

SHORT REPORT

Don't save the ball!

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Objectives: To identify, over a period of 12 months, all attendances at an accident and emergency department by children over the age of 5 years with an injury to a wrist, hand, or finger, and to examine those sustained as a result of a blow from a ball.

Methods: The case notes of all children aged 6–13 years attending the Accident and Emergency Department of the Royal Aberdeen Children's Hospital in the year 2001 as a result of a wrist, hand, or finger injury sustained from a blow by a ball were reviewed, and the cause, type, and severity of the injury noted.

Results: A total of 187 children were identified; 69% were boys and football was the main sport involved. Most (93%) were radiographed, and 40% were positive; most fractures were sustained outwith school. Hand dominance was not significant.

Conclusions: These injuries are common and may be preventable with modification of rules, equipment, and coaching. A register of youth sporting injuries may show if there are any detrimental long term effects.

Sport plays a significant part in the lives of many children, and ball games are popular both at school and in leisure time. Football (as goalkeeper), basketball, netball, volleyball, cricket, and rugby all involve hand contact with a fast moving heavy ball, with the potential for forced hyperextension of the fingers, hand, and wrist. Ball games have been noted¹ to account for the greatest number of paediatric sports injuries in Hong Kong. From clinical encounters in the Accident and Emergency (A&E) department, it became apparent that there was a high presentation rate of wrist, hand, and finger injuries caused by a blow from a ball during sport. The aim of this study was to confirm the suspicion that this type of, often serious, injury is more prevalent in children than previously reported in the United Kingdom² and to underline the need for modification of sports for youth players.

METHODS

A retrospective study was undertaken over the the year 2001 in the A&E department of the Royal Aberdeen Children's Hospital. This hospital has the only paediatric A&E department in the north east of Scotland, serving a total population of over half a million, about 84 000 of whom are under 14 years of age. Over 22 000 new patients under the age of 14 years are seen annually, 12 000 of whom attend with injuries. The attendance card of each child of 6–13 years of age presenting with a finger, hand, or wrist injury was systematically reviewed. All such injuries caused by a blow from a ball were included in the study, and details of the cause, type, and severity of the injury were noted. Other mechanisms of injury such as falls were excluded. The possibility of non-accidental/intentional injury was considered in each of the presentations, but all injuries were judged to be consistent with the history given.

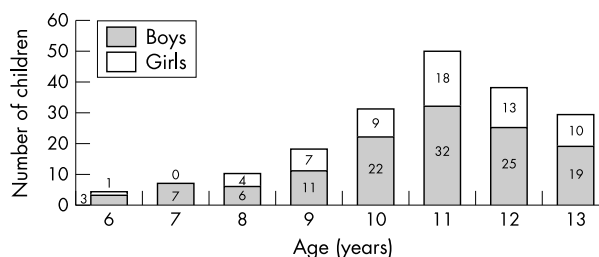


Figure 1 Presentation of hand, wrist, and finger injuries by age and sex.

Table 1 Ball related injuries

Sport	Boys	Girls	Total
Football	92	28	120
Basketball	18	14	32
Netball	0	13	13
Rugby	12	1	13
Cricket	1	3	4
Hockey	0	2	2
Volleyball	2	1	3

RESULTS

A total of 187 children were seen over the study period with such injuries. The mean age of attendance was 10.7 years, and 125 (69%) were boys (fig 1). Football (soccer) was the main sport involved, resulting in 120 (64%) of the injuries, with 93 (78%) sustained by boys (table 1). Not all the records noted the position of the player, but 25 of the football injuries were recorded as having been sustained by goalkeepers.

Radiographs were obtained in 174 cases (93%); 40% were positive: 67 fractures and two dislocations—that is, 37% of the total presentations had sustained a serious injury, 69% of which were sustained by boys. One third of the finger injuries and half of the wrist (distal radius/ulna) injuries were fractures (table 2). One fracture required manipulation under a general anaesthetic. Thirteen of the finger fractures were to the proximal phalanx, and 15 to the middle phalanx. Twelve (43%) of the finger fractures were to the little finger. Hand dominance was not significant.

The fracture rate was higher in the injuries sustained outwith school (table 3).

DISCUSSION

Injuries are a common, unwanted aspect of participation in sports, and injuries to the upper extremity in children are increasing with the expanded participation in and higher competitive levels of youth sport. A previous paper on the epidemiology of all paediatric sports related injuries showed a fracture rate of 29%³; this is lower than our rate of 37% for ball induced hand and wrist injuries alone, and we have no explanation for this finding. Sahlin⁴ noted that sports accidents

Table 2 Details of injuries sustained

Site of injury	Fracture/dislocation	Soft tissue injury	Total (%)
Finger	28	58	86 (46)
Wrist (distal radius/ulna)	27	27	54 (29)
Thumb	7/2	27	36 (19)
Scaphoid	1 (radiologically proven)	6 (clinically tender, x ray neg)	7 (4)
Metacarpal	4	0	4 (2)

Table 3 Injuries broken down into whether they were sustained in school or during leisure time

Location	Total referred	Soft tissue injury	Fracture (% of referred)
School	105	77	28 (27)
Leisure	82	41	41 (50)

account for 27% of all childhood accidents, but his incidence of 53% boys is lower than our rate of 69% and the 71% found by Taylor and Attia.³ In all these papers, football (soccer) was noted to be one of the most common causes of injury in boys. Bhende *et al*⁵ showed that football is associated with more hand injuries by any mechanism than any other organised sport.

It has been shown that most youth football injuries are mild,⁶ but the incidence of injury increases with age as children become heavier and achieve higher skill levels.⁶⁻⁸ An American paper⁹ showed that, overall, goalkeepers had injury rates similar to those of other playing positions, but Boyd *et al*¹⁰ showed a high incidence of distal radial fractures in young goalkeepers as a result of saving the ball.

Finch *et al*¹¹ showed that most sporting injuries occurred during competition or formal training, and Zoch *et al*¹² and Maitra¹³ showed that, in adolescents, most football injuries occurred during school activities. Our findings show that, although more children were referred from schools in our study, there was a lower rate of serious injury. This may reflect a higher threshold for referral from schools or more aggressive play in leisure time.

Finger injuries have previously been noted in basketball¹⁴ and rugby,¹⁵ although the incidence of rugby injuries is lower in children than adults.

Sports related injuries may impinge on training and participation in competitive matches, preventing progression to higher league sport, the aspiration of many children. Recognition of injury patterns with early activity modification and the initiation of efficacious treatment can prevent disability and return the young athlete to sport.¹⁶ This is important, as Yde and Nielsen¹⁷ noted that, of the ball games played by adolescents, soccer produced the most serious injuries requiring the longest rehabilitation period. Both fractures and soft tissue injuries may be best dealt with in a sports injury clinic,¹⁸ but return to competition should never compromise care.

It has been shown that the danger of accidents and injuries can be reduced by preventive measures such as weight categories in children's leagues,¹⁹ rule modifications such as jumping for the ball in soccer and rugby,²⁰ better coaching,²¹ and excluding younger children from taking part in technically advanced sports activities.⁴ The use of lighter weight balls has reduced the incidence of distal radial fractures in goalkeepers,¹⁰ and, in Australia, rule modifications at the under 10 level has substantially reduced injury rates.²²

Take home message

Childhood hand and wrist injuries from balls are common in sporting activities. Their incidence may be reduced by increasing the awareness of parents and coaches, the use of lighter balls for children, and the introduction of weight categories for players.

Conclusions

The injuries in this series were all caused by a blow from a ball. Lighter balls for younger children would reduce the force of a blow, and weight categories would ensure that heavier players were not kicking or throwing balls with greater force at lighter players. These modifications of rules, equipment, and coaching practices have been shown to reduce injuries in other areas, and their wider implementation should be considered. A register of injuries kept by sporting bodies would be of benefit, and such injuries could be carefully monitored to ascertain whether they result in any detrimental long term effects.

Injuries to the fingers, hand, and wrist are common in ball sports, and parents and coaches should be made aware of the risk of such injuries in youth players.

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