

INJURIES IN QUIDDITCH: A DESCRIPTIVE EPIDEMIOLOGICAL STUDY

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ABSTRACT

Background: Quidditch is a fast growing, physically intense, mixed-gender full-contact sport. Originally adapted from Harry Potter novels, quidditch was first played in 2005 in the USA but is now played worldwide. It is essential to elucidate patterns of injury for the safety and growth of the sport of quidditch. It also provides a unique opportunity to study injury patterns in mixed-gender full-contact sport, an area of increasing importance with the developing culture of transition from single-gender to mixed-gender sports.

Purpose: The purpose of this investigation was to examine the types of injuries sustained while playing quidditch in terms of their incidence, anatomical distribution and severity, and gender distribution.

Methods: An anonymous self-reporting questionnaire was distributed to all active quidditch players in the UK. Data collection included player demographics, type of injury, mechanism of injury, player position, experience and treatment required, relating to the previous 12 months.

Results: A total of 348 participants of 684 eligible athletes responded to the questionnaire representing a 50.87% response rate. There were 315 injuries reported by 180 athletes in total, with an overall incidence of 4.06 injuries per 1,000 hours. A statistically significantly different rate of concussion was observed with female athletes sustaining more concussion than males ($p=0.006$). The overall rate of concussion was 0.651/1000hrs in males and 1.163/1000hrs in females (0.877/1000 hours overall).

Conclusions: This study provides the first quantitative description of injury rates in quidditch. The overall injury rates are no higher than those reported in other recreational contact sports. Female athletes were found to have a higher rate of concussion, which needs further investigation. These findings are relevant to players concerned about safety in quidditch and to governing bodies regarding governance of the sport.

Level of Evidence: 3b

Key words: Concussion, descriptive epidemiological study, fracture, Harry Potter, injury, quidditch

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INTRODUCTION

The real-life sport of quidditch was first adapted from JK Rowling's Harry Potter novels in 2005 in the USA.¹ Since then, it has grown vastly in popularity involving approximately 20,000 players in 25 countries across the world, including the UK, Australia, Brazil, Uganda and Korea.^{2,3} So far there have been three quidditch World Cups held by the International Quidditch Association, where national teams can compete at an international level.

Within the UK, the annual British Quidditch Cup is the largest and most prestigious UK tournament with the 32 best UK teams competing, having qualified from their respective regional tournaments.⁴ Summer 2017 marked the launch of the Quidditch Premier League, whereby eight regional teams will battle for the title of quidditch UK champion.⁵

Rules are largely based on the fictional game: Three "chasers" try to score past one "keeper" by throwing the "quaffle" (a slightly soft volleyball) through any of the three opposing team's hoops for 10 points. Meanwhile, two "beaters" attack opposing players with one of three "bludgers" (dodge balls), which temporarily knock a player out of the game if hit. The final ball is the "snitch", which consists of a human runner shielding a tennis ball in a sock hanging from the back of their shorts.⁶ An award of 30 points is made to the team whose "seeker" is able to catch the snitch. Catching the snitch also ends the game. There are therefore two teams of seven people and up to five balls in play at any one time. Substitutions can be made at any time during the game and players can switch positions by being substituted out of the game and swapping headbands (the colors of which are used to designate player roles). The likeness continues even down to the athletes carrying 'broomsticks' (PVC pipes) between their thighs at all times. Competitive sports are based on a handicap that defines it (e.g. one must pass backwards in rugby) and for quidditch this is the use of a broomstick. Unlike the fictional game, players are unable to elevate themselves into the air therefore this remains a ground-based sport, which is played on grass. The pitch is pill shaped, with two semicircles capping the ends of a rectangle.

Superficially, it may appear that the true uniqueness of quidditch is the handicap of being mounted

upon a broomstick, and the possible consequences this has in terms of running and tackling dynamics and injury patterns. However, quidditch is at the forefront of pushing for gender inclusivity in sport with its unique mixed-gender rule and full contact nature. Most sports are segregated by sex: with women only competing against women, and men only competing against men. Even the few mixed sex sports dictate a specific number of 'female' or 'male' players on each team. This can make sport a hostile environment for non-binary athletes (non-binary is defined as "having both masculine and feminine characteristics and/or identifying as being neither male nor female").⁷ The IQA (International Quidditch Association) have a "four maximum" gender rule which states that a team can contain a maximum of four players actively playing who identify as the same gender at one time.³ This means that a player of any gender, whether they do or do not identify with a gender at all, can be involved.

Quidditch has previously been likened to rugby, due to its full contact nature and lack of body padding.⁸ Therefore it could be assumed that the two sports will have similar injury patterns. However, the addition of the broom, and the mixed gender aspect of the sport make quidditch unique. The purpose of this study is to therefore examine the types of injuries sustained while playing quidditch in terms of their incidence, anatomical distribution and severity, and gender distribution. This will hopefully determine the safety of the sport under the current rules and provide information for the public, athletes and medical professionals.

METHODS

A descriptive epidemiological study was conducted to examine injury patterns sustained by quidditch club members registered with the national governing body, Quidditch UK. All athletes who were recorded as having competed in a competitive match in the most recent season were invited to participate in a self-reporting questionnaire. An introductory statement on the questionnaire stated that participation in the questionnaire is completely voluntary and that all information given is confidential. Consent was implied by the participant completing the questionnaire. Data collection took place between March and July of 2016.

A web-based survey was created on GoogleDrive, a third-party site, which allowed confidential data to be collected. Data collection referred to the previous 12 months and included patient demographics; number of years' experience; self-reported skill level defined as novice, intermediate or advanced; type of injury sustained; mechanism of injury; player position at time of injury; number of injuries sustained; type of medical professional that was the first responder; treatment required and time of return to quidditch.

Incidence was defined as rate of injury per 1,000 hours of quidditch played during the study period. Both practices and matches were included in this figure. Injury was defined as any injury sustained whilst playing quidditch that required "medical attention", meaning the players medical condition was assessed by a qualified professional, including first aiders, nurses, paramedics and doctors. A superficial injury is defined as an abrasion, superficial hematoma, and superficial laceration.

Statistical analysis was performed using SPSS Version 20.0 (IBM, Armonk, New York, USA). A chi-squared test was performed for analysis of categorical data.

RESULTS

Demographics

A total of 348 participants of 684 eligible athletes responded to the questionnaire representing a 50.87% response rate. Of these there were 164 females, 176 males, and five transgender participants. Three participants did not disclose their sex. Overall mean height of athletes was 170.37cm (SD 22.33cm), mean weight was 71.57kg (SD 18.74) and mean BMI was 24.02kg/m² (SD 6.84).

Hours played per week

The mean number of hours played per week per player was 4.28 (SD 1.86). The total number of hours played was 77,532 hours in the year studied.

Incidence of Injury

There were 315 injuries reported by 180 athletes in total, with an overall incidence of 4.06 injuries per 1,000 hours. Data on player position and type of injury sustained was missing for 14 of these injuries. Players of increasing skill level were observed to report higher injury rates (see Table 1). Ninety-five participants sustained one injury, 52 sustained two injuries, 22 sustained three injuries, five sustained four injuries, and six sustained five injuries overall. There were 141 injuries in females, 163 in males, eight in transgender players and three in athletes who did not disclose their sex. Twenty-seven injuries were sustained in seekers, 151 were sustained in chasers, 77 were sustained in beaters, 44 sustained in keepers and two sustained in snitches (Table 2).

Types of injury

No differences were seen between males and females in superficial injuries ($p=0.103$), sprains ($p=0.129$), fractures ($p=0.854$) or dislocations ($p=0.750$) (Table 3). A statistically significantly different rate of concussion was observed with female athletes sustaining more concussion injuries than males ($p=0.006$). In particular female beaters sustained far more concussions ($n=17$) compared with their male counterparts ($n=2$), ($p=0.002$). The overall rate of concussion was 0.651/1000hrs in males and 1.163/1000hrs in females (0.877/1000 hours overall).

Treatment

Of those injuries that were not treated in hospital, 70 were managed by a paramedic, 102 were managed by a volunteer first-aider, 25 were managed by a primary care physician and two were managed at a minor injuries centre. Data on treatment was missing for 29 injuries.

A total of 17 injuries required hospital admission. Sixty-eight presented to the emergency department

Table 1. Number of injuries per self-perceived skill level.

	n	Total number of injuries	Mean Number of injuries per player	Total hours played per year by group	Injury rate per 1,000 hours
Novice (N)	80	40	0.50 (SD 0.81)	16224	2.47
Intermediate (I)	199	152	0.93 (SD 1.16)	44824	3.39
Advanced (A)	69	90	1.30 (SD 1.22)	16484	5.46

Table 2. Frequency of injury location per player position.

	Seeker	Chaser	Beater	Keeper	Snitch	Total	%
Head	6	46	21	12	1	86	28.6
Face	0	2	3	0	0	5	1.7
Neck	1	7	2	2	0	12	4.0
Upper Limb	13	34	22	16	0	85	28.2
Chest	0	6	1	1	0	8	2.7
Abdomen	0	4	2	0	0	6	2.0
Pelvis	1	1	0	0	0	2	0.7
Lower Limb	6	51	26	13	1	97	32.2

Table 3. Frequency of injury between males and females.

TOTALS	Superficial		Sprain		Fracture		Dislocation		Concussion		ACL Tear	
	M	F	M	F	M	F	M	F	M	F	M	F
Frequency	35	20	72	50	17	16	6	4	26	42	3	3
Not injured	128	121	91	91	146	125	157	159	137	99	160	138
Chi squared (2-tailed)	p=0.103		p=0.129		p=0.854		p=0.750		p=0.006		p=1.000	

and did not require hospital admission. One patient presented to an otolaryngologist and one patient was managed by a nurse (but not in the emergency department).

For those patients admitted to hospital and requiring surgical input: one participant was conservatively managed for a tibial fracture; one participant required wrist open reduction internal fixation, one participant underwent open reduction and internal fixation for a tibial fracture; one underwent double meniscus repair and ACL reconstruction; one required single meniscus repair and ACL reconstruction; one required a diagnostic knee arthroscopy, one required an open ACL reconstruction.

Return to quidditch

The mean time to return to quidditch was 27.37 days (SD 45.48, Range 0-365). Data on recovery time was missing from 55 injuries. Three injuries resulted in those participants not returning to quidditch.

DISCUSSION

Incidence of injury

Incidence of injury was found to be 4.06 per 1,000 hours. Actual practical and game incidence rates could not be specified, but this overall figure appears to be low in comparison with injury rates of other

team sports. For example, men's amateur rugby league has been found to have injury rates as high as 114 per 1000 hours, amateur Australian football has an injury rate of 27.2 per 1000 hours and professional men's football has been reported as having an injury rate of 8.0 per 1,000 hours.^{9,10,11}

Types of injury

Head and extremity injuries were the most common injuries observed in quidditch. This is a similar injury pattern seen in a study of youth rugby injuries.¹² The concussion incidence rate is of particular interest, which was reported as 0.877/1000 hours. In isolation, this does not appear to be an alarming figure when compared to other full contact sports, for example the concussion incidence rate in a study of rugby league injuries was 8/1000 hours.¹³ A systematic review of rugby league injuries estimated the incidence of concussion during match play to be as high as 8.0 and 17.5 injuries/1000 playing hours, however this study also highlighted large variation in concussion rates due to different methods of sampling and different definitions of injury used.¹⁴

Over twenty percent of quidditch injuries (21.5%) reported were described as 'concussion'. This is relatively high when compared to other full contact sports, for example amateur rugby union where con-

ussion constituted 4.7% of the injuries reported.¹⁵ Even in professional level rugby, concussion only formed 3-10% of injuries.¹⁶ Therefore while the absolute risk of concussion compared to other mainstream contact sports is low, concussion seems to be over represented in the sport of quidditch. It was also observed that more females sustained concussion compared with males (42 vs. 26). In particular, female beaters reported far higher numbers of concussion vs. male chasers (17 vs. 2). Observed differences in concussion rates warrant further investigations.

In the last 10 years, the understanding of concussion as a brain injury has become accepted in many sports. The need for immediate withdrawal from play of the athlete, assessment with SCAT 3 and graduated return to play has become widely accepted.¹⁷ This recognition is as important for amateur sport as it is for professional sport. In the case of quidditch as an amateur sport the minimal time between concussion and return to play should be 12 days. Furthermore, in the case of a second concussion within 12 months' medical review should be sought. The findings of this study should inform the discussions of the International Quidditch Association around both the information provided to participants and the education necessary to recognise and manage concussion when it occurs.

Gender and injury

There are mixed findings in the literature regarding injury patterns in players of different genders. For example, it has been reported that female athletes have a higher incidence of ACL injuries than male athletes.^{18 19} Conversely, the main finding in a Belgian study of football players was that the injury rate was 24% lower in females.²⁰ These findings may suggest that in some sports, there is a difference in incidence of injury between genders and the type of injury may be the differentiating factor between gender rather than the overall incidence. In this study there was no statistically significant overall difference in rates of injury between different genders in superficial injuries ($p=0.103$), sprains ($p=0.129$), fractures ($p=0.854$) or dislocations ($p=0.750$), which bolsters the quidditch community's position on a safe gender inclusive sport.

Skill level and injury

Players of increasing self-reported skill level were observed to have higher injury rates. This result may be due to confidence of the more advanced players to go in for tackles or collisions during the game where risk of injury is greater. Another explanation is that advanced players may have played a higher proportion of their hours as games, and as such were exposed to a higher risk of injury at these times.

Player position and injury

Chasers sustained the most injuries out of the injured population. However, information about the non-injured population's playing positions within the 12 month period is not available. So while it can be shown that the most chasers got injured out of all the players that reported an injury, whether this is a high or low proportion of all the chasers in the UK cannot be determined. Therefore a causal link cannot be made as positions of players who did not sustain an injury within the 12-month period were not recorded and relative risk calculations could not be performed.

Snitches and seekers sustained the fewest injuries, perhaps as a result of less game time. In quidditch, the snitch gets released on the 18th minute of the game. This means that the snitch and the seeker only commence involvement from the 18th minute onwards. There are also fewer players in these positions in play at any one time. Considering the fact that the average game lasts approximately 30-40 minutes, this means that these positions receive about half the amount of game time as other positions, for example chasers. Counterbalancing the lack of comparative game time, snitching is anecdotally known to be an aggressive role, which may increase the risk of injury. The athlete spends the duration of their game evading two seekers and can use full contact to do so.

Study strengths and limitations

This study is the first of its kind to explore risk of injury in quidditch. It is important to quantify injury risk in any new sport, but particularly important in quidditch considering the rapid increase in participation globally. As a pilot study, this stands alone to describe the injuries observed over a 12-month period amongst quidditch players in the

UK, however, its limitations reduce the strength of any conclusions drawn.

The response rate of this survey was 50.9%, and as such may predispose to non-response bias. Fortunately the sample consists of every registered active quidditch player in the UK, and is therefore representative of the population of interest. Non-response bias was minimized by clearly stating that responses were confidential, and not asking identifiable information such as team name. Non-response bias may have been caused if injured athletes were more likely to complete the questionnaire than uninjured teammates, for example if they believed their responses were more useful to the study. However, athletes were encouraged to complete the questionnaire with equal emphasis on injured and non-injured athletes.

It is also important to note the possibility of recall bias, as the players were expected to recall the details of injuries from the past twelve months. The whole basis of the study is reliant on self-reported data, so the possibility of inaccurate reporting should be considered.

Estimating exposure time for each player is more complex in quidditch than other sports due to match length variance as the game ends when the snitch is caught, not after a set time period. Players were asked to report average hours played per week. The respondents were not asked to specify whether their injuries were sustained during practice or game time, and similarly the respondents were not asked to define their playtime as such.

A further limitation is the possibility of misreporting chronic overuse injuries. This could be the case due to the fact that the injury definition used included the need for the player to require medical attention on the pitch. Some chronic overuse injuries may alternatively present to a general practitioner or a physiotherapist, rather than requiring medical attention acutely during play.

Furthermore, the study relies on the self-reported information from the players. Understanding of medical terminology will differ between participants and sometimes it is difficult to understand what a participant means by a particular response. For example, one player described a 'double meniscus repair', but it is unclear what the player is describing anatomically.

Future research

Follow up studies should focus on collecting more information about player exposure to quidditch, in terms of time spent playing games and in practice. Medical literature on injuries in other sports has previously shown considerable difference in injury rates, depending on the context/nature of the participation, for example training vs. games.^{21 22} It would also be useful to collect more information about players who are not in the injured cohort, for example what position they usually play. In order to form a causal link between position of player and injury rate, this information is vital.

At this stage, the impact the broomstick has on injury patterns cannot be determined, and so further research could also focus on mechanism of broomstick related injury. This is important to analyze as it is one of the factors that makes quidditch a unique sport, along with its mixed gender nature.

A prospective observational study would be preferable for future research into quidditch injuries to eliminate several forms of bias encountered. However this pilot study gives an overview of a new sport and will guide further research efforts.

CONCLUSION

Quidditch is an inclusive sport, but, like its fictional relation, it is not without risk of injury. The risk of all injury appears no greater than other established sports, despite the mixed gender nature. However, there is a high incidence of concussion in quidditch which needs to be explored in future research. In the interim, education around the recognition and management of concussion should be made a priority.

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