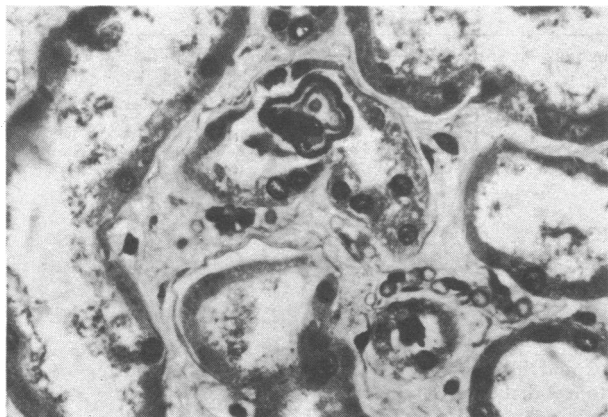


(5.7 mg/100 ml), and phosphate 7.9 mmol/l (24.5 mg/100 ml). Intravenous urography and retrograde pyelography disclosed regular enlarged kidneys with normal ureters and renal outlines. Haemodialysis was performed a few hours after admission. Thereafter blood calcium concentration was 1.6 mmol/l (6.4 mg/100 ml) and phosphate 6.7 mmol/l (20.7 mg/100 ml). The patient became anuric and underwent dialysis five times between 18 and 25 June. On 24 June serum calcium was 2.25 mmol/l (9 mg/100 ml) and phosphate 3.1 mmol/l (9.6 mg/100 ml). The patient died on 27 June from gastrointestinal haemorrhage.

Postmortem renal histological examination (see figure) showed interstitial oedema and dilatation of tubules with flattening and necrosis of tubular epithelium; several tubular lumens were obstructed by crystalline deposits with concentric structure, coloured by von Kossa stain. No lymphomatous infiltrates were found. Glomeruli were normal.



Postmortem renal fragment: stratified calcium deposit in tubule. Degenerative epithelial changes are obvious. (Haematoxylin and eosin. $\times 130$.)

Comment

As in other reported cases¹ acute hyperphosphataemia occurred during chemotherapy for lymphoma and was associated with rapid disappearance of lymphomatous tumours. Hyperphosphataemia was essentially due to drug-induced release of phosphorus from destroyed malignant lymphoblasts, although renal insufficiency may have played a minor part in increasing the serum phosphorus concentration.

While the most usual causes of ARF in malignant lymphomas were excluded, such as hyperuricaemia, ureteral obstruction, and renal tumoral infiltration, characteristic lesions of acute nephrocalcinosis² were found at necropsy. Most probably hyperphosphataemia, with a very high calcium phosphorus product (139.65 (mg/100 ml)) favouring extraskeletal calcifications, directly provoked renal lesions and dysfunction. Several facts support this hypothesis. Firstly, in hypercalcaemic patients phosphate infusion may induce ARF with features similar to that observed in our patient—that is, hyperphosphataemia, rapid fall of serum calcium concentration, and nephrocalcinosis.³ Secondly, hyperphosphataemia aggravates experimental chronic uraemia through calcium phosphate deposition in the kidneys.⁴ Finally, in keeping with our findings, a recently reported leukemic patient had chemotherapy-induced hyperphosphataemia and ARF with the presence of a renal calculus detected by ultrasound.⁵

¹ Cadman, E C, Lundberg, W B, and Bertino, J R, *American Journal of Medicine*, 1977, **62**, 283.

² Heptinstall, R H, *Pathology of the Kidney*. Boston, Little Brown, 1974.

³ Carey, R W, et al, *Archives of Internal Medicine*, 1968, **122**, 150.

⁴ Ibels, L S, et al, *New England Journal of Medicine*, 1978, **298**, 122.

⁵ Ettinger, D S, et al, *Journal of the American Medical Association*, 1978, **239**, 2472.

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Postcards or outpatients: an alternative method of follow-up

Conventional outpatient review is both expensive and inefficient: expensive to both the patient and the hospital authority, and inefficient because it fails to discriminate between the patient who is well and the patient who requires further detailed investigation or treatment. Outpatient review can monitor the progress of the patient for his own benefit, provide an analysis of current practice, or simply reassure either patient or doctor.

This study was carried out to determine whether a proforma completed by the patient could accurately reflect the problems and complications occurring after outpatient urological procedures.

Method and results

A system of pre-paid reply postcards was instituted for patients attending as day cases for urological endoscopy under general anaesthesia (see fig).

Please tick the appropriate box for each of the following questions:—		
	Yes	No
1. Did you have pain on passing water?	<input type="checkbox"/>	<input type="checkbox"/>
2. Did you have any blood in your water?	<input type="checkbox"/>	<input type="checkbox"/>
3. Did you have to pass water more frequently?	<input type="checkbox"/>	<input type="checkbox"/>
4. Did you have a shivering attack?	<input type="checkbox"/>	<input type="checkbox"/>
5. Did you have to call out your GP?	<input type="checkbox"/>	<input type="checkbox"/>
PATIENT'S NAME..... DATE.....		

The pre-paid reply card.

The questions were designed to assess the occurrence of the most probable complications of the procedures—namely, dysuria, haematuria, frequency of micturition, and rigors—but were described on the cards using non-medical terms. A further question relating to the incidence of medical practitioner call-out was included to give some indication of the subjective response of the patient. A total of 1090 cards was issued. The first 200 patients were given the card after the procedure and were instructed by the nurse in charge to answer the five questions at 24 hours from discharge and then to post the card. In the light of the experience gained from this initial series the subsequent 890 patients had their instructions and explanations reinforced by a member of the medical staff.

In the first series 120 of the 200 cards issued were returned, and in the second series 812 of the 890 cards issued were returned. Eleven patients returned cards with one or more questions unanswered.

Comment

The potential of reply-paid questionnaires has been shown by Ogg,¹ Howie and Clark,² and Howie³ with response rates of 81–99%. A survey of published work has shown that this system of patient-completed postal responses has rarely been used in clinical practice.

The discrepancy in response rates between our two series may be attributed to a failure in communication by the staff on issuing the cards. After the initial series one of the medical staff reinforced the instruction to the patients before their discharge from the unit. This gave an immediate rise in the response rate which was maintained throughout the series.

In 1976 the cost to the health authority of an outpatient attendance in a non-teaching acute hospital in England was £9.22,⁴ but there is an appreciable variation in the costs of hospital services throughout the United Kingdom. Such a figure does not take into account the cost of transporting the patient to and from the hospital; any loss of earnings; or loss to the family, employment, or country. At present the total cost of these patient-completed cards including production and postage would not be over 10p per card.

An adaptation of this system using cards with suitably framed questions could well be used to monitor the progress of patients in many other circumstances. Patients who did not respond, or those who indicated by their reply that further review was appropriate or necessary, would be sent conventional appointments. Although an

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.

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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.

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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