Diuretics in CLD

This symposium on chronic lung disease of prematurity (CLD) by Kotecha et al covered important aspects and controversies in the management of CLD. We accept the authors’ inability to cover all aspects of management. We feel that some space could have been devoted to diuretics in management of CLD. Nearly all patients with CLD of some stage of their disease will receive diuretics and most of them will be on them for a long time. We came across only one systemic review by Brion et al in the Cochrane database. Conclusion of the authors was that there was no beneficial effect of using distal tubular diuretics for more than 4 weeks after initial stage. There was also no benefit in adding potassium sparing diuretics or newer diuretics like metalozide. Despite the very little evidence base for diuretics in CLD, one finds nearly all CLD patients on a diuretic cocktail. In addition to their effect on electrolytes, they affect Ca/Po metabolism. This may exacerbate osteopenia of prematurity and may have adverse effect on lung compliance. There is a need for more discussion or clear guidelines on this issue.

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References
1 Kotecha S. Management issues in CLD of prematurity. Arch Dis Child Fetal Neonatal Ed 2002;87:F2–F6

Table 1 Demographics of the two study groups and temperature difference

<table>
<thead>
<tr>
<th></th>
<th>Wrapped</th>
<th>Unwrapped</th>
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<tr>
<td>Number</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Male:female</td>
<td>5:5</td>
<td>3:7</td>
</tr>
<tr>
<td>Mean weight (kg)</td>
<td>1.635</td>
<td>1.595</td>
</tr>
<tr>
<td>Mean gestation week</td>
<td>32/40</td>
<td>32/40</td>
</tr>
<tr>
<td>Gestation range</td>
<td>30/40–34/40</td>
<td>27/40–33/40</td>
</tr>
<tr>
<td>Transit time (min)</td>
<td>5 min 48 sec</td>
<td>7 min 6 sec</td>
</tr>
<tr>
<td>Range</td>
<td>4–10 min</td>
<td>5–10 min</td>
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<tr>
<td>Temperature difference</td>
<td>−0.34°C (°C)</td>
<td>−0.21°C (°C)</td>
</tr>
<tr>
<td>Range</td>
<td>−0.7 to +0.1°C</td>
<td>−0.5 to +0.1°C</td>
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</table>
Positioning long lines: response to Reece et al

Percutaneously inserted central venous lines are widely used in neonatal intensive care to administer parenteral nutrition and medications. It is important to ascertain the position of the line tip before use as incorrectly positioned long lines can lead to life-threatening complications like cardiac tamponade and pulmonary oedema.1,2 Reece et al suggested that it is prudent to use a routine contrast radiograph to localise the line tip in newborn infants.3 We would like to comment on their suggestion and report a relevant study that was carried out on our neonatal unit.

Intravenous water soluble contrast is not commonly used in neonates and very little is known about its potential side effects in premature infants.4,5 Studies have shown that renal clearance is prolonged in premature infants because of renal immaturity.5 Data in children have shown a number of possible side effects, including hypotension and cardiac arrhythmia.6 Moreover, obtaining an intravenous contrast radiograph of a long line would require additional medical and nursing time as a doctor would have to “gown up” for the procedure. This may not be logistically feasible in some busy neonatal units, especially out of hours.

Reece et al were unable see the line tip clearly on the plain images, even after a contrast study.5 This was due to delay between the injection of contrast and the radiographer exposing the film. This shows that fine coordination is required between the radiographer and the person injecting the contrast. Specific training may necessary.

We performed a retrospective study of the reliability of plain radiographs in identifying the position of the line tip in our tertiary neonatal intensive care unit. Over a 10 month period all 27 babies who had long lines inserted were included. In all cases an experienced junior doctor (IB) and a consultant neonatologist (VA) were present to ascertain the position of the line tip. Over a 10 month period all 27 babies who had long lines inserted were included. In all cases an experienced junior doctor (IB) and a consultant neonatologist (VA) were present to ascertain the position of the line tip. In eight cases, even after a contrast study, the line tip could not be identified correctly due to the superimposition of other structures. In these cases the radiologists suggested that a contrast study was necessary.

Specific training may necessary.

We wish to raise a few concerns regarding the study reported by Rahman and colleagues.1 We found it surprising that only five species of microorganisms were isolated in this series of over 1000 blood cultures obtained from neonates with sepsis. Similar studies done in other major cities of Pakistan, with much smaller sample sizes, have shown a wider spectrum of pathogens. Anwer et al1 showed 11 species types in 38 cultures. Khan and Akram1 showed more than eight different species types from 89 cultures, and Bhutta1 reported 11 species types in a series of 276 positive blood cultures. In addition to the five species causing neonatal sepsis reported by Rahman et al (Esherichia coli 36.6%, Staphylococcus aureus 29.5%, Pseudomonas 22.4%, Klebsiella 7.6%, and Proteus 3.8%), all the other investigators have also reported Strep. spp and Enterococcus, and most reported Streptococci, Salmonella spp, and group B Streplococci. Although the authors do not clearly state whether they excluded hospital acquired infections in their series, the studies reported by Bhutta1 did exclude nosocomial infections.

The antimicrobial susceptibility data reported by Rahman et al are not interpretable as the number of microorganisms on which antimicrobial susceptibility testing was performed is not presented. In addition, the susceptibility results are not internally consistent; 60% of the Staphylococcus aureus tested are reported to be ampicillin sensitive but only 27% were Amoxicillin + Clavulanate (Augmentin) sensitive. This represents a highly unusual result and we wonder if the results are correct. We also find it surprising that the combination of the prone position and the 45° head up tilt was found to be superior to the supine position. We had then hypothesised that the combination of the prone position and the 45° head up tilt could facilitate diaphragmatic activity.

I do not think that this hypothesis can be totally dismissed by the results of Dimitriou et al as suggested by the authors, since their infants were studied in different positions that is, supine in their study and prone in our study.

References


Authors’ reply

We thank Professor Dellagrammaticas for his comments on our study.1 Dellagrammaticas and colleagues1 hypothesised that the combination of the prone posture and the 45° head up tilt position could facilitate diaphragmatic activity. We however, propose that the improvement in oxygenation seen in the head up tilt position was more likely to be due to a change in lung volume. In the head up tilt position, the weight of the abdominal contents on the diaphragm is reduced, tending to increase functional residual capacity.2 In contrast, ultrasonographic examination3 has demonstrated that the diaphragm is significantly thicker at end expiratory volume in the prone rather than the supine position, which is likely to result in reduced diaphragm strength. Indeed, we demonstrated4 Pimax (a measure of respiratory muscle strength) was lower in the prone compared to the supine position and the supine posture with 45° head tilt.

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References
Effect of salt supplementation of newborn premature infants on neurodevelopmental outcome at 10–13 years of age

I read with interest the report by Al-Dahhan and colleagues1 on the beneficial effect of NaCl supplementation of preterm infants during the neonatal period on their later neurodevelopmental outcome. They found better memory, learning, language, and educational performances at the age of 10–13 years in premature infants who were given 4–5 mmol/day NaCl when compared with those not receiving NaCl supplement. In this regard it is relevant to mention our most recent findings describing a new aspect of the relation of neonatal sodium homeostasis to central nervous system function. Namely, we showed that hyponatraemia is one of the most significant risk factors for development of sensorineural hearing impairment detected by transient evoked otoacoustic emission and confirmed by auditory brainstem response.2

In addition, I consider their report raises an important ethical issue, in that I regard their selection of references as subjective and arbitrary. In particular, the work of our group in revealing some major features of sodium homeostasis in premature infants has been ignored; for example, renal salt wasting, sodium depletion, and hyponatraemia,3,4 and the first introduction of NaCl supplementation in a dose of 3–5 mmol/kg/day to prevent sodium deprivation, to improve somatic stability, and to avoid untoward clinical consequences.5

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References

Author’s reply
Methinks Professor Sulyok doth protest too much. His early, pioneering work on electrolyte balance in the newborn is well known, and extensively cited in an earlier review of the subject co-authored by myself.6 In this, inter alia, his study of the effect of salt supplementation on the renin-angiotensin-aldosterone system7 is quoted in support of the hypothesis that hyponatraemia in premature infants is due to salt depletion rather than water retention. The reason these papers were not cited in the present paper is that they are not relevant to it. The paper is not a historical or general review of hyponatraemia in the newborn but the results of a study specifically designed to examine neurodevelopmental outcome in two particular groups of infants previously studied by ourselves.8,9 His recent study of hyponatraemia and sensorineural deafness in preterm infants9 had not been published when our paper was submitted to the Archives, although we would certainly have referred to it if it had been.

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References

CORRECTION
We would like to apologise for an error that occurred in the paper Oxygen therapy for infants with chronic lung disease by S Kotecha and J Allen (Arch Dis Child Fetal Neonatal Ed 2002; 87:F11–F14). The following sentence, under the heading Weaning from home oxygen, should have read: Vermeulen et al showed that infants who could be weaned from oxygen had median saturations of 97% during one hour awake studies, spent only 14% of time with saturation ≤ 95% and 2% of time ≤ 92%.

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