycosylated form of L-ferritin, and has been shown to correlate with intracellular iron in the absence of confounding factors.4 However, serum ferritin is secreted in response to a wide variety of stimuli, including, for example, inflammation and shows gender differences in newborns.5,6 Thus, in circumstances, serum ferritin may not accurately represent tissue iron stores.

It has already been reported that STIR does not correlate with other measures of iron metabolism in the newborn and is primarily because it is highly expressed by reticuloocytes and other immature erythroid cells, with or without iron deficiency.

The high sensitivity and specificity of the TfR-F ratio in adults is based upon their relationship in iron deficiency in the absence of factors that might otherwise elevate STIR levels.2 With both variables subject to these confounding factors in the neonate, I do not agree with the author’s assertion that the TfR-F index “gives a measure of iron requirements in relation to iron availability” in this unique population.

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Events. The reciprocal regulation of the transferrin receptor and ferritin have recently been expertly reviewed by Hentze and Kuhn.7

We agree that serum ferritin is increased in response to inflammation but the infants that we studied were born at term following normal pregnancies. All the babies had normal birth weights and did not require neonatal care. We think that it is unlikely that inflammation or other stimuli affected our serum ferritin values. Furthermore, in this study, and in our previous study of preterm infants8 we found no gender differences in contrast to the results published by Tamura et al.9 Our figures for cord ferritin levels at term (listed first as mean ± SD) in neonatal infants is almost identical to that reported by Tamura et al (164 ± 106 µg/l v 166 ± 110 µg/l), but our value for male infants is higher (160 ± 97 µg/l v 123 ± 71 µg/l). We doubt if there are real gender differences in ferritin levels. Therefore, we are still of the opinion that TfR-F index is a measure of iron requirements in relation to iron availability in the fetus and newborn as in adults and children.

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5 Changes in plasma ferritin in first 72 hours of life

EDITOR,—Recently, Miiall et al1 have reported a rapid rise in serum ferritin in the first 48 hours of life in neonates. But we have noticed in our clinical day to day practice that this rise is transient and may not be clinically significant. To confirm this, we looked at the initial serum ferritin levels in a stable group of term neonates admitted to the neonatal intensive care unit of King Fahd Hospital of the University, Al-Khobar, Saudi Arabia.

Neonates with congenital anomalies, peri- nat al asphyxia, and those requiring ventilatory support were excluded. The serum ferritin levels were measured together with electrolytes by using an automatic analyser (Dimension, Delaware, USA), which were relayed by the reporting computer system (Ulti-view, Los Angeles, USA). Serum creatinine was available for the first 72 hours on a limited number of neonates. Of the selected babies were stable within the first 48 hours of life and there was no need for extra serum electrolyte and creatinine measurements. Out of all the newborns admitted during the three month study period who fulfilled the inclusion criteria, 13 neonates had serum ferritin measurements available for the first 72 hours. These readings were noted down and were analysed using the SPSS software. The statistical analysis was done to see if there was any significant change over the mean, standard deviation and statistical significance.9,10

Out of thirteen neonates, seven (53.8%) had an increase in their plasma ferritin on the second day while four (30.7%) had a
The drop to 0.44, as compared with day 1 of
necessarily indicate renal failure or kidney
atinine level in early newborn period does not
the first 72 hours of life. A raised serum cre-
reduction. The remaining two (15.3%) had
no change in their creatinine. After 72 hours
of life, 12 out of 13 (92%) of the cases had a
reduction in the creatinine (fig 1). By the
time, the mean serum creatinine of the
cohort had dropped to a significant level,
0.64 mg/dl to 0.44 mg/dl, p = 0.04 (table 1).

The study demonstrated a trend of fall in
serum creatinine level by 72 hours. This
reflected the improvement in the renal
function and GFR. The improvement in the
GFR has shown to be a function of postcon-
cepitional age, reflected by lower creatinine
levels in term and near term infants as com-
pared with preterm infants.1

We noted that the rise in creatinine in the
first 48 hours was no longer and by the third
day most of the creatinine levels (92%) had
dropped down. One could argue about the
sample size of our study. The sample size was
restricted as no extra blood was extracted for
sample size of our study. The sample size was
restricted as no extra blood was extracted for

In conclusion, caution should be exercised
on the causes of peripheral nucleated red
cells in newborn children and would add another
differential diagnosis to this finding.

In the last decade, we have discovered two
families affected by haemoglobin disorders
where the diagnosis was suspected by the
presence of high numbers of nucleated red
cells in neonatal blood tests. In neither family
was the potential for significant haemoglobin
disorders suspected. The families concerned
were Indian Asian in origin and the marriages
were consanguineous. The children now
present with thalassaemia intermedia, but
because of the difficulty in predicting the
clinical course of these disorders, it is not yet
clear whether they will become transfusion
dependant, although this is highly likely for
two individuals, one in each family.

The first recognised child in Family 1 was
born in 1991. A blood test performed because
of jaundice on the third day of life showed
160NRBC/100WBC. Other causes of eryth-
roblastosis were excluded. Haemoglobin
analyses on the parents showed that the
mother was heterozygous for Indian inversion/
intermedia: Is it possible consistently to
detect thalassaemias from genotype. Brit J

The literature to date contains one large
series,2 two similar case reports with fluoxetine3
and two case reports with paroxetine.7

In the case of fluoxetine, the syndrome was
described as a withdrawal phenomenon.

In the first, a neonate born to a mother on
fluoxetine had jitteriness, irritability, tachy-
phoea, temperature instability, tremors,
increased muscle tone, and a hyperactive Moro
reflex.4 All except the last of these are clinical
features seen in serotonin toxicity in adults
using selective serotonin uptake inhibitors
(SSRIs) therapeutically or in overdose.5 The
neonate in this case had fluoxetine levels that
were measurable initially and which fell as
symptoms resolved.

In the second case reports with paroxetine,
the syndrome is referred to as a withdrawal
phenomenon. However the time course and
symptoms were similarly typical of serotonin
excess.

In the cases reported by Stiskal et al6 the
neonates developed the features within a
short time of birth and they resolved over a
period of days. In case 2 an increased serum
paroxetine level was reported in the infant. The
level was too low to detect by day 15, supporting
a toxicity syndrome, rather than a withdrawal
phenomenon. Similarly, in case 4 there was a
raised serum paroxetine level at the time of the
adverse effects. Serum paroxetine levels have
been positively related to serotonin toxicity in
adults.

The features of case 4 may also have
been exacerbated by the use of opiates in the
delivery room. Pethidine is a well recognised
cause of serotonin toxicity in conjunction with
a serotonergic agent.7

By March 2001, there were 13 reports to
the Australian Drug Reaction Advisory
Committee classified as ‘withdrawal syndrome

Table 1

<table>
<thead>
<tr>
<th>Child</th>
<th>Date of birth</th>
<th>Age (days)</th>
<th>Hb (g/dl)</th>
<th>WBC (corrected)</th>
<th>NRBC/ 100WBC</th>
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<tr>
<td>ZR (male)</td>
<td>20/07/90</td>
<td>3</td>
<td>11.1</td>
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<td>22</td>
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<tr>
<td>MR (female)</td>
<td>16/08/91</td>
<td>5</td>
<td>12.7</td>
<td>24.0</td>
<td>160</td>
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<tr>
<td>ZR (female)</td>
<td>09/11/96</td>
<td>9</td>
<td>13.3</td>
<td>9.0</td>
<td>100</td>
</tr>
<tr>
<td>HA (male)</td>
<td>16/07/96</td>
<td>1</td>
<td>13.7</td>
<td>11.7</td>
<td>2000</td>
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<tr>
<td>AA (male)</td>
<td>02/07/99</td>
<td>19</td>
<td>14.2</td>
<td>13.9</td>
<td>983</td>
</tr>
</tbody>
</table>

www.archdischild.com
neonatal in conjunction with maternal use of an SSRI. However, on perusal, many appear to describe serotonin toxicity. We have also been involved with the management of a neonate, born to a mother following a sertraline overdose, who exhibited features of serotonin toxicity. In this case there was a single maternal ingestion 1 hour before delivery and therefore no earlier foetal exposure to cause withdrawal. We are concerned about the increasing use of the term “neonatal withdrawal syndrome” in symptomatic neonates being born to mothers on SSRIs. This may prompt the use of the term “neonatal withdrawal syndrome” no earlier foetal exposure to cause withdrawal. The condition should be correctly referred to as “neonatal serotonin toxicity” or, less specifically, poor neonatal adaptation secondary to serotonergic agents.

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Authors’ response

Editor,—Isbister and colleagues point out important issues in defining the syndrome we and others described. Their argument is that the described syndrome is due to a hyper serotonergic state, rather than a lack of serotonin effect, as the term “withdrawal” suggests. We agree that this issue must be clearly solved because of the significant implications in the clinical management of some of the patients, especially concerning the role of continued breast feeding. At the same time, we are unsure whether we have sufficient data to declare that this is a hyper serotonergic condition. When we started summarising our experience as a report, we debated what terminology should be used to describe our patients. The term “SSRI discontinuation syndrome” was considered as it simply describes the temporal relationship between the dose and the syndrome. However, we opted for “withdrawal” because of its common use in similar cases in the literature. For example, a report by Kent and Laidlaw describes a full term healthy boy born to a mother on sertraline who was breast fed for three days. A day after weaning he developed agitation, poor feeding, constant crying, insomnia, and an enhanced startle reaction. These effects intensified over 48 hours then subsided. The time course in this case strongly suggests a withdrawal reaction. Our 2 patients had therapeutic serum concentrations of the drug. However, we do not know the concentrations prior to the presentation, hence the interpretation of the data is not as simple as Isbister and the colleagues indicate.

We think that the conditions we described resulted from a hypo-serotonergic state due to withdrawal. However, the possibility of functional excess of serotonin cannot be ruled out from the clinical assessment alone as there is considerable overlap between the two entities. The cause of the discontinuation syndrome in adults also remains incompletely understood.

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