Shoulder injury in professional cricketers

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Abstract

Objective: To describe the impact of shoulder injuries on professional cricketers during the 2005 England and Wales first class cricket season.

Design: Professional cricketers in England were asked to complete two questionnaires relating to shoulder injuries. Players who returned both questionnaires were included in this study.

Main outcome measurements: The impact of any shoulder pain whilst playing cricket, impaired cricketing performance and shoulder injury related problems during training and activities of daily living.

Results: One hundred and fifty eight of a total of 378 players (42\%) returned both questionnaires. Twenty-three per cent of the participants described shoulder injury during the 2005 season. Injury prevalence (the percentage of players not available for selection in a match due to shoulder injury) was 1.7\%. Sixty-four per cent of shoulder injured players often or always had associated problems when fielding, and 58\% of shoulder injured players fielded in a specific position to avoid shoulder injury related problems. Eighteen per cent of all study participants felt pain on throwing at some stage during the survey period.

Conclusions: Professional cricketers generally play on with shoulder injuries without missing matches, though their performance, especially during fielding, is often compromised. Research into the diagnoses, aetiology, appropriate treatment and prevention of shoulder injuries in cricket is required.

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1. Introduction

In 2005, internationally agreed injury surveillance methods for professional cricket were published which provide an important framework for comparison of patterns of injury occurrence within and between cricket playing nations (Orchard et al., 2005). However, there are inherent limitations in these injury surveillance methods in identifying the true burden of injuries in cricket. This is because the internationally agreed system only includes injuries that prevent a player from being fully available for selection in a major match; or during a major match, causes a player to be unable to bat, bowl, or keep wicket when required by either the rules or the team’s captain. As in most elite level sports some cricketers continue to play despite being injured. Those injuries are not included in official injury surveillance data as they do not meet the stated definition of an ‘injury’. Therefore, the true extent and impact of injury problems that are ‘played through’ are unknown.

The prevalence of shoulder injuries, i.e. the average proportion of players missing through injury (Orchard et al., 2005), for the 2002 England and Wales Cricket Board (ECB) professional cricket season was 0.8\% (Newman, 2003). Australian injury surveillance data encompassing the years 1995–2001, does not give overall...
figures, but states shoulder injury prevalence amongst batters as 0.3%, pace bowlers 0.9% and spin bowlers 1.1% (Orchard, James, Alcott, Carter, & Farhart, 2002). Orchard, James, and Portus (2006) Orchard et al. (2006) gives a mean seasonal shoulder injury incidence, i.e. the number of injuries per squad per season, over a 10-year period as 1.1 with a mean prevalence of 0.9%. However, in contrast to these relatively low reported shoulder injury incidence and prevalence rates under the international consensus definitions, data from studies of elite junior and senior professional cricketers indicates that a relatively high number of cricketers may be affected by shoulder injury (Bell-Jenje, 2003).

The primary aim of this study was to determine the impact of shoulder injury in professional cricketers on various aspects on fielding, batting and bowling, along with training and activities of daily living. A further aim was to estimate the proportion of England and Wales first class county cricketers who experienced any form of shoulder injury during the 2005 season and to establish the prevalence of shoulder injuries amongst the study participants.

2. Methods

Physiotherapists of all 18 professional first class county cricket clubs in England and Wales were asked to administer two questionnaires to all contracted players during the 2005 cricket season. One, administered in June, related to shoulder injuries present during April and May and the other, administered in September, to shoulder injuries present in June, July and August. Therefore, this study did not quite consider the whole season as the last questionnaire was distributed early in September, whilst the last games of the season were being played. This was because it was felt that player availability to complete the second questionnaire would be limited if it was administered any later as the season would have been completed. To allow data from the entire study period to be analysed only those players who returned both questionnaires were included.

For the purposes of this study, shoulder injury was defined as any shoulder pain, weakness or instability that caused the player to miss cricket matches or training during the 2005 First Class County Cricket season. In addition, if players did not miss matches or training but experienced shoulder pain, weakness or instability that compromised cricket performance or training, or impacted on their activities of daily living, they were also considered to have a shoulder injury. Chronic injuries were defined as those that had an onset more than 6 months prior to the beginning of the season, i.e. April 2005. Shoulder injuries were considered recurrent in players who had a shoulder injury during 2005 and also experienced a similar, separate, problem in their affected shoulder in any of the previous 3 years. This definition of recurrence differs slightly from that of the internationally agreed definitions, which state that a recurrent injury occurs subsequently to a similar, recovered injury in the same side of the body that occurred earlier in the same season. (Orchard et al., 2005).

Although the questions were answered anonymously, the physiotherapist entered a squad number so that both completed questionnaires from the each player could be matched. The players could not be identified by the authors from this number.

This research was approved by the University of Nottingham ethics committee and the study was carried out by ECB medical staff.

The questionnaire data was analysed using Excel (Microsoft) descriptive statistical functions. Players where asked to indicate their main role in the team and were categorised as either specialist batters, spin bowlers, fast bowlers or wicketkeepers. All new, chronic and recurrent shoulder injuries experienced, were used to determine the percentage of study participants who experienced shoulder injury during the 2005 season. In addition, injury prevalence was reported as the average percentage of study participants not available for selection in a match at any given time during the season due to shoulder injury (Orchard et al., 2005).

The impact of shoulder injury on players was determined by their responses to questions on shoulder pain whilst playing cricket, impaired cricketing performance and restrictions on cricketing role, along with questions regarding effect of the injury on training and activities of daily living. Players were asked to state whether their shoulder injury had an impact; always, often, sometimes, occasionally or never during the 2005 season.

3. Results

There were 378 contracted players at the 18 counties at the beginning of the 2005 cricket season. In all, 158 returned both questionnaires and were therefore included in the study. This represented a response rate of 42%. The mean age of the players was 27 years (range 17–39 years).

Of the 158 players who returned both questionnaires, 132 (84%) recorded that they were predominantly right handed for throwing and 26 (16%) were left handed for throwing.

3.1. Proportion and prevalence of shoulder injury

Thirty-six of the 158 players (23%) who returned both questionnaires experienced shoulder injury during cricket matches, training or activities of daily living during
the 2005 ECB First Class County cricket season. Thirty (83%) of the 36 shoulder injured players had new injuries in 2005, six (17%) were chronic and 11 (31%) were considered to be recurrent. The number and percentage of players of each type, and the number and percentage of those with shoulder injury are shown in Table 1.

Twenty-seven shoulder injured players (75%) were affected only in their throwing arm and five (14%) were affected exclusively in their non-throwing arm whilst four (11%) described bilateral injuries.

The 158 participants in this study missed 161 match days as a consequence of shoulder injury during the 2005 season. Those with shoulder injury played a mean of 55.5 match days of cricket in the 2005 season and missed a mean of 4.5 days due to their shoulder injury. The prevalence of missed matched days as a consequence of the shoulder injury for the participants was therefore 1.7%. However, 25 (69%) of the 36 players with shoulder injury did not miss any match days due to their shoulder problem and on only five occasions during the study period did players leave the field of play for treatment of their shoulder injury.

3.2. Impact of shoulder injury on cricketing performance

None of the 16 wicketkeepers who participated in the study reported having a shoulder injury during the 2005 County cricket season. One of the 36 shoulder injured players, a bowler, sustained his injury a few days prior to completing the second questionnaire and did not play in the meantime. Therefore, he was not able to indicate the effect of the injury on cricketing performance. Of the remaining 35 shoulder injured players, 22 (63%) reported that the injury often or always had a negative impact on fielding. Shoulder injury often or always negatively impacted on bowling in seven (35%) of the bowlers with shoulder injury whilst just four players (11%) reported their shoulder injury negatively impacted on batting.

3.2.1. Fielding

Twenty-nine (83%) of the 35 shoulder injury effected players thought their shoulder problem had never caused them to drop or miss the ball; however, 21 players (60%) fielded at least once in a specific position to avoid a problem with their shoulder. Only seven (20%) ever moved from within the circle1 to outside, yet 20 (57%) changed from outside the circle to fielding inside the circle. Ten (29%) did this always or often. Twenty-nine players of the 31 players with injury in the throwing arm side (94%) noticed a reduction in power when throwing from the outfield. In 20 (65%), this occurred always or often. Pain was often or always felt on throwing by 20 players (65%) and only one (14%) of the 31 players who reported a shoulder injury in their throwing arm side never felt pain on throwing.

3.2.2. Batting

The impact of shoulder injury on batting is displayed in Table 2. Only a small percentage of players with shoulder injury experienced related problems when batting.

3.2.3. Bowling

Of the other 20 bowlers who played whilst experiencing a shoulder injury, six (30%) never experienced shoulder pain with bowling and a further six (30%) rarely had shoulder pain on bowling. Three bowlers (15%) comprised of two fast and one spin, always had pain when bowling. Ten bowlers (50%) reduced the number of balls bowled in training whilst seven (35%) reduced the number of overs bowled in matches as a consequence of their shoulder injury. Speed and spin was affected in nine (45%) and (15%) of bowlers, respectively and six (30%) avoided particular deliveries (Table 3).

3.2.4. Cross-training

Eighteen (51%) of the 35 players who had a shoulder injury that effected cricket performance always or often found strength training to be effected by their shoulder problem.

3.2.5. Activities of daily living

Nine of the 36 shoulder injured players (26%) were never effected in any of their activities of daily living. Lifting or carrying heavy objects was always a problem for five injured players (14%) and often or sometimes a problem in 26 (72%). Very few players with shoulder injury ever found eating or activities to achieve personal

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1The circle—in limited overs cricket, is an oval delineating the infield from the outfield is marked on the pitch. It is formed by two semi-circles of 30m radius centred on each wicket with parallel lines joining each semi-circle.

<table>
<thead>
<tr>
<th>Player type</th>
<th>Number (%) of players of each type</th>
<th>Number (%) of players with shoulder injury</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specialist Batters</td>
<td>45 (28.5)</td>
<td>15 (33.3)</td>
</tr>
<tr>
<td>Spin Bowlers</td>
<td>27 (17.1)</td>
<td>6 (22.2)</td>
</tr>
<tr>
<td>Fast Bowlers</td>
<td>70 (44.3)</td>
<td>15 (21.4)</td>
</tr>
<tr>
<td>Wicket keepers</td>
<td>16 (10.1)</td>
<td>0 (0.0)</td>
</tr>
<tr>
<td>Total</td>
<td>158 (100.0)</td>
<td>36 (22.8)</td>
</tr>
</tbody>
</table>
hygiene to be affected by their shoulder injury, e.g. cleaning teeth, washing hair or body.

4. Discussion

This research identifies a problem of shoulder injuries in professional cricketers in England and Wales. There is currently no published literature that demonstrates the extent of this problem. The data confirms our hypothesis that shoulder injuries cause impairment of cricketing performance, though cricketers often continue to play with these problems and so the extent and impact of these injuries will not be highlighted in injury surveillance data (Newman, 2003; Orchard et al., 2002, 2006). The study provides data on shoulder injury only from the perspective of the cricketers themselves. Diagnostic information was not requested from the physiotherapists or doctors who managed them. This should be investigated in subsequent studies.

The distribution of player types of the participants (Table 1) is typical of the make up of a county cricket side, which would normally include one wicketkeeper, four fast bowlers, one spin bowler and six batters. The age of the participants is also typical of county cricket.

The proportion of study participants with shoulder injury was high (23%). In addition, the prevalence of shoulder injuries amongst participants (1.7%) was also higher than that found in previous injury surveillance studies such as the 0.8% shoulder injury prevalence reported by Newman (2003) and the 0.9% reported by Orchard et al. (2006). These new statistics are a cause for concern but should be considered in light of the study’s limitations. It is possible that this injury rate is higher than the true shoulder injury rate in professional cricketers in England and Wales as many players were not included in the study as they did not return both questionnaires. These players may have chosen not to respond as they had not experienced shoulder injury that season. Prevalence rates for the study period, which was not quite the entire season, may have been similarly affected and is possibly higher than the actual figures.

An additional limitation of this study was its retrospective design. The quality of the data was therefore subject to factors such as recall bias and memory decay (Jenkins, Earle-Richardson, Slingerland, & May, 2002).

In order to minimise these limitations, separate questionnaires relating to the first and second part of the season where administered.

As previously stated, many of the injuries identified in this study would not show up on conventional cricket injury surveillance data as in only 11 (7%) of study participants did they cause a loss of playing time (Orchard et al., 2005). Yet, these are not necessarily brief problems with 11 describing recurrent problems and six describing chronic injuries persisting more than 6 months.
This study indicates that shoulder injury impinges on performance or compromises the potential contribution of a player to his team. The cricketing activity most often associated with shoulder injury is fielding, followed by bowling and then batting. More than half of affected players lose the flexibility of fielding in all positions and tend to adopt positions inside the fielding circle, presumably to avoid powerful throws. A possible explanation for these changes to fielding position are revealed by the statistics relating to reduction in throwing power as a consequence of the shoulder problem and the avoidance of throwing, which is probably due to anticipated pain. Reassuringly, shoulder injury does not seem to affect catching, though pain is often felt when throwing and power is noticeably reduced when throwing from the outfield.

Although many of the bowlers affected by shoulder injury admitted to pain during bowling, over half of those bowlers with problems never reduced the volume of bowling in training or matches, nor found speed or spin reduced. It was hypothesised that particular deliveries, e.g. googlies (balls that spin in the opposite direction to the bowlers usual delivery), quicker balls, in-swingers (balls that swing towards the batter), might put more strain on the shoulder and associated structures and so be more painful (Gregory, Batt, & Wallace, 2002), however, few bowlers avoided any particular deliveries. Whether this was because none of the various delivery types were problematic, or because their performance demanded bowling their full range of deliveries despite shoulder injury associated problems, cannot be assessed from the results of this study.

The players’ responses indicate that batting is less often affected by shoulder injury than the other main disciplines of the game. However, of all the player types: specialist batters, bowlers and wicketkeepers, the highest proportion of shoulder injuries occurred in the specialist batters. It is unlikely that batting itself is a risk factor as very few players reported shoulder injury whilst batting and although batting involves swinging a long bat weighing up to 1.5 kg, though rarely over shoulder height, it is not an activity likely to damage the shoulder. It is also possible that bowlers are inherently better at safely performing overhead functional movement and that may contribute to a lower rate of shoulder injury as compared to specialist batters.

Evidence from baseball indicates that high throwing workload is more significant risk factor than throwing technique or level of conditioning (Olsen, Fleisig, Dun, Loftice, & Andrews, 2006) and of all player types batters probably have the greatest throwing workload. Most spend a great deal of practice time having balls thrown for them to hit. They are then obligated to reciprocate by throwing at their batting colleagues. Again, the influence of these potential risk factors requires further investigation. A study describing the differences in behaviours of the player types with regards number of throws, distance of throws and categorisation of throwing technique would be valuable.

The number of training days lost to shoulder injuries was not great, but this may not reflect the quality of practice in those that continued to train with shoulder injury. Though not assessed by the study, it is likely that players would have missed elements of fielding practice.

The data does show that strength training is sometimes compromised and this could impact on many aspects of performance. Although strength training may be a factor in the aetiology of shoulder injuries (Haupt, 2001), restrictions on this element of cricket conditioning could contribute to further shoulder injury if players have difficulty performing injury prevention and rehabilitation exercise programmes.

Shoulder injuries do not just cause problems in the professional lives of these cricketers, but interfere with lifting and carrying, though less with dressing, hygiene and eating.

5. Conclusion

Shoulder injuries in cricketers are common and can become chronic or recurrent. Despite this, affected cricketers generally play on without missing matches, yet their performance is compromised by changing position in the field to avoid throwing from the outfield. Bowling and batting are only occasionally affected, yet it is specialist batters who are more often affected by shoulder injury than those who bowl or keep wicket. This study has described the substantial impact that shoulder injuries can have on cricketers, and hence has established shoulder injuries as a priority area for future research. Therefore, it is vital that continued research investigate the risk factors, mechanisms and potential preventive strategies for shoulder injuries, to reduce the burden of these injuries on elite cricket players.

Conflict of Interest Statements

The authors do not foresee any conflict of interest in publishing this paper. If further information is required in regard to this please email the required details to craig.ranson@ecb.co.uk.

Ethical Statement

This research was approved by the University of Nottingham ethics committee. If further information is required in regard to this please email the required details to craig.ranson@ecb.co.uk.
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