MONTIORING REPORTED AND MEASURED GAME FATIGUE RECOVERY IN COLLEGIATE WOMEN LACROSSE ATHLETES DURING THE SPORT SEASON

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BACKGROUND

- Monitoring fatigue in sport provides valuable information on athlete health, recovery, and readiness.
- Methods to monitor fatigue include measures of self-reported wellness and neuromuscular performance, often evaluated using countermovement jumps (CMJ).
- Research regarding changes in fatigue during the competitive sport season is limited.

PURPOSE

- To assess athlete perception of fatigue and CMJ performance on game day and the timeline of recovery during the following two days
- A secondary aim was to examine relationships between preceding workloads and measures of fatigue and CMJ performance.

METHODS

- National Collegiate Athletic Association Division I women lacrosse athletes (n=24; 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 %)
- Perceived level of fatigue was reported using a 0 -10 scale (0 = no fatigue; 10 = maximal fatigue) immediately before CMJ testing on bilateral force plates.
- Neuromuscular performance was assessed using the reactive strength index-modified (RSI-mod), which is a CMJ metric calculated as the ratio between jump height and time-to-takeoff.
- Each week, athletes performed testing on game day (GD), 24 hours post-game day (GD+1), and 48 hours post-game day (GD+2).
- Previous week's accumulated workload was collected from microsensors, via global positioning system monitoring, that were worn during all practices and games.
- Data was collected over a five-week period consisting of 1 game (n=5) and 5 training sessions (n=25) per week.

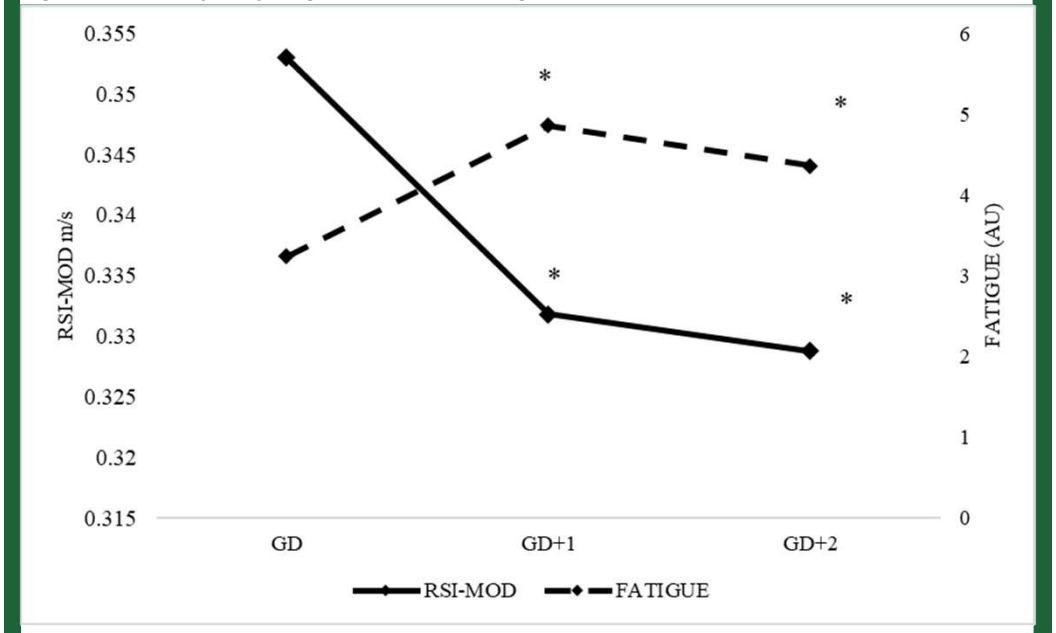
KEY FINDINGS

RSI-mod and self-reported fatigue scales can be used to assess athlete fatigue in NCAA DI women lacrosse athletes

Table 1. Changes in RSI-mod and fatigue from GD to GD+1 & GD to GD+2

	GD	GD+1	GD+2	p-value	% Change (GD to GD+1)	% Change (GD to GD+2)
RSI-mod	0.35 ± 0.06	0.33 ± 0.05	0.32 ± 0.05	<0.001	-5.7	-8.6
Fatigue	3.2 ± 1.2	4.9 ± 1.5	4.4 ± 1.2	<0.001	53	38

Figure 1. Game-day and post-game measures of fatigue and RSI-mod



Note: GD: game day; GD+1: 24hr post-game day; GD+2: 48hr post-game day; RSI-MOD: reactive strength index-modified; FATIGUE: self-reported fatigue; * different from GD

Figure 2. Subjective Fatigue Survey

Overall Fatigue	
Rating	**Description**
0	No Fatigue
1	Very Light Fatigue
2	Light (weak) Feeling of Fatigue
3	Moderate Fatigue
4	
5	Heavy (strong) Feeling of Fatigue
6	
7	Very Heavy Feeling of Fatigue
8	
9	
10	Maximal Fatigue

STATISTICAL ANALYSIS

- Two repeated-measures analyses of variance (RMANOVA) assessed differences in RSI-mod and self-perceived fatigue from GD to GD+1 to GD+2.
- If significance was found ($p<0.05$), Bonferroni pairwise comparisons were used as post hoc tests.
- A linear regression analysis was performed to determine if weekly accumulated load predicted changes in RSI-mod and self-perceived fatigue.

RESULTS

- RSI-mod and self-perceived fatigue differed ($p<0.001$) from GD to GD+1 and from GD to GD+2.
- There was no significant difference in RSI-mod or self-perceived fatigue from GD+1 to GD+2
- Previous week's accumulated player load did not predict RSI-mod or self-reported fatigue ($p>0.05$).

CONCLUSIONS and PRACTICAL APPLICATIONS

- RSI-mod and self-reported fatigue can be used to assess the acute changes in athlete fatigue post-game.
- Previous week's accumulated workload was not able to predict changes in RSI-mod or self-reported fatigue from GD to post-game.
- Monitoring fatigue can aid in assessing athlete readiness following game play and inform subsequent training plans.
- Due to continued elevated fatigue response 48hr post-competition, it is recommended that daily recovery strategies be implemented to mitigate the impact on subsequent training sessions.
- RSI-mod and self-reported fatigue scales can be used together or alone to assess athlete fatigue.

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