Impact of Active and Passive Recovery on Metabolic Measures in Female Soccer Players

Mariah M. Varner, Samantha Bray, Dontez King, Mathew Richman, Joohee I. Sanders. Shippensburg University, Shippensburg, PA

Most sporting events have a period of time where athletes take a break from competition. During this break many athletes do not cool down or warm up again before returning to competition, which may increase a risk of injury or cause a decrease in performance when play is resumed. **PURPOSE**: To investigate the effects of passive and active recovery on subsequent performance. **METHODS**: Ten Shippensburg Women's Soccer Team players (19.2 ± 1.1 yrs) completed two sessions of testing, in randomized order. Each session consisted of a warm up, two-eight minute 5v5 short sided games, and four of the same test battery. Each test battery was measured: 1) after warm up, 2) after first half of game, 3) after recovery, and 4) after the second half of the game. Each test battery consisted of measuring heart rate (HR), blood lactate, and rate of perceived exertion (RPE). Two way ANOVA with repeated measures was used to compare active versus passive recovery conditions during multiple time points. **RESULTS**: HR during passive recovery decreased significantly from the first half of game (154.0 ± 21.9 to 91.1 ± 15.9 bpm, $p < .05$). HR then spiked backed up immediately after second half of the game (145.9 ± 17.8 bpm). During active recovery, HR remained elevated during recovery (143.2 ± 15.4 to 145.2 ± 14.3 bpm, $p > 0.05$) and slightly decreased (137.6 ± 17.3 bpm) immediately after the second half. Baseline lactate levels were significantly higher on the day of active recovery than passive recovery (7.4 ± 2.3 vs. 4.6 ± 2.9 mM, $p < 0.05$). Furthermore, active recovery produced significantly higher lactate than passive recovery (14.9 ± 7.4 vs. 3.7 ± 2.9 mM, $p < 0.05$). However, active recovery showed 13.6% decrease (from 14.9 ± 7.4 to 13.1 ± 6.5 mM) in their lactate levels after the second half of game whereas during passive recovery, an increase in lactate level of 18.9% was shown (3.7 ± 2.9 to 4.4 ± 1.8 mM). RPE also confirmed that the subjects were feeling less fatigued after active recovery than passive recovery although the difference was not significant (10.8 ± 1.4 vs. 11.3 ± 1.5, $p > 0.05$). **CONCLUSION:** Active recovery left subjects feeling less fatigued in the second half which was noted by a decrease in HR, RPE, and lactate in the second half of the game. These results suggest that active recovery could decrease the risk for injury and increase an athlete's performance in the second half.