

economic advantage has been shown in our study, the greatest benefit must be of more time for the patient who requires this, whether for further investigation or treatment.

The conventional arrangements for follow-up of patients from hospital may be inappropriate for the asymptomatic patient who does not require clinical measurement or hospital investigative facilities. The success of this investigation suggests that a system of reply-paid cards can provide an efficient and realistic method of review. If applied selectively this system could have enormous potential advantage for patients, staff, and the National Health Service.

We thank Mr J W Fowler for permission to include his patients in the survey; the nursing staff of our day bed unit and diagnostic theatre for their help; and Miss J Johnson for typing the manuscript.

¹ Ogg, T W, *British Medical Journal*, 1972, 4, 573.

² Howie, J G R, and Clark, G A, *Lancet*, 1970, 2, 1099.

³ Howie, J G R, *British Medical Journal*, 1977, 1, 1467.

⁴ Department of Health and Social Security, *Health and Personal Social Services Statistics 1977*. London, HMSO.

(Accepted 16 March 1979)

Department of Urology, Royal Infirmary, Edinburgh

ALAN J L HART, FRCS, registrar in urology (now senior registrar in urology, Western Infirmary, Glasgow)
PETER EDMOND, FRCS, consultant urologist

Eli Lilley & Co Ltd, Basingstoke, Hampshire

DAVID J VARMAN, BA, clinical associate (now medical services associate, Bristol Myers Ltd, Stamford House, Langley, Slough, Bucks)

Injuries to boys who scramble

There has recently been an increasing interest in motorcycle scrambling among the young. This sport may be begun at 6 years of age, and since it needs a vehicle 24 times more prone to road accidents than cars,¹ people are understandably concerned about the dangers. In the light of the fact that accidents account for more deaths in those aged over 1 than any other single cause² parents' concern for their children's safety seems justified.

A previous study looked at patients injured during motorcycle scrambles who were referred direct to a casualty department.³ I studied the number of incidents occurring at scrambles, the type of injury sustained, and the effect of having a medical officer on the course.

Methods and results

During the 1978 season I attended each of the twelve scrambles held around Tyneside with a fully equipped team from the St John Ambulance Brigade. The organisers specified that each competitor had to wear full safety equipment, including braced gloves and boots, shoulder pads, and face guards. At each event the casualties treated by St John ambulancemen or the doctor and those sent to hospital were noted.

There were 24 races at each event, with an average of 25 competitors per race. Their ages ranged from 6 to 16 years, with most being 10 to 14. Although an average of four casualties were treated during each race by the St John ambulancemen, most had superficial injuries and the doctor had to be called to only a small proportion of the accidents—once in every 83 rider races. Many of the casualties had only bruises or sprains, and from 5760 rider races only 13 patients needed to be referred to a casualty department for radiography. This gave a hospital referral rate of 1 per 443 rider races. Four boys had a definite fracture of the radius or ulnar, three a fracture of the tibia or fibula, and three a possible fracture of the tibia or fibula. One boy had fractured metacarpals, one a fractured femur, one a dislocated shoulder, and one haemarthrosis of the knee.

Comment

Leg injuries predominated—a finding consistent with those of studies of motorcycle road accidents.⁴ Hand and wrist injuries made up the remainder. (One boy had fractures of leg and wrist.) A casualty rate of 1 per 443 rider races does not seem excessive and certainly does not make it the most dangerous of sports provided all adequate safety precautions have been taken, as in this case. Motor sport in general is

covered by strict regulations on safety, which demand the presence of a doctor and ambulance at all races and practices. The youth scrambles are not required to follow these Royal Automobile Club regulations, and it is up to the organising committee to decide on an adequate first-aid policy. This study shows that the presence of a skilled first-aid team and doctor can help to reduce the number of cases referred to casualty departments as well as providing on-the-spot help should a major accident occur.

¹ *British Medical Journal*, 1979, 1, 39.

² Jackson, R H, and Wilkinson, A W, *British Medical Journal*, 1976, 1, 1258.

³ Stilwell, J H, *British Medical Journal*, 1978, 1, 758.

⁴ Mackay, G M, *Journal of Forensic Science Society*, 1975, 15, 7.

(Accepted 20 March 1979)

Gateshead St John Ambulance Division, Gateshead, Tyne and Wear
MAURICE PLACE, MB, BS, divisional surgeon

Sodium in peritoneal dialysis solutions

We would like to point out a possible problem during the use of peritoneal dialysis solutions.

Clinical features and investigations

At this hospital we routinely use 10-litre plastic containers of peritoneal dialysis solutions containing anhydrous dextrose 1.36% w/v and a declared approximate ionic concentration of sodium 141 mmol(mEq)/l with other electrolytes (Difusor, Boots). Recently four of our patients receiving peritoneal dialysis, three on a long-term programme and one in acute renal failure, developed hypertension, cerebral oedema, and deterioration in general health immediately after dialysis. They were hospital inpatients and were under strict fluid and dietary control. Serum sodium concentrations before dialysis were 136-141 mmol/l, and the patients were observed to be well. When the patients were hypertensive, serum sodium concentrations of 149-150 mmol/l were recorded, and this was not due to dehydration.

Measurement of the sodium content of the dialysis solutions showed concentrations of 146-148 mmol/l, although the label stated "approximately 141 mmol/l." Patients who showed adverse effects when dialysed against sodium concentrations of 146-148 mmol/l showed no such effects when dialysed with fluids of sodium concentration 140-144 mmol/l. We obtained, from the manufacturers, the exact sodium contents of 20 recent batches of peritoneal dialysis and haemodialysis fluids (see table). Of the 20 batches of peritoneal dialysis fluid examined, seven contained 146-148 mmol/l of sodium.

Variation from stated sodium content in 20 batches of peritoneal dialysis solutions and 20 batches of dialysis solutions

Variation by (mmol/l):	-2	-1	0	+1	+2	+3	+4	+5	+6	+7
No of peritoneal dialysis solutions:		1	1		6	4	1	5	1	1
No of haemodialysis solutions*:	2	4	7	6	1					

*Haemodialysis fluid is supplied as a concentrate and does depend on accurate dilution to obtain predicted amount of sodium per litre.

Comment

Swales¹ reported similar adverse effects with the dialysis of hypotonic patients, in which only small amounts of fluid were removed. He postulated that appreciable amounts of sodium could move along the concentration gradient between the peritoneal dialysis fluid (141 mmol/l) and the patient's serum (in the reported case 125 mmol/l) and cause acute pulmonary oedema. A similar concentration gradient would exist in our patients, where the dialysis fluid sodium concentration was 148 mmol/l and the patients' serum sodium concentration 136 mmol/l.

The sodium content of the peritoneal dialysis fluid is controlled according to *British Pharmaceutical Codex* limits, which allow a variation of $\pm 5\%$ on the stated level. This means that a nominal sodium content of 141 mmol/l may be between 134 and 148 mmol/l