

Sear

Views


4676

©Journal of Sports Science and Medicine (2006) 05 , 340 - 348

Download

236

Research article

from September
2014**Assessment of Short-Distance Breaststroke
Swimming Performance with Critical Velocity**Daijiro Abe¹,  Hiroaki Tokumaru¹, Shigemitsu Niihata², Satoshi
Muraki³, Yoshiyuki Fukuoka⁴, Sachio Usui⁵, Takayoshi Yoshida⁶Citations in
ScholarGoogle

Share this article



Full Text

PDF

[Author Information](#) [Publish Date](#) [How to Cite](#)[Email link to this article](#)**ABSTRACT**

For high-velocity running or swimming, the relationship between velocity (v) and its sustainable duration (t) can be described by a hyperbolic relationship: $(v - V_{crit}) \cdot t = D'$, where V_{crit} is termed critical velocity, and D' is defined as a curvature constant of the hyperbolic curve. The purposes of this study were to examine whether the V_{crit} could be applied to evaluate short-distance breaststroke swimming performance and to evaluate the relative contribution of D' in short-distance swimming performance. Eleven male swimmers performed a series of time trials corresponding to 75, 100, and 150-m in an indoor 50-m swimming pool. The observed records were calculated into average velocities of each event to determine V_{crit} and D' . After the determination of V_{crit} and D' , all subjects performed 50-m time trial on another day. A maximal anaerobic power test using cycle ergometer was also performed in the laboratory. The average velocity of the 50-m time trial significantly correlated with the obtained V_{crit} but not with D' . D' was significantly correlated with the residual error, calculated from the regression analysis for the relationship between V_{crit} and the average velocities of 50-m time trial. A cluster analysis showed that most of the subjects were classified as V_{crit} dependency when performing 50-m time trial. Those results indicated that V_{crit} could be applied to evaluate short-distance swimming performance, and it determined around 80% of the short-distance breaststroke swimming performance.

Key words: Critical swimming velocity, D' , hyperbolic curve, cluster analysis

Key Points

- For high-velocity running or swimming, the relationship between velocity (v) and its sustainable duration (t) can be described by a hyperbolic relationship: $(v - V) \cdot t = D'$, where V is termed critical velocity, and D' is defined as a curvature constant of the hyperbolic curve. The D' contributed only around 20% of the breaststroke swimming performance even in a short-distance event.
- Critical velocity determined around 80% of 50-m breaststroke swimming performance, and it could be a useful tool for evaluating short-distance swimming performance.
- Most of the swimmers showed characteristics for critical velocity dependent physical fitness even in short-distance swimming event.

HOME

Contact

Email alerts

ISSUES

Current

In Press

Archive

Supplements

Most Read

Articles

Most Cited

Articles

ABOUT

Editorial
board

Mission

Scope

Statistics

AUTHORS

Authors

instructions

For Reviewers



JSSM | Copyright 2001-2018 | All rights reserved. | [LEGAL NOTICES](#) | [Publisher](#)

It is forbidden the total or partial reproduction of this web site and the published materials, the treatment of its database, any kind of transition and for any means, either electronic, mechanic or other methods, without the previous written permission of the JSSM.

This work is licensed under a  [Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License](#).