ACUTE EFFECTS OF MATCH PLAY INDUCED FATIGUE ON JUMP PERFORMANCE IN COLLEGIATE WOMEN'S VOLLEYBALL

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Purpose

Due to the intense physical demands of volleyball match play[1-3], it is plausible the neuromuscular system may be acutely fatigued from match play, impairing performance in the following days[4-6]. The countermovement jump (CMJ) is a common assessment for monitoring acute physical readiness[7]. This study was an investigation into the changes in maximal jump performance and subjective recovery in response to match play induced fatigue.

Methods

Seven National Association of Intercollegiate Athletics women's volleyball athletes participated in this study (age, 20.2 ± 0.9 years). During six sets of round-robin tournament style match play, participants wore portable microsensor units sampling at 100 hz (Catapult OptimEye S5, Catapult Innovations, Team Sport 5.0, Melbourne, Australia) in order to measure external training load. Maximal jump performance and subjective recovery were measured using countermovement jump (CMJ) and short recovery stress scale (SRSS): 1 hour before match initiation (Pre), immediately upon conclusion of play (Post0), 24 hours post, (Post24), and 48 hours post(Post48). CMJ data was collected using dual force plates sampling at 1000Hz (ForceDecks FD Lite, Vald Performance, Brisbane, QLD). Athletes reported session rate of perceived exertion (sRPE) withing 15 minutes of match completion. Repeated measures ANOVAs were used to identify change with Hedge's *g* effect sizes used to assess magnitude of change.

Results

Participants accumulated a mean Player Load of 758.6±216.9 au, and mean session rate of perceived exertion of 1184.1±363.2. SRSS results indicated elevated stress (ES=1.401 to 1.588) and decreased recovery (ES = -1.358 to -1.848) 24 hours post-match, trending towards baseline 48 hours post-match. CMJ height (CMJH) decreased immediately post-match ($p<0.01$, ES= -0.216), partially recovered Post24 ($p=0.109$, ES=0.130), and fully recovered by Post48 ($p < 0.01$, ES=0.216) (Figure 1.).

Conclusions

CONCLUSIONS: The external load of match play was similar to that of previously reported values for a 5 set division 1 collegiate match[8]. It was concluded that match play likely contributed to the observable decline in post-match maximal jump performance. Further, jump performance may be expected to return to baseline status 48 hours after match play, while subjective stress levels may remain elevated.

JUMP PERFORMANCE MAY BE EXPECTED TO RETURN TO BASELINE STATUS 48 HOURS AFTER VOLLEYBALL MATCH PLAY, WHILE SUBJECTIVE STRESS LEVELS MAY REMAIN ELEVATED.

Practical Applications

Coaches and practitioners may expect jump performance to return 48 hours after volleyball match play, even if subjective stress remains elevated. This information can be utilized practically when designing training in the days following match play.

Additionally, CMJH may be a useful metric to measure acute changes in neuromuscular readiness in collegiate volleyball athletes.

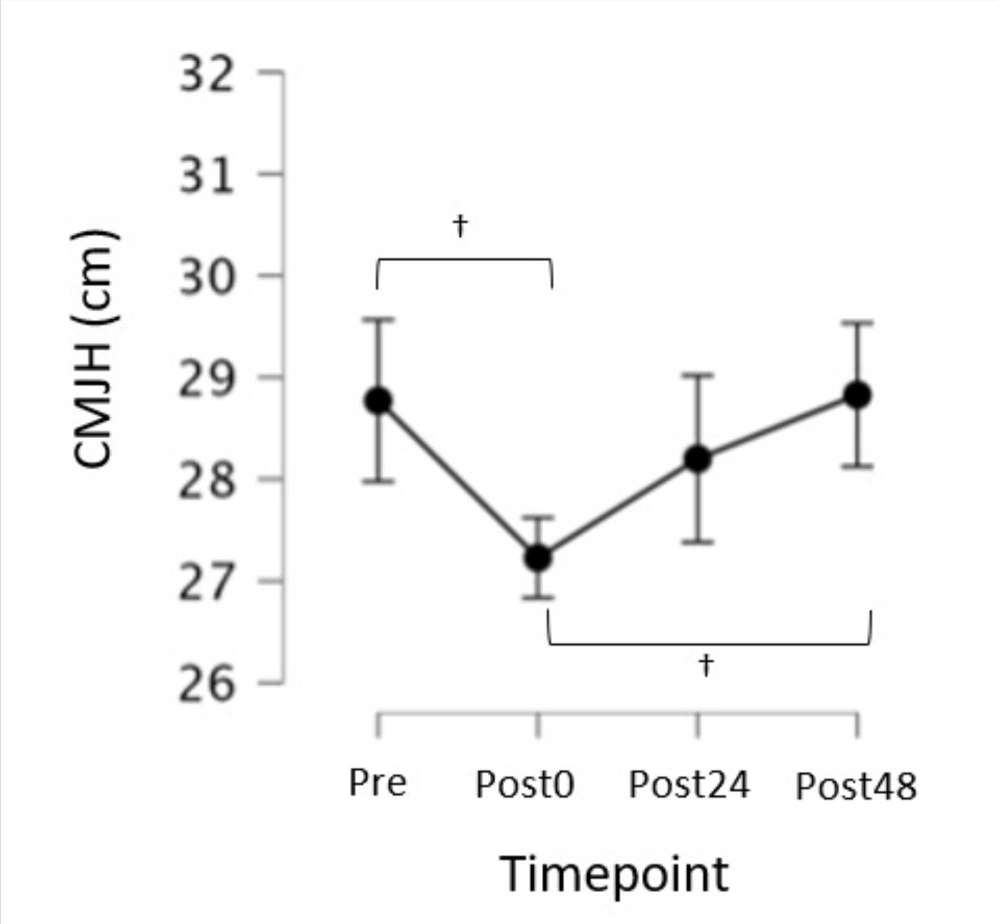

Figure 1. ***CMJH across all time-points.***

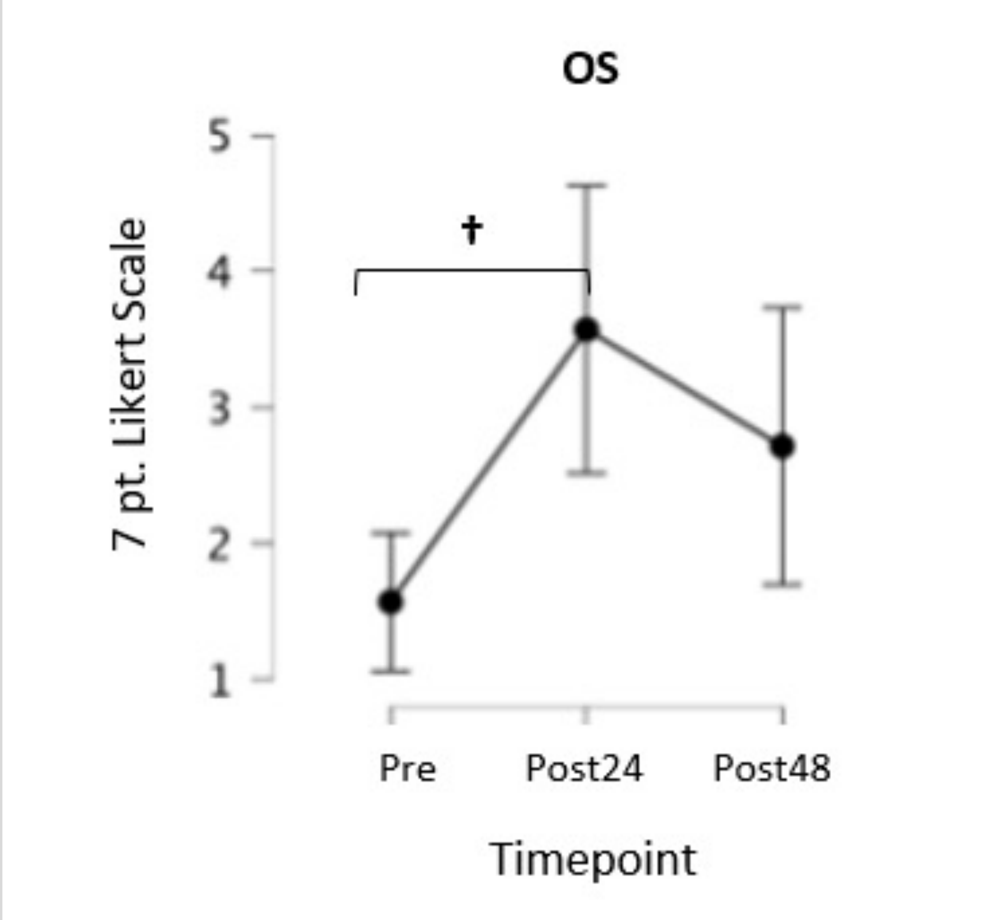

Figure 2. ***Subjective Overall Stress across all timepoints.***

† Denotes statistical significance between time-points ($p \leq 0.01$). Error bars represent 95% confidence interval.

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