

Table 1 Children with CF and renal failure associated with antibiotic treatment

| Patient | Age | Weight (kg) | Other related problems | Pre-antibiotic plasma Cr ($\mu\text{mol/l}$) | Antibiotics used (mg/kg/day) | Gentamicin concentration* (mg/l) | Dose adjusted to (mg/kg/day) | Day first raised Cr noted | Biopsy findings | Peak Cr ($\mu\text{mol/l}$) | Treatment | Outcome at 3 months; Cr ($\mu\text{mol/l}$) |
|---------|-------|-------------|---------------------------|------------------------------------------------|-----------------------------------|----------------------------------|------------------------------|---------------------------|-----------------|-------------------------------|---------------|-----------------------------------------------|
| 1 | 9 y | 23 | Liverdisease | 64 | Gentamicin 10 Cefuroxime 200 | 13.9 peak (D8) | Stopped | 9 | ATN | 862 (D16) | Conservative | 43 |
| 2 | 4 mth | 5.6 | Constipation Diarrhoea | 49 | Gentamicin 8.5 Ceftazidime 130 | 16.2 random (D18) | Course already completed | 17 | Not done | 494 (D19) | PD for 5 days | 55 |
| 3 | 7 y | 22 | Pseudo Barther syndrome | NR | Gentamicin 12 Ceftazidime 150 | 10 peak 2.1 trough (D2) | 11 | 16 | ATN | 776 (D22) | HD for 4 days | 60 |

*Only out of range/inappropriate gentamicin levels tabulated. Cr, creatinine; ATN, acute tubular necrosis; NR, not recorded; PD, peritoneal dialysis; HD, haemodialysis; D, day.

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Authors' reply

Dr Biban states that we did not adequately emphasise the neurologic side effects of interferon treatment. Although it has been reported that interferon alpha has been responsible for various neurologic side effects, there are no clear data indicating the frequency of these in children. Short term interferon therapy has been safely used at our department in treating various different conditions, particularly in the complex hemangiomas for many years. No side effects of interferon therapy except mild fever, malaise, leukopenia, and elevation of liver transaminases have been observed. These were reversible by stopping therapy for a short period. In one patient who received long term interferon therapy, peripheral neuropathy developed during the treatment.

This patient was a 15 year old boy with Hodgkin's disease who received interferon as an adjuvant immunotherapy post autologous stem cell transplant. Peripheral neuropathy developed 20 months after IFN treatment.¹ A large cumulative dose combined with the prolonged treatment may have had an important role in this complication in our case. We concluded that the use of interferon in children affected by KSM or in children with various benign tumours containing vascular elements is still a good therapeutic alternative. If the duration of treatment and the cumulative doses of interferon are closely monitored, severe neurologic side effects during IFN therapy would not be an important problem. As the use of interferons in various conditions gradually expands, the data related to the adverse neurologic side effects will increase and be better understood.

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Reference

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Acute renal failure and cystic fibrosis

It is surprising that there are few reports of acute renal failure (ARF) in children with cystic fibrosis (CF) given the large number of antibiotic courses prescribed and the possibility of either direct toxicity from aminoglycosides or the occurrence of interstitial ne-

phritis. The registry of our regional paediatric renal unit shows no cases of ARF in a CF patient between 1985 and 1998, but three cases between 1999 and 2001, all of whom had received gentamicin and ceftazidime.¹

Over the past nine months we have been referred three additional CF patients who had been treated with a combination of gentamicin and ceftazidime/cefuroxime (table 1). The initial doses of antibiotics used to treat the patient were within UK guidelines,² but the gentamicin levels were raised. All six children had received a number of other medications including, in some instances, other antibiotics prior to the gentamicin and cephalosporin combination. Only one of the four biopsy specimens revealed interstitial nephritis in addition to the acute tubular necrosis (ATN) changes found in all four. All six children have made a good renal recovery with normal blood pressures and creatinine levels at three months.

A recent e-mail survey of members of the British Association for Paediatric Nephrology revealed four other cases of ARF with combination antibiotic therapy in CF patients (three of four with ceftazidime and gentamicin). The increased incidence points to the need for increased vigilance when gentamicin and cephalosporin combinations are used to treat exacerbations, particularly if there is a potentially dehydrating state or pre-existing renal anomaly. The cases have been reported to the Committee for the Safety of Medicines and we suggest a national monitoring programme should be instigated.

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Fatal iatrogenic hyponatraemia

We recently cared for a 13 month old girl admitted to hospital following a short history of diarrhoea and vomiting. Clinical examination revealed lethargy and moderate dehydration. Initial serum sodium was 137 mmol/l and she was commenced on intravenous fluids using 4% dextrose/0.18% saline.

Twelve hours after admission the child suffered a generalised tonic-clonic seizure at which time the serum sodium was found to be 120 mmol/l. Unfortunately, the child went on to have a respiratory arrest, developed fixed dilated pupils, and died despite full intensive care. An extensive postmortem examination revealed only diffuse cerebral swelling with necrosis of the cerebellar tonsils.

It is well recognised that symptomatic hyponatraemia can result in significant morbidity and mortality in previously healthy children^{1,2} and adults.³ The administration of hypotonic intravenous fluids to children can be fatal and the reasons for this have been well documented for several years. Many physiological stimuli encountered during acute illness result in the non-osmotic release of antidiuretic hormone; these include pyrexia, nausea, pain, reduced circulating volume, and the postoperative state. The administration of hypotonic intravenous fluids in