Repeated Sprint Training Improves International Rugby League Player Fitness and Performance: A Case Study

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Abstract

This case study uniquely documents the completion of a short duration (two-week) repeated sprint training (RST) [1] intervention program prescribed to an international Rugby Football League (RFL) player (full-back). The implemented RST intervention was shown to be an effective training modality for improving many of the physical phenotypes (timed agility: 8.9 %; timed sprints: -2.2 to 3.1 %; lower limb power: 2.0 %; maximal aerobic capacity: 6.6 %) considered important for successful RFL match-play performance (Table 1), which are likely to have contributed to modest improvements in match-play performance attributes within the latter stages of matches (Table 2).

Methods

Subject: A male international, RFL full-back (age: 23.4 yrs; stature: 175 ± 0.6 cm; body-mass: 83 ± 0.6 kg) was tested 6 weeks preceding the 2016-17 RFL Four Nations International competition.

Pre and post intervention testing procedures: Anthropometric (stature, seated height and body-mass) measures and physical fitness tests (counter-movement jump [CMJ], 5-0-5 agility and linear sprints) were used.

Individualised GPS match-play monitoring: Treadmill velocity achieved at ventilatory threshold (vV̇O₂max) and maximal oxygen consumption (vVO₂max) in conjunction with the maximal sprint speed (MSS) and anaerobic speed reserve (ASR: vVO₂max - MSS) values were used to establish individualised GPS speed thresholds [2] (Low [0.0-16.5 km·h⁻¹], High [16.6-17.2 km·h⁻¹], Very High [17.3-21.9 km·h⁻¹] and Sprinting [22.0-33.0 km·h⁻¹]) to monitor 6 pre and 5 post intervention domestic matches.

Two-week repeated sprint training intervention: Sessional PlayerLoad™ (AU) and rating of perceived exertion (sRPE;AU) were recorded (Fig. 1) during three sessions per week consisting of either 3 (week 1) and 4 sets (week 2) of 7 x 30 m timed straight line, maximal sprints over the entire course of the RST training intervention [1] (Fig. 1).

Statistical Analysis

First and second half standard deviations (SD) for the pre RST GPS match-play (n = 6) metrics were multiplied by 0.2 to determine smallest worthwhile change (SWC). Laboratory SWC and typical error (TE) for field tests were used to establish the practical significance (% chance and odds ratio).


Key message: Two weeks RST [1] is sufficient to improve components of professional RFL player physical fitness likely leading to improved match-play activity during the latter portions of competitive matches. Consideration should be given to the undulating and progressive increases in training load when periodising Fig. 1).

Table 1. Pre and post mean (SD) RST physical fitness test scores, accompanied by absolute and relative (%) changes in performance parameters, laboratory smallest worthwhile (SWC) and practical significance in the form of percentage (%) chance and odds ratio of a true positive change occurring.

Table 2. Eight selected GPS metrics used to monitor the athletes’ match-play performance pre (6 match mean [SD]), post (5 match mean [SD]) two weeks of RST according to the first and second half.

RHE = Repeated High Intensity Effort