

Foot and Ankle Injuries in Cricket Players: The Current State of Our Knowledge

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ABSTRACT

Cricket is the most popular sport in India and the commonwealth countries and is played in around 60 countries around the world. Although considered a noncontact sport, the press is replete with high-profile players missing match time due to acute or chronic injuries. We attempted a narrative review of site-specific injury epidemiology and incidence and found that the available literature is very sparse when looking at foot and ankle injuries in cricket. Most publications are generalized in nature and come from the developed world; very few are from the four countries of the Indian subcontinent, where cricket is passionately played at all ages. Most of the work also focuses on elite players, with limited data available from lower-level player groups. Site-specific description of injury is limited and inadequately documented.

The commonest documented injury in the foot and ankle is lateral ligament injury, which may itself lead to posterior impingement in fast bowlers. No data is available that can correlate injury patterns or incidence with player types, which creates a hindrance to planning injury prevention protocols; future research needs to focus on correlating player types, like bowlers. The epidemiology and injury incidence in the dominant foot/ankle, the chronicity, and the rehabilitation required are all areas that need to be studied. It may also be important to identify the biomechanics involved and player types who have a high-risk for potential foot and ankle injuries.

Keywords: Ankle, Cricket, Foot, Impingement, Injury, Sports injury.

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INTRODUCTION

Although cricket is considered a low-energy noncontact sport, the injury profile associated with the game is quite diverse and involves many anatomical body parts. Potentially, a wide range of overuse and impact injuries have been documented in cricketers, as they are involved in activities like running, bowling, throwing, batting, jumping, catching, and diving.^{1,2} Test match cricket becomes physically demanding because of the length of the game (5 days) and the shorter formats of the game are often played at a frenetic pace. All formats of the game can lead to the more common noncontact injuries, ranging from muscle strain to torn tendons and even stress fractures.³ Injuries in cricket players can be due to repetitive trauma/overuse or acute trauma due to sudden impact (collisions) during matches or practice.⁴ Overuse injuries predominantly occur in bowlers, although fielders involved in bowl throwing may exhibit some of them. Impact injuries are rarer and may occur on the field due to direct contact with another player, fall on the ground, or while diving to save boundaries or catch the bowl.

The documentation of injury incidence in cricket is sparse in the published literature; the British Sports Council documents an incidence of 2.6 injuries/10,000 hours of play.⁵ In contrast, the Australian Cricket Board has reported a higher incidence of 24.2/10,000 player hours.³ In a recent study from New Zealand, the reported incidence of injuries is 64.1 injuries/1,000 player hours in males and 36.1 in female cricketers over a 12-year period.⁶ Area-wise description of injuries and their relative incidence is uncommonly documented.

Because of the dynamic nature of the game, which involves sudden bursts of speed with quick direction changes and repetitive movements, there is substantial stress on the lower limbs of the players.⁷ The lower limb has a variety of documented injuries and accounts for 49.8% of all injuries in South African cricketers⁴ and 45% of limb injuries in English cricket.⁷ Only 8.7% are foot and ankle

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injuries, which primarily were contusion or hematoma formation in 41% and ligamentous injuries or an ankle sprain in 29% of players.⁸ The prevalence of match time loss due to foot and ankle sprains is 0.8–1.4%.^{3,9} When the modern, updated injury definitions were applied,¹⁰ which included both time-loss and nontime-loss injuries, the prevalence of ankle and foot injuries was noted to be 6.8 and 4%, respectively.¹¹

A stable foot and ankle are mandatory in any sport and injuries to these areas greatly impact the player's performance and influence return to sports. We found a paucity of published literature focused on, or defining foot and ankle injuries in cricket, which may be either due to the underreporting of the injuries or less significance given to these injuries by the players. We thus attempted to review the current literature published on cricket injuries in an attempt to

identify injury incidence of foot and ankle injuries and if possible the possible impact on the player performance.

MATERIALS AND METHODS

A systematic literature search for foot and ankle injuries in cricket was performed by four independent authors (Rajesh K Rajnish, Mandeep S Dhillon, Siddhartha Sharma, and Sandeep Patel) through the electronic database of PubMed/Medline on the 23rd of July 2023; specific keywords were predefined according to the planned study outcome (Table 1).

A secondary search of bibliographies of all included articles was performed to include the maximum possible literature on foot and ankle injuries in cricket. The search result was restricted to English, and the primary electronic search resulted in 338 articles. All these articles were scrutinized based on their titles and abstracts for inclusion. Finally, 15 articles related to our review were included for further analysis. Articles excluded were review articles, abstracts, and non-English articles.

Observation and Analysis

On extraction of the data, it was noted that there is a scarcity of publications focused on injuries in cricket, with most published literature from Australia, England, New Zealand, West Indies, and South Africa (Table 2). Most of the published work focuses on the overall injury patterns defined by the specified surveillance guidelines;¹⁰ the focus primarily seems to be on acute injuries, which lead to the cricketer losing playing time or undergoing some interventions.

When the data was examined to assess the incidence and nature of foot and ankle injuries, it became evident that only one study had comprehensively analyzed such injuries among elite players in South Africa. In this study, a total of 104 injuries were documented in 82 players over a span of 4 years. The study identified bowling as the cause of 30% of the cases, with the nondominant foot being more affected than the dominant foot. Moreover, the ankle was involved twice as frequently as the foot. Among the documented cases, gradual onset injuries held significant prominence, and 15% of the injuries were recurrent in the foot, with 5% classified as chronic. All other studies focused on injuries to the entire body rather than specifically to the foot and ankle.

Leary and White conducted a retrospective evaluation on a group of 54 cricketers for injuries (defined as the onset of pain and disability resulting from playing cricket or during training sessions) while they were part of a county cricket club in England from 1985 to 1995.⁷ Throughout the study duration, a total of 990 injuries were

identified, encompassing an injury exposure period of 17,247 days of play. The calculated incidence of injury stood at 57.4/1,000 days played. The majority of injuries were situated in the lower limbs, making up 44.9% of the overall injury count. Within this category, foot, and ankle injuries constituted 8.7%. Specifically, these injuries comprised contusions or hematoma formation in 41% of cases and ligamentous injuries or sprains in 29% of players.

Gregory et al., in a prospective cohort study from the United Kingdom, compared the anatomic site of injury sustained among the spin and fast bowlers in young cricketers. There were 42 spin bowlers, 70 fast bowlers, and 29 injuries were reported collectively. The incidence of injury per one thousand balls in relation to anatomic sites in fast bowlers was 0.057 at the knee, 0.043 at the ankle, 0.029 at the lower back, for the shoulder 0.007, for the spin bowlers' shoulder 0.055, and for the low back 0.011. The incidence percentage of ankle, knee, and shoulder injuries was significantly different for spin and fast bowlers.¹²

Stretch et al., from South Africa, reported the incidence of injury in cricket players serially from 1993 to 2005 in four studies.^{4,13–15} Although they documented cricket-related injuries in lower limbs, they did not elaborate on the foot, and ankle injuries separately. The reports suggested an increase in lower limb injuries from 1993 to 2003, from 37.5 to 49.5%, compared to the upper limb injuries for the same study period, from 34.1 to 23.3%. Subsequently, in 2005, South African physiotherapists and doctors prospectively reported 1,606 injuries in 783 players; the incidence of lower limb injuries was 49%, with major injuries seen in bowlers (40%), and to a lesser extent in fielders and wicket-keepers (33%).

In 2023, Olivier et al.¹⁶ published injury surveillance data of foot and ankle injuries in elite South African cricketers, both males and females, over a 3-year period. In 82 players, 104 foot and ankle injuries were documented; most injuries occurred on the nondominant side (96%). Around 80% of these injuries occurred for the first time and were nonimpact injuries. Bowlers and fielders incurred 30 and 19% injuries, respectively. Of 104 injuries, 52 (50%), players could not participate in at least one match or practice session. Ankle sprain/lateral ankle ligament injuries were the most common, accounting for 35% of all injuries, predominantly in fielders (33%). Other foot and ankle injuries were medial ankle ligament injuries in 4%, fractures in 5%, posterior ankle impingement in 8%, heel bursitis in 3%, Achilles tendon bursitis in 7%, peroneal tendon bursitis in 7%, plantar fasciitis in 3%, and syndesmotic injuries in 1% of players.

Orchard et al. published the injury analysis of Australian male cricketers at the state and national level over 10 consecutive years based on international injury surveillance methods.^{17,18} Injury to the lower limb constituted approximately half of the injuries (49.1%) and the incidence of injuries to the shin/foot/ankle was the third most common injury (10.9–23.8%).

Soomro et al. conducted injury surveillance on 408 male Australian–Sydney Grade cricketers across 20 teams in 2018.¹⁹ During the study period, 86 injuries were registered in 65 players leading to a loss of 385 weeks of play. The overall injury incidence rate was 35.54 injuries/10,000 play hours. The most common injury was to the lower back (20%), followed by foot injuries in 14% of players.¹⁹

In a retrospective analysis of injury patterns during a single cricket season among West Indian cricketers, Mansingh et al. identified and reported a total of 50 injuries based on the international injury definition. Among these recorded injuries,

Table 1: Literature search for the current published data on foot and ankle injuries in cricket.

Database	From the period of inception to 23 July 2023 with keywords	Results
Medline (PubMed)	#(((Bowlers) or (bowler)) or (cricket)) and ((foot) or (ankle))) and (cricket)	102
	#((Elite cricketer) or (cricketer)) and (foot injury)	28
	#(((Elite cricketer) or (cricketer)) or (((cricket bowler) or (fast bowler)) or (bowler))) and (ankle injury)	18
	#(((Elite cricketer) or (cricketer)) or (((cricket bowler) or (fast bowler)) or (bowler))) and (foot injury)	29
	#((Cricket) or ((fielder) or (fielding))) and (ankle)	45
	#((Cricket) or ((fielder) or (fielding))) and (foot)	116
Total		338

Table 2: Foot and ankle injury incidence

Sl no.	Study and year	Total players	Total injury	Foot and ankle injury	Site of foot and ankle
1	Leary and White 2000; England ⁷	54	990 over 10 years	8.7%	Contusion or hematoma—41% Ligamentous injuries/ sprain—29%
2	Gregory et al. 2002; England ¹²	112 bowlers only	29	0.043/1,000 balls bowled	
3	Stretch 1993, 2001, 2003, 2005; South Africa ^{4,13-15}	Multiple studies	Suggested increase in lower limb injuries from 1993–2003, from 37.5 to 49.5%, compared to the upper limb injuries for the same study period, from 34.1 to 23.3%	No specific mention	
4	Olivier et al. 2023; South Africa ¹⁶	82	Ankle sprain/lateral ankle ligament injuries were the most common, accounting for 35% of all injuries, predominantly in fielders (33%). Other foot and ankle injuries	104 foot and ankle injuries	Medial ankle ligament—4%, fractures—5%, posterior ankle impingement—8%, heel bursitis—3%, Achilles tendon bursitis—7%, peroneal tendon bursitis—7%, plantar fasciitis—3%, and syndesmotic injuries—1%
5	Orchard et al. 2006; Australia ⁹	Not mentioned	886 over 10 years	Incidence of injuries to the shin/foot/ankle injuries accounted for 17%	
6	Soomro et al. 2018 Australia ¹⁹	65	86	Foot injuries in 14% of players	
7	Orchard et al. 2023; Australia ¹⁸	1,345 male and 959 female players	A total of 4,540 injuries in males and 3,580 injuries in females	Lower limb/foot/ankle stress fractures (2.0/100 players per season)	
8	Mansingh et al. 2011; West Indies ²⁵	All matches of the West Indian team over 1 year	79 injuries, 50 significant	One case of ankle sprain and two cases had injuries to the tibia	
9	Walker et al. 2010; New Zealand ²¹	No information	Total injuries were 498 of which lower limb injuries were 156 and 79 of which sustained injury in foot and ankle region, including the Achilles tendon	$N = 44$ —Achilles tendon injury (sprain or strain—37 and tear in seven players). 27—tibia/fibula and $N = 25$ —ankle injuries. Injury to the foot was in 10 players	
10	Dovbysh et al. 2021 New Zealand ²²	268	Not mentioned	The ankle injury was reported in 6.5% of players in domestic players	
11	Walter et al. 2020; New Zealand ²³	219	31 injuries in 23 players	Foot injuries were reported in three bowlers and one batsman, with an aggregate percentage of 13% during the tournament	
12	Dhillon et al. 2011; India ⁸	95	48 significant over 1 year of observation	Seven ankle sprains, one calcaneus fracture, two phalangeal fractures	Eight ankle injuries, and two phalangeal fractures of the toes. 7/8 ankle injuries were ankle sprains/ligament injuries, 1—calcaneus fracture

one instance of ankle sprain and two cases involving tibial injuries were documented.²⁰

Walker et al. conducted a study on cricket-related injuries in New Zealand spanning a 6-year period from 2000 to 2005. Their study criteria encompassed injuries requiring at least an overnight hospital stay. The analysis revealed that upper limb injuries were the

most prevalent, accounting for 36% of the cases, followed by lower limb injuries at 31%. Within the category of lower limb injuries, a third of the cases ($N = 44$) involved Achilles tendon injuries. These injuries primarily resulted from overexertion to the execution of strenuous or repetitive movements, leading to sprains or strains in 37 cases and tears in seven players. A similar number of injuries

were observed in the tibia/fibula ($N = 27$), ankle ($N = 25$), and knee ($N = 21$) regions. Additionally, 15 players experienced injuries to the femur, while 10 players sustained foot injuries. Out of 156 injuries, 79 were situated in the lower limbs and localized to the foot and ankle region, including cases involving the Achilles tendon.²¹

Dovbysh et al., in a recent study published in 2021, evaluated the injury epidemiology of domestic and international male cricket players of New Zealand from seasons 2009–2010 to 2014–2015 across all formats of matches. Of the total 268 cricketers incidence of total match injury rates were 37.0 and 58.0 injuries/10,000 player hours in domestic and international cricket, respectively, approximately 1.7 times higher in international players than domestic players. In domestic players, the most common injury was of the hamstring (8.2%), ankle injury was reported in 6.5% of players, while in international players most common site of injury was groin (13.5%), followed by the lumbar spine, hamstring, overall lower limb injury was a most frequent injury in both domestic and international level players.²²

Walter et al. prospectively collected the injury data in the International Cricket Council (ICC) Men's Cricket World Cup 2015 based on media reports throughout all 49 matches among 219 players who participated in the tournament. They evaluated the time-loss and nontime-loss injuries and considered the injured player's position, injury site, and injury activity onset. The report suggested a total of 31 injuries in 23 players. Overall, fast bowlers had the highest injury prevalence during the tournament. Knee and foot injuries were more prevalent in fast bowlers. Foot injuries were reported in three bowlers and one batsman, with an aggregate percentage of 13% during the tournament. However, the hamstring and abdominal/trunk side strains were the most frequent injuries.²³

Dhillon et al., in a prospective observational study over 1 year, evaluated the orthopedic injuries in elite cricket players from the Punjab Cricket Association. Using the international consensus injury definitions, 48 of 95 cricketers sustained significant and 12 had insignificant injuries. The incidence was 3.27/10,000 hours of play and lower limb injuries were the most frequent (19/60), followed by upper limb injuries (16/60). Bowlers had the most severe injuries, specifically of the lower limb, while fielders had more upper limb injuries. Among the 19 lower limb injuries, seven ankle injuries, one calcaneus fracture, and two phalangeal fractures of the toes.²⁴

All the above data was on acute injury or injury incidence. A specific, focused search for chronic ankle injuries, like ankle impingement, revealed two focused studies discussing posterior ankle impingement in fast bowlers. Mansingh, from the West Indies,²⁵ documented six fast bowlers who presented with pain in the front foot on the forced plantar or dorsal flexion of the ankle, more so on landing. Significant Os trigonum was identified by radiology or magnetic resonance imaging; four needed surgical excision, while two were managed by steroid injections.

Tawade and Kadam²⁶ evaluated 152 club-level fast bowlers and noted that 68% of those who had reported a sprained ankle, went on to develop posterior ankle impingement; however, the data they presented was somewhat limited.

DISCUSSION

Injury surveillance in cricket has been coming into focus in recent years, as this data about the nature and severity of injury to specific body parts, when correlated to the nature of the player (bowler, batsman, etc.) gives significant insights into the application of injury risk reduction methods and helps in improving healthcare

protocols. Our literature search revealed that there is overall limited literature on injuries in cricket players and most of the work comes from the developed world, with very few publications from the Indian subcontinent; on the contrary, cricket in India, Pakistan, Sri Lanka, and Bangladesh probably accounts for the maximum interest generated in the sport worldwide.

Despite being the most popular game in India, we still lack a national-level organized injury surveillance protocol for injury documentation; this exists in A-class and international-level cricket only.²⁷ To the best of our knowledge, there is no specific protocol for documenting the injury patterns and injury incidence among cricketers at various ages, with little differentiation into gender and player type, except maybe in elite players.²⁸

Furthermore, site-specific data and the correlation of its significance to the type of player, in the form of playing time lost and return to sport, is sparse. This could have significance as injuries are most common in fast bowlers, and the landing foot logically seems to have a high injury potential, second only to the lumbar spine due to the torsion associated with bowling. Chronic issues like ankle impingement in bowlers have not been given due space in the literature, despite famous Australians like Brett Lee and Mitchel Staarc being side-lined due to this problem. Although ankle ligament injuries are common in all sports, the correlation noted by Tawade and Kadam²⁶ and the potential evolution of this into posterior ankle impingement in bowlers due to long stride lengths and altered biomechanics needs more in-depth study.

Our review has revealed the sparsity of site-specific evaluation of injury patterns and etiology in the current literature; this is important to know and we would encourage more data collection at all levels of cricket, starting from club cricket to elite players, with a special focus on the foot and ankle, which are at high risk due to the complex biomechanics of the ankle and hindfoot joints. Gender differences, level of training and practice, and player activities like bowling, may also have some roles which need to be explored for foot and ankle injuries.

CONCLUSION

Despite cricket's widespread popularity and extensive participation by all age-groups, the documentation of site-specific injuries, particularly concerning foot and ankle injuries, remains surprisingly scarce. Existing data highlights lateral ligament injuries as the prevalent issue in this region, potentially leading to persistent problems such as impingement. The limited data availability poses challenges in formulating effective injury prevention protocols. Therefore, targeted research is urgently required to examine injury patterns correlated with player characteristics and biomechanics to address this gap.

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