POSITION-SPECIFIC MATCH DEMANDS ACROSS A COLLEGIATE WOMEN'S LACROSSE SEASON

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BACKGROUND

- Quantifying athlete external load match demands can inform training programs to ensure athletes receive sufficient stimuli to prepare for competitions.
- Further, examining differences in sport positional groups can be beneficial for individualized off-season program design.

PURPOSE

- To assess positional differences in match external loads across a collegiate women's lacrosse season.

METHODS

- National Collegiate Athletic Association Division I women lacrosse athletes (n=13; mean+SD; age: 20.21 + 1.35 years; body mass: 66.14 + 8.89 kg; height: 165.51 + 6.81 cm; body fat: 26.78 + 3.43 %) participated.
- Athletes who played > 50% of each game were included for data analysis: attack (n=3), midfield (n=6), and defense (n=4).
- For 18 matches of a single competitive season, athletes wore a microsensor positioned between the scapulae for collection of external load data via global positioning system.
- External load metrics included: Playerload ((PL, (AU)), player load per minute (PL/min), total distance (TD, meters), high speed distance (HSD, distance >70% of max speed, meters), high speed efforts (HSE, # of efforts completed >70% of max speed), explosive efforts (EE, # of accelerations, decelerations, and changes of direction), max velocity (MV, meters/second), repeated high intensity efforts (RHIE, # of accelerations and decelerations at > 2m/s2), and energy expenditure ((kilocalories (kcal)).
- A multivariate analysis of variance (MANOVA) was used to assess the differences in external loads across sport position groups ($p<0.05$)

KEY FINDINGS

- **Positional demands significantly vary in NCAA DI women's lacrosse athletes**
- **Midfielders experienced the highest external loads**

Table 1. Position specific match demands.

	Attack (n=3)	Midfield (n=6)	Defense (n=4)	p-value	ES
PL (AU)	831 ± 129 (792-869)	948 ± 130* (924-973)	932 ± 161* (885-978)	<0.001	0.106
PL/min (AU/min)	5.1 ± 0.7 (4.8-5.3)	5.7 ± 0.7* (5.6-5.9)	5.6 ± 0.9* (5.3-5.8)	<0.001	0.109
TD (m)	8427 ± 1273 (8045-8810)	9780 ± 1222*% (9553-10007)	8516 ± 1145 (8183-8848)	<0.001	0.225
High Speed Distance > 70% (m)	158 ±106 (126-189)	287 ± 142*% (260-313)	249 ± 218* (185-213)	<0.001	0.099
High Speed Efforts > 70% (#)	16 ± 10 (13-19)	23 ± 11* (21-25)	21 ± 15* (16-25)	0.002	0.058
Explosive Efforts (#)	34 ± 11 (31-37)	48 ± 20*% (45-52)	30 ± 16 (26-35)	<0.001	0.186
Max Velocity (m/s)	6.8 ± 0.6 (6.6-7.0)	7.0 ± 0.5 (7.0-7.1)	7.0 ± 0.4 (6.8-7.0)	0.015	0.041
Accelerations (#)	70 ± 27 (62-78)	104 ± 25*% (99-108)	75 ± 17* (70-79)	<0.001	0.306
Decelerations (#)	53 ± 27 (45-61)	68 ± 19*% (65-72)	61 ± 16* (57-66)	<0.001	0.086
RHIEs (#)	12 ± 6% (10-14)	17 ± 7*% (15-18)	9 ± 4 (7-10)	<0.001	0.222
Energy Expenditure (kcal)	1363 ± 317 (1268-1458)	1564 ± 234*% (1521-1608)	1292 ± 169 (1242-1341)	<0.001	0.202

Note: PL =Player load; PL/min = player load per minute; TD = total distance; RHIE = repeated high intensity efforts; ES = effect size. Values are expressed as mean + standard deviation with associated 95% confidence interval in parentheses; *** > attack; % > defense**

Figure 2. External Load Monitoring Device

RESULTS

- Match demands differed across position groups (Table 1).
- Midfielders experienced higher TD, HSD, EE, accelerations, decelerations, RHIE, and energy expenditure compared to defenders and attackers ($p<0.001$).
- Defenders experienced greater PL ($p<0.001$), PL/min ($p<0.001$), HSD ($p<0.001$), HSE ($p = 0.002$), accelerations ($p<0.001$) and decelerations ($p<0.001$) compared to attackers.
- Attackers engaged in more RHIEs ($p<0.001$) than defenders.

CONCLUSIONS and PRACTICAL APPLICATIONS

- Midfielders experienced higher volume and intensity of external load metrics in regular season when compared to defense and attack players.
- Except for RHIE, defensive players experienced higher external loads than attackers, highlighting variations in positional demands.
- It is recommended that practitioners focus strength and conditioning programs and practice plans to prepare midfielders for the high external load and intensities experienced within matches.
- Athlete recovery strategies should also be maintained in women's lacrosse programs to decrease the risk of injury and increase athlete readiness.

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