ANAEROBIC PERFORMANCE PROFILES OF D1A COLLEGE RUGBY PLAYERS

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INTRODUCTION

Rugby Union (RU) is a field-based collision team sport played over 80 minutes, consisting of two 40-minute halves. Competitive Rugby Union is characterized by intermittent bouts of high-intensity tasks (e.g., sprinting, accelerations, decelerations, scrummaging, lineouts, tackling, rucking, and mauling) lasting between five and 15 seconds interspersed with lower-intensity activity or rest (e.g., walking and jogging) lasting up to 40 seconds. While descriptive data are readily available for elite RU athletes, research describing the physiological performance characteristics of United States D1A RU athletes does not exist. Understanding the physical capacities of D1A University RU athletes would assist in long term athlete development from grassroots to university, recruitment, load, and player management. Thus, the primary aim of this study was to explore the physical capacities of D1A college rugby players. The secondary aim was to physically benchmark college RU players against other rugby playing nations within various standards of competition.

METHODS

Thirty-three D1A rugby athletes from a single university volunteered to participate in this study. Anaerobic performance profiles that were measured included: weighted 1RM pull up, single countermovement jump (CMJ), 4 repeated CMJs, 1 RM back squat, 1 RM bench press, seated medicine ball throw, 10 m sprint, 40 m sprint, and 5 m repeated sprint ability (RSA) test. Tests were completed over 5 pre-season testing days. No other training was performed during the testing period. On the first day participants signed informed consent statements and completed heath screening. Also, height, body mass, and 1 RM pull up (body mass plus added external weight) were conducted. During day 2 testing, the 1 RM back squat was measured. Also, all CMJ testing was measured using a Just Jump Mat. Day 3 consisted of the seated medicine ball throw (9 kg) and 1RM bench press. Day 4 included all sprint testing using a timing gate system. The final day of testing included body composition measurement using air-displacement plethysmography. For statistical analysis, participants were divided between forwards (n = 19) and backs (n = 14). Independent samples t- tests was used to assess differences between backs and forwards on all variables. Results were considered significant when $p \leq 0.05$.

The popularity of **college rugby** is growing in the United States. An investigation of anaerobic performance profiles of college rugby athletes could help coaches better understand **performance requirements** and **training**.

RESULTS

For anthropometric variables, forwards had greater height, body mass, and percent body fat. For performance variables, backs performed significantly better than forwards in the CMJ, 4CMJ, 10m sprint, 40m sprint, RSAt, and RSAa. Data with corresponding Cohen's *d* can be found in Table 1.

CONCLUSIONS

In the sample tested, backs were smaller, lighter, and had a lower percent body fat, which helped predispose them to better performance CMJ, sprinting, and RSA.

PRACTICAL APPLICATION

Rugby coaches and strength and conditioning coaches may need to be aware of greater body size and composition of athletes, such as forwards in this investigation, when designing training programs and practices. The forwards in this investigation had greater percent body fat while also exhibiting reduced lower body aerobic power as measured by CMJ and RSA.

Variable	Position	Mean±SD	*p* value	Cohen's *d*
Height (cm)	Forwards	180.1±5.6	0.034	0.78
	Backs	175.8±5.6		
Body mass (kg)	Forwards	97.9±8.5	<0.001	2.01
	Backs	82.1±6.8		
Body fat %	Forwards	19.2±7.7	0.001	1.33
	Backs	10.9±3.4		
CMJ (cm)	Forwards	65.3±5.0	<0.001	-1.45
	Backs	74.2±7.4		
4CMJ (cm)	Forwards	55.1±3.2	<0.001	-1.63
	Backs	63.1±6.6		
4CMJct (s)	Forwards	0.4±0.1	0.792	-0.09
	Backs	0.4±0.1		
1RM SQ (kg)	Forwards	162.3±20.7	0.367	0.32
	Backs	155.5±21.2		
SMBT (m)	Forwards	4.7±0.4	0.598	0.19
	Backs	4.7±0.5		
1RM PU (kg)	Forwards	121.7±12.2	0.182	0.48
	Backs	115.9±11.7		
1RM BP (kg)	Forwards	120.1±14.8	0.114	0.57
	Backs	110.1±20.7		
10m Sprint (s)	Forwards	1.7±0.1	<0.001	1.69
	Backs	1.6±0.1		
40m Sprint (s)	Forwards	5.5±0.2	<0.001	1.7
	Backs	5.1±0.2		
RSAt (m)	Forwards	770.8±24.4	0.002	-1.18
	Backs	785.0±13.1		
RSAb (m)	Forwards	138.7±7.0	0.153	-0.52
	Backs	141.8±4.2		
RSAa (m)	Forwards	128.5±4.0	0.002	-1.19
	Backs	132.5±2.2		

Table 1. Anthropometric and Performance Variables for Forward (n=19) and Back (n=14) Positions.
Abbreviations: CMJ-countermovement jump, 4 CMJ=4 CMJs, 4CMJct=Average contact time during 4 CMJs, 1RM SQ=1 repetition maximum squat, SMBT=seated medicine ball throw, 1RM PU=1 repetition maximum pull up, 1 RM BP=1 repetition maximum bench press, RSAt=repeated sprint ability total distance, RSAb=repeated spring ability best distance, RSAa=repeated sprint ability average distance.

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