Health economics

Skiing injuries: the increasing workload

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All skiing injuries presenting to a fracture clinic during the period December 1992 to April 1993 were studied. Fifty five patients with 59 injuries were treated during this period. Thirty (54.5%) were male and 25 (45.5%) female. The mean age was 34 years (range 9–61). The anatomical distribution of injuries seen corresponded very closely with those seen in much larger studies abroad. There were 35 upper limb injuries (59.3%), 22 lower limb injuries (37.3%), with only two spine and trunk injuries (3.4%). While only two patients underwent surgery abroad, a further 12 needed surgical intervention on return, requiring a total stay of 61 'inpatient days'. The bulk of the workload was, however, on an outpatient basis, with a total of 172 appointments. Many advances have been made towards improving the safety of skiing. However with skiing becoming increasingly popular we can expect an increasing workload and cost associated with such injuries.

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Skiing has continued to increase in popularity since the Second World War, with 653 000 people from the UK now taking skiing holidays abroad each year.¹ Exposure to this potentially dangerous activity has led to a large number of injuries, with skiers subsequently returning to the UK for definitive treatment, follow up treatment, or both.

While large epidemiological studies have been performed in hospitals serving skiing centres abroad, notably Australia, United States and continental Europe,^{2–4} to date we are not aware of any literature detailing the prevalence and pattern of skiing injuries in citizens of the UK returning from holidays abroad.

Chase Farm Hospital is a District General Hospital which serves a population of approximately 250 000. Enfield is a relatively affluent area which may lead to a higher proportion of subjects taking skiing holidays than in some other parts of the UK.

The aim of the study was to quantify the number and pattern of skiing injuries seen in our fracture clinic, and to estimate the additional workload undertaken by the hospital staff.

Patients and methods

The study period was from 1 December 1992 to 30 April 1993. All patients presenting to our fracture clinic with a history of a new skiing injury were included in the study.

Once identified, a questionnaire was completed on each patient. Details of the country in which the accident occurred, treatment before return, mode of referral and delay between injury and return were acquired. The type and site of injury were categorized. At the end of each patient's treatment, length of inpatient stay and operations performed (if applicable), number of outpatient visits, physiotherapy sessions, radiographs taken and plaster casts applied were recorded.

Results

Fifty five patients with 59 injuries were identified. The age range was 9–61 years (mean 34) with a bimodal distribution (Table 1). There were 30 males and 25 females. Modes of referral were quite evenly distributed, being direct to the fracture clinic in 14 (25.4%), via general practitioner in 21 (38.2%), and via Chase Farm Hospital accident and emergency department in 20 (36.4%) patients. The countries in which the skiing injuries were sustained can be seen in Table 2. The mean delay between injury and presentation was 6.8 days (range 1–22).

The injuries sustained were arranged into three broad groups: upper limb, neck and trunk, and lower limb. Their incidence and further sub-divisions are shown in

Table 1. The number of patients injured, by age group

Age (years)	Number	%
0–10	1	1.8
11–20	11	20
21–30	17	30.9
31–40	5	9
41–50	10	18.1
51–60	10	18.1
61+	1	1.8
Total	55	100

Table 2. The countries in which the patients sustained their injuries

Country	Number	%
France	20	36.3
Austria	15	27.2
Italy	10	18.3
Switzerland	6	10.9
USA	2	3.6
Spain	2	3.6
Total	55	100

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Table 3. The injuries sustained, by anatomical site

Injury	Total	%
Upper limb	35	59.3
Shoulder	6	10.2
Upper arm	2	3.4
Elbow	2	3.4
Wrist/forearm	13	22
Thumb	12	20.3
Neck and trunk	2	3.4
Neck	1	1.7
Ribs	1	1.7
Lower limb	22	37.3
Hip	0	0
Thigh	1	1.7
Knee	13	22
Lower leg	6	10.2
Ankle/foot	2	3.4
Total	59	100

Table 4. The operations performed, by anatomical site

Operation	Number
Upper limb	
Repair A-C joint	1
R/O screw A-C joint	1
Repair ulnar collateral ligament thumb	1
ORIF # radius	1
Neck and trunk	
Application Blackburne tongs	1
Anterior fusion C5/C6	1
Lower limb	
Arthroscopy	2
ACL repair	1
MCL repair	1
ORIF tibial plateau/spine	2
MUA # tibia	2
Locked nailing # tibia	1
Repair tibialis anterior tendon	1
Total	16

Table 3. The commonest single injury was fractured distal radius (nine cases).

While abroad, the overwhelming majority of patients were treated conservatively with only two (3.6%) patients undergoing surgery before returning to the UK. Forty (83.3%) had radiographs immediately after their injury, and all these films were available on presentation to the fracture clinic. Conservative treatment before return consisted of plaster cast/backslab in 33 (60%) patients and strapping or sling in 11 (20%) patients.

In total, the 55 patients received a total of 172 (mean 3.1, range 1–12) outpatient consultations. Twenty patients were referred to the physiotherapy department, and 32 patients required the services of the plaster technicians, with a total of 44 casts being applied or modified.

Twenty six of the study group required further radiographs as part of their treatment or follow up management. A total of 130 radiographs were taken.

Twelve (22%) patients were admitted directly from the fracture clinic. All underwent surgery, a total of 16 procedures being performed. These are listed in *Table 4*.

The total inpatient stay was 61 days, with a mean of 5 (range 1–21) days. It can be seen that the majority of the operations were on the lower limb, in particular in and around the knee.

It is likely that five patients will need readmission for removal of metalwork (four operated on at Chase Farm Hospital, one abroad).

Discussion

During the winter months skiing injuries present a significant workload to our District General Hospital. Whilst these patients only accounted for approximately 2% of all new fracture clinic patients seen they represented 10% of all admissions from the clinic. Although the number of patients in our study was relatively small, they represent a similar cross-section of injuries to those seen in the much larger epidemiological studies performed in ski centres abroad.^{2,3,5}

From reports worldwide it can be seen that there has been a dramatic but selective decrease in the numbers of skiing injuries over the last 20 years. Early epidemiological studies in the 1940s showed that the ankle and tibia were the most frequent sites of significant injury⁶ in skiers, with spiral fracture of the distal fibula earning the title of 'the skier's fracture'.⁷

With the advance of ski boot and binding technology there has been a significant reduction in tibial fractures.⁸ However, it has been shown that these improvements have done nothing to protect the knee from torsional injury.³ This can also be seen from our own figures. Indeed, severe sprains of the knee, usually involving the anterior cruciate ligament have shown a marked increase.⁹ This is reflected clearly in our study, with 46% of the knee injuries undergoing some form of surgery.

With the decline in lower leg injuries as a result of equipment improvements, it is now upper extremity injuries which appear to predominate as they have shown no such decline.^{8,9} Our own study shows a predominance of upper limb (59%) to lower limb (37%) injuries. 'Skier's thumb', or ulnar collateral ligament injury, has been reported as the commonest upper extremity injury.^{10,11} This accounted for 20% of all the injuries seen in our study, although wrist injuries were slightly more common (22%).

It is clear from the number of operations required for patients returning home that treatment received abroad represents little more than a 'first aid' service. Despite comprehensive ski insurance policies covering medical treatment abroad, the National Health Service faces the burden of the treatment costs for this small but important group of serious sports injuries.

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