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Injury rate and patterns of Sydney grade cricketers: a prospective study of injuries in 408 cricketers

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ABSTRACT

Background The grade cricket competition, also known as premier cricket, supplies players to the state and national teams in Australia. The players involved are generally high-performing amateur (subelite) club cricketers. However, to date, there is no study on the injury epidemiology of Australian grade cricket.

Aim To conduct injury surveillance across all teams playing Sydney Grade Cricket (SGC) competition during the 2015–2016 season.

Methods A cohort study was conducted to track injuries in 408 male cricketers in 20 teams playing SGC competition. Players were tracked through the MyCricket website's scorebook every week. Cricket New South Wales physiotherapists were alerted if there were changes to the playing XI from the last game. If any changes were made due to injury, then an injury incident was registered.

Results During the course of the season, a total of 86 injuries were registered from 65 players, resulting in a loss of 385 weeks of play. The overall injury incidence rate was 35.54 injuries/10 000 playing hours with an average weekly injury prevalence of 4.06%. Lower back injuries (20%) were the most common injuries followed by foot (14%), hand (13.75%), knee (7.5%) and calf (7.5%). Linear regression analysis showed that the likelihood of injury increased as the mean age of the teams increased ($R=0.5$, $p<0.05$).

Conclusion The injury rate in SGC is lower than that reported at elite level. However, the high rate of lower back injuries (20%) highlights an area of concern in this cohort. High workloads or inadequate physical conditioning may contribute to such injuries. This study sets the foundation for understanding injury epidemiology in grade cricket and examines the links between injury and performance, these results may assist coaches and administrators to develop and implement cricket-specific injury prevention programmes.

BACKGROUND

More than one million Australians play cricket annually.[1] Of these, a large number play organised cricket at the club level. Of the 3995 cricket clubs in Australia,[2] about a quarter are based in New South Wales (NSW) and most of them are concentrated around the greater Sydney region showing that the region is a major hub for cricket participation. Many club cricketers can be categorised as subelite or junior cricketers, of which some may have aim of becoming elite cricketers, from this point on in the manuscript players participating at the club level will be referred as 'community cricketers'. However, longitudinal studies on injury epidemiology in this cohort have not been reported in the literature. The probable reasons for this may be linked to more resources or research funding directed at the elite level, or specifically at junior and adolescent fast bowlers, possibly due to the perception that these cohorts have a high injury risk.

Over the past decade, the dynamics of play at the community cricket level have changed considerably, making club cricket competitions uniquely placed among non-contact sports, where many players participate in three distinct formats of the game, that is, T20, 1-day and multiday cricket. Each format has a different requirement of player workload and intensity.[3] T20, the shortest format of cricket, is also colloquially termed as the 'explosive version of the game' and it places greater physical demands and need for power and agility on the players.[4–6] The increased physical demand results in 50%–100% more sprints per hour in T20 cricket when compared with multiday cricket, in other words the changes in the physical demand can be termed as workload fluctuations.[3] At the community level, where the fitness and conditioning may not be comparable to elite cricketers, workload fluctuations may result in increasing injury rates (IRs).

Among junior cricketers, the injury incidence ranges between 24% and 34% per season for the cohort of players participating in the season, with the IRs for batters and fielders being similar to those of bowlers.[7–10] However, a 10-year injury report of elite Australian cricketers playing international and state cricket showed an average seasonal injury incidence of 18.3%.[11] For junior cricketers, injuries are common in the lower limbs, back and hands/fingers, whereas for elite adult cricketers the common time-loss injuries include non-tendinous shoulder injuries, wrist and hand fractures, side and abdominal strains, low back stress fractures, thigh and hamstring strains and shin and foot stress fractures.[8 9 12] The high rate of cricket-related injuries at the community level affects player participation, and place a burden on the healthcare system.[13]

In NSW, the Sydney Grade Cricket competition, also known as the 'NSW Premier Cricket Competition', has been played for the past 120 years. It is the premier club cricket competition comprising 20 male club cricket teams from the region. According to Cricket NSW, this competition is 'a breeding ground for future NSW and Australian representatives'. In this manuscript, grade players and grade teams refer to the players and teams that play in NSW Premier Cricket Competition. Each

grade team consists of five senior divisions, as well as restricted age group playing in the Poidevin-Gray Shield (under 21) and AW Green Shield junior competition (under 17). The season generally starts in September and runs for about 7 months up till March of the following year. The first-grade teams (highest ranking team from each club) comprises high-performing amateur (subelite) club cricketers, and often hosts international or state squad players. Good performances in the first grade may pave a pathway for selection in elite teams.

In the context of cricket played at the community or subelite level, ground surface characteristics such as hardness and grass type may be linked with injuries.[14–16] The conditions of home ground, practice facilities, hardness of outfield and pitch surface vary significantly from club to club and are generally a surrogate of the resources available to the clubs. Given each team in the NSW Premier Cricket is based in different areas of the greater Sydney region which covers 12 367 km^2 and is larger than countries such as Cyprus and Lebanon, geospatial mapping may assist in better understanding the injury distribution. Due to topological, geographical and surface variations in the landscape, the role of geospatial mapping has been advocated by injury epidemiologists to gain a better understanding of sports injuries.[17] Geographical analysis or geospatial mapping allows epidemiologists to understand the geographical variations in the injury statistics.[18] Moreover, to develop targeted injury prevention strategies, in the future, it is important to identify areas or clusters for high injury risk. Considering the importance of grade cricket, it is vital to understand the burden of injury in this competition by using traditional injury epidemiology and geospatial epidemiology. Since an injury epidemiology report covering the whole season of Sydney Grade Cricket has never been published in the literature, we used the 2015/2016 season as a basis for a report on injury epidemiology of cricketers playing in the first grade NSW Premier Cricket Competition.

METHODS

The first-grade XI of all grade teams (n=20) playing the NSW Premier Cricket Competition were tracked during the 2015/2016 season in a cohort study. Data for injury surveillance were obtained from MyCricket website, where all team scores and statistics are officially updated. After the first round, each subsequent round was analysed to track any changes in the team from the previous round by a researcher (SS). If a team's playing XI was different from the previous round playing XI, SS informed Cricket NSW physiotherapists (DR/CE) who then contacted the team's captain or the coach to enquire if any player missed out due to injury. When the reason for change was cited as an injury, DR/CE followed up players to record the location and type of injury. Players who made it to the playing XI were added as a part of the team's squad, that is, if a team included 11 new players to play for them then the squad size would be 22 (11 original Players+11 new players). The accurate calculation of squad size was necessary to calculate injury incidence. Considerations for determining squad size for each grade team included:

1. Initial team selected for the first match in the first grade.
2. The squad would grow through the season as any new player selected from a lower grade played first grade.
3. Once a player played first grade, they became part of the 'squad' and were monitored by DR/CE for injury regardless of which grade they played each subsequent round.
4. Any state squad members in that grade club.
5. Retrospectively if a new player returned straight into first grade after being injured from round 1.

The regular season for each team was 28 scheduled games (including finals) played between 26th September 2015 and 3rd April 2016. Taking into account factors such as scheduled byes, bad weather and competition progression, an average of 20 games were played by each team throughout the season (range: 17–27). However, not all weeks had games scheduled, for example, New Year and Christmas. Therefore, in this manuscript 'weeks' refer to match weeks.

All aspects of the study were reported in accordance with the Strengthening the Reporting of Observational Studies in Epidemiology Statement: Guidelines for reporting observational studies (see online supplementary appendix I).[19]

Injury definition

In this study, the definition of 'injury' was adopted from the international consensus statement on cricket injuries Orchard *et al*,[20] which states that a 'match time-loss' injury is 'any injury or other medical condition that prevents a player from being fully available for selection for a major match' or 'any illness due to which the player misses one or more matches'.

This definition also includes injuries which 'during a major match, cause a player to be unable to bat, bowl or keep wicket when required by either the rules or the team's captain'. However, due to limited resources and retrospective tracking of injuries using 'missed match data', we were unable to capture these injuries.

IR definition (exposure hours)

For the purpose of this study, IR was defined as the number of injuries per hour of athletic exposure. Generally, this parameter is expressed in 1000 or 10 000 hours of athletic exposure (match time+training time or only match time). We used IR expressed in 10 000 hours of match time, due to unavailability of training time data. IR was calculated using the formula previously reported in the literature[21]:

$$IR\ per\ 10,000\ exposure\ hours = \frac{Total\ number\ of\ injuries}{Total\ time\ of\ athletic\ exposure\ in\ hours} \times 10,000$$

Data extraction

All the data were extracted to Microsoft Excel 2013, which was also used for further data analysis. Further data analysis was conducted in SPSS V.24.0. Conversion of player days to injuries per 10 000 exposure hours was based on Orchard *et al* in which a day of play in a first class game or test match is equivalent to 6 hours of play, and a 1-day match is 6 hours 40 min (6.66 hours).[22] Given that there are 40 overs in a T20 game and 100 overs in a 1-day game, the time of exposure in the short format cricket (T20) was calculated as 2.66 hours per day being 40/100 times the 6.66 hours for a 1-day match. A similar number is also achieved if we use International Cricket Council guidelines for bowling 15 overs/hour, that is, (40 overs/15=2.66). Injury prevalence (IP) was calculated according to Orchard *et al*, where overall IP for all formats is calculated using missed player days as the numerator, with a denominator of number of playing days multiplied by squad members and the result expressed a percentage.[20] In this study, days were replaced by playing weeks to simplify calculations.

Injury severity

To understand the impact of injuries, we calculated injury severity (IS). This was calculated as a function of time loss (in weeks), if there were multiple injuries then the time loss was summed. For

Table 1 Grade cricket activity, exposure totals and injury epidemiology

Season variable	Results
Total no of players used in first grade	408
Average players used per club	20 (SD±2.5)
Average age	24.1 (SD±5.3)
Total matches played in the season	218
Player exposure time (hour)	24197
Average matches played per club	20.2 (SD±5.3)
Total injuries	86
Average injuries per club	4.1 (SD±2.8)
Average weeks missed due to an injury	4.5 (SD±11.1)
Injury prevalence	4.06%

A total of 11 (5%) matches of the 218 matches played were affected by rain resulting in varying amounts of play conducted over the course of the match. Given the small number, these matches were not excluded from the final analysis.

example, if a player missed 3 weeks of season time due to an injury, the IS was calculated to be 3; whereas, if a player missed another 6 weeks of season time due to an injury the total IS was 3+6=9.

The average injury severity (AvIS) for a team was defined as the total IS divided by the total number of injuries in the team. In the above-mentioned example for IS calculation, the AvIS can be calculated by sum of total IS (3+6)/total injuries (2)=4.5. This method assists in understanding the burden of injuries on each team during the season. The burden of injuries for the purpose of this study is time lost in weeks and its effect on team's performance. To further explore IS in terms of exposure time, we calculated the average weeks missed per 10 000 hours of play, and called this measure injury severity based on exposure (ISBE), this measure assists in quantifying the severity of injury based on player exposure time. It is a useful measure because it allows comparison among different formats of cricket and with other sports.

Data analysis

Univariate analyses of variance (ANOVAs) were performed to compare (1) the difference between long and short forms of cricket in terms of IS, (2) the differences in IS for initial injuries with subsequent injuries, (3) the severity of injuries across sites of injury.

The assumption for normality was tested through Shapiro-Wilk and Kolmogorov-Smirnov tests. Due to the violation of parametric ANOVA's assumption of normality ($p<0.05$), a non-parametric Kruskal-Wallis one-way ANOVA on ranks was run to compare the severity of injuries across the locations of injuries (lumbar spine or other sites). Similarly, the parametric assumption of homogeneity of variance was violated for comparison of differences between long and short form of cricket in terms of injury incidence, therefore, a weighted least squares ANOVA was performed.

After checking for data normality, linear regression was performed to investigate the relationships between (1) mean age of squad and IR, (2) week of the season and injury incidence, (3) week of the season and the number of injuries and (4) player age and IS. A binary logistic regression was performed to investigate the association between format of play and the location of injuries (lumbar spine or all other injuries). These relationships were presented as R where its value represented the strength of the relationship, that is, trivial (0.0–0.1), small (0.1–0.3), moderate (0.3–0.5), large (0.5–0.7) or very large (>0.7).[23] Geospatial mapping to identify the locations of clubs having high IRs was performed by using ArcGIS Desktop V.10.5.1 (ESRI, Redlands, California, USA).

RESULTS

Player characteristics and exposure time

We tracked 408 cricketers in the 20 grade teams who played a combined total of 218 matches, (2 days n=106, 1 day n=57, T20 n=55) spanning over 325 match days. A cumulative exposure time of 24 197 player hours (see table 1). The age of the cricketers ranged between 14 and 53 years with the average age being 24.1

Table 2 Analysis of injury by grade teams

Club	Injuries	Sum weeks missed (severity)	Average weeks missed (severity)	Player hours	Injury rate (injury/ 10 000 hours)	Sum weeks missed (severity)/ 10 000 hours	Average weeks missed (severity)/ 10 000 hours	Squad size	Prevalence %
Team 1	11	51	4.63	1185.99	92.75	430.02	39.04	22	10.1
Team 2	8	29	3.63	1116.70	71.64	259.69	32.51	27	4.74
Team 3	8	20	2.5	1151.41	69.48	173.70	21.71	18	3.4
Team 4	8	22	2.75	1194.70	66.96	184.15	26.16	22	5.3
Team 5	7	32	4.57	1203.28	58.17	265.94	40.39	18	6.4
Team 6	6	29	4.83	1151.41	52.11	251.86	43.42	25	6.03
Team 7	5	33	6.6	1151.41	43.42	286.61	89.02	20	7.53
Team 8	5	13	2.6	1298.57	38.50	100.11	20.02	23	2.8
Team 9	4	4	1	1108.12	36.09	36.09	9.02	21	1.14
Team 10	4	45	11.25	1220.70	32.77	368.64	112.64	20	10.2
Team 11	4	25	6.25	1541.02	25.96	162.23	54.06	19	5
Team 12	3	12	4	1064.83	28.17	112.69	25.08	21	2.68
Team 13	3	13	4.33	1134.12	26.45	114.63	52.91	19	3.1
Team 14	3	15	5	1471.73	20.38	101.92	40.77	20	3.4
Team 15	2	2	1	1134.12	17.63	17.63	13.27	18	0.74
Team 16	2	5	2.5	1618.89	12.35	30.89	15.44	21	1.04
Team 17	1	16	16	1038.83	9.63	154.02	154.02	15	3.4
Team 18	1	7	7	1082.12	9.24	64.69	64.69	22	0.84
Team 19	1	12	12	1134.12	8.82	105.81	100.19	16	2.07
Team 20	0	0	0	1194.70	0	0	0	20	0
Overall	86	385	4.48	24196.7	35.54	159.11	37.00	20.1	4.06

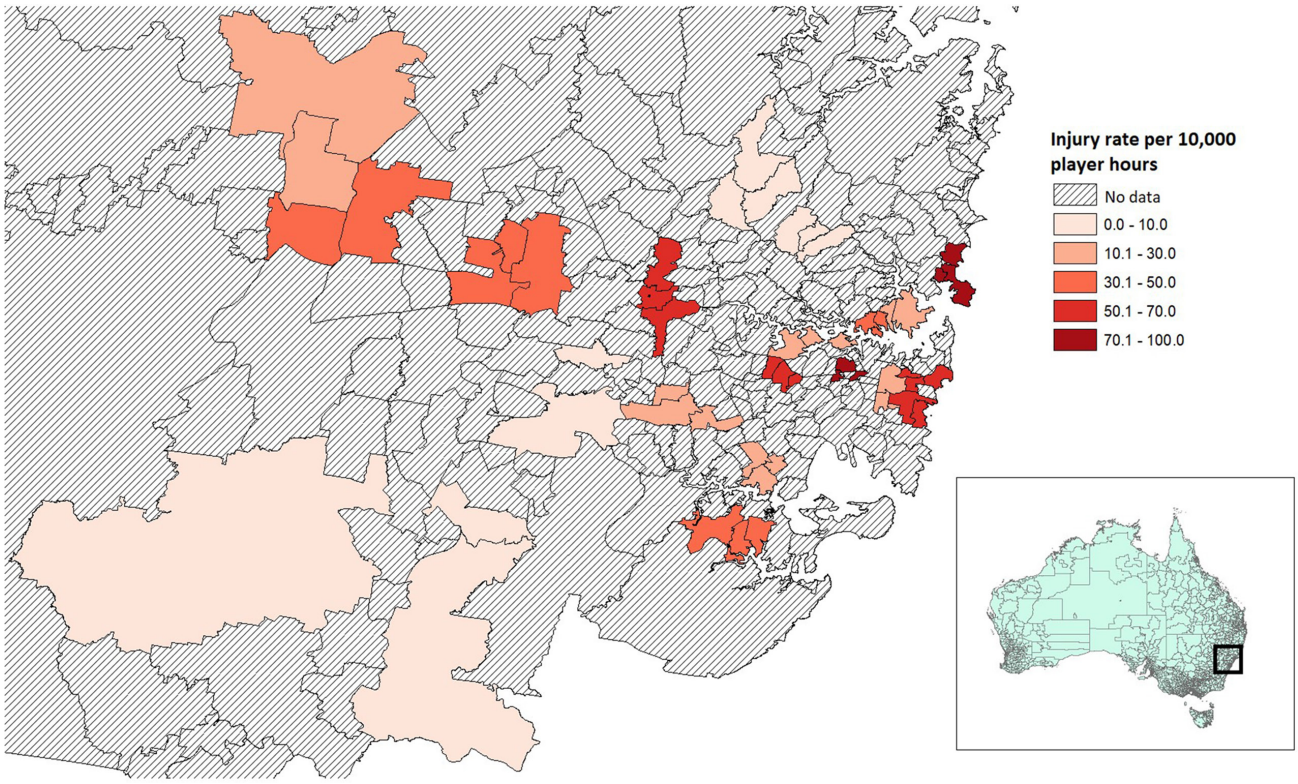

Figure 1 Geospatial injury distribution of injury rate for Sydney grade teams.

years (SD: ±5.3). There were 86 injuries sustained by 65 players, of which 21 were recurrent injuries (4 players had 3 injuries, 13 players had 2 injuries and 48 had only 1 injury). The age of injured subset of cricketers ranged between 18 and 43 years with the average age being 25.62 years (SD: ±2.2).

Descriptive injury epidemiology

There was a total of 385 weeks missed due to injury across all clubs in the competition, with an average of 4.06% of all players missing per week due to injury (average weekly IP). The overall injury incidence rate was 35.54 injuries/10 000 playing hours. The average IS was 4.48 weeks missed per team. The IRs, severity and prevalence by squad can be seen in table 2. In terms of team-specific injury burden, a Northern Beaches-based team had the highest number of injuries (n=11), followed by a team based in Inner West (n=8) and Mid-West region (n=8) (see figure 1 and table 2).

Geospatial mapping

Geospatial mapping was used to identify the geographical distribution for injuries (figure 1). We examined the injury hotspots and a visual inspection showed that most injury hotspots were located in Northern and Eastern suburbs of Sydney. Northern Beaches had the highest IR (92.75/10 000 hours), whereas Southwestern and Western suburbs had the highest IS ranging between

Table 3 Injury location, age, severity, previous injury and distribution by format of play

Location	No of Injuries	Proportion %	Age	Severity	20/20	1 day	Long form	Recurrent injury	Recurrent injured %
Lower back	17	19.77	25	7.88	1	5	11	3	17.65
Foot	12	13.95	24.25	3.58	2	4	6	2	16.67
Hand/wrist	11	12.79	28	4.27	2	4	5	2	18.18
Knee	9	10.47	25.89	6.67	2	3	4	2	22.22
Abdomen	8	9.30	28.45	2.87	1	3	4	2	25
Calf	6	6.98	30.33	3.83	0	4	2	2	33.33
Hamstring	6	6.98	25.10	3	0	2	4	3	50
Illness	5	5.81	22.6	1.22	2	2	1	1	20
Elbow	3	3.49	20	3.33	0	1	2	2	66.67
Groin	2	2.33	28	1	0	1	1	0	0
Hip	2	2.33	26	1.51	1	0	1	0	0
Shoulder	2	2.33	21.50	2.49	0	0	2	0	0
Chest/pecs	1	1.16	22	9	0	1	0	1	100
Unidentified	2	2.33	20	1	0	1	1	1	50
Totals	86	100	N/A	N/A	11	31	44	21	29.99

N/A, not applicable.

Table 4 Comparison of lower back injuries with all other injury types

	Lower back	All other injuries
Injuries	17	69
Age	25	26
Severity	7.88	3.64
Week injured	15.23	14.87
Recurrent injuries	3	18
T20	1	10
1 day	5	26
Long format (LF)	11	33
Proportion of injuries in LF	64.7%	47.8%

16 and 13.75 weeks, respectively. Southwestern suburbs also had the highest average ISBE (173.27/10 000 hours), followed by North (114.62/10 000 hours) and Western Sydney (112.64/10 000 hours) (see table 2).

Site of injury

The largest proportion of reported injuries were lower back (LB) (n=17, 20%). This was followed by foot (14%), hand/wrist (12.7%), knee (10.5%) and (9.3%) and calf injuries (7%) (see table 3). There were two injuries for which the anatomical location was not identifiable (missing data). However, we included them in the analysis as they led to a corresponding time loss. In terms of IS, LB injuries (n=17) had the highest average severity (mean=7.88 weeks missed) followed by knee injuries (mean=6.67 weeks missed). As LB injuries were the most common (n=17) and the most severe, we did some further exploratory analysis to compare them with all other injuries (table 4). The average severity of LB injuries was 7.88 weeks missed compared with the average severity of all other injuries being 3.63 weeks missed. The majority of LB injuries occurred in longer format games 64.7%, whereas for other anatomical injury sites, the longer format accounted for only 47.8% of injuries.

Relationship between risk factors and reported injuries

Format of play

The weighted least squares ANOVA comparing the difference between long and short form cricket injury incidence was significant ($F(1, 28)=6.613$, $p<0.05$). As seen in figure 2, short form cricket had a higher injury incidence per 10 000 player hours (mean=32.56, SD=1.24, n=17) than long form cricket (mean=12.67, SD=1.33, n=13). Univariate ANOVA comparing the difference between long and short form of cricket IS was non-significant ($p>0.05$).

There was a moderate association between the mean age of the squad and number of injuries ($R=0.46$), $p<0.05$. As mean age of the squad increased the number of injuries increased. There was also a moderate relationship between mean age of the squad and IR ($R=0.5$), $p<0.05$. The relationship between mean age of the squad and IS was weak ($R=0.11$) $p>0.05$.

Average injury severity

The AvIS for teams was 8.17–8.28 weeks missed per injury. Linear regression of AvIS (in weeks) with the week of the season was strong $R=0.54$, $p<0.05$. The analysis showed that IS was high at the start of the season and tapered off as the season progressed.

Relationship between performance covariates and reported injuries

The team's overall performance was determined by its final ranking on the competition leader board (1 being the highest ranked team, 20 being the lowest ranked team).There was a weak correlation between a team's overall performance and the incidence of injury ($R=0.14$), $p>0.05$. A moderate relationship was present between a team's mean age and their overall performance ($R=0.39$), $p=0.08$. There was no relationship between the cumulative games missed by a team due to injury and its ranking ($R=0.02$), $p>0.05$.

DISCUSSION

This study provides an insight on the injury epidemiology of grade cricketers in Sydney. The injury prevalence of 4.06% is line with the previously reported literature on elite cricketers.[11 24 25] The injury incidence rate 35.54 injuries/10 000 playing hours is comparable to the mean IR of other non-contact or quasi-contact team sports such as soccer (35.4/10 000 hours),[21 26 27] basketball (33.19/10 000 hours),[28 29] tennis (40.2/10 000 hours)[30 31] and volleyball (21.5/10 000 hours).[32 33] However, it is lower than the pooled estimate of elite senior cricketers (98.2/10 000 hours).[34]

The results showed a higher rate of LB (20%) compared with that reported in the elite or the junior cohorts.[9 12 35] Lumbar

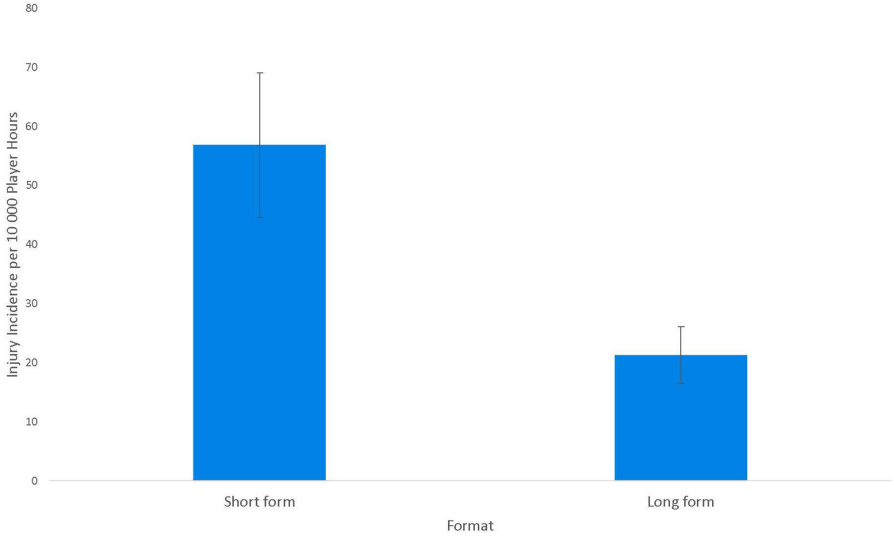

Figure 2 Format of play and injury incidence per 10 000 player hours, SD error bars.

spinal injuries are clearly an area of concern at club cricket level. The key contributing factors linked to these injuries are age, bowling biomechanics (excessive lateral trunk flexion), high bowling workload or spikes in workloads and inadequate physical conditioning.[7 36–41] Of these factors, the most easily modifiable risk factor is workload. Adhering to bowling workload guidelines and avoiding spikes in the workload may prevent overuse and bony stress injuries to the LB. Although there has been some research to automate bowling workload monitoring,[42 43] mostly using inertial sensors with global positioning system, this technology is expensive and therefore accessible only to elite cricketers. In the future, cheaper alternatives such as using gyroscopes and accelerometers, which are used in smart watches to track movement, could be used to monitor bowling workloads.[44]

Generally, the most severe injuries in cricket are lumbar stress fractures that result from repetitive microtrauma due to high ground reaction forces.[45] Such injuries are preventable by appropriate medical supervision, workload monitoring and engagement in injury prevention activities.[27 41 46] If the athletes show prodromal symptoms of discomfort in the LB, early radiological imaging to detect bony stress and may prevent spondylolisthesis (LB fracture) or modification of their activity may lead to early return to play.[47] Therefore, grade cricketers can benefit from pre-season screening and medical coverage during matches.

The high rate of foot injuries (14%) is an interesting finding. Possible causes could be related to the use of substandard footwear and uneven ground surface.[48] The pathophysiology and the biomechanics of foot injuries need to be investigated in future studies. There is strong evidence from Netball and Basketball that wobble board training can significantly reduce ankle injuries.[27 49] Similar strategies to prevent ankle injuries may be incorporated in the conditioning programmes by the cricket clubs. Hand and finger injuries accounted for (13%) injuries. These were generally contact injuries sustained during fielding the ball. Possible ways to reduce such injuries may include more stringent coaching of fielding and catching techniques, and the use of preventative taping on the fingers before the fielding sessions.[48]

The geospatial mapping showed that there was a geographical variation in the IRs. Grade teams from Northern and Eastern suburbs of Sydney had a higher rate of injury compared with other grades in the region. Although the factors associated with this variation were not clear but prospective injury studies, with larger datasets, investigating ground conditions may assist in exploring these factors.

The findings of this study showed that the IR was significantly higher in the shorter format compared with the longer format of cricket. This trend is also seen in elite cricketers and is attributed to increased participation in T20 cricket.[50] The shorter format of cricket does reflect greater physical demands compared with multiday cricket, where the former required 50%–100% more sprinting per hour.[3] Player workload also varies with other factors such as playing positions which will differ significantly between batsmen, bowlers and all-rounders. Even fielding positions can generate different workload profiles, as the relatively sedentary slip fielder is unlikely to generate as high a workload on average compared with the more athletic cover fielder or boundary rider. The link between workload fluctuations and injury has been well documented,[37 51] and is considered a surrogate for development of overuse injuries.[52] At the subelite or junior level, where the fitness and conditioning may not be comparable to elite cricketers, workload fluctuations may result in high IRs as reflected in the results of this study.

Future directions

This study was planned in 2015 before the updated injury consensus statement Orchard *et al*[53] was published later, so the most recent injury definition was not used in this study. Future studies should be designed considering the use of the updated injury consensus statement as the previous definition was limited to include only the 'time-loss' injuries, while any 'medical attention' injuries were discounted. The limited inclusion of injuries in the analysis may have resulted in underestimation of IR. Another factor that may have influenced the IR significantly was the unavailability of training exposure data. Inclusion of training data and training injuries may assist in better understanding the dose–response effect of workload on overuse injuries.

Future research should report the details of the inciting event to understand the mechanism of injury, along with specific anatomic diagnosis rather than a general body region. This information can assist in developing a better understanding of the biomechanical description of the injury. According to Bahr and Krosshuag,[54] this is an important aspect to develop injury prevention programmes in the future. This study was not able to report on these factors due to the limitation of research staff, however, in future injury surveillance methods such as 'athlete interviews' can be used. As this approach involves a personal interview or a questionnaire filled by the athlete on their recall about the injury mechanism, it is less likely to be biased when filtered by a medically qualified person completing the injury report.[55]

CONCLUSION

In summary, this is the first study to report the burden of injuries in grade cricket played in Australia and provides an insight on injuries in the Sydney Grade Competition. The IR observed in this study is similar to other non-contact sports but is lower than that reported in elite cricketers. The high rate of injuries in T20 for grade cricketers is consistent with the trend of increased IRs in T20 cricket for elite cricketers. Although the incidence of lower back injuries is higher in grade cricket, a single strategy of workload restriction may not be sufficient to curb this issue as the back injuries may be linked to multiple other factors such as bone maturation, physical conditioning, playing surface or previous injury profile. Therefore, cricket administrators should focus on multipronged strategies for injury prevention.

Main messages

- This is the first study to report injury epidemiology of Australian grade cricketers.
- The injury rate in Sydney grade cricketers is 35.54 injuries/10 000 hours.
- The high rate of lower back (20%) and foot (14%) injuries is an area for concern and needs urgent attention.

Current research questions

- Will the understanding injury epidemiology high-performing amateur (subelite) club cricketers assist in development for injury prevention strategies?
- What injury prevention strategies will reduce the high rates of lower back injuries in grade cricketers?
- Can geospatial mapping assist in identifying covariates linked to injuries?

Correction notice This article has been corrected since it was published Online First. The author name Chris Evans has been corrected to read Chris Evens.

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