CHANGES IN DECELERATION IMPULSE FOLLOWING DIFFERING MODALITIES OF HIGH INTENSITY INTERVAL TRAINING

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Background

Muscle damage following exercise has been shown to impact jumping patterns, likely due to peripheral fatigue and delayed onset muscle soreness (DOMS). Specifically, the deceleration impulse during a counter movement jump (CMJ) has been shown to decrease up to 48 hours after eccentric exercise. The purpose of this pilot study was to investigate the changes in deceleration impulse following two differing exercise modalities (cycling and treadmill running) of high-intensity interval training (HIIT). We hypothesized that the change in impulse would be greater in the treadmill running group as compared to the cycling group, due in part to increased eccentric loading during running.

Methods

- 4 participants (2 F, 2 M; 28.3 ± 2.4 years)
- No current HIIT training
  - HR_{max} and 4x4 HIIT treadmill protocol
    - Active Period (AP: 4 min): 85-95%
    - Recovery Period (RP: 3 min): 60-70%
- DOMS was subjectively reported using a 0-6 Likert scale for lower extremity muscle soreness
  - Immediately post and 24-hours post exercise
- CMJ collected on VALD ForceDeck (VALD Performance, Australia)
  - Immediately before, immediately after and 24 hours post exercise
- Hedge's g effect sizes (ES) calculated

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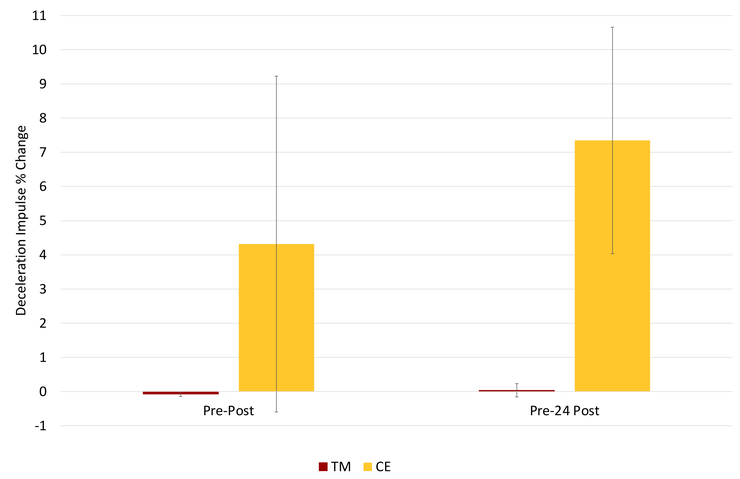
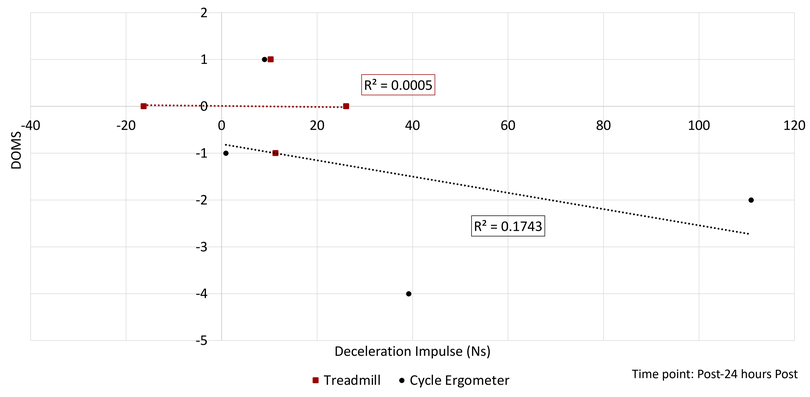
Results



- Average deceleration impulse following cycling HIIT (40 ± 50.06 Ns) was 509.55% greater than following treadmill HIIT(7.85 ± 17.65 Ns).
  - Effect size: 0.86
- Change in deceleration was moderately negatively correlated with with DOMS following cycling (r= -0.42) and weakly negatively correlated with DOMS following treadmill running (r = -0.02).



Conclusions

These preliminary findings suggest that cycling HIIT could have a greater impact on eccentric CMJ performance, and therefore may require a greater recovery time than the treadmill counterpart.

Practical Application

Although only preliminary findings, the data suggest that HIIT modality may influence subsequent performance and should be considered when prescribing HIIT exercise protocols for athletes, to allow for adequate recovery before further training or competition.

Future Directions

- This is part of a larger, ongoing study. More participants are needed to fully elucidate the effects of cycling and running HIIT on deceleration impulse.
- Investigation of the effect of different modalities on concentric impulse.

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