the following 9 cm spinal needles with a Quincke point through the skin: 20 gauge, 22 gauge, 25 gauge (Becton Dickinson, Ireland), 23 gauge (Terumo Corporation, Japan), and 0.2 ml 1% plain lignocaine⁵ (Astra Pharmaceuticals, Sweden) through a 25 gauge intravenous needle (Becton Dickinson, Ireland). The order of the needles (and thus the sites of insertion) was randomised. The volunteer was unaware of the needle size used or whether local anaesthetic had been infiltrated. After each needle or infiltration of lignocaine the volunteer completed the visual analogue scale. Results were analysed using the Wilcoxon signed rank test for paired observations.

The volunteers' ages ranged from 26 to 54 years; two were women. The chart shows the pain scores. When the pain scores with the different needles were compared statistically significant differences existed between all the needles ($p < 0.01$); an exception was the difference between the 22 gauge and 23 gauge needles, which was not significant. The finer needles caused less pain. There was also a significant difference ($p < 0.01$) between the pain scores of the 20 gauge, 22 gauge, and 23 gauge needles and the infiltration of lignocaine. There was no significant difference in pain scores between the 25 gauge needle and the infiltration of lignocaine. No learning effect was detected.

The number of volunteers recording their lowest pain score was seen after the infiltration of local anaesthetic and the insertion of a 25 gauge needle.

Visual analogue pain scores for each needle size and for skin infiltration anaesthesia in the 12 volunteers.

Comment

This study looked only at the pain caused by the insertion of spinal needles through the skin. Deeper structures penetrated during dural puncture do not have clinically important sensory innervation and should not alter the interpretation of the results of this study. Volunteers can discriminate between different sizes of needles used for spinal anaesthesia. If 25 gauge needles are used as described by an experienced anaesthetist then local anaesthesia is unnecessary. Should dural puncture be unsuccessful, then a local anaesthetic agent may be infiltrated through the spinal needle before its removal. In inexperienced hands, or if an introducer is thought to be necessary, infiltration of a local anaesthetic agent is desirable.

We thank our colleagues for baring their backs so willingly.

- 1 Haroldson S. Headache after spinal anesthesia: experiments with new spinal needles. *Anesthesiology* 1951;12:321-7.
- 2 Scott DB. Spinal anaesthesia. *Br J Anaesth* 1975;47:421.
- 3 Drummond GB, Scott DHT. Deflection of spinal needles by the bevel. *Anaesthesia* 1980;35:854-7.
- 4 Revell SI, Robinson JD, Rosen M, et al. The reliability of a visual analogue scale for evaluating pain. *Anaesthesia* 1976;31:1191.
- 5 Moore DC. *Regional block*. Springfield, Illinois: Charles C Thomas, 1973.

(Accepted 19 December 1984)

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How dangerous is sledging?

Every season brings its crop of injuries related to the weather. In winter, when the first snow falls, children use trays, plastic bags, and any other makeshift device to travel down the local inclines. The well organised use sledges traditionally made of wood, although plastic ones have been popular recently. The dangers of accidentally sliding on to roads or railways are obvious but we think that the dangers of sledging in the local park are probably underestimated. There are no references to sledging accidents in published works, although professional bob sledging is referred to by the American College of Sports Medicine in its encyclopaedia.¹ The speeds of around 100 mph (161 kph) reached in professional sledging make it particularly risky.

After a fatal head injury in a child who hit a tree while sledging² we have recorded sledging injuries presenting in one accident department over eight days. We have also attempted to identify preventable features.

Methods and results

Between 13 January and 21 January 1985, after the first snowfalls, 101 patients were recorded as having sustained injuries from either colliding while on, falling off, or being hit by a sledge. These patients represented almost 4% of our total workload over this period. The notes of these patients made at the accident and emergency department were examined and details extracted for analysis.

Sixty four patients were male, the peak age being 13. Sixty one of the patients fell into the age range 6-15. The youngest patient was 6 months old, being hit by a sledge while in the arms of his spectator mother. The oldest patient was 64 years old; he was also struck while watching, sustaining crush fractures of two thoracic vertebrae and being admitted to hospital. Some 71 injuries occurred between the hours of 1300 and 1700, with only 14 occurring after dark.

Twenty five patients were "pedestrians" hit by sledges; some of them were unconnected with sledging, others were walking back up the slope for another run. Of the whole group, 16 required admission to hospital and a further 35 hospital follow up, most often for fractures. The table shows the injuries suffered. Two children required laparotomy for intra-abdominal injury; both had a ruptured spleen. A patient with renal trauma remained in hospital for one week with persistent haematuria, though an intravenous urogram was normal and no operative intervention was necessary. Of those patients who sustained a fracture of the leg, five were children with a fractured femur. Although head injuries were common, no patient in our series sustained a fracture of the skull. The spinal fractures were all either crush fractures of vertebral bodies or fractures of transverse processes. There were no deaths.

Injuries associated with sledging

Injury	No of patients	Injury	No of patients
Bruising	30	Facial fracture	7
Fracture of the leg	21	Spinal or pelvic fracture	5
Head injury	10	Rib fracture	3
Lacerations	9	Ruptured spleen	2
Fracture or dislocation of the arm	9	Renal trauma	2
		Other	3

Comment

Sledging is a hazardous pastime. We think that the number of injuries we have recorded highlights its dangers. Children are particularly at risk and should be given more parental supervision. Most areas have well known sledging slopes; these should have properly cordoned off runs which are free of obstructions. People could watch or ascend the slopes safely outside the barriers. In our series this might have eliminated the "collided with" and "hit by" groups and reduced the injuries by 56%.

- 1 Allaria A. Sledging. In: *Encyclopaedia of sport sciences and medicine*. American College of Sports Medicine. New York: Macmillan, 1971.
- 2 *Leicester Mercury* 1985 Jan 17.

(Accepted 19 February 1985)

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