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Assessment of player performance following return to sport after hamstring muscle strain injury

G.M. Verrall[a], Y. Kalairajah[a,*], J.P. Slavotinek[b], A.J. Spriggins[a]

[a] *SPORTSMED SA Sports Medicine Clinic, 32 Payneham Road, Stepney, Adelaide, SA 5069, Australia*
[b] *Department of Medical Imaging, Flinders Medical Centre, Adelaide, Australia*

KEYWORDS
Hamstring muscle strain;
Player performance;
Return to sport

Summary
Objective: To determine if there is any decrease in playing performance of athletes following return to sport after recovery from hamstring muscle strain injury.
Design: Prospective cohort study.
Participants: One professional Australian football team over two playing seasons.
Methods: For every game, the team coach rated player performance proportional to time spent on the ground playing (an integer score out of a maximum of 10). Player performance ratings were compared pre- and post-hamstring muscle strain injury to assess player performance upon return to sport.
Results: Thirteen athletes had hamstring injuries and the required player ratings were available. The mean player performance rating for the entire playing season in which the player was injured was 6.9. The mean player performance rating for the two games prior to injury was 6.8 as opposed to 5.4 for the two games after return to sport. Athletes had a significantly lower player performance rating immediately upon return to sport when compared to ratings for the entire season ($p < 0.001$) and when compared to ratings from the two games prior to injury ($p < 0.001$).
Conclusions: Following return to sport from hamstring injury, player performance as assessed by the team coach is reduced. This suggests that some athletes may return to sport prior to complete resolution of the injury.

Introduction

Hamstring muscle strain injuries are common in many sports, including the various football codes.[1,2] In Australian football, hamstring injuries are responsible for the greatest quantity of competition time lost due to injury[2] and have a high recurrence rate.[2,3] Athletes in professional sports are aware of the troublesome nature and high recurrence rate of hamstring injuries.[4] Despite this there is often an expectation from the team, coach and the athletes themselves to return to active competition as soon as practical following this injury. Although no data have

* Corresponding author. Tel.: +61 8 8362 8111; fax: +61 8 8362 6635.
E-mail address: yega@orthospecialist.net (Y. Kalairajah).

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Table 1 Summary of player performance ratings in injured players

	Mean	Median	Range	S.D.
For entire season	6.8	6.7	5.7—7.8	0.56
For two games prior to injury	6.8	7.0	5.5—8.0	0.70
For two games after return to sport	5.1	5.0	4.0—6.5	0.87

Data is presented for the 13 players where comparisons could be made. Comparing all three columns a Friedman test demonstrated significant difference between the three periods $p < 0.001$. A pairwise Exact Wilcoxon Signed Ranks Test demonstrated significant differences between player ratings for the entire season compared to player ratings for the two games after return to sport $p < 0.001$ and player ratings for the two games prior to injury compared to player ratings for the two games after return to sport $p < 0.001$.

been presented about player performance after return to sport from hamstring injury, evidence from magnetic resonance imaging (MRI) studies,[5] laboratory studies of muscle stretch injury[6,7] and the observed high recurrence rate[3] suggests that the injury in many cases has not fully resolved at the time of return to sport. Accordingly, the aim of this study was to determine if athlete performance is poorer following return to sport after recovery from hamstring injury.

Method

All athletes were male and played professional Australian football for an elite level team consisting of first and reserve grade teams. The study was conducted over two full playing seasons with the team playing weekly for 25 competition matches in each season.

Hamstring muscle strain injury was noted when a player developed pain localised to the posterior thigh during the course of playing or training and subsequent MRI scan detected focal intramuscular hyperintensity within the hamstring muscle(s) on T2 images.[8—10]

For every first grade game the club coach rated player performance proportional to time spent on the ground. Players who had limited on-field time (less than one-quarter) were not rated. This rating was an integer score to a maximum of 10. Player ratings for the two games prior to injury and for the entire playing season in which the player was injured were compared to player ratings for the first two games played after return to sport. Players were included in the study if they played at least two matches out of a possible two in the first grade team after return to sport following injury.

An exact Friedman test was performed comparing all data followed by pairwise Exact Wilcoxon Signed Rank Tests if the Friedman test was significant. Thus, we compared player performance ratings from the two matches after returning to competition to the player performance ratings of the player for the entire season and to the player performance ratings for the player in the two matches prior to injury.

Results

Across the two seasons, a total of 20 hamstring injuries were recorded. Thirteen of these injuries had relevant player ratings and were therefore included in the analyses. Seven athletes were excluded (three had insufficient pre-injury ratings, four had insufficient post-injury ratings). Three of the 13 returned to play in the reserve grade and played one match there, before being promoted to the first grade team, whereas the other 10 played in the first grade team for their return from injury match. Only first grade matches were rated. Player ratings are summarised in Table 1. There was significantly reduced performance in the first two games after return to sport compared to performance during the entire season ($p < 0.001$) and the two games prior to the injury ($p < 0.001$).

Discussion

This study demonstrates that player performance in Australian football is reduced in the immediate return to play period following hamstring injury. This is consistent with the hypothesis that athletes often return to sport prior to complete resolution, with respect to muscle healing, of injury.[3] As obtaining direct histological evidence is difficult in the study of athletic hamstring injuries, indirect evidence, such as player performance or persistent MRI abnormalities may provide support for the proposition of incomplete resolution of injury prior to return to sport. Other studies also support this proposition.