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Erythema nodosum and circulating immune complexes in acne fulminans after treatment with isotretinoin

The syndrome of acne fulminans includes severe ulcerating cystic acne, fever, and arthralgia.¹ Other documented features include microscopic haematuria, an increased erythrocyte sedimentation rate and white cell count,¹ anaemia,² myalgia,¹ and, in one case, erythema nodosum.³ Circulating immune complexes have not previously been reported, although their presence is suggested by the findings of arthralgia, microscopic haematuria, and erythema nodosum.

In the past three years we have seen three patients with erythema nodosum and acne fulminans, which in two cases appeared to have been triggered by treatment with the recently introduced analogue of vitamin A, isotretinoin. Evidence of circulating immune complexes was sought in these two patients, and we report our findings.

Case reports

Case 1—An 18 year old man had had acne for several years which had recently become resistant to conventional treatment. He was treated with isotretinoin 0.5 mg/kg daily, increasing after four weeks to 1 mg/kg daily. Three weeks later he was admitted to hospital with fever, crusted and ulcerating lesions on his chest, and erythema nodosum on his shins. Investigations showed the following abnormalities: erythrocyte sedimentation rate 70 mm in the first hour; haemoglobin concentration 11.9 g/dl; white cell count $11.5 \times 10^9/l$, neutrophils 80%; platelet aggregation test for circulating IgG immune complexes yielded a positive result on two occasions at 1/160 dilution (normal less than 1/20); and faecal occult blood was weakly positive on three consecutive occasions. Results of latex and sheep cell agglutination tests, antinuclear factor titre, and results of urine microscopy were normal or negative. *Propionibacterium acnes* was isolated from acne lesions.

Case 2—A 21 year old Asian man with severe nodulocystic facial acne unresponsive to oral antibiotics was treated with isotretinoin 1 mg/kg daily. His acne became progressively more inflamed over the ensuing three weeks, with the development of arthralgia, lesions similar to those of pyogenic granuloma on the chest,⁴ and erythema nodosum on his shins. The following abnormalities were found: erythrocyte sedimentation rate 50 mm in the first hour; white cell count $14.3 \times 10^9/l$, neutrophils 67%; platelet aggregation test for circulating IgG immune complexes yielded a positive result on two occasions at 1/160 dilution (normal less than 1/20); and serum IgG concentration was 21.7 g/l (normal 8.0-18.0 g/l). Microscopy of urine yielded normal results.

In both cases symptoms responded rapidly to moderate doses of prednisolone (25-30 mg daily). Improvement was accompanied by a fall in the titre of circulating immune complexes to normal values within four weeks. Isotretinoin was continued at 1 mg/kg daily and achieved excellent results in three to four months.

Comment

Acne fulminans is a rare complication of severe acne. The two patients reported on here developed the condition after starting treatment with isotretinoin. Although acne does commonly worsen in the first few weeks of treatment with isotretinoin,⁵ we are not aware that it has previously been implicated as a precipitant of acne fulminans.

Circulating immune complexes are found when erythema nodosum

occurs in other conditions such as sarcoidosis, and their presence has been predicted in acne fulminans.² On the basis of the clinical findings in a patient with acne fulminans and erythema nodosum Williamson *et al* postulated that an Arthus reaction was taking place.³ They were able to show an exaggerated response to an intradermal injection of *P. acnes* suspended in saline, and suggested that this antigen might also play a part in the Arthus reaction. They did not, however, show the presence of circulating immune complexes. Using the platelet aggregation test, a reliable method for detecting soluble IgG complexes, we confirmed that circulating immune complexes may be found in acne fulminans.

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Is a local anaesthetic necessary when using fine gauge spinal needles?

Over the past 100 years since Bier introduced spinal anaesthesia in man needles for this procedure have improved in design, becoming finer and sharper. The use of fine gauge needles lessens the risk of headache after lumbar puncture.¹ The most commonly used sizes are 22 gauge, 23 gauge, and 25 gauge. The use of 25 gauge needles reduces the incidence of headache after lumbar puncture to less than 2%.² The 25 gauge needle is flexible, however, and the use of an introducer is recommended.

Drummond and Scott have shown that needles may be more accurately directed in the midline if the bevels of the needles face caudally rather than laterally.³ This method has been followed by one of us (GRP), who finds it unnecessary to use an introducer in routine clinical practice with 25 gauge spinal needles.

To make insertion of a spinal needle as painless as possible it is almost universal practice to infiltrate the skin with a small volume of local anaesthetic using a 25 gauge intravenous needle. This is painful owing to the stinging sensation of the local anaesthetic. It seems unnecessary to use infiltration anaesthesia if a lumbar puncture is performed with a 25 gauge needle alone. As discrimination of needle size in the lumbar region is said to be poor, it may be unnecessary to use infiltration anaesthesia for sizes other than 25 gauge.

We have tried to compare the pain caused by the insertion through the skin of spinal needles in common use to see if they can be discriminated and to see if infiltration anaesthesia is necessary with the use of fine needles.

Subjects, methods, and results

Twelve anaesthetists from this department, of all grades and both sexes, volunteered for the study. The 10 cm visual analogue scale⁴ was explained to them. The conventional limits of the scale are no pain at all and the worst pain you could possibly imagine. The scale was modified so that the upper limit of pain was the pain caused by the insertion of an 18 gauge spinal needle (Becton Dickinson, España, SA) through the skin without local infiltration anaesthesia. This avoided crowding at the lower end of the scale.

An area 15×15 cm around the spinous processes of L3 and L4 was cleaned using a chlorhexidine spray (Dispray, Stuart Pharmaceutical) and dried with a gauze swab. A previous study of 10 volunteers had shown sensitivity over the spinous processes to be no different from that of skin more laterally. An 18 gauge spinal needle was introduced through the skin to give the upper limit of the visual analogue scale. The same investigator then inserted

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.

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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 sledding 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 sledding 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%.

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