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Treatment of renal failure in neonates

Sir,

We are interested by the frequency with which renal failure is diagnosed and peritoneal dialysis prescribed in Manchester¹ as we have dialysed only two infants in the last 40 000 births: one with severe birth asphyxia and one with congenital heart disease, both of whom died. Six other infants in whom renal failure was present at the time of death were not dialysed because their primary condition (birth asphyxia or congenital abnormalities) was irreparable. We suspect that the difference lies at least in part in the criteria for diagnosis.

'Poor urine output' together with uraemia and hyperkalaemia do not necessarily constitute acute renal failure. All these are common in preterm neonates with normal renal excretory ability. The babies cited above are the only ones in whom we detected a significantly reduced glomerular filtration rate as indicated by a plasma creatinine concentration rising above 130 $\mu\text{mol/l}$. Creatinine measurement is an indispensable indicator of renal function. Although a single result for plasma creatinine may be difficult to interpret (both because of maternal influences and analytical interferences), a rising creatinine concentration is a useful indicator of functional renal decline. Moreover, the measurement of urine creatinine will distinguish between decreased renal perfusion and intrinsic renal failure. Low urine volume will occur with both.

The high plasma urea concentration, common in sick preterm infants, is caused by their hypercatabolic state with urea excretion rates up to 15 mmol/kg/day in our studies. Similarly potassium turnover is far higher in catabolic infants, and may exceed the capacity of the normal preterm kidney which can only filter 3 or 4 mmol/kg/day. It is not surprising that hyperkalaemia is common.

Our observed incidence of renal failure severe enough to require dialysis is in agreement with that of Brocklebank of 0.2/1000 live births.² Other infants may have had transitory renal impairment which was managed, without hazard, conservatively. Although Meeks and Sims do not mention the number of births their unit covers, their incidence of infants requiring dialysis does seem high.

While we would agree that peritoneal dialysis is a relatively straightforward technique, it is not without its

hazards, and is no substitute for careful monitoring of renal function together with paying meticulous attention to the details of water and electrolyte balance. We believe that recoverable renal failure amenable to dialysis is uncommon. Moreover, in view of the long term neurological and renal consequences in the survivors of neonates receiving dialysis,² treatment should be approached with caution.

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Clinical research group

Sir,

Clinical research is an integral part of training for the hospital doctor and experience in this field has become an important factor in securing senior registrar posts. Junior doctors with a busy clinical commitment may find it difficult to find time and motivation to undertake clinical research. With this in mind, a clinical research group was formed in Liverpool in 1985 to promote clinical research in paediatrics among junior doctors in the region.

The main aim of the group is to provide an informal forum to exchange ideas, discuss, promote, and improve the quality of clinical research in paediatrics. Doctors are encouraged to present hypotheses or ideas for research at an early stage of development after having formulated the idea into a written research protocol, but before having embarked on the project. The group discusses the proposed hypothesis and protocol and may make constructive criticisms and suggestions for alterations to the methodology. After completion of the project, presentation to the group affords a valuable opportunity for practice of a spoken paper before a critical audience before presentation to a scientific meeting.

Doctors who have previous experience in clinical research are invited to share their experience and lecture on research methodology and related subjects. Topics have included: the design and analysis of results from a clinical questionnaire, literature searching, design and running a drug trial, the use of a personal computer to run a research project, reviews of statistical software, and advice in planning an MD thesis. Guests are invited from staff within the hospital and university, to talk on selected topics requested by members of the group. Contributions on statistical analysis have been particularly well received. Members of the department of medical illustration have talked on the presentation of graphical material and artwork for publication and slides, and on the preparation of posters for scientific meetings.

Since the group was formed in 1985 the administration and organisation of the group has passed from one senior registrar to the next. The group has successfully promoted a wide interest in clinical research among junior staff.

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Impact of AIDS on neonatal care

Sir,

I greatly enjoyed Tom Lissauer's annotation on the impact of AIDS (does he mean HIV infection?) on neonatal care.¹ I beg to differ, however, on his conclusion that we should avoid the 'two tier' system of neonatal care. At delivery, where there is much blood and liquor and the potential for staff to become infected (although none have yet been shown to have been infected at delivery), the Royal College of Obstetricians and Gynaecologists have not unreasonably proposed a general improvement in standards of hygiene, and extra precautions for delivery of women who are HIV seropositive or from high risk groups.² Their proposals regarding precautions to be taken by paediatric staff at delivery also seem eminently reasonable.

The risk to staff of contracting HIV infection from a baby postnatally, however, is exceedingly low and there may be virtually no risk. To suggest that we should be wearing gloves and eye protection whenever we are taking blood or performing any invasive procedure on any newborn must be an over reaction. Why should the risk stop in the newborn period? The corollary is surely that we should wear gloves whenever we take blood from any child, or adult for that matter. Yet, as Dr Lissauer himself states, the major risk is of accidental autoinoculation with HIV positive blood against which gloves provide very little protection. In many hospitals in New York gloves are worn for all procedures as Dr Lissauer's statement implies. The annual gloves bill for one hospital in the Bronx is over 5 million dollars (A Mezey, personal communication). I think this is illogical, expensive, and off putting to parents and children. I believe staff with open lesions (cuts, eczema) should cover these with waterproof tape. I will wear gloves to take blood from babies and children I know to be, or suspect of being, HIV positive and try to avoid needle stick injuries at all times. But I will not wear gloves and eye protection to take blood from or handle other newborns or older children.

References

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Bradycardia associated with chlorhexidine spray

Sir,

We report a possible iatrogenic cause of bradycardia in a term neonate.

Case report

The girl was born by normal delivery after an uneventful antenatal period. Her Apgar scores were 9 and 10 at 1 and 5 minutes respectively. No medication was given during the labour. In order to prevent possible mastitis the mother used chlorhexidine spray on her breasts from the third feed when the baby was 12 hours old. Cyanotic spells associated with bradycardia (<40 per minute) but not with apnoea occurred from 48 hours. The heart rate was lowest during sleep but increased on stimulation. Multiple episodes occurred over the next 48 hours, and some needed treatment with atropine, to which they responded. An electrocardiogram confirmed sinus bradycardia. The chlorhexidine spray was stopped and the bradycardias became less frequent and less severe. By day six they had abated completely and follow up examination at five weeks was normal. Investigations including full blood count, urea and electrolytes, thyroid function tests, cardiac enzymes, and an echocardiogram were all normal. The serum chlorhexidine concentration at 120 hours was 11 pg/l. This was estimated when the spray had been stopped and the worst of the bradycardias had abated.

Adrenergic nerve damage, which was dose dependent but reversible, has been produced in rat irides after the local injection of as little as 0.25 µg of chlorhexidine.¹ The gastrointestinal absorption of chlorhexidine has not been studied in man but assumed to be low² despite studies showing significant absorption through the intact skin of newborn infants.³ The dose of chlorhexidine in each spray is 430 µg. Over 24 hours (assuming six feeds) 2.5 mg is delivered to the breast and could be ingested by the baby. Studies on absorption of chlorhexidine from the gastrointestinal tract need to be conducted and awareness of possible side effects maintained.

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