28th ECSS Anniversary Congress, Paris/France, 4-7 July 2023

The likelihood of tackler success when contacting the ball-carrier at different heights for different types of tackles across youth, senior and elite levels

Hendricks, S., Till, K., Scantlebury, S., Dalton-Barron, N., Gill, N., den Hollander, S., Kemp, S., Kilding, A., Lambert, M., Mackreth, P., OReilly, J., Owen, C., Spencer, K., Stokes, K., Tee, J.

University of Cape Town and Leeds Beckett University

Tucker, R., Vaz, L., Weaving, D., Jones, B.

INTRODUCTION:
Reducing head injury, at all levels, is a top priority for rugby stakeholders and governing bodies. Accordingly, World Rugby and national governing bodies have proposed tackle law changes to lower the height of a legal tackle. Any tackle technique injury prevention strategy that negatively affects tackle performance is not likely to be accepted and implemented by players or coaches. If where the tackler contacts the ball-carrier (i.e. tackle height) is going to be a key tackle injury prevention strategy, its relationship to tackle success needs to be studied at the different levels of play. The purpose of this study was to compare the probability of tackler success when contacting the ball-carrier at different heights for different types of tackles across seven levels of play.

METHODS:
Video footage of 271 male rugby union matches were analysed for tackle characteristics across seven independent playing groups (Under(U) 12, n=25 matches; U14, n=35; U16, n=39; U18 Amateur n=39; U18 Elite n=38; Senior Amateur, n=40; Senior Elite, n=50) within England, New Zealand, South Africa, Portugal and USA. This equated to a total of 52 204 tackle events. A logistic regression model with type of tackle, tackle direction, first point of contact, tackle sequence, number of players, and attacker intention as explanatory variables and tackle success as the outcome variable was computed. Based on the model, post-estimation marginal effects were used to determine the probability of success (Pr Tackler Success) for the interaction between type of tackle (arm, active shoulder, passive shoulder, smother) and the first point of contact (head/neck, shoulder, mid-torso and legs). Differences between Pr margins were also calculated, with the a priori alpha level set at $p<0.05$.

RESULTS:
Within senior elite, senior amateur, U18 amateur, U14 and U12, for all four types of tackles, the probability of success did not significantly change ($p>0.05$) when contacting the head/neck compared to the other points of contact (for instance, for active shoulder tackles within senior elite: head/neck Pr 0.84 95% CI 0.86-0.89; shoulder Pr 0.87 95% CI 0.86-0.89, mid-torso Pr 0.83 95%CI 0.81-0.85, legs Pr 0.81 95%CI 0.79-0.83). For tackles within the legal tackle height, irrespective of type of tackle, the contact point with a high probability of success at all levels was the shoulder (for instance, at the senior elite arm Pr 0.75 95% CI 0.74-0.77; active shoulder Pr 0.87 95% CI 0.86-0.89, passive shoulder Pr 0.84 95%CI 0.82-0.86, smother Pr 0.86 95%CI 0.84-0.87).

CONCLUSION:
Contacting the head/neck area does not benefit tackling performance and contacting lower areas of the ball-carrier has a higher likelihood of tackler success. These findings complement video analyses studies on tackle injuries. Knowing that contacting the head/neck area does not benefit the tackler's ability to succeed strengthens and supports injury prevention initiatives that is aimed at encouraging players to contact the ball-carrier lower.

Topic: Sports Medicine and Orthopedics

Presentation Oral