RESEARCH ABSTRACT

Injuries to Head, Face and Eyes

By Allison Altman, MS

INTRODUCTION

Lacrosse is increasingly popular, with high school and college participation reaching 234,000 in 2003.

Men's lacrosse is a fast-paced, heavy-contact sport that requires helmets, face masks, mouth guards, gloves and upper-body padding. Women's lacrosse, while played with a similar stick and speed, does not permit purposeful contact. Until 2003, only mouth guards were worn for protection, and protective eyewear was made mandatory only as recently as 2004.

Few studies have been conducted on injuries in lacrosse players. For the most part, injuries have been found to be similar between men and women. However, injuries to the head, face and eyes (HFE) may be gender dependent. The purpose of this study was to examine the distribution of specific HFE injuries between men's and women's lacrosse in high school and college players.

METHODS

Data were gathered prospectively from 2000 to 2003 from 23 high school programs, 34 college men's teams, and 64 college women's teams. Injury data were recorded by athletic trainers at each of the respective schools. Demographic data, competition time, and practice time were collected for each athlete. The body part, injury type, activity during incidence, injury mechanism, and time lost to injury were recorded for each injury. Injuries were further subdivided based on session type, the nature of injury, the anatomical location, mechanism, and specific activity at the time of injury. Relative injury rates between high school and college males and females were compared.

Women sustain head, face and eye injuries more frequently than men because of a lack of protective equipment in that area.

RESULTS

In total, 114 female and 114 male high school athletes reported HFE injuries. In contrast, more than twice as many female college athletes reported HFE injuries compared with their male counterparts (268 female vs. 132 male HFE injuries). Concussions were the most common type of injury, with males sustaining slightly more concussions than females.

Compared with males, females incurred more contusions and fractures to the HFE in high school and college, and were injured more frequently at the nose, eyes and face. As was expected, more males were injured from body-to-body contact, and females were injured from stick or ball contact.

More concussions occurred during games than during practices. High school males sustained concussions from player and stick contact, while most high school females sustained concussions from stick contact. College women sustained more concussions from shooting, passing and ball handling, while men sustained most of their concussions from loose-ball situations.

DISCUSSION

The primary difference between male and female lacrosse is the use of helmets by males for HFE protection. This difference likely has led to the greater number of face and eye injuries in females. Females experience a higher rate of HFE injuries overall, despite having less physical contact during play. Despite the use of helmets, concussions are still frequent in males. Improvements in stick and ball handling cut down on injuries.

The findings from this study reaffirm the mandate to enforce protective eyewear in women's lacrosse. Future studies should examine changes in injury rates now that eye protection is mandatory. While some authorities have voiced concerns that protective equipment encourages a rougher women's game, no evidence supports these claims.

CONCLUSION

Lacrosse at any level is a relatively safe sport. However, HFE injuries do occur and can be dangerous. Women sustain HFE injuries more frequently than men, which reflects the lack of protective equipment in that area. This study supports the use of mandatory protective eyewear for women, rule enforcement, and skill improvement in hopes of reducing these injuries.

Lincoln, A.E., Hinton, R.Y., Almquist, J.L., Lager, S.L., Dick, R.W. "Head, face, and eye injuries in scholastic and collegiate lacrosse." American Journal of Sports Medicine. (2007) 35(2):207-215.

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LAX-Specific Injuries a 'Crosse' to Bear

By Richard Willy, PhD, PT

Action packed, lacrosse is one of the fastest-growing sports in America: participation has increased more than 138 percent in the past decade. Yet it is one of the oldest team sports, predating football, basketball and baseball. In fact, lacrosse is nearly 1,200 years old, with roots in Native American culture.

Because of the rapid growth in participation, clinicians are seeing greater numbers of lacrosse-related injuries – with a profile specific to the sport.

Lacrosse players use a netted stick, called a "crosse," to throw and catch a solid rubber ball roughly the size of a tennis ball. The sport is played on a field with a goal at each end.

Men's lacrosse is a contact sport; women's lacrosse is not. Men are required to wear approved helmets, pads, mouthpieces and gloves; women wear only a faceguard and mouthpiece. These differences in style of play between men's and women's lacrosse have resulted in sex-specific injury patterns.

THE MEN'S GAME

The majority of injuries in men's lacrosse – including the nearly 75 percent that occur in games – result from contact with another player. Because the most vigorous contact occurs during games, men are four times more likely to suffer an injury in a game than during practice.

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Contact injuries overwhelmingly occur above the waist: shoulder separations (acromioclavicular sprains) are among the most prevalent. Fractures of the fingers and wrist are fairly common because of frequent stick checking during games.

Perhaps the most concerning trend is the high rate of concussions, which represent almost 9 percent of injuries. Concussions become even more prevalent in games, representing 20 percent of competition-related injuries.

Some other facts about men's lacrosse injuries:

- 75 percent of practice injuries are non-contact in nature (Dick et al., 2007).
- Non-contact knee injuries represent almost 15 percent of all lacrosse injuries in males, with anterior cruciate ligament (ACL) tears being the most common. Motion analysis studies have demonstrated that performing a cutting or jumping maneuver while holding a stick significantly increases the amount of torque experienced at the knee (Chaudhari et al., 2005). These types of torques have been linked to ACL injuries.
- Rates for contact and non-contact injuries are the highest during pre-season practices and games and decrease as the season progresses. Thus, physical conditioning may play a role in injury rates.

THE WOMEN'S GAME

Mostly because of the non-contact nature of the sport, female lacrosse players sustain 20 percent fewer injuries compared with their male counterparts. Sixty percent of women's injuries are non-contact. The vast majority of injuries occur in the lower extremity.

As with men's lacrosse, injuries occur most frequently during the pre-season. Of these, ankle sprains are the most prevalent. ACL ruptures are second and easily represent the greatest source of lost playing time.

Reflecting the limited amount of protective equipment, injuries to the head, face and eyes are much more common than they are among men. What's more, the incidence of facial and eye injuries has increased lately, perhaps because of the introduction of lightweight composite sticks that enable athletes to throw the ball at much higher velocities.

Concussions are relatively common, especially considering the supposed non-contact nature of women's lacrosse. In fact, lacrosse has the third-

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highest concussion rate among women's sports, behind only soccer and basketball.

ACL PREVENTION PROGRAMS

The rate of ACL injuries in men's and women's lacrosse is less than other field sports, such as soccer. Regardless, ACL injuries are serious and can end an athlete's season or career. An alarming 50 percent of all individuals who suffer an ACL injury develop radiographic signs of knee arthritis within 10 years of the injury. This high rate of arthritis does not seem to be affected by whether the athlete has the ACL reconstructed.

Programs designed to reduce the incidence of ACL injuries often are suggested for high-risk sports such as basketball, soccer and lacrosse. These programs involve plyometric and strengthening exercises. Special emphasis is placed on proper jumping and cutting techniques during movement drills.

ACL prevention programs for lacrosse should incorporate the carrying of a lacrosse stick during movement drills to more closely mimic the unique demands of the sport. However, the scientific jury is still out as to whether these programs actually reduce ACL injuries.

PROTECTIVE EQUIPMENT DEBATE

Despite the high rate of injuries to the head, helmets are outlawed in women's lacrosse. In fact, USA Lacrosse, the national governing body for the sport, has an official stance against more protective equipment. USA Lacrosse argues that greater emphasis should be placed on the improved training of coaches and officials so that the non-contact rules of the women's game are properly enforced. USA Lacrosse maintains that more protective gear will only promote a more reckless style of play, perhaps even increasing the rate of injuries to the head, face and eyes.

The fact that men's lacrosse also has a high concussion rate, despite the use of helmets, suggests that more equipment may not be the answer. In fact, women's soccer and basketball have equally high rates of head and facial injuries.

Many sports medicine experts disagree and chastise USA Lacrosse for not adopting helmets for women's lacrosse. Eye injuries and concussions can be life altering; clearly, more research is needed to determine whether safer playing techniques or increased protective equipment is the answer.

With its long history and recent surge in popularity, lacrosse is here to stay. As awareness of lacrosse-specific injuries grows, athletes and clinicians can work together to improve prevention and treatment techniques. Greater conditioning prior to the season, ACL injury prevention programs, and an emphasis on safe playing techniques may help athletes enjoy injury-free seasons.

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Q&A

Shoulder Injuries

By Dr. Irene Davis

HOW COMMON ARE SHOULDER INJURIES IN LACROSSE?

According to the NCAA, the shoulder is the fifth-most-injured body part. During games, it is the most-injured body part.

WHY IS THE SHOULDER SO VULNERABLE?

Lacrosse is an overhead, collision sport. The lacrosse stick creates a long lever arm, which results in the shoulder experiencing high torque when the player falls or is struck with an outstretched arm.

WHAT TYPES OF INJURIES CAN OCCUR TO THE SHOULDER?

Anterior dislocations are most common and can occur when a player falls or is struck while holding a stick out to the side. Less common posterior dislocations can occur from a fall or being struck with the arm in a forwardly flexed position. Superior labral tears occur when a player is checked with arms in an overhead position, such as during shooting.

ARE FRACTURES COMMON?

Clavicle fractures and acromioclavicular joint injuries are common and are usually sustained from collision with another player or by falling on the point of the shoulder.

HOW ARE SHOULDER INJURIES TREATED?

The majority of injuries are treated with conservative intervention by physical therapists. Treatment is focused on reducing pain and inflammation, followed by improving joint mobility and strength, and ending with neuromuscular retraining of sport-specific movements. The Sully shoulder brace – a neoprene support that is wrapped around the shoulder and across the chest – often is used to provide support for shoulder instability while the patient is recovering.

IS SURGERY EVER NEEDED TO TREAT THESE INJURIES?

Surgery may be needed in severe cases such as extreme shoulder instabilities, labral tears and clavicular fractures.

CASE STUDY

Incorporating Activity Progression

By Ken Neu, PT

The patient shoulder-checked an opponent with his left arm extended. He felt immediate searing pain in his anterior shoulder.

PATIENT HISTORY

A 24-year-old male lacrosse player was referred for physical therapy for a possible labral tear in the left shoulder secondary to an injury he sustained during practice. He reported that he had shoulder-checked an opponent with his left arm extended laterally. He immediately felt a searing pain in his anterior shoulder but was able to continue practice. However, the pain increased such that, by the end of practice, he was unable to actively raise his left arm. Despite treatment with ice and ibuprofen during the first 24 to 48 hours, his symptoms worsened. A slow return of active movement was accompanied by persistent pain in the anterior shoulder. He was unable to participate in lacrosse and weight training in the two weeks before he sought medical care.

ASSESSMENT

The patient had a negative X-ray and his cervical spine and elbow were clear. He stood with a protracted, internally rotated and slightly anteriorly displaced left shoulder; his scapula was anteriorly tilted. His active range of motion was 10 to 15 percent less in his left shoulder than in his right and was painfully limited in abduction, extension, and internal and external rotation. He was unable to horizontally abduct for fear of pain. Strength was limited in the same motions and in his lower and middle trapezii. He demonstrated difficulty with humeral elevation above 90 degrees, with increased scapular motion to compensate. An apprehension test was negative, but relocation improved his symptoms. Speeds and Neer impingement tests were positive and O'Brien test was inconclusive. Capsular mobility was limited posteriorly and slightly hypermobile anteriorly. Central thoracic segmental mobility was limited.

TREATMENT

Treatment began with a combination of aggressive thoracic and posterior glenohumeral capsular mobilization, as well as general posture and glenohumeral stabilization exercises. These were aimed at maximizing joint congruity and setting a foundation for effective mechanics. Interferential current stimulation and ice were used post-treatment to manage pain and minimize inflammation. Thoracic and scapular strengthening were addressed first. This was followed by glenohumeral strengthening for proximal control in open and closed chain modes. Within four weeks, the patient achieved full active mobility and started light lacrosse passing drills and running. He returned to weight training; however, he was restricted from bench presses, clean and jerks, flies and military presses. Upper-body ergometer was incorporated for endurance, and interval training was introduced to promote early speed progression.

RE-INTEGRATION

At eight weeks post-injury, throwing activities that were focused on proper mechanics were added. At the same time, the patient began working on stick work and shooting. He gradually returned to play with a Sully shoulder brace for protection. He was able to return to full weight training and 100 percent participation at 12 weeks without the need for any assistive device.

SUMMARY

Successful treatment of athletes includes identifying all factors limiting performance and a program that incorporates a functional/sport-specific activity progression. Physical therapy is uniquely suited to provide these components and to promote a rapid and safe return to play.