

Shoulder injuries in soccer players

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Summary

Even though soccer is the most popular sport of the world, no review is available at present to resume the available data on shoulder injuries in soccer. The aim of this review is to report the available epidemiological data on shoulder specific injuries in soccer players and to describe the common mechanisms of shoulder injuries in soccer. Studies published through September 15, 2011, were identified by using MEDLINE, EMBASE, CINAHL and Pre-CINAHL, PubMed, Web of Science, and the full Cochrane Library. Reference lists of included studies were searched by hand. Studies were included if they reported on shoulder injuries in soccer players. Limits were not placed on year of publication, status of publication, or language. The journal, authors, and author affiliations of included studies were masked from 2 reviewers. We planned to perform a study on the epidemiology, mechanisms and management of shoulder injuries in elite soccer players. We also planned to use Review Manager (RevMan, Version 5 for Windows) to calculate the magnitude of treatment effect. No studies on clinical outcome of shoulder injuries in elite soccer athletes were found. No studies on the mechanism of shoulder injury in elite soccer players were found. The results of the available studies on epidemiology are reported. Despite soccer is the world's game, few studies focused on shoulder inju-

ries in soccer players, and therefore no definitive conclusions can be drawn. Further research is warranted to clarify the epidemiology, mechanisms and management of shoulder injuries in elite soccer players.

KEY WORDS: soccer; sports; athletes; shoulder; injury.

Introduction

Soccer is the world's game, played by more than 120 million people around the world (1). Soccer is governed internationally by the Fédération Internationale de Football Association (FIFA), which organises the World Cup every four years. Soccer is a contact sport characterized by short and quick movements such as sprinting, sudden acceleration or deceleration, cutting, pivoting, shooting and kicking. Tackling and collision are also common (2).

Management of elite athletes is challenging. As the enormous economical revenue around the most famous sports events worldwide is linked to sponsors and media coverage, physicians are often faced with the pressing requirements of the athlete, the coach, the team, the media, the sponsors, and supporters. Elite athletes more than any other group place the physician in a position of having to be innovative. In many instances, this carries with it an unquantifiable risk. Management of elite athletes should allow them prompt return to the previous levels of sport activity (3-7).

Few studies have been published on the mechanisms of shoulder injuries in athletes, including American football (8), rugby (9), basketball (10, 11), baseball (12-18), swimming (19-28), tennis (29-33), lacrosse (34) and volleyball (35-38). No review is available at present to resume the available data on shoulder injuries in soccer.

The aim of this review is to report the available epidemiological data on shoulder specific injuries in soccer players and to describe the common mechanisms of shoulder injuries in soccer.

Search Strategy

Studies published through September 15, 2011, were identified by using MEDLINE, EMBASE, CINAHL and Pre-CINAHL, PubMed, Web of Science, and the full Cochrane Library. Reference lists of included studies were searched by hand. Studies were included if they reported on shoulder injuries in soccer players. Limits were not placed on year of publication, status of publication, or language. The journal, authors, and author affiliations of included studies were masked from 2 reviewers. We excluded from the search case reports.

We planned to perform a study on the epidemiology, mechanisms and management of shoulder injuries in elite soccer players. We also planned to use Review Manager (RevMan, Version 5 for Windows) to calculate the magnitude of treatment effect. However, because no studies on clinical outcome of elite soccer athlete were found, no pooling of data was performed. Also, no studies were available to report on the mechanism of injury in elite soccer players. The only studies available reported on epidemiology, and they are below reported.

Results

Epidemiology

Male elite football player injuries

Football players are commonly exposed to different kind of traumas, above all lower limb injuries (39). Some studies reported a higher percentage of lower extremity injuries compared to those of the upper extremity injuries (40, 41), with a percentage of trauma to lower limb ranging from 64% to 88% (39-41). FIFA data collected during Japan/Korea World Cup (2002) (42) and Germany World Cup (2006) (43) reported higher percentages of upper and lower extremity injury: respectively 4.6% vs 76% and 8.2% vs 73.1%. Similar data have been reported either during European Championships (EURO 2004, 8.8% vs 84.4%) (44) and Olympic Games (Athens 2004, 6.4% vs 71.4%) (45).

Shoulder injuries are therefore less frequent than lower injuries in the game of football. The percentage of shoulder damage during international tournaments are the following: 3.8% during Athens 2004 (45) and 4.4% during EURO 2004 (44). Junge et al. performed a surveillance of football injuries during international tournaments in the 4-year period from 1998 to 2001, reporting shoulder injuries between 2% and 13% (46).

However, in the last years, shoulder injuries have represented an increasing health problem in football players. The modern soccer has been characterized by high speed game, "dangerous" tactical solutions such as pressing and marking, augmented number of legal and illegal physical contacts. FIFA injury reports show the high incidence of contact injuries compared with non-contact injuries [World Cup 2002 (42) and World Cup 2006 (43), 73% vs 27%]. All these factors lead to increasing number of traumatic injuries, including fractures and dislocations, caused by falling on the ground. Several injury reports support the high incidence of traumatic injuries compared to overuse injuries (EURO 2004, 80% vs 20%; Men's Under 19 European Championships 2005, 94% vs 6%) (44). Injury reports allow to identify the time of injury onset, pointing out that the risk of injury is higher during the official match respect the training. These data are confirmed by FIFA data collection from Olympic Games (Beijing 2008, 81.8 % vs 18.2) (47) and European Championships (EURO 2004, 84 % vs 16 %) (44).

Even though specific data related to different role played in the field are missing and upper limb traumas can onset in all players, it is obvious that goalkeepers are more exposed to shoulder disorders than other field players.

Female football player injuries

Until the early 1970s football was almost only played by men, but during the last two decades of the twentieth century the game rapidly increased in popularity among women. In 1982 there were the first European Championships for women and in 1991 there was the first World Cup in China. Female soccer leagues have been performed in Sweden for the last 25 years, making it one of the countries with more female soccer tradition. In Sweden, soccer is the most popular female team sport (48) and the second largest sport after male soccer (49). In 1997 a total of 203.853 soccer players were registered in Sweden, of which 20% were women, with an increase of 7% since 1995 for female soccer players (50).

Nowadays, the number of international women's matches is increased compared to the past and women's youth tournaments have been integrated into the official calendar of the FIFA. The increased number of woman football competitions and the features of game itself, such as speed of game and the athletic level, may lead to an increased risk of injuries. Despite the growing popularity of women's football, few researches on female football players are available. Faude et al. (51) performed a study on 165 female soccer players

from 9 teams competing in the German national league, reporting a percentage of upper and lower extremities respectively 5.3% and 80%. Jacobson and Tegner (52) performed a study on 269 female soccer players from 12 senior football teams from the Swedish premier league, reporting a percentage of upper and lower extremities respectively 2% and 75%. Tegnander et al. (53) performed a study on 181 female soccer players from Norwegian female elite soccer, reporting a percentage of upper and lower extremities respectively 4.7% and 80.9%; they also reported a percentage of shoulder injuries of 2.1%. Percentages of upper and lower extremity injury have been also collected during International tournaments, such as European Championships (Women's Senior European Championships-WOCO 2005, 5.5% vs 88.8%) (44) and Olympic Games (Athens 2004, 7% vs 69%) (45). The percentage of shoulder damage during International tournaments are the following: 7% during Athens 2004 and 0% during WOCO 2005 (44).

In the literature, data on the difference of injuries between female and male players are not definitive. In a survey of injuries performed during international football tournaments, Junge et al. showed that the incidences of injury in female players in the 1999 FIFA Women's World Cup and the football competition of the 2000 Olympic Games were lower than the rates in the corresponding tournaments for male players (46). However, data reported from 2004 Olympic Games do not support these findings (45). On the other hands, Elias et al. performed a surveillance study in a 10-years period of the USA Cup youth football tournament, reporting a lower rate of injury in female compared with male U-19 players (54).

Children injuries

Participation of children and adolescents in football is increased almost during the last decades. Data collected from American Youth Soccer Organization and US Youth Soccer Association report respectively 650.000 and 3.2 million of players younger than 19 years (55).

Moreover, the Soccer Industry Council of North America estimated 18.2 million of Americans playing soccer in 1999, including 13.8 million of athletes younger than 18 years (56). In 2002 American children and adolescents increased to 15.2 million (57).

The increase of exposure to activity, due to growing participation, leads to an augmentation of soccer-related injuries in children. In 2006, 186.544 soccer-related injuries have been estimated by the US Consumer Product Safety Commission (CPSC). Approximately 80% of these injuries affected participants younger than 24 years, and approximately 44% occurred in participants younger than 15 years (58). Age represents a factor able to modify the risk of injuries, like supported by data from the literature. Participants younger than 15 years tend to have a higher relative injury risk and greater prevalence of injuries compared with older players. The incidence of injuries among young player is 2 events per 1000 participants (59), whereas incidence reported in athletes older than 12 years is 4 to 7.6 events per 1000 player-hours (60).

Analysis of body part involved in soccer-related injuries, pointed out that injuries to the lower extremities are most common respect injuries of upper extremity, which represent just 3% to 12% of total injuries (61, 62). The involvement of shoulder, together with wrist/hand/elbow, is uncommon, and shoulder injuries represent only the 1.1%-1.8% of total injuries (63).

We tried to differentiate shoulder injuries between goalkeeper and field players, however no data were available in the literature to discriminate the kind of shoulder injury by role on the field.

Conclusions

Even though soccer is the most popular sports of the world, few studies focused on shoulder injuries in soccer players, and the-

refore no definitive conclusions can be drawn (64-67). Further research is warranted to clarify the epidemiology, mechanisms and management of shoulder injuries in elite soccer players.

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