Effects of short-term training using SmartCranks on cycle work distribution and power output during cycling

Abstract:
SmartCranks use a free running bearing to promote independent pedal work by each leg during cycling. This system is designed for training the upstroke phase during cycling. The effects of training with SmartCranks on the power output (PO) and on cycle work distribution at the anaerobic threshold and the maximum power level were examined. Twenty male, non-professional cyclists were randomly assigned into intervention and control group, training 5 weeks with SmartCranks and conventional cranks, respectively. Before and after the training period the subjects performed an incremental test to exhaustion. Lactate was measured to determine the individual anaerobic threshold (IAT) and forces at the pedal were recorded to quantify changes in the work distribution over the full revolution. We observed no significant statistical difference for peak power (PO; 333.3 ± 32.8 W vs. 323.3 ± 21.8 W) and PO at IAT (229.6 ± 30.1 W vs. 222.7 ± 25.2 W) for SmartCrank and control conditions, respectively (P > 0.05). However, we did observe that work distribution in the downward phase was significantly reduced in the SmartCranks training group at peak PO (from 70.0 ± 4.9