

CONCUSSION CHRONICLES

Immediate Removal From Activity After Sport-Related Concussion Is Associated With Shorter Clinical Recovery And Less Severe Symptoms In Collegiate Student-Athletes

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INTRODUCTION

According to the most recent international consensus statement on concussion in sport, players should not be allowed to return to play on the same day of a suspected concussion and should undergo an evaluation by a licensed health professional prior to returning to sports.⁽¹⁾ Due to the competitive nature of athletes, or external pressure, underreporting in sport occurs and these strict guidelines are in place to protect athletes.⁽²⁾ The recommendations of no same day clearance following a suspected concussion have been largely been adopted by sports governing bodies throughout the world.

A concussion has more recently been described as a functional, rather than structural, injury resulting from a neurometabolic cascade resulting in dysfunction of normal neural cellular physiology.⁽³⁾ The characteristic concussion symptoms are believed to be the result of this altered cerebral physiology. Lazzarino et al., (2012) investigated six athletes who sustained a second concussion in close proximity to the first, but were asymptomatic at the time of the second impact, and found a significant increase in symptom duration and severity compared to the first hit.⁽⁴⁾

The current study under review sought to examine the effect of timing of removal from play after concussion on clinical outcomes. It was hypothesized that immediate removal from activity after a concussion would be associated with less time missed from sport, shorter symptomatic period, and better outcomes on acute clinical measures.

METHODS

Data was obtained from the National Collegiate Athletic Association and Department of Defence Concussion Assessment, Research, and Education (CARE) Consortium. The CARE Consortium has prospectively collected sport-related concussion assessment data on student athletes since 2014 and currently consists of 30 universities, including 4 US military service academies across the USA. Clinicians from participation institutions complete a post-injury clinical reporting form describing concussion-related factors, such as timing, mechanism of injury, player reporting characteristics (immediate or delayed reporting, presence of delayed symptom onset) and acute indicators of injury severity.

Data from 506 sport-related concussions, from 2014-2016, sustained across 18 sports at 22-member institutions were analyzed.

Primary independent variable was removal from activity (RFA) status. RFA status was ascertained via 2 yes/no questions completed by the clinician on post injury reporting form:

- 1) "Did the athlete immediately report the injury?"
- 2) "Was the athlete immediately removed from play?"

If there was a "yes" response to both questions, then it was classified as immediate-RFA. If there was a "no" response to either question, this was classified as delayed-RFA.

METHODS CONTINUED

The primary outcome was total time lost attributed to sport-related concussion (measured in days) beginning on the clinician reported date and ending on the date the athlete received clearance for return to play.

Secondary outcomes included total and severity of concussion symptoms (measured by SCAT3), symptom duration, and clinical assessment scores (i.e., SCAT3). These outcomes were measured at 2 acute time points after injury, 0-6 hours (time 1) and 24-48 hours (time 2).

KEY FINDINGS

- 184 athletes (36.4%) were grouped into I-RFA and 322 (63.6%) athletes grouped in D-RFA.
- Immediate removal from play was associated with significantly less time missed from sport and shorter symptom duration.
- Immediate removal from athletic activity resulted in approximately 3 fewer days lost because of sport-related concussion than that seen in the delayed-RFA group.
- I-RFA athletes had significantly less severe acute sport-related concussion symptoms and were at lower risk of recovery taking greater than 14 days.
- The I-RFA athletes had a 39% lower likelihood of taking greater than 14 days to full clearance and 47% lower likelihood of taking greater than 21 days to full clearance.

DISCUSSION & BIASES

This provides objective evidence that immediate removal from activity following a suspected sport-related concussion may be beneficial to recovery.

Unfortunately, as previously mentioned, athletes are poor reporters of injury. However, if athletes and key stakeholders are made aware that reporting injury actually increases the likelihood of being cleared to return to activity sooner, they may be more willing to disclose injury status.

This study has several limitations which should be taken into consideration:

1. The study relied on clinician reports and athlete self-reports, which are inherently biased.
2. We believe that the yes/no question is not a good way to report injury status because the athlete could have been immediately removed but because they weren't actually reporting the injury themselves, the answer was "no" which placed them in a category of "delayed-RFA."

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REFERENCES

- (1) McCrory ,P., Meeuwisse, W.H., Dvořák, J., Aubry, M., Cantu, B., et al. (2017). Consensus statement on concussion in sport: the 5th International Conference on Concussion in Sport held in Berlin, October 2016. *British Journal of Sports Medicine*, 51(11):838-847.
- (2) Kroshus, E., Garnett, B., Hawrilenko, M., Baugh, C.M., & Calzo, J.P. (2015). Concussion under-reporting and pressure from coaches, teammates, fans, and parents. *Social Science Medicine*, 134:66-75.
- (3) Giza, C. C., & Hovda, D. A. (2014). The New Neurometabolic Cascade of Concussion. *Neurosurgery*, 75(0 4), S24-S33.
- (4) Lazzarino, G., Vagnozzi, R., Signoretti, S., Manara, M., Floris, R., Amorini, A.M., Ludovici, A., Marziali, S., McIntosh, T.K., Tavazzi, B. (2012). The importance of restriction from physical activity in the metabolic recovery of concussed brain. In: Argrawal A, editor. *Brain injury: Pathogenesis, monitoring, recovery, and management*.Rejika,Croatia: InTech, 501-522.