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Review Article

The shoulder in cricket: What's causing all the painful shoulders?

Manit Arora [a,*], Sunil H. Shetty [a], Mandeep S. Dhillon [b]

[a] Department of Orthopaedics, Padmashree Dr DY Patil Hospital and Research Centre, Navi Mumbai, India
[b] Department of Orthopaedics, Post-graduate Institute of Medical Education and Research, Chandigarh, India

ARTICLE INFO

Article history:
Received 9 April 2015
Accepted 24 June 2015
Available online 26 July 2015

Keywords:
Cricket
Shoulder injury
Rotator cuff
Glenohumeral internal rotation deficit

ABSTRACT

Background/objectives: Shoulder injuries account for roughly 5% of all injuries sustained by cricketers, most likely an underestimation of a larger problem facing the sport. The cause for shoulder injuries has been sparsely investigated among cricketers. The aim of this review is to summarize the available literature on possible mechanism for shoulder injuries among cricketers.

Method/materials: MEDLINE and EMBASE (Search terms: ''cricket'' AND ''shoulder injuries''; ''cricket'' AND ''rotator cuff tears''; ''cricket'' AND ''impingement''; and associated synonyms) were performed in March 2014. The authors further canvassed the reference list of selected articles and online search engines such as Google Scholar. Inclusion criteria were studies that assessed shoulder injuries among cricketers. A total of 9 studies was identified on primary search, and later expanded to 15 studies.

Results/discussion: Bowlers and fielders are most frequently affected by shoulder injuries, likely a result of their overhead throwing actions. Spin bowlers tend to be worse for wear that fast bowlers. A number of possible theories have been proposed as to the cause for shoulder pain among cricketers including: scapular dyskinesia, glenohumeral internal rotation deficit and weak musculature surrounding the cuff. Most cricketers with shoulder pain appear to have an increase in external rotation and loss of internal rotation range of motion in the affected shoulder.

Conclusion: We propose a combined mechanism of injury that results in shoulder pain among cricketers. Further work is needed to identify the cause of the problem and implement targeted interventions aimed at each step of the proposed pathway.

* *Corresponding author*. Department of Orthopaedics, Padmashree Dr DY Patil Hospital and Research Centre, Navi Mumbai, India. Tel.: +91 8452846005.
E-mail address: manit_arora@hotmail.com (M. Arora).

http://dx.doi.org/10.1016/j.jajs.2015.06.003

1. Introduction

Shoulder injuries account for roughly 5% of all injuries sustained by cricketers,[1] although this is most likely an underestimation of a much larger problem. The cause for shoulder injuries among cricketers has been sparsely investigated, largely because of their small share of global injuries compared to other more common injuries such as hamstring strains. The aim of this review is to summarize the available literature on possible mechanism for shoulder injuries among cricketers and provide recommendations for future research in this field.

2. The problem

Injuries in cricket are common. A review of long-term injury surveillance studies by stretch (2007) across Australia, South Africa and England, found that most injuries occur early in the season when the least cricket is being played.[2] Upper limb injuries constituted 29% of all injuries in this review.

The England and Wales Cricket Board reported that 5.5% of all injuries among first-class County Cricketers, during the 2001 and 2002 season affected the shoulder, with similar findings reported in South Africa (5.2%) and among the first-class Australian teams (7%).[1,3,4] A recent Australian injury study over 11 seasons, found that shoulder tendon injuries account for 0–1.4% of all injuries per season, with other shoulder injuries having an incidence rate of 0–1.5%.[5] Prevalence rates of shoulder tendon injuries range from 0.1 to 1.4% and prevalence for other shoulder injuries range from 0 to 1.0%.[5] In another 10 year study, the mean shoulder injury incidence was 1.1 per season with a mean prevalence of 0.9%.[4] Australian injury surveillance data encompassing the years 1995–2001, demonstrates that shoulder injury prevalence among batters was 0.3%, fast bowlers 0.9% and spin bowlers 1.1%.[1]

In contrast, a recent study of English county cricket players suggested that up to 23% may experience some form of shoulder injury, with the majority affected in the throwing arm.[6] This suggests that there may be an underestimation of shoulder injuries in cricket.[7] A limitation of the above data set is that three countries (Australia, South Africa and England) have produced data with none available from other cricket-playing nations. There is a need for all cricket playing nations to monitor injury rates among cricketers so that inter-country differences may be explored and appropriate targeted interventions developed.

3. Which cricketers are most affected?

Traditionally, overhead athletic activity has been associated with shoulder injuries. Cricket is no different, with fielders and bowlers engaged in overhead throwing activities the most prone to shoulder injury.

Australian data shows that bowlers have roughly three to four times the shoulder injury prevalence rate of batters.[1] Injuries for bowlers are well above the average for all other cricketers at each age group and show an increase as players' age. Interestingly, among bowlers spin bowlers tend to be worse for wear with respect to shoulder injuries than fast-bowlers.[1] In a study of 112 first-class English bowlers ($n = 42$ spin; $n = 70$ fast), Gregory et al (2002) found that spin bowlers have a higher incidence of shoulder injuries (0.055 injuries/1000 balls) versus fast-bowlers (0.007 injuries/1000 balls).[8]

During bowling in cricket, the internal shoulder rotators are involved in the acceleration phase of the arm through concentric contractions, while the external rotators are involved in the deceleration phase.[9] Shoulder injuries were more common in fast bowlers with a front-on action than bowlers with a side-on or mixed-action and shoulder injuries were more common in wrist spinners than finger spinners.[10] In wrist spin the bowlers appear to rotate the bowling shoulder internally, while the arm circumducts.[10] Gregory et al speculated that this action of internal rotation during spin bowling may predispose one to impingement and injury.[8] It has been suggested that the presence of possible dysfunction in the shoulder rotators, combined with front-on bowling action and external rotation hypermobility are possible predisposing factors for chronic shoulder injuries in cricket fast bowlers.[10]

However, the majority of shoulder injuries in cricket are related to tendon injury and though to be more likely related to fielding, particularly throwing, than to bowling.[3,4] Throwing a cricket ball from the outfield is likely to be a provocative activity for shoulder injury. It is common for cricketers with shoulder problems to field in positions that reduce the distance to be thrown.[6]

Clearly, fielders and bowlers engaged in overhead throwing activities and abnormal torques across the shoulder joint are most at risk for shoulder injuries.

4. What causes shoulder injuries among cricketers?

During the overhead throwing motion the shoulder complex functions as a regulator of forces generated by the legs and the trunk.[11] It is this regulating function as well as the high velocities that accompany the throwing motion that places large forces across the glenohumeral joint.[12] These forces as well as the frequent repetition of the overhead throwing action produce severe stresses on the muscles, bones and joints of the upper extremity.[13]

Previous studies of overhead athletes in other sports have found that those with shoulder injuries have higher training loads,[14,15] have altered scapula kinetmatic,[16] altered muscular strength patterns[17] and greater internal rotation (IR) to external rotation (ER) range of motion in the dominant shoulder.[17] Cricketers, similarly, also have been shown to have a glenohumeral internal rotation range of motion deficit[7] and weak scapula stabilizer musculature.[18]

Repetitive overhead activities likely lead to adaptation to the pillars that constitute the shoulder joint – the bones (including the scapula), the cuff and the muscle stabilizers. Whether the subsequent change in shoulder kinematics is adaptive[17,19,20] or the result of pathology[21–23] remains an area of debate.