

Letter to editor

Have recent changes to the rugby union laws of scrummage reduced serious cervical spine injuries?

Dear Editor-in-chief

All areas of play in rugby union are acknowledged to be potentially dangerous but it is in the scrum where the most frequent and serious spinal injuries occur (McIntosh & McCrory, 2005). This letter addresses the questions: what is it about the scrum which accounts for the alleged increased frequency of scrummage associated spinal cord injury (particular in the cervical region) and what has the Rugby Football Union [RFU] done to minimise the chance of cervical cord damage by changes to the Laws? Scrums are used to restart play after infringement of Law 20.1. The team which is successful in winning the ball from the scrum can provide quality possession and space to their attacking backs (IRB, 2005).

The three front row players are especially vulnerable to serious cervical spine injury. The majority of neck injuries are caused by heads not being properly aligned when opposing front row players make initial contact as the scrum is being formed. If the scrum collapses then excessive forward flexion/rotation of the cervical spine can occur and by wheeling the scrum this can result in increased abnormal lateral flexion/rotation. Added to these possible abnormal increases in directional movement of the cervical spine is the force generated at engagement. It has been calculated that in the front row a static weight of up to 1600kg is placed on each player's neck. Fracture dislocation (usually between C4/C6) of the spine can be the resulting injury which if the cord is involved can cause tetra paresis.

In response to this evidence the IRB amended the law of scrummage which was put into effect 2007 in the hope of reducing the incidence of serious cervical spine injury. This is summarised as a 4 step Law of engagement which is: "crouch, touch, pause, engage". The distance between the front rows must now be less than arms length before making contact. Prior to the introduction of this Law with the stipulated distance apart before engagement, the front row forwards were then more likely to foul and possibly injure an opposing player because of the sheer force generated at the initial point of contact caused by a combination of the acceleration of the players over the distance between the front rows multiplied by their combined weights. With the new Law now in place worldwide for over 18 months and more particularly with its rigorous enforcement during the recent World Cup in 2007, there is now sufficient data available for analysis to enable scrutiny of the effect of this change to the Law in protecting players from cervical spine injury.

Data analysis

The IRB World Cup 2007 provided ideal material for the surveillance of how the amended Law 20.1 could affect

player safety in the scrum (Fuller et al., 2008). The conclusion from the data from documented World Cup injuries was that the incidence of serious cervical spine injury in the scrum was lower than had been predicted. Furthermore an interim evaluation of the amended Law by Gianotti et al. (2008) using data from the Accident Compensation Corporation have confirmed that since the Law was introduced, the observed claims for serious cervical spine injury (5%) were significantly lower than the predicted claims (82%).

Fuller et al. (2007) have recorded the frequency of cervical spinal injuries associated with the scrum since the Law 20.1 was amended. They designed a 2 season prospective cohort study in the English Rugby Premiership and followed-up 546 players. They found that there were no catastrophic cervical spinal injuries and they concluded that more cervical spinal injuries were caused by tackles (37%) and weight training (33%) than by scrummaging (<20%). While there are different methods for collating data used by the various RFUs by using insurance claims and the reports of medical experts the overall conclusion is that since the introduction of the Law there has been a significant reduction in cervical spine injury in what was albeit a relatively infrequent injury associated with the scrummage.

Although only 18 months have elapsed since the introduction of the amended IRB Law, firm evidence has already been documented in defense of the change in the method of engagement in the scrum. While changes to the Law have been in force for only 18 months the data compiled so far suggests that the new Law has reduced cervical spine injury in the scrum (Quarrie et al., 2007). The Laws governing the scrum will continue to be under constant scrutiny and review to provide all of the protection that they can afford to players of the game in reducing the risk of serious cervical spine injury.

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References

- McIntosh, A.S. and McCrory, P. (2005) Preventing head and neck injury. *British Journal of Sports Medicine* **39**, 314-318.
- International Rugby Board. (2005) Laws of the game Rugby Union. Law 20 Scrum, Dublin, International Rugby Board. 101-105.
- Fuller, C.W., Brooks, J.H., Cancea, R.J., Hall, J. and Kemp, S.P. (2007) Contact events in rugby union and their propensity to cause injury. *British Journal of Sports Medicine* **41**, 862-867.
- Fuller, C.W., Laborde, F., Leather, R.J. and Molloy, M.G. (2008) International Rugby Board World Cup 2007 injury surveillance study. *British Journal of Sports Medicine* **42**, 452-459.
- Gianotti, S.M., Hume, P.A., Hopkins, W.G., Harawira, J. and Truman, R. (2008) Interim evaluation of the effect of a new scrum law on neck and back injuries in rugby union. *British Journal of Sports Medicine* **42**, 427-430.

Quarrie, K.L., Gianotti, S.M., Hopkins, W.G. and Hume, P.A. (2007)
Effect of nationwide programme on serious spinal injuries in
New Zealand rugby union: ecological study. *British Medical
Journal* **334**, 1150.

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