

POSTER PRESENTATION

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Contribution of aerobic and anaerobic capacity to 2000 m rowing performance

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Background

Previous studies strongly have supported importance of aerobic capacity for 2000m rowing performance [1-3] and there are few studies that demonstrated anaerobic capacity had critical role in rowing performance [4-6]. The purpose of the present study is to investigate the relationship between 2000m rowing performance and anaerobic capacity, which were estimated by critical power (CP) model [7,8] and by all-out tests of short duration as well. We also examined aerobic capacity.

Subjects and methods

Nine male collegiate rowers (age: 20.0 ± 1.0 yrs, height: 174.5 ± 4.5 cm, weight: 70.1 ± 7.5 kg) performed 1) incremental exercise tests to determine VO_{2max} , 2) CP test (400m, 600m, 800m and 1000m), and 3) 2000m test. For each subjects, the amount of work (power \times time) was plotted against exercise time. The CP was determined as the slope of the linear regression between the work and time. The anaerobic work capacity (AWC) was determined as the y-intercept of the linear regression. AWC was evaluated with standard error of estimation (SEE) [8] for the sake of accurate observation. If SEE of regression line was greater than 10 % of AWC, it was recalculated except one trial that had largest error.

Results

CP (302.7 ± 35.2 watt) was correlated with VO_{2max} (4.1 ± 0.4 L \cdot min⁻¹, $r = 0.70$, $p < 0.05$, Figure 1) and power output during 2000 m test (P2000, 326.9 ± 29.3 watt, $r = 0.86$, $p < 0.01$, Figure 2). AWC (11.4 ± 3.8 kJ) was not correlated with P2000 ($r = 0.33$). Our data demonstrated that there was significant correlation

between AWC and residual error between CP and P2000 ($r = 0.79$, $p < 0.01$, Figure 3).

Discussion

These results are in accordance with the established interpretation by which contribution of aerobic capacity to rowing performance are well recognized [1-6]. However, our data suggest that anaerobic capacity estimated by AWC also have a pivotal role for rowing performance. Since CP and AWC are affected by familiarity of

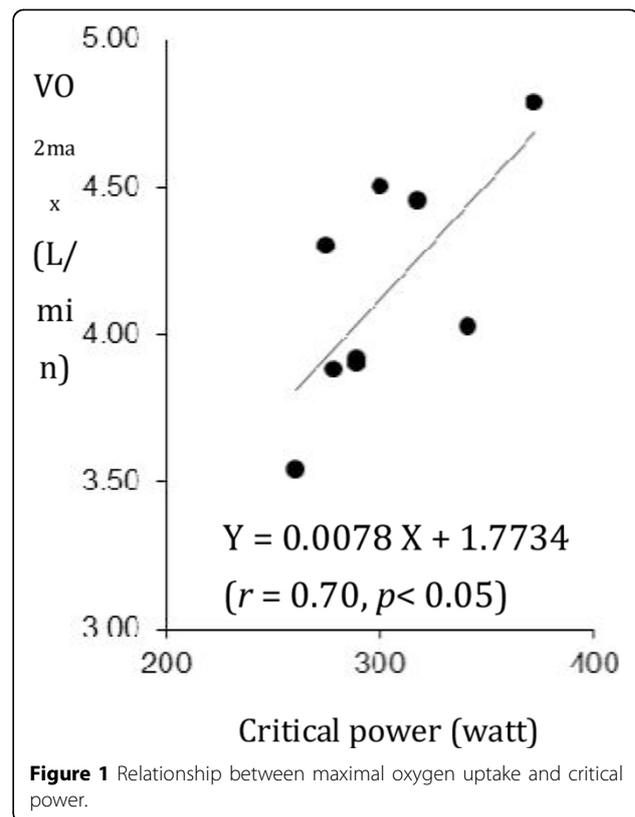
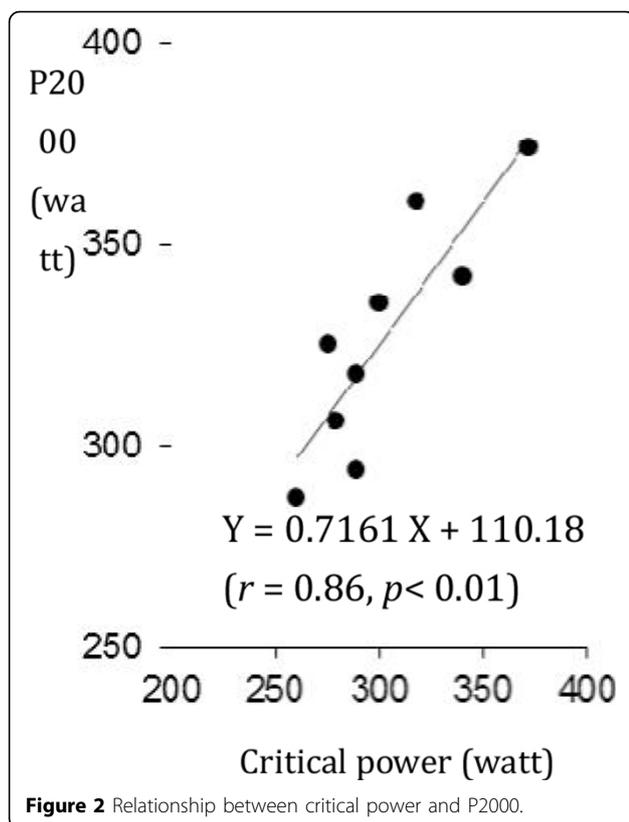


Figure 1 Relationship between maximal oxygen uptake and critical power.

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subject to intensive exercise [8] and physiological condition such as fatigue caused by consecutive training sessions, examination of anaerobic capacity might predict rowing performance more precisely in practical competitive situation.

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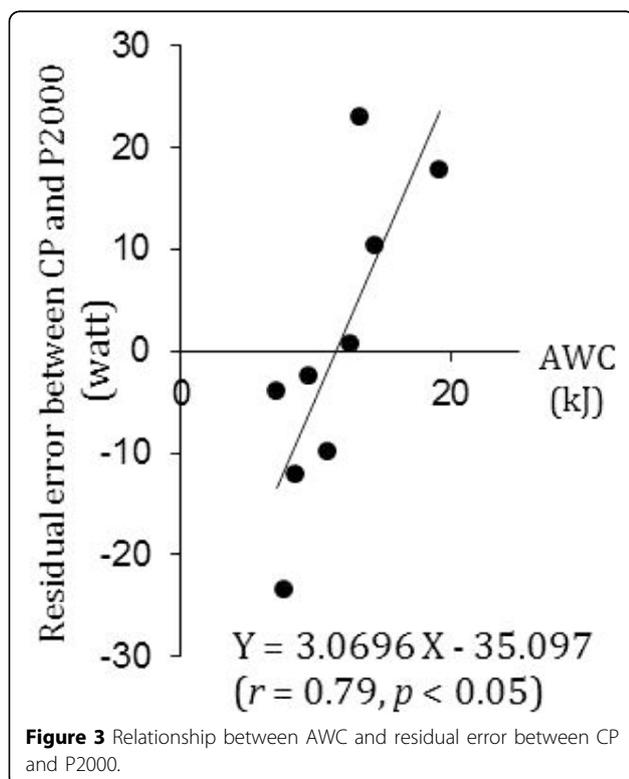
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