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One Year of Severe Eye Injuries in Sport

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Summary:

A one year prospective study was undertaken to assess all sports injuries requiring inpatient treatment at Manchester Royal Eye Hospital. (1 January to 31 December 1987.) Fifty two patients were admitted (25.1% of all admissions due to trauma). Racquet sports accounted for 51.9% of these cases. Eight patients required 12 surgical procedures and there were 3 perforating injuries. Sport is becoming an increasingly important cause of severe eye injury and the encouragement of adequate ocular protection is now a matter of urgency.

Recent studies have shown the increasing importance of sport as a cause of eye injury[1,2,3]. However, it is also apparent that sport is becoming responsible for a greater proportion of severe injuries to the eye[4]. This is an ominous trend which is likely to continue, because of the rising popularity of sport.

Seventy-five years ago sport accounted for 0.7% of eye injuries admitted to Glasgow Royal Infirmary[5]. Twelve years ago, at the Royal Victoria Hospital, Belfast[6], the figure was 4.1%. The aim of this study is to place in modern perspective the increasing importance of sport as a cause of severe eye injury; to identify areas of special risk; and thus to consider effective preventive measures. For the purposes of this survey, a "severe" eye injury is one which requires inpatient management.

Patients and Methods

All patients requiring admission to Manchester Royal Eye Hospital between 1 January and 31 December 1987, for management of an eye injury sustained during sport, were included in this prospective survey. A detailed history was taken including the circumstances of the injury, experience at the sport, previous ophthalmic problems and whether spectacles, contact lenses or ocular protection were worn. Details of clinical examination and management were recorded. Follow-up time ranged from two to eleven months.

Results

In 1987, 52 patients were admitted to hospital following injuries sustained during sport. The total number of patients requiring inpatient care after an injury during this period was 207. Sport thus accounted for 25.1% of all severe eye injuries. Table 1 shows the numbers injured at each sport. No significant seasonal variation was noted either for individual sports or for the survey as a whole.

The right eye was involved in 27 patients (52%) and the left in 25 (48%). In no patients were both eyes involved. Forty-five patients (87%) were male and 7 (13%) female. The mean age of patient was 28 years, with a range of 11-68 years. The average experience of each sportsman or woman in the sport responsible for the injury, was 7.7 years. One patient was wearing glass spectacles and four wore hard contact lenses. No patient was using eye protection and no

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patient had any personal experience of protective wear or how to obtain it.

Contact with the projectile of the sport (ball or shuttlecock) was by far the commonest cause of injury, affecting 38 patients (73.1%). Injuries caused by the hitting instrument (racquet, stick, or club) were responsible for a further ten (19.2%), and blows from an opponent's fist caused the remaining four (7.7%). Of the 10 injuries caused by the hitting instrument eight were inflicted by a badminton or squash racquet, the remaining two being caused by a hockey stick and a golf club.

Table I. *The sports involved*

Sport	*No. of patients*	*%*
Football	17	32.7
Squash	12	23.0
Badminton	10	19.2
Tennis	4	7.7
Cricket	2	
Rugby	2	
Golf	2	17.4
Hockey	1	
Real tennis	1	
Darts	1	
Total	52	100%

Table II. *The injuries sustained*

Injury	*Number*	*%*
Skin lacerations	10	19.2
Blowout fracture of orbit	5	9.6
Macroscopic hyphaema	31	59.6
Raised intraocular pressure	12	23.0
Iris tears or dialysis	5	9.6
Significant angle recession	8	15.4
Cataract	1	1.9
Vitreous haemorrhage	7	13.5
Commotio retinae	12	23.0
Retinal break	4	7.7
(Retinal detachment)	(2)	(3.8)
Choroidal rupture	1	1.9
Penetrating injury	3	5.8

Table III. *Final visual acuity*

Acuity	*No. of patients*	*%*
>6/6	28	53.9
6/9 - 6/12	17	32.6
6/18 - 6/60	3	5.8
<6/60	4	7.7
Total	52	100.0

Table II shows the more important effects of these injuries. Superficial or minor effects are not listed. All patients had intraocular and/or severe orbital trauma. Many patients had more than one injury. The term 'significant angle recession' implies angle recession of sufficient severity to place the patient at risk of glaucoma, requiring long term follow-up. Macroscopic hyphaema was the commonest reason for admission and was present in 31 patients (59.6%).

Racquet sports (squash, badminton and tennis) accounted for 27 patients (51.9%) (including six of the seven ladies injured) and caused two of the three penetrating injuries. Of these 27, 19 (70.3%) were caused by the ball or shuttlecock and eight (29.7%) by the racquet.

Eight patients (15.4%) required a total of 12 operations. Five patients had clinical evidence of an orbital blowout fracture (two were punched during a football game, one was struck by a hockey stick, one by a squash racquet and one by a cricket ball). Of these, four patients underwent computerised tomography, which confirmed the diagnosis in all four patients. Three required the placement of an orbit floor prosthesis. Two patients sustained a retinal detachment. One was struck by a squash racquet, and one by a golf club. The latter required three operative procedures.

There were three perforating injuries. The first was caused by a dart which had passed through the upper lid and superior rectus tendon before piercing peripheral retina. Primary repair with cryopexy proved sufficient. The second was caused by a badminton racquet in a low myope wearing glass spectacles for the first time and resulted in a corneal laceration with disruption of the crystalline lens. Primary repair and partial lens aspiration was followed by completion of lens removal and anterior vitrectomy. The visual acuity recovered to 6/4 with a contact lens. The third

Table IV. *Patients with most severe visual loss*

Case	*Visual acuity*	*Cause*	*Sport*
1.	6/18	Macular damage	Badminton
2.	6/24	Retinal detachment	Squash
3.	6/36	Macular damage	Rugby
4.	3/60	Macular damage	Squash
5.	1/24	Macular damage	Badminton
6.	CF	Retinal detachment	Golf
7.	NPL	Enucleated	Squash

patient was struck by a squash racquet in an eye which had previously suffered a perforating injury during a game of squash. Hard contact lenses were being worn at the time. The globe was disrupted. Primary repair was effected, but the globe required enucleation a few days later.

Table III shows the final visual acuity for all patients in the study. Table IV shows the cause of visual loss and the sport involved, for those seven patients with a final visual acuity of less than 6/12.

Discussion

Patterns of injury change with the passage of time[5,6] and protective legislation[7,8]. In 1913, of 1000 consecutive eye injuries admitted to the Glasgow Royal Infirmary over a five year period, the proportion sustained at sport was 0.7%[5]. At the Royal Victoria Hospital in Belfast over the ten years to 1976 this proportion had increased to 4.1%[6] of a total of 2032 patients. In this study, of 207 patients with eye injuries admitted during 1987, 25.1% were caused by sport. It is possible that sport may become the most common cause of severe eye injury in the not too distant future. It is therefore of great importance to be aware of the risks inherent in sport and to reduce them wherever possible.

Of those injuries sustained during sport, the proportion requiring inpatient treatment is extremely high (18.5%[2], 18.7%[3], 27.4%[4]). This compares very unfavourably with the proportion for injuries in general (0.42%[9]) and reflects on the great potential for severe injury of popular sports in this country. This is a matter for great concern.

Despite the fact that football is the commonest cause of eye injury in this series, one feels, to an extent, that the risk of injury is intrinsic to the sport. To attempt realistically to protect against injuries on the field would necessitate cumbersome headgear which would undoubtedly be rejected by the participants. Prophylaxis is important, but it must also be realistic. It is therefore more important to consider those sports in which ocular protection would be both practicable and productive.

The indoor racquet sports, squash and badminton, must be the prime targets. Together these were responsible in this series for 42% of all injuries, for two of the three perforating injuries and for the majority of the patients with significant long-term visual loss. Both these sports have been the subject of previous warnings[10,11,12,13], yet injuries continue. Severe eye injuries at badminton now occur with a similar frequency to those seen at squash and the badminton shuttlecock appears capable of inflicting injury of the same order of severity as that caused by the squash ball[14].

It is notable that no patient in this study was wearing protective spectacles. No patient had any experience of ocular protection, nor knowledge about where to obtain them. Only one patient knew a sporting colleague who used protective spectacles. This demonstrates a general lack of knowledge about eye protection, and this is unfortunate. The value of widespread ocular protection in sport has already been demonstrated[15,16]. Protective polycarbonate spectacles are available for wear on the court and are designed to deflect

blows onto the glabella and orbit margins. They can incorporate refractive correction and should be encouraged. Under no circumstances should a player wear glass spectacles. It is the duty of his optometrist or ophthalmologist to dissuade him from so doing. The illusion that contact lenses offer partial protection in this situation should be dispelled. They merely complicate an injury.

It is a common misconception that experience in itself protects from injury; that accidents are the preserve of the tyro. In this series the mean experience at the sport involved was 7.7 years and the sample includes sportsmen of proven competence. The illusion that injuries are only for beginners, must be quashed.

Despite the laudable increase in the popularity of sport as a means of exercise, it is important to place into perspective its potential risks. At the moment scant attention is paid to the possibility of severe eye injury with its attendant morbidity in a young population. The widespread encouragement of ocular protection, where practicable, is important and ophthalmologists have a crucial educative rôle to play.

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