

An investigation into the relationship between match play performance characteristics and post-match RPE responses in professional rugby union players



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Introduction

Monitoring player fatigue and the subsequent planning of training load is critical for optimum recovery in sports performance. Recent advances in sports monitoring technology have resulted in Global Positioning Systems (GPS) being used to quantify external training load. Internal training load is an individual's psycho-physiological subjective perception of intensity of effort, for which the Rate of Perceived Exertion (RPE) scale has been found as a valid and reliable measure (Herman et al., 2006).

The purpose of this study was to assess the relationship between match play performance characteristics; specifically collision analysis and high speed running, and post-match RPE responses in professional rugby union players.



Methods

Thirty eight professional rugby union players (mean age 25.29 ± 3.9; range 20-35yrs) from the same European club participated in this study.

Data was collected across 12 competitive matches during a 4-month competition block during the 2014/15 European League season.

Match play performance characteristics were assessed objectively using Catapult's S4 10Hz GPS tracking system (Catapult Innovations, Melbourne, Australia).

Subjective markers of fatigue were obtained using session-RPE values (CR10-scale) recorded post-match. Internal training load was calculated by multiplying the match intensity RPE (0-10) by the duration of the minutes played and reported in arbitrary units.

Correlations between variables were assessed using Pearson product-moment correlation coefficient.

Results continued...

TABLE 2. PEARSON CORRELATION BETWEEN FORWARD'S RPE, HIGH INTENSITY CONTACTS AND HIGH SPEED RUNNING

		HSR	HIC	RPE
HSR	Pearson Correlation	1	.545	.397
	Sig. (2-tailed)		.000	.000
	N	80	79	75
HIC	Pearson Correlation	.545	1	.625
	Sig. (2-tailed)	.000		.000
	N	79	79	75
RPE	Pearson Correlation	.397	.625	1
	Sig. (2-tailed)	.000	.000	
	N	75	75	78

Results

Large effect size correlations were found between high impact collision (HIC) data and RPE post match in forwards ($r=0.625$, $p<.001$) and backs ($r=0.648$, $p<.001$). Furthermore, moderate -large effect size correlations were found between measures of high speed running (HSR) and RPE post match with backs ($r=0.597$, $p<.001$) and among forwards ($r=0.397$, $p<.001$). See Table 1 and 2

TABLE 1. PEARSON CORRELATION BETWEEN BACKS RPE, HIGH INTENSITY CONTACTS AND HIGH SPEED RUNNING

		HSR	HIC	RPE
HSR	Pearson Correlation	1	.524	.597
	Sig. (2-tailed)		.000	.000
	N	107	107	92
HIC	Pearson Correlation	.524	1	.648
	Sig. (2-tailed)	.000		.000
	N	92	107	92
RPE	Pearson Correlation	.597	.648	1
	Sig. (2-tailed)	.000	.000	
	N	92	92	93

Discussion & Conclusions

The findings of this study suggest that there is a strong relationship between match play RPE and the total number of high impact collisions among both backs and forwards. Furthermore, the study demonstrates that there is also a positive relationship between RPE and the volume of high speed running performed. Therefore, appropriate rest and recovery periods need to be planned after games with high levels of HSR and, in particular, HIC to maximise recovery and subsequent optimum performance. The study suggests strong support for RPE as a subjective measure of fatigue that provides a simple and effective method of gauging player effort during games.

References

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