

requiring radiography (perhaps those with recurrent dislocations who have had previous films and the elderly who are unlikely to need stabilizing surgery in the future) the addition of Entonox would add no risk or inconvenience. In those likely to be kept waiting I would advocate the use of intravenous analgesia before X-ray and afterwards reduction by an experienced operator, without sedation. Unfortunately it is often the unsupervised inexperienced managing such patients and for them a second doctor competent in the technique of sedation is required for the patient's comfort and safety. Until experienced senior A&E staff are freely available to supervise their juniors patients may not be treated in the most efficient manner theoretically possible, but we should nevertheless strive to treat them safely and not allow them to suffer in pain.

I. G. KENDALL

Regisran in Accident & Emergency Medicine
Basingstoke District Hospital
Basingstoke

Serious eye injuries caused by darts

Sir

The prevention of accidents can only be achieved by knowledge of causes and consequences. The importance of identification of the causes and prevention of accidents has led to the formation of the Medical Commission on Accident Prevention and the Child Accident Prevention Trust. These bodies often depend upon clinicians to identify and report new or unrecognized causes of severe injury. Penetrating eye injuries can cause severe ocular damage with lasting visual impairment and cosmetic disfigurement. Darts have only recently been recognized as a cause of severe eye injury (Cole & Smerdon, 1988).

We have reviewed 21 patients with penetrating eye injuries caused by darts. All injuries occurred between 1 January 1982 and 31 December 1988 and were identified via the surgical database and the operating theatre books at the two hospitals. Two patients with injuries probably caused by darts were not included in the study as we were unable to obtain satisfactory historical and clinical details. Thirteen patients were interviewed and examined by the authors while the information on the remaining patients was obtained from their medical records. The minimum follow-up was 11 months.

All the patients were children with 15 patients aged below 10 years and five between 11 and 13 years. The male to female ratio was 2.5:1 (15:6). There were 9 right and 12 left eyes involved. All injuries occurred in the home setting either the patient's or a friend's. Four patients took longer than 24 h after injury to attend hospital. Two of these patients were afraid to tell their parents of the injury while the other two did not realize the severity of the injury. In 10 cases the dart was thrown by another child while three injuries resulted from the dart bouncing off the target. Pulling the dart out of the board resulted in four injuries while the exact mechanism of injury was unknown in the remaining four. It was difficult to

determine the exact number of injuries caused by the flight end of the dart but it is possible that most of the injuries caused while pulling the dart out of a dartboard were caused by the flight end. The upper lid was punctured in six patients. The lower lid was not involved in any of the injuries. Overall, a final visual acuity of 6/6 or better was achieved by only eight patients with four patients achieving vision of 6/60 or worse.

Severe ocular injuries in children often occur during play. Popular games vary with the times; in the 1950s arrows were a frequent cause of penetrating injuries (Lambah, 1962). In one major study of penetrating eye injuries between 1950 and 1960 (Lambah, 1962), none were caused by darts, while darts are mentioned as a cause in another study during this period (Roper-Hall, 1959). In more recent studies in the 1970s and 1980s (Horan, 1979; Grin *et al.*, 1987), darts have been noted to be a cause of perforating eye injuries in children. Darts have only been identified as the commonest cause of such injuries in children in a recent study by Cole & Smerdon (1988). Delays of more than 24 h in attending the casualty department were seen in four of our cases. Perforations by darts can be small and the child or parent may not appreciate the severity of the injury. This is particularly so when the upper eyelid is involved.

The game of darts was, until recently, an adult sport played largely in public houses. In recent years the sport has received extensive television coverage and has therefore become very popular. A survey of three large toy stores in London and Manchester revealed nine different types of darts on sale manufactured by three different companies. Only one company printed a clear warning on all its products. The warning reads 'Darts is an adult sport. It is dangerous for children to play without supervision'. Some of the other products carried warnings in small print while three had no warning at all. Although a large number of adults play darts regularly it is interesting to note that in our study none of the penetrating eye injuries due to darts were in adults. Among children the biggest danger is at play and it would appear that parents' apparent lack of awareness of potential danger to their childrens eyes is an important factor. Preventive measures can help to reduce the incidence of these injuries but these can only be considered when new dangers are identified. It is the responsibility of ophthalmologists to identify and report new causes of severe ocular trauma. There is at present no requirement for a physician to report ocular injuries caused by dangerous toys to the Consumer Safety Unit. The European Community directive on the safety of toys came into effect on 1 January 1990 but darts with metallic points are excluded as they are not regarded as toys. It is suggested that all darts on sale should carry a clear and prominently displayed warning. Perhaps all serious injuries related to toys should be reported to the Consumer Safety Unit so that causes of all severe injuries may be identified early and appropriate measures taken. The general public should be made aware of the vulnerability of children to injuries by darts and this may only be possible via the media (Roper-Hall, 1959). It may be argued that since the game of darts is recognized to be an adult sport, darts and dartboards should not be sold in childrens' toy stores.

B. C. K. PATEL
Senior Registrar,
Moorfields Eye Hospital,
London

L. H. MORGAN
Senior Registrar,
Manchester Royal Eye Hospital,
Manchester

REFERENCES

- Cole M. D. & Smerdon D. (1988) Perforating eye injuries caused by darts. *British Journal of Ophthalmology* **72**, 511–4.
- Grin T. R., Nelson L. B. & Jeffers J. B. Eye injuries in childhood. (1987) *Pediatrics* **80**, 13–17.
- Horan E. C. (1979) Perforating eye injuries in Cork. *Transactions of the Ophthalmological Society U.K.* **99**, 511–4.
- Lambah P. (1962) Some common causes of eye injury in the young. *Lancet* **2**, 1351–1353.
- Roper-Hall M. J. (1959) The treatment of ocular injuries. *Transactions of the Ophthalmological Society U.K.* **79**, 57–69.

Ketamine in severe acute asthma

Sir

We recently treated a 35-year-old female asthmatic patient with intravenous bolus ketamine. She is known to be steroid dependent and her prednisolone had been ill-advisedly stopped. She arrived at hospital in severe status asthmaticus and failed to respond in the emergency room to nebulized salbutamol, intravenous aminophylline and hydrocortisone, and blood gases deteriorated. One hour after initiating therapy it was decided to ventilate her mechanically and blood gases improved as a result. However, with the patient very restless and peak airway pressures reaching 60–80 cm H₂O, ketamine was given by intravenous bolus with the aim of achieving sedation without compromising cardiovascular parameters. We were also aware of a report in which ketamine had been used successfully in the treatment of bronchospasm. Peak airway pressures dropped to 40 cm H₂O and it was necessary to give two more smaller bolus doses of ketamine over the next 75 min. What subsequently impressed us was the fact that it was possible to extubate her after only 3¼ h, before any effect from the hydrocortisone, administered 4½ h earlier, would have been expected. She subsequently made an uneventful recovery.

This has led us to question whether ketamine might have a wider role in the treatment of severe acute asthma, given that asthmatic deaths have been increasing in recent years (Burrey, 1974; Jackson *et al.*, 1982), and that a significant number of these still occur in hospital (Sears *et al.*, 1985; Rothwell *et al.*, 1987) where it has been shown that management is variable and treatment sometimes delayed due to the severity of the attack being underestimated (Rothwell *et al.*, 1987; Bucknall *et al.*, 1988).

Ketamine has known bronchodilator effects, although its mechanism of action is unclear (White *et al.*, 1982), and it has been implicated as beneficial in the treatment of bronchospasm in the elderly (Sheref, 1985), the young (Belts *et al.*, 1971; Fisher, 1977; Strube *et al.*, 1986), by continuous infusion (Sheref, 1985; Strube *et al.*, 1986; Park *et al.*, 1987), in ventilated (Fisher, 1977; Rajanna *et al.*, 1982; Park *et al.*, 1987) and non-ventilated (Betls *et al.*, 1971; Strube *et al.*, 1986) subjects, in asthmatics (Fisher, 1977; Strube *et al.* 1986; Park *et al.*, 1987) and non-asthmatics (Rajanna *et al.*, 1982). However, no clinical trial has ever been conducted. Although ether has also been shown to benefit severe acute asthma (Robertson *et al.*, 1985) this is neither widely available nor easily administered, and is less free of side effects.