SWACSM Abstract

Sled-pull Training Protocol Increases Critical Speed in Female Collegiate Soccer Players

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ABSTRACT

Critical speed (CS) is the speed one can sustain while maintaining blood lactate, phosphocreatine, and oxygen uptake levels. “Distance capacity beyond CS” (D’) is the reserve an athlete can draw from to run faster than their CS. By increasing CS and D’, athletes can sustain a faster threshold pace (CS) and have a greater sprint capacity (D’). Unlike distance traveled and speed, which do not reflect the metabolic strain of an exercise, CS and D’ assess the relative intensity of an activity to provide individualized inter- and intra-competition insight. **PURPOSE:** This investigation evaluated CS and D’ among men and women Division I collegiate soccer players for the first time and assessed the efficacy of a 12-week sled-pulling program intended to improve their CS profiles. **METHODS:** Using a 3-minute all-out 25-meter shuttle run, the speed of the first 150s (S’150), CS, and D’ of 23 men (20.22 ± 1.53 years, 168.28 ± 51.17 cm, 73.44 ± 23.46 kg) and 17 women (19.58 ± 1.02 years, 167.07 ± 3.81 cm, 62.46 ± 8.41 kg) was assessed before and after the training protocol. Video analysis was used to track displacement over time. **RESULTS:** The training program increased the S’150 of men by 3.58% (3.66 ±0.19 vs 3.77 ± 0.17 m/s, $p<0.05$) and of women by 6.46% (3.26 ± 0.17 vs 3.47 ± 0.14 m/s, $p<0.05$). Training increased CS in women only by 12.30% (2.63 ± 0.28 vs 2.95 ± 0.20 m/s, $p<0.05$). **CONCLUSION:** Sled-pull training improved the CS profile of both men and women. Additional research is necessary to determine how improvements in S’150 and CS translate to better performance in competition.