Amiodarone and breast feeding
An infant was born at 33+2 weeks gestation by caesarean section after an in utero diagnosis of fetal ascesis and tachycardia. The mother had received treatment during pregnancy with flecainide, amiodarone, and propranolol. The amiodarone was prescribed initially at 200 mg three times a day and was reduced to twice a day after 11 days.

During "office hours". This gave the potential for inadvertent prolongation of antibiotic treatment of symptomatic babies if the blood cultures are negative at 48 hours.

Reducing antibiotic use on the neonatal unit by improving communication of blood culture results: a completed audit cycle
It is common clinical practice to discontinue antibiotic treatment of asymptomatic babies if the blood cultures are negative at 48 hours. However, if blood culture results are only available during the normal working day, then antibiotic treatment of some babies may continue into the next working day. In our neonatal unit, blood culture results were routinely received from the microbiology laboratory via fax as a list every morning. Extra positive results would be telephoned through, if they became available, during the normal working day. Results could also be checked by the clinical staff telephoning the laboratory during “office hours”. This gave the potential for inadvertent prolongation of antibiotic courses for up to a day. In a previous study, McDonald et al found this to be a common occurrence. It is of concern because unnecessary antibiotic use may contribute to antibiotic pressure on the neonatal unit.

We performed two audits into this problem within our neonatal unit. Our audit standard on each occasion was that antibiotics should be stopped at 48 hours, if blood cultures were negative, unless a decision to continue was clearly documented in the case notes. Babies with negative blood cultures were identified from the microbiology database. Each episode was classified into one of four groups: (a) antibiotics not started; (b) antibiotics stopped within 48 hours; (c) antibiotics given for more than 48 hours deliberately; (d) antibiotics given for more than 48 hours unintentionally.

The results are summarised in table 1.

The first audit was conducted on 451 babies with negative blood cultures between January 1997 and December 1998. We were able to collect complete data from case notes and drug charts for 376 (83.4%) of these blood cultures. We found that the audit standard was not met in 144/376 (38.3%). The median (range) duration of antibiotic treatment for each baby was 60 (16.9–332) hours.

The blood culture analyst used in our laboratory (BacTAlert Microbial Detection System; Organon Technika Corporation, Durham, North Carolina, USA) tests for bacterial growth every 10 minutes and communicates the blood culture status (positive or negative) to a computer. After our initial audit, we established a computer link between the blood culture analyst and the neonatal unit. This allows the clinical staff to check the status of any blood culture in the analyst in real time, 24 hours a day.

The second audit was performed on babies with negative blood cultures between May 2000 and August 2000. Two hundred negative blood cultures were identified. Complete data were available for 179/200 (89.5%). The audit standard was not met in only 20/179 (11.2%); p<0.001 compared with the first audit. The median (range) duration of treatment was reduced to 48 (1–182) hours (p<0.0001).

There was an overall reduction of two doses of antibiotic per baby (from a mean of 8.8 to 6.8 doses per baby).

Overall, we estimated that we gave 21,674 doses of antibiotics on the neonatal unit between January 1997 and December 1998. If the computer system had been in operation during this period, we estimate that we could have reduced this by 16.2% to 18.169. We think that this magnitude of reduction in antibiotic pressure on the neonatal unit is worth achieving.
Swaddling and heat loss

The letter of Hawkes et al. raises the important issues of swaddling and temperature on admission to the neonatal unit. Besch et al. carried out a limited comparison of different swaddling materials and found a transparent plastic bag together with radiant heat to be effective in preventing heat loss in infants over 2 kg. Following a report in the literature, we have begun wrapping all preterm infants < 1000 g in a thin plastic wrap. The wrap is preheated on a radiant warmer and the infant is immediately placed (undried) on the plastic sheet, which is folded over (but loosely) enclose the torso and extremities from the neck down. The infant is left in the wrap until transported to the neonatal unit and the temperature has stabilised in a humidified environment. The median temperature of the 19 < 1000 g infants admitted since wrapping was commencement was 36.7°C on arrival to the nursery compared with 35.5°C for the previous 86 unwrapped infants (p = 0.002; using Mann-Whitney U test). There were no significant differences in birth weight, gestational age or Apgar scores between the groups.

Although our experience is in smaller preterm infants (who are more prone to hypothermia), our results are in keeping with those of Vohra et al., who studied infants < 32 weeks. We now plan to wrap all preterm infants < 1500 g.

The plastic wrap is likely to be more effective than towels because of reduction in evaporative heat loss and because it allows observation of the infant. However, the plastic wrap is unlikely to significantly reduce radiant heat loss, so an additional heat source is essential for preterm infants. Some form of head swaddling is also important and needs further study. Aluminum foil may reduce evaporative, convective, and radiant heat loss but does not allow observation or radiant warming.

It appears there are many aspects of swaddling that require further investigation.

M P Meyer

Neonatal Paediatrician, Neonatal Unit, KidsFirst, Middlemore Hospital, Auckland, New Zealand and the University of Auckland, mmpeyer@middlemore.co.nz

Preventing hypothermia at birth in preterm babies: at a cost of overheating some?

In the Epicure study, the odds ratio of death before discharge for babies whose temperature on admission to the neonatal unit was > 35°C was 0.86 (95% confidence interval (CI) 0.39 to 0.85) compared with those with lower temperatures. In 2001, we therefore introduced a policy of wrapping neonates < 30 weeks gestation in polythene bags at birth without first drying them. Temperatures on admission to the neonatal unit after the introduction of this policy were compared with those of historical controls of < 30 weeks gestation admitted unwarmed between 1996 and 2000. The admission temperatures were analysed by stepwise multiple regression against being “bagged” or not, time to admission to the unit, birth weight, gestation, mode of delivery, month of delivery, and maternal temperature. Significant coefficients of variation existed between admission temperature and:

- being bagged +0.35°C (0.09 to 0.62) (co-efficient, 95% CI);
- time to admission −0.02°C (−0.01 to −0.03) per minute;
- birth weight +0.07°C (0.02 to 0.1) per 100 g;
- gestation +0.0007°C (0.0002 to 0.001) °C per week.

Thus “bagging” increased admission temperatures by 0.35°C, which is rather less than the rise of 1.9°C in babies < 28 weeks gestation reported in a previous study. Table 1 shows that, in the comparable groups, this rise of 0.35°C resulted in a significant reduction in incidence of hypothermia (< 35.5°C) in “bagged” babies. However, significantly more of them (12%) were hypothermic (≥ 37°C), a phenomenon previously reported but not discussed.

The risks of hypothermia are less well defined than those of hypothermia, but it may increase the risk of pathological damage of partial or even total ischaemia. The technique of wrapping babies in polythene bags would seem to benefit very preterm babies, although we may yet have to learn to use it appropriately.

T Newton, M Watkinson

Neonatal Unit, Birmingham Heartlands Hospital, Birmingham, UK; michael.watkinson@heartatl.wmids.nhs.uk

References


<table>
<thead>
<tr>
<th>Table 1</th>
<th>Incidence of hypothermia and hyperthermia in control babies and babies wrapped in polythene bags (study group)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control group</td>
<td>Study group</td>
</tr>
<tr>
<td>Number</td>
<td>230</td>
</tr>
<tr>
<td>Gestation (weeks)</td>
<td>27.5 (23–29)</td>
</tr>
<tr>
<td>Weight (g)</td>
<td>1020 (400–1900)</td>
</tr>
<tr>
<td>Number &lt;35.5°C</td>
<td>96 (42)</td>
</tr>
<tr>
<td>Number &gt;37.0°C</td>
<td>1 (0.4)</td>
</tr>
</tbody>
</table>

Values are either median (range) or number (%). CI, Confidence interval.

Technique for insertion of percutaneous central venous catheters in the newborn period

The use of percutaneous central venous catheters is of proven value for the provision of parenteral nutrition and intravenous drug treatment in neonates. They have become an integral part of the management of very low birthweight infants in most intensive care units.

At the Royal Children’s Hospital in Melbourne we used a plastic catheter, which has an external diameter of 0.6 mm and comes in a variety of different lengths (Epicutanea catheter manufactured by Vygon; lengths 15, 30, and 50 cm; ref nos 2184.015, 2184.00, and 2184.005; cost AU$59.10). It is packaged with a metal 19 GA butterfly needle for use in insertion of the line.

This technique has some drawbacks.

1. The 19 GA needle is difficult to put directly into neonatal veins because of its large size.
2. It can be difficult to appreciate “flash back” of blood into the metal needle.
3. It is not possible to “flush” the needle to ensure correct positioning of the line as well as patency of the vessel.
4. It is not feasible to place femoral venous lines using this method.

We therefore use a method whereby the vein, using the Seldinger technique, is ultimately cannulated with a 20 GA catheter through which the slits line can be inserted.

1. The procedure should be carried out under optimal conditions using an aseptic technique. If the infant is already ventilated, we advocate the use of a muscle relaxant as well as adequate sedation. This is especially advisable for insertion of femoral venous lines.
2. The vein is initially cannulated with a 24 GA (external diameter 0.7 mm) cannula. The sites most often used are the great saphenous vein at the ankle or knee joint, the femoral vein, the basilic or cephalic veins in the antecubital fossa, or, occasionally, the superficial temporal vein. A transfusilator or “cold light” inserted into the finger of a sterile glove can be of use in locating deep veins as well as protecting the sterile field.
3. A guidewire is then inserted through the cannula into the vein. We use a “duoflex spring wire guide”: diameter 0.45 mm, length 25 cm (duoflex spring wire guide manufactured by Arrow; product no AW-04018; cost

References

Umbilical granulomas: a randomised controlled trial

The Archimedes section has previously contained a brief section on the treatment of umbilical granulomas. We have now conducted a randomised controlled trial of the management of umbilical granulomas. The trial compared silver nitrate cautery with the use of topical antibiotics in each nappy change (conservative management). The primary end point was the number of umbilical granulomas that persisted for three weeks after the anterior abdominal wall was silver nitrate cautery. The trial was conducted at the Homerton Hospital in London and the Royal Free Hospital in London.

The trial showed that the use of silver nitrate is superior to conservative management. In our experience these changes have been associated with a reduction in the number of umbilical granulomas and a decrease in the number of umbilical granulomas that require surgical intervention. We do not use pharmacological treatment or repeat cautery on umbilical granulomas.

G Bayley
Bristol School of Anaesthetics, Bristol, UK

Correspondence to: Dr Bayley, Department of Anaesthetics, Bristol Royal Infirmary, Marlborough Street, Bristol, UK, kateandguy@hotmail.com

References

Progressive ventricular dilatation (PVD) over the past 22 years

We read with interest the article of Murphy et al., and it prompted us to review our own experience with progressive ventricular dilatation (PVD) over the past 22 years at the Maine Medical Center (MMC). Since 1980, we have used a single approach to management of PVD. As noted in previous publications, we have observed the need for intervention to be rapid head growth defined as an increase in occipitofrontal circumference of 2 cm a week or more rather than relying on measurement. In this degree of head growth, we have increased intracranial pressure, we have introduced by directly draining ventricular fluid through a 21 gauge angiocath placed into the right coronal suture to the right lateral ventricle. This catheter is connected to a ventricular drainage system and drainage is maintained for at least five days if possible. The catheter is then removed and the decrease in head circumference and ventricular size recorded. The infant is watched for return of rapid head growth and an angiocath is kept as a backup. This procedure is repeated until the infant reaches about 2 kg in weight, and if rapid head growth continues, a permanent ventriculoperitoneal shunt is placed. We do not use pharmacological treatment or repeat lumbar puncture to treat PVD.

As pointed out by Murphy et al., PVD sufficient to require intervention occurs almost exclusively in infants with grade 3 or 4 intraventricular haemorrhage (IVH). As expected, the very low birthweight infants with high grade IVH have a high mortality. Table 1 shows a comparison between the outcomes for grade 3–4 IVH at MMC during the 1980s and over the past five years (1997–2001 inclusive), and the data of Murphy et al. grouped in the same way. As noted, there is little difference over time or between studies. Overall mortality for grade 3–4 IVH was 33% (26/79) for Murphy et al., 33% (31/94) for MMC 1980s and 31% (13/41) for MMC in 1997–2001. Until grade 3–4 IVH can be eliminated, posthaemorrhagic hydrocephalus will continue to occur with high morbidity and mortality.

LT Weissman, P M Maro, D L Kessler, D B Sobel, D L Morrow, S Boggs, W Allan
Department of Pediatrics, Maine Medical Center, Portland, Maine, USA; weissl@mmc.org

References

Table 1: Comparison between the outcomes for grade 3–4 intraventricular haemorrhage (IVH) in the three studies

<table>
<thead>
<tr>
<th>Grade 3–4 IVH (% of all &lt;1500 g)</th>
<th>Murphy et al</th>
<th>MMC 1980s</th>
<th>MMC 1997–2001</th>
</tr>
</thead>
<tbody>
<tr>
<td>Death &lt;14 days</td>
<td>97%</td>
<td>18/79 (23%)</td>
<td>29/94 (30%)*</td>
</tr>
<tr>
<td>PVD requiring treatment</td>
<td>65%</td>
<td>34/61 (56%)</td>
<td>24/65 (37%)</td>
</tr>
<tr>
<td>VP shunt/late death (% of PVD treatment)</td>
<td>63%</td>
<td>18/38 (47%)</td>
<td>12/3 (15/24=63%)</td>
</tr>
</tbody>
</table>

*Rate for all infants <35 weeks.
**Rate for all deaths <30 days.
MMC, Maine Medical Center; PVD, progressive ventricular dilatation; VP, ventriculoperitoneal.
Do we need to assess the thyroid function in the infants of mothers with Hashimoto’s thyroiditis?

We read with interest the recent comprehensive review of neonatal thyroid disorders, which gave evidence-based answers to many important questions. The author recommended that all babies born to mothers with Hashimoto’s thyroiditis should be reviewed at 10 days to 2 weeks and a thyroid function test taken because infants may develop transient hypothyroidism or, very rarely, hyperthyroidism.

As paediatricians, in a hospital with a paediatric endocrine caseload similar to some tertiary centres and a subregional neonatal intensive care unit with local deliveries of 6000 per annum, we think that the potential benefits of this practice are difficult to justify. We do understand that such practice will help in identifying babies who may develop transient congenital hypothyroidism caused by maternal thyrotropin receptor blocking antibodies. However, the incidence of this form of hypothyroidism has been estimated to be 1 in 180 000 normal infants (~2% of congenital hypothyroidism) and the majority of them will have raised thyroid stimulation hormone levels that can be detected by the current neonatal screening. Based on a simple calculation, in a unit of our size only one baby will be detected every 30 years. We feel that there would be major disadvantages if we are to adopt the author’s recommendation. Firstly, an extra hospital visit for babies and parents; secondly the need to bleed many healthy infants; and finally the potential for confusion and unnecessary anxiety. Until objective evidence emerges about the significance of subtle thyroid dysfunction in early life we feel that the current screening programme should not be extended.

A M Habeb
Paediatric Department, Hull Royal Infirmary; abdul.habeb@hey.nhs.uk

M Zubier, P Fairhead, V Mathew
Paediatric Department, Hull Royal Infirmary

References
Reducing antibiotic use on the neonatal unit by improving communication of blood culture results: a completed audit cycle

M A Jardine, Y Kumar, S Kausalya, S Harigopal, J Wong, A Shivaram, T J Neal and C W Yoxall

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