Tackling rugby injuries with predictive analytics

Modelling the association between training loads and injury risk in professional Rugby Union.

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**Background:** Injury incidence and the resulting absence from playing and training in professional Rugby Union is high in comparison to some team sports, with an 88% probability of a player incurring at least one time-loss injury during a season (Williams et al., 2013). Training loads, defined as the product of training volume and training intensity, have been used to predict and prevent the occurrence of non-contact, soft-tissue injuries in other collision sports (Gabbett, 2010), but the training-injury relationship is yet to be explored within professional Rugby Union.

**Objective:** To model the association between training loads and injury risk in a cohort of professional Rugby Union players, and to add this information to a predictive model in order to help reduce the injury burden within this sport.

**Methods:** Throughout the 2013/14 season, daily training and match loads were collected from ~250 consenting players representing five Premiership teams, using the session rating of perceived exertion (sRPE) method. Time-loss injury data was obtained from the existing RFU English Professional Rugby Union Injury Surveillance Project. A generalised linear mixed model will be used to determine the relationship between training load indices and injury risk. Further to this, training load data will be added to other risk factor variables (e.g., previous injury load, age, and playing position) within a machine-learning model to help teams predict and prevent the occurrence of injuries in future seasons.

**Conclusions and future work:** This will be the first study of training load and its association with injury risk in professional Rugby Union. The information obtained from this study will allow teams to better manage training loads, such that the negative effects of training can be minimised. Furthermore, the development and application of an injury prediction model will help reduce the injury burden within professional Rugby Union. Training load and injury data has been collected.
throughout the 2013/14 Premiership season, and will be analysed over the summer period, with a view to testing the accuracy of the resultant predictive model during the 2014/15 season.

References
