

DANNO MUSCOLARE, RISPOSTA INFIAMMATORIA-IMMUNITARIA E DECADIMENTO DELLA PRESTAZIONE IN UNA SETTIMANA CON 3 PARTITE IN CALCIATORI MASCHI PROFESSIONISTI

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Abstract

Obiettivo. Sono stati indagati gli effetti di tre partite (Gara1, Gara2, Gara3) in un microciclo settimanale sul recupero della performance e la risposta infiammatoria in calciatori maschi professionisti.

Metodi. I giocatori sono stati divisi in un gruppo sperimentale (EXP; $N = 20$) ed in un gruppo di controllo (CON; $N = 20$). Valori ematici, *repeated sprint ability* (RSA), affaticamento muscolare e grado di movimento del ginocchio (KJRM, *knee range of motion*) sono stati valutati pre- e post-gara e durante il recupero.

Risultati. La corsa ad alta intensità durante la Gara numero 2 (G2) ha subito un decremento compreso tra il 7 e il 14% rispetto alla Gara 1 (G1) ed alla Gara 3 (G3). La capacità di ripetere sprint è diminuita, nel gruppo sperimentale, dal 2 al 9% nei 3 giorni post-gara con il maggior decremento registrato dopo G2. Nel gruppo EXP, la partita ha aumentato l'affaticamento muscolare (di circa 7 volte) rispetto al gruppo di controllo con il più grande aumento causato da G2, mentre il *range* articolare del ginocchio si è ridotto nel gruppo EXP rispetto al gruppo CON (5-7%) ed è stato recuperato più lentamente dopo G2 e G3 rispetto a G1.

CK, CRP, sVCAM-1, sP-Selectin e cortisolo hanno fatto registrare valori di picco 48h dopo la gara, con G2 che ha determinato il maggiore incremento. I risultati relativi a leucociti, testosterone, IL-1 β e IL6, anche se alterati 24h dopo ogni gara, sono stati simili tra tutte le gare. Il plasma TBARS e le proteine carboniliche sono aumentate di circa il 50% post-gara: il maggiore incremento è stato registrato a 48h da G2. Il rapporto tra glutanione ridotto e ossidato ha fatto registrare valori inferiori nelle 24h dopo tutte le gare con G2 che ha determinato il recupero più lento. La capacità totale antiossidante e l'attività della glutanione perossidasi è aumentata (9-56%) per 48h in risposta alla gara.

Conclusioni In sintesi, il recupero della performance post-gara e gli adattamenti infiammatori in risposta a 3 gare giocate in un microciclo settimanale mostrano differenti pattern di risposta, con forti indicazioni di un ampio stress fisiologico e stato di fatica dopo la gara centrale, preceduta solamente da 3 giorni di recupero.

Considerazioni personali

- Il tempo di recupero post-gara e di risintesi delle scorte di glicogeno si attesta con una durata variabile tra le 48-72h (Krustrup et al. 2011; Gunnarsson et al. 2013; Bendiksen et al. 2012; Nybo 2012).
- Lo stress fisiologico causato da partite frequenti è superiore a quello osservato in pre-campionato, periodo caratterizzato da allenamenti intensi e ripetuti (Heisterberg et al, 2013).
- Dallo studio emerge in maniera evidente come si instauri, nell'organismo del calciatore dopo una gara, una condizione di danno muscolare (determinata dai valori di CK libero nel circolo ematico) e di stress ossidativo (rappresentata dal rapporto glutanione ossidato e glutanione ridotto -il glutanione è un potente antiossidante che difende le proteine del nostro corpo dall'azione dei radicali liberi-).
- Tutti i parametri identificativi dello stato infiammatorio, di performance e immunitario subiscono un danno rilevante dopo la seconda gara infra-settimanale (G2).
- Avendo a disposizione solamente 3-4 giorni di recupero tra le partite (spesso insufficiente per rigenerare l'omeostasi all'interno dell'organismo) **diventa molto importante la scelta dei mezzi e la durata dell'allenamento nei giorni tra una gara e l'altra.**
- L'affaticamento muscolare e la conseguente risposta ormonale evidenziati in questo studio vanno presi in considerazione per consentire ai giocatori di recuperare la capacità di prestazione.
- Nello studio non viene considerata una vasta sfera che ruota attorno al mondo sportivo, che è quella psicologica sulla quale influiscono una quantità indefinita di variabili che talvolta possono determinare variazioni sulla pianificazione della seduta di allenamento.

MUSCLE DAMAGE, INFLAMMATORY, IMMUNE AND PERFORMANCE RESPONSES TO THREE FOOTBALL GAMES IN 1 WEEK IN COMPETITIVE MALE PLAYERS

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Abstract

Purpose We examined effects of a three-game, 1-week microcycle (G1, G2, G3) on recovery of performance and inflammatory responses in professional male footballers.

Methods Players were randomized into an experimental (EXP; $N = 20$) and a control group (CON; $N = 20$). Blood was drawn and repeated sprint ability (RSA), muscle soreness and knee range of motion (KJRM) were determined pre- and post-games and during recovery.

Results High-intensity running during G2 was 7–14 % less compared to G1 and G3. RSA declined in EXP by 2–9 % 3 days post-game with G2 causing the greatest performance impairment. In EXP, game play increased muscle soreness (~sevenfold) compared to CON with G2 inducing the greatest rise, while KJRM was attenuated post-game in EXP compared to CON (5–7 %) and recovered slower post G2 and G3 than G1. CK, CRP, sVCAM-1, sP-Selectin and cortisol peaked 48 h post-games with G2 eliciting the greatest increase. Leukocyte count, testosterone, IL-1 β and IL6 responses, although altered 24 h post each game, were comparable among games. Plasma TBARS and protein carbonyls rose by ~50 % post-games with G2 eliciting the greatest increase 48 h of recovery. Reduced to oxidized glutathione ratio declined for 24 h post all games with G2 displaying the slowest recovery. Total antioxidant capacity and glutathione peroxidase activity increased (9–56 %) for 48 h in response to game play.

Conclusion In summary, post-game performance recovery and inflammatory adaptations in response to a three- game weekly microcycle displayed a different response pattern, with strong indications of a largest physiological stress and fatigue after the middle game that was preceded by only a 3-day recovery.

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