Sports injuries in an accident and emergency department

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SUMMARY

Over a one year period, 2270 sports injuries were seen in the Accident and Emergency Department at the Royal Infirmary, Edinburgh. This represented 3.9% of the total new patients seen in that year. Football and rugby were the most frequent sports responsible for injury. Seventy-eight per cent of injured persons were 26 or under and 88.7% of injuries occurred in men. The two months with the most sports injuries were September and February; 74% (1683) patients stated they trained at least once a week and 85% (1895) played the sport in which they were injured at least once a week. Players who did not train were less likely to incur a severe injury than those who did. Fourteen per cent of the injuries were the result of foul play, but again foul play was less likely to cause a serious injury; 41% of injuries were to the lower limb; 45% of injuries were fractures, dislocations, lacerations and head injuries; 7% of patients required admission to hospital and 22% were referred to a clinic. Seventy-seven per cent of the referrals were to the orthopaedic department. The relevance of these figures to the accident and emergency workload is discussed.

INTRODUCTION

Participation in sport is generally assumed to be beneficial to health. Inevitably, however, sports men and women risk injury and in recent years the importance of sports medicine has been recognised and sports injury clinics have been initiated. Many sports injury clinics do not offer emergency services and some only cater for top class competitors so that the majority of injuries occurring in organised sport still present

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first of all to the accident and emergency department. The aim of this prospective study was to assess the proportion of referrals to the accident and emergency department due to injuries incurred whilst participating in sport, and to note which sports and which injuries occurred. Since it is often assumed that training protects against injury, all patients with sports injuries were questioned about their training.

METHODS

Sports injuries presenting to the Accident and Emergency Department, Royal Infirmary of Edinburgh were prospectively studied over a one year period from 1 April 1980–31 March 1981. Only injuries occurring in organised sports were included. On a standard proforma the patient's age, sex and sport responsible for the injury were recorded together with the date of the injury and the frequency with which the patient both trained and played this sport and any other. Patients who trained once a week or more were considered to train regularly and the same definition was taken for the frequency of participation in the sport itself. The relationship of the injury to foul play or defective clothing or equipment was recorded. The site and nature of the injury, the treatment received in the accident and emergency department and disposal were noted but the patient was not followed up beyond his initial attendance in this study. All this data was computerised to simplify the presentation of results as frequency tables and percentages. Cross tabulation was performed to compare two variables such as training and type of injury.

RESULTS

In the year 1 April 1980–31 March 1981, 2270 persons out of 58 539 casualties admitted that their injury had occurred as a result of participation in organised sport. The sports responsible are shown in Tables 1 and 2.

Age distribution and sex

Fifty-two per cent of injuries occurred in those 21 or under and 78% in those aged 26 or under. Eighty-seven per cent in those under 30 and 97% in those under 40. The age range in this series was from 9–74 with a mean age of 22.2 ± 6.6 years. The mean age for sportsmen was 22.16 ± 6.59 and for sportswomen 20.9 ± 7.5 ; 2015 injuries occurred in men and 255 in women.

Seasonal variation

Table 3 shows the number of sports injuries presenting to the department month by month. There were less injuries in the holiday periods; December–January and May–August. This trend is not reflected in the total number of patients presenting to the department in these months.

Table 1 Sport responsible for injury and mean age in all patients

Sport	Number of injuries	Percentage	Mean age $\pm$ SD
Football	932	41	22.5 $\pm$ 6.3
Rugby union	520	23	20.8 $\pm$ 6.0
Skiing	163	7	22.7 $\pm$ 8.7
Hockey	84	4	19.8 $\pm$ 7.1
Squash	82	4	28.1 $\pm$ 6.9
Basketball	70	3	18.6 $\pm$ 5.5
Karate	59	3	22.5 $\pm$ 5.1
Judo	45	2	18.6 $\pm$ 5.5
Badminton	43	2	28.7 $\pm$ 11.3
Cricket	33	1	28.6 $\pm$ 9.5
Horse riding	31	1	24.4 $\pm$ 10.6
Volleyball	23	1	
Boxing	20	1	
Tennis	17	1	
Athletics	16	1	
Jogging	14	1	
Gymnastics	14	1	
Golf	10	0.5	
Others	94	4	

Table 2 Female sports injuries (255)—sports responsible

Sport	Number	Percentage
Skiing	61	24
Hockey	43	17
Horse riding	25	10
Basketball	22	9
Badminton	18	7
Volleyball	12	5
Squash	9	4
Gymnastics	8	3
Athletics	6	2
Karate	5	2
Judo	5	2
Others	41	16

Table 3 Seasonal variation of number of sports injuries

January 171 (5023)	May 163 (4932)	September 254 (4899)
February 277 (4462)	June 144 (4798)	October 214 (4869)
March 205 (5057)	July 103 (4757)	November 221 (4805)
April 223 (4827)	August 143 (5365)	December 152 (4745)

Figures in brackets are total referrals to accident and emergency department for that month

Training

Seventy four per cent (1683) patients claimed they trained once a week or more and 85% (1895) claimed they played at least once a week. Thus the vast majority of injuries occurred in reasonably fit individuals accustomed to the rigors of their sport. Cross tabulation of training and regular participation against severity of injury failed to demonstrate any difference in the severity of the injury received by those who trained or played regularly and those who did not.

Foul Play

Fourteen per cent (327) of the injuries were said to have occurred as a result of foul play. Twenty-four per cent of footballing injuries were due to foul play compared with only 9% of rugby injuries. Foul play was less likely to result in a serious injury when cross tabulation displays of foul play against type of injury were examined.

Site and type of injury

The site and type of injury are shown in Tables 4 and 5. The lower limb was the site of injury in 41% of patients, followed by the upper limb (34%) and head and neck (16%). When these figures are broken down more specifically it is found that the ankle (19%) and hand (17%) were the parts most frequently injured. The majority of injuries could be classed as soft tissue sprains and strains (55%), but 45% of the injuries were fractures, dislocations, lacerations and head injuries. Thus injury in sport is not inconsequential.

Table 4 The site of injury in 2270 sports injuries

Head and neck	363	16%
Upper limb	763	34%
Shoulder	147	7%
Arm and wrist	229	10%
Hand	387	17%
Trunk	83	4%
Lower Limb	935	41%
Hip and thigh	32	1%
Knee	214	10%
Calf	110	5%
Ankle	417	19%
Foot	162	7%

Table 5 Type of injury in 2270 sports injuries

Soft tissue	1256	55%
Laceration	222	10%
Fracture	533	23%
Dislocation	75	3%
Head injury	57	3%
Ligament/cartilage tear	71	3%
Others	24	1%
Effusion	21	
CVS	1	
Urological	1	
Psychiatric	1	

Treatment and disposal

Eight-four per cent (1906) patients had one or more radiographs taken. The broad categories of treatment given are shown in Table 6. Sixty-four per cent were advised

and discharged with or without symptomatic treatment such as pain killers, elastocrepe bandage, elastoplast dressings, 36% required more active treatment in the form of suturing, plastering, reduction of fractures and dislocations, antibiotics, aspiration, nail trephining or splintage.

Table 7 shows the disposal of the patients; 36% required to be followed up and 7% required admission; 6% were reviewed by the accident and emergency department; 8% were sent home to be followed up by their GP and 22% were referred to other hospital clinics. The department responsible for further management of those who were referred to clinics or admitted is shown in Table 8. Seventy-seven per cent of the 677 patients were subsequently reviewed by the orthopaedic department.

Table 6 Treatment received in accident and emergency department in 2270 sports injuries

Advice, symptomatic treatment and discharge	1457	64%
Suture/steristrip	208	9%
Plaster of paris $\pm$ reduction	159	7%
Support/splintage	234	10%
Referral without treatment	181	8%
Others	28	1%

Table 7 Disposal

No follow up	1266	57%
G.P.	172	8%
A & E follow up	132	6%
O.P. clinic	505	22%
Admission	163	7%

Table 8 Department involved in follow up

Orthopaedic	520	77%
E.N.T.	77	11%
Neurosurgery	45	7%
Oral surgery	20	3%
General surgery	6	1%
Medical	2	—
Urology	2	—
Cardiothoracic	1	—

DISCUSSION

There are a number of limitations in a prospective study of this nature. We have only categorised sports injuries which presented to this department. In the city of Edinburgh there are two smaller accident and emergency departments which will also have seen and treated sports injuries. There is also a separate 24 h eye accident and emergency service and therefore eye injuries are generally excluded from this survey. Children up to the age of thirteen are usually seen in the children's hospital so that injuries occurring in children's sport are also not included. We must also accept that we do not know how many people participate in the various sports available in the Edinburgh area and therefore we can make no assessment of the risk of incurring an injury in a particular sport. Others have attempted to do this for some sports particularly rugby (Walkden, 1975; Weightman & Browne 1974, 1975; Durkin, 1977; Sparks, 1981) but these were

club doctors who were able to accurately assess the number of injuries/player hours occurring in their club. A survey of sports injuries presenting to an accident and emergency department is a survey of those injuries which appear serious enough to warrant referral (either by the patient himself or the club doctor) and which then arrive at the chosen accident and emergency department.

Crompton & Tubbs (1977) made a retrospective survey of sports injuries presenting to the Birmingham Accident Hospital. Their gross figures are similar to ours in that 40 169 casualties, 2809 (7%) were injured whilst participating in sport. It might be reasonable to suggest, therefore, that 4–7% of the caseload in accident and emergency departments are the result of sports injuries. Eighty four per cent of our patients required radiographic investigation and 36% required specific treatment so that sports injuries account for a small but significant proportion of an accident department workload. Little or no training in the treatment of sports injuries is given at undergraduate or post graduate level and this should be rectified. The doctor examining a patient injured in sporting activity requires a greater understanding of the mechanics of that injury and a more ready understanding of the demands of the patient to return to his sporting activity. Simple conservative immobilisation of the injured part may do great dis-service to the patient and to the injury. In a previous paper the benefits of immediate physiotherapy for the sprained ankle has been clearly demonstrated (Brook et al., 1981).

The high incidence of injuries in Association Football and Rugby Union was expected. Weightman & Browne (1974, 1975) estimated that injuries occur in football at a rate of 36.5/10 000 man hours play and in rugby at a rate of 30.5/10 000 man hours play. Figures for other sports were lower, 10.3/10 000 man hours for men's hockey and 1.46/10 000 man hours for badminton. If our injury rates are assumed to be similar then the 932 football injuries represent more than 250 000 hours of play and 520 rugby injuries represent over 170 000 hours of play, 84 hockey injuries (both men and women) represent about 75 000 and 43 badminton about 300 000 hours. We have at present no way of checking these estimations in our area.

The seasonal distribution of injuries is to be expected from social patterns in the Edinburgh area. The two months with the highest number of sports injuries were February and September immediately following the period of lay-off in the major contact sports, namely rugby and football. This is confirmed when these two sports are looked at individually (Davies & Gibson, 1978).

One striking fact in this study is the high number of injured participants who trained and played regularly. This may reflect greater opportunity for injury and since we do not know the training and playing frequency of those who are not injured, we cannot comment on whether players are protected from injury by training although this seems likely and the seasonal figures suggest it. Certainly training did not in this prospective study appear to protect against severity of injury. These questions can only be resolved at club level.

The site most frequently injured was the lower limb. The large injury contribution of football and rugby made this inevitable and others have reported the preponderance of lower limb injury in these sports (Weightman & Browne, 1974). Particular attention should be paid to the training of accident and emergency doctors in the treatment of ankle injuries. It is inadequate to exclude a fracture and send the patient home when

dealing with a sportsman. The site of injury depends of course on the sport and analysis of the site and type of injury in any particular sport should alert one to preventative measures which can be employed. We hope to break down our figures for a number of the common sports in a future article.

Forty-four per cent of the patients required some form of follow up, 77% of those followed up in clinics being reviewed by the orthopaedic department (23% of all sports injuries). Much of the responsibility for sports injuries lies with the orthopaedic services. The 45 patients seen by the neurosurgical services represents a special head injury ward in Edinburgh run by the neurosurgical department. Only 24 patients were referred for physiotherapy which suggests that not enough use is being made of this service in those patients with soft tissue injuries (Brooks *et al.*, 1981).

We would conclude that injuries sustained in sport make a considerable demand on the Accident and Emergency Services of the UK, in our experience this being 3.9% of the total patients. The patients were in general, young and presumably in their productive working years and a much more aggressive therapeutic approach is almost certainly required. It would appear that the staff in this Teaching Hospital Department are lacking in understanding of the requirements of sportsmen and their soft tissue injuries and greater emphasis should be placed on the appropriate education in the undergraduate and postgraduate years. It would be possible to improve appreciation of the problems with special clinics to which sporting soft tissue injuries were referred and perhaps the introduction of such a clinic in the accident and emergency setting with appropriate physiotherapy backup would be the most beneficial step which can be taken to immediately rectify the problems in this difficult clinical area.

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