# LETTERS TO THE EDITOR

## Patient knowledge and compliance with growth hormone treatment

EDITOR,—There is no direct method of assessing compliance to natural sequence human growth hormone treatment and even urinary growth hormone measurements have proved unsuccessful.[1] What information is available concerns older treatment regimens of intramuscular injections which, not surprisingly, were unpopular with most patients because of pain.[2] More recently Brook and colleagues at the Middlesex Hospital have described their experience of compliance to subcutaneous growth hormone injections with disappointing results.[3]

We have recently reviewed the treatment of 107 (56 boys, 51 girls) consecutive children receiving daily subcutaneous growth hormone injections at the Hospital for Sick Children, Great Ormond Street (n=85) and associated peripatetic clinics (n=22). Mean age was 10·5 years. All patients were interviewed in the presence of a growth research nurse (LM or MM) during the first three months of 1992.

Interestingly only 68% accurately knew their diagnosis, mainly because of the understandable confusion of patients receiving growth hormone treatment, believing they were growth hormone insufficient; 32% of our patient group had low birthweight syndromes, skeletal dysplasias, or Turner's syndrome and were growth hormone sufficient. Understanding of the growth hormone treatment regimen, in all its aspects, was recorded in 93% of patients at Great Ormond Street and 95% of patients at peripatetic clinics. This was surprising compared with the Middlesex group's result of only 48%.[3] Half of our patients were taught their injection technique at home, although many were in consultation with one of our growth research nurses. Using such an approach 76% of patients/parents took on full responsibility for their injections within seven days. A tenth admitted missing three or more injections per month and 20% remembered receiving teaching by a growth research nurse during the previous year. Altogether 62% remembered having a dose change during the last year, although a calculation of dose is made on a surface area basis for all our patients at yearly intervals to determine if a change is required.

We appreciate that knowledge of injection technique does not necessarily equate with compliance, especially during the pubertal age range. However education is one aspect of treatment which can be improved,[4] whereas compliance is much more difficult to influence. We suggest that a major factor accounting for the adequate knowledge of the treatment regimen was the involvement of a research nurse in our growth clinics for the previous six years. It is probable that our results are representative of patients/parents being given a relatively free choice of injection devices,[5] which may directly improve compliance and thereby growth response.[6] Moreover we believe that attention to teaching with the involvement of a dedicated growth research nurse is essential to optimise acceptance of long term daily injection regimens.

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## Audit of screening for congenital hypothyroidism

EDITOR,—Pharoah and Madden conclude that administrative deficiencies were predominantly responsible for inefficiencies of the screening programme.[1] We are currently auditing the neonatal screening programme in the South East Thames region and would like to make the following points:

(1) One of the most important features of well run screening programmes is ownership of the programme. At present in many districts the opposite appears true. The programme involves several health care practitioners at different stages of the programme (for example midwives, health visitors, paediatricians, and community paediatricians) but in many districts there is no one person nominated as responsible for the whole programme. In our survey of health professionals in all districts it appears that only 7% (one of 15) districts in our region had a nominated person in charge of the programme. Nominating named individuals with overall responsibility for monitoring the programme (similar to immunisation coordinators) could improve administrative problems.

(2) A particular problem in inner city districts not mentioned in the report is the difficulty of matching up children when different surnames are given to different recorders or when first names and surnames are muddled. In two districts that we have investigated the problem of 'alternative' surnames resulted in a failure to match 18% (318/1745) of cases initially. Cards could be designed so that mother's surname and father's surname can both be entered separately on the card avoiding this difficulty.

(3) Pharoah and Madden suggest that many of the problems of under and over enumeration due to cross boundary flows of births could be addressed by requiring the district of residence to be recorded on the card sent to the laboratory. However, particularly in inner city districts mothers are often highly mobile around the time of birth (for example being rehoused, temporarily staying with parents, giving alternative addresses to allow care in particular hospitals, etc). Rapid regular monitoring of unmatched results and babies without results may help to identify movement problems. Allocation of NHS numbers at birth (rather than at registration) could resolve this problem.

(4) Finally the authors recommend that regional screening programmes should undertake audits of the stages involved in the screening programme by setting standards for the various stages in the process, comparing practice with these standards, and implementing change as needed. In liaison with the directors of screening laboratories in SE Thames Region we have set operational process standards for many of the steps involved and would be happy to share them with any interested party.

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1 Pharoah POD, Madden MP. Audit of screening for congenital hypothyroidism. *Arch Dis Child* 1992; **67**: 1073–6.

## Continuous infusion of zidovudine in HIV related thrombocytopenia

EDITOR,—Continuous intravenous infusion of zidovudine was beneficial in children with symptomatic HIV infection.[1] However clinical trials investigated only oral treatment and none compared the oral and intravenous routes of administration. Here we report that HIV related thrombocytopenia, and other related symptoms developing while oral treatment was administrated, may be corrected by continuous infusion of the drug.

### Case report

A patient developed a symptomatic HIV infection at 4 months of age with hepatosplenomegaly, failure to thrive, and recurrent bacterial infections as the main symptoms. CD4 cell count was $0{\cdot}130\times10^9$/l and the proliferative response to mitogens was depressed. Clinical and immunological improvement (CD4: $0{\cdot}450\times10^9$/l) was achieved by 150 mg/m²/6 hours of oral zidovudine (daily dose: 24 mg/kg). At 12 months of age the child presented with haemorrhagic symptoms and a platelet count of $10\times10^9$/l. Platelet bound IgG reactive with specific glycoproteins (gpIIb-gpIIIa) and circulating platelet antibodies were detected. The number of megakaryocytes was normal. Symptomatic thrombocytopenia persisted despite immunoglobulin treatment. A response was obtained with high doses of oral prednisolone (2 mg/kg/day), but several relapses were observed as soon as the dose was slowly tapered off. At 18 months of age a continuous infusion of zidovudine, 1 mg/kg/hour, was initiated via a catheter using a lightweight portable infusion pump and administered over one year (figure). An overall clinical improvement was noted with regression of the hepatosplenomegaly. The platelet counts remained within normal values despite the discontinuation of the steroid treatment. In addition, immunological tests initially improved and P24 antigen became undetectable. The continuous infusion was well tolerated without neutropenia or

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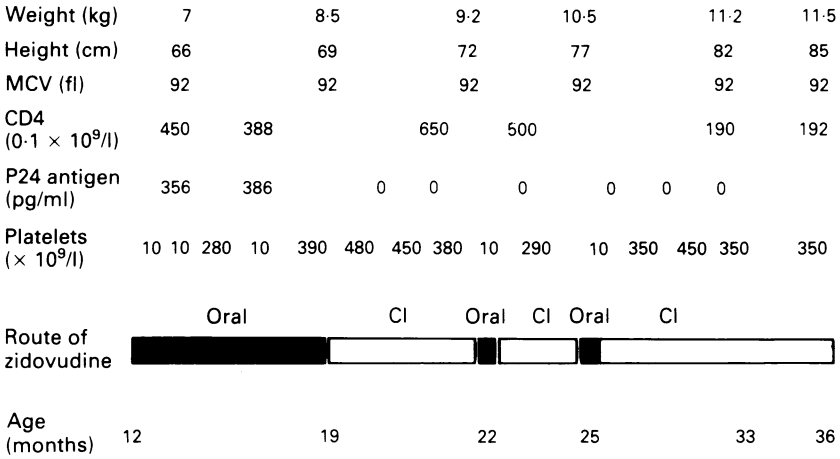


*Patient's data covering a period of 20 months, starting at 12 months of age when thrombocytopenia developed; CI=continuous infusion, MCV=mean corpuscular volume.*

anaemia. On two occasions (at 22 and 25 months of age) the intravenous route was transiently switched to oral treatment at a daily dose of 600 mg/m² (24 mg/kg) given in four or six divided doses. Each time a symptomatic relapse occurred and was corrected when the intravenous route was resumed. Plasma concentrations of zidovudine were measured by high performance liquid chromatography.[2] At 150 mg/m²/6 hours (24 mg/kg/day) given orally, the peak plasma concentration one hour after oral dosing was 800 ng/ml and the trough level was undetectable (limit of detection: 12·5 ng/ml); these levels were similar to those determined in our other HIV positive children, excluding a specific defect of zidovudine absorption in our patient. Steady state concentration was 534 ng/ml during continuous infusion.

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## Reporting of vaccine associated mumps meningitis

EDITOR,—Vaccine associated mumps meningitis was one of the conditions reportable to the British Paediatric Surveillance Unit (BPSU) between February 1990 and January 1992. During this two year period, 15 confirmed cases were reported.[1] Eight reports were in children aged 12–24 months resident in England and Wales. Based on the BPSU study the estimated risk of vaccine associated mumps meningitis in this age group was 1·5 per 100 000 vaccinations given. However when the BPSU data were supplemented by laboratory reports, a much higher rate of approximately 10 per 100 000 vaccinations was observed (Dr E Miller, personal communication). This higher rate is consistent with observations in other countries.[2]

The low rate derived from BPSU reports may be due to the fact that paediatricians did not link the illness (which was usually mild) to measles, mumps, rubella vaccination, which had been given up to 28 days previously. This could be avoided by taking a full immunisation history (including dates) on all children at the time of admission. Particular attention should be paid to vaccinations in the previous month.

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## Haemorrhagic shock encephalopathy or near miss sudden infant death syndrome?

EDITOR,—Drs Bacon and Hall suggest that haemorrhagic shock encephalopathy syndrome (HSES) is probably a secondary phenomenon after a severe initial insult.[1] We hypothesise that this syndrome may represent the result of acute onset, severe hypoxaemia as may occur in infants who suffer apparent life threatening events (ALTE).[2] Many of the features of HSES are similar to those that occur in infants who have suffered ALTE or sudden infant death syndrome (SIDS): median age of 15 weeks, peak onset period at night, slight excess in winter months, mild prodromal illness, found hot and sweaty, and with postmortem pulmonary congestion.

Previous reports on changes after severe 'near miss' SIDS have also shown the presence of metabolic acidosis, cardiovascular instability, acute renal failure, ischaemic colitis and acute neurological dysfunction.[3] Some of these infants also showed mild hepatocellular dysfunction and hyponatraemia.

It may be appropriate for infants who have recovered from HSES to be screened for abnormalities in oxygenation. However, as with SIDS, the dilemma is to identify patients at risk of this life threatening illness before symptoms develop.

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## Treatment of refractory ulcerative oesophagitis with omeprazole

EDITOR,—We read the paper of Dalzell *et al* with interest.[1] They reported a complete resolution of ulcerative oesophagitis refractory to $H_2$ blockers by omeprazole in a 7 year old boy.

We recently saw a 4 month old boy who was diagnosed endoscopically to have an ulcerative oesophagitis at the age of 2 months. A two month course of cisapride, cimetidine, and a mucosal protective agent (alginate antacid), together with thickening of the feeds and positioning initially improved his symptoms of crying when drinking milk. While still taking this treatment, however, excessive crying during and after milk feeding reoccurred. Urine analysis was normal. A semielemental diet had already been introduced without obvious benefit. Endoscopy revealed a marked distal oesophagitis. Omeprazole at 3·5 mg (0·5 mg/kg) once a day was given for a period of six weeks. During the first 48 hours of this treatment, the clinical symptoms disappeared spectacularly. Endoscopy five weeks later did not reveal any signs of oesophagitis.

In adults, omeprazole, a substituted benzimidazole with strong, prolonged 24 hour inhibition of gastric acid secretion by blocking $H^+/K^+$-ATPase in parietal cells, is very effective in treating severe oesophagitis refractory to treatment with $H_2$ receptor antagonists. Rare side effects such as myopathy, epidermal necrosis, and endocrine adverse effects have been described.[2-4] In infants and children, however, there is lack of experience and cautious use is warranted. Our report is to our knowledge the first to describe a beneficial effect of omeprazole on refractory oesophagitis in a young infant. Like Dalzell *et al* we suggest that omeprazole should be considered as an alternative treatment for ulcerative oesophagitis resistant to traditional treatment.

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## Recurrent parotitis

EDITOR,—We were interested to read that the cause of recurrent parotitis in children 'has of yet not been satisfactorily explained'.[1]

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