

Cycling Versus Treadmill Potentiation Effects Following High-Intensity Interval Training

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ABSTRACT

High-intensity interval training (HIIT) has emerged as a popular form of exercise, with intermittent bouts of higher and lower intensity cycles. Not well understood to date is the influence of HIIT exercise modality (e.g., cycling vs treadmill running) on measures of jump performance. A generally accepted metric for assessing performance and overall athleticism involves performing a countermovement jump (CMJ). Furthermore, heavy exercise has been shown to improve muscle performance using post-activation potentiation. **Purpose:** This study compared the effects of HIIT bouts of cycling vs treadmill running on CMJ concentric impulse, peak takeoff force, and jump height. **Methods:** Eleven young, active adults (5 females, 6 males, 27.20 ± 3.42 years) completed 30-minute 4x4 HIIT protocols on a treadmill and stationary bike with a 7-day interval between measures. Participants also performed CMJs before and after the exercise bouts using VALD force plates. Impulse was calculated during the first 100ms of the concentric portion of takeoff and peak takeoff force was normalized to body weight. Values are presented as percent change. **Results:** Average concentric impulse increased by 3.2% following the cycling protocol and 4.7% following the treadmill protocol. Peak net takeoff force increased by 5.98% following the cycling protocol and 8.57% following the treadmill protocol. These changes led to no difference in jump height following the cycling protocol (0.80%); however, jump height increased by an average of 4.05% following the running protocol. **Discussion:** This study illustrates that both cycling and running HIIT protocols can increase certain CMJ variables such as impulse and takeoff force. However, the treadmill HIIT protocol demonstrated a larger magnitude of change compared to cycling. The larger increase in these variables following running may have accounted for the increase in jump height seen after running and not after cycling. Treadmill running HIIT may simulate the post-activation potentiation phenomenon seen after strength training due to its higher-impact loading compared to cycling. These results could be of interest to athletic populations, as the results may help athletes decrease their risk of injury and increase performance.