Background

- Some cancer risks can be reduced by physical activity, but assessment is often self-reported and imprecise.
- Must establish individuals' objective, quantitative, and predictive measures for non-invasive means of activity levels.

Proposed Model

Cycling is an effective model for activity assessment and this study is to demonstrate how 3 tests can determine an individual's Anaerobic Work Capacity (AWC), the threshold between heavy and severe exercise known as Critical Power (CP), and the correlation between AWC expended (AWCexp) and changes to the torque-velocity curve (T-v).

Methods

- Male (n=10) and female (n=2) subjects, regularly trained cyclists or triathletes. Age (37.8 ± 11.6). Weight (72.7 ± 6.2)
- Exercise at increasing powers until exhaustion.
- For a set time of “all-out” power. CP=last 30 second average. AWC=“area under the curve”
- 3 Separate T-v sprints, each at a different AWCexp fatigue levels based on predicted 6-min exhaustive power (CP6).

Results

- Figure 3 represents the actual T-v curve. Each line is representative of the torque and velocity data for the corresponding sprint throughout the protocol.
- Figure 4 represents the correlation between AWCexp and T/Tmax, V/Vmax, and the area under the T-v curve.

Conclusions

- Protocol to Determine Changes to the Torque Velocity Curve above Critical Power while Cycling (Kelly Humes)
- Comparison of Threshold Determination between Blood Lactate Samples and Near Infrared Spectroscopy (NIRS) (Kristine Knowles)
- Modeling of real-time power output based on wearable, non-invasive NIRS device (Clemson Univ)

References


Additional references are provided in the text.