A BIOMECHANICAL ASSESSMENT OF FRONT ROW RUGBY UNION SCRUMMAGING

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Introduction

The purpose of the rugby union scrum is to restart play. In doing so, the scrum places sixteen players into a confined area, where physical force is exerted to an opponent without the need for either player to be in possession of the ball [(1)]. The rugby union scrum is a powerful offensive skill that provides a base for attack [(1)].The extent to which a forward pack can exert force on their opposition during the engagement determines the success of the scrum [(1)].

Methods

Forty male front row forwards volunteered to participate in the current study. Participants were classified into sub groups: junior (n=20, 19.7 ± 0.6 years, 184.9 ± 4.7cm, 99.5 ± 9.1 kg), senior (n=10, 23.2 ± 3.2 years, 181.7 ± 7.3cm, 105.8 ± 11.3kg) and professional (n=10, 24 ± 2.7 years, 185.6 ± 4.2cm, 113.3 ± 8.1kg).Players were tested in a series of eight engagements on an instrumented scrum machine. In accordance with current International Rugby Body (IRB) laws a call of "crouch, touch, pause, engage" was implemented to initiate the movement. A full body marker system was utilized with 3-D motion analysis via 14 high resolution Eagle 4 cameras. 3 Kistler Force plates were used (models 9287 & 9281B) collecting forces from the body and machine respectively.

Results & Discussion

The average peak horizontal force generation across all trials produced by the professional front row players, proved to be significantly greater ($p<.01$) than both the amateur senior and junior players (4896.99N ± 297.88N vs. 3422.28N ± 864.11N & 3069.51N ± 811.89N respectively). As a result of lower body kinematic examination throughout the engagement phase, it was demonstrated that hip flexion angle was significantly different between cohorts ($p<.05$).

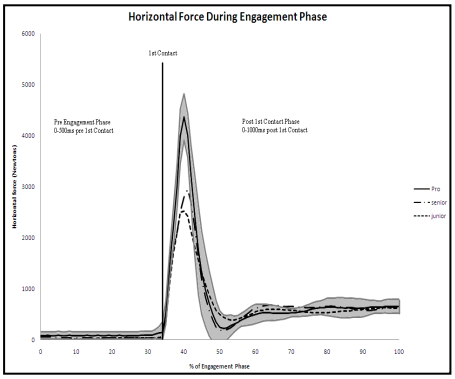

Figure 1. Horizontal force production during Engagement

Conclusion

The game of rugby union is continually evolving so that it can compete on a spectator base with larger team sports. As a result, rules have been introduced to speed the game up and subsequently make it safer and more appealing. Yet little is truly understood about what contributes to injury, performance and reliability of the rugby scrum.

References

1. Milburn, PD., Sports Medicine. 16: 168-179, 1993