Anaerobic Critical Velocity of Master Swimmers

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1. INTRODUCTION

Based on the concept of critical velocity (CV), a new trend has been suggested with the aim to determine anaerobic performances. Using short distances trials, the concept of anaerobic critical velocity (AnCV) seems to represent the functional anaerobic capacity of swimmers. Marinho et al. (2011) found a linear relationship between AnCV and 50 m swimming performance (S_{50}) in young swimmers, suggesting that AnCV could be a relevant parameter to monitor and prescribe anaerobic training sets. The purpose of this study was to analyze the relationship between AnCV and swimming performance in master swimmers. Also, ascertain if AnCV may be determined based in two or three swimming distances, 15, 25 and 50 m (T_{15}, T_{25} and T_{50}, respectively).

2. METHODS

Twenty four male master swimmers participated in this study (training experience ≥ 10 years). For each swimmer, 15, 25 and 50 m front crawl sprint with in push-off start were collected with a stopwatch by two expert evaluators. AnCV was determined as the slope of the distance-time trend line. The Pearson´s correlation coefficient was used for correlations, significance was set at $p < 0.05$.

Table 1. Physical characteristics in mean (standard deviation).

	(n = 24)
Age (years)	42.0 ± 7.5
Height (m)	1.74 ± 0.10
Body Mass (Kg)	74.8 ± 14.1
Body Mass Index (Kg/m^2)	24.7 ± 3.5

3. RESULTS AND DISCUSSION

The swimming velocity associated to T_{50} (1.39.0±0.23 m.s^{-1}) was significantly faster (respectively, t = 9.5, 13.0; p > 0.01) than $AnCV_{25,50}$ and $AnCV_{15,25,50}$ (1.31.0±0.23 m.s^{-1} and 1.29.0±0.22 m.s^{-1}, respectively). T-Test revealed that $AnCV_{25,50}$ and $AnCV_{15,25,50}$ were not significantly different (p > 0.01) and Bland-Altman plot bias and limits of agreement between $AnCV_{25,50}$ and $AnCV_{15,25,50}$ evidenced that the random scatter of points between the upper and lower confidence limits is indicative of a good fit. Linear regression of T_{50} on $AnCV_{25,50}$ revealed that the latter can be predicted with reasonable accuracy from the 25 / 50 m swim trials, both were strongly associated ($r^2 = 0.97$; SEE = 0.04).

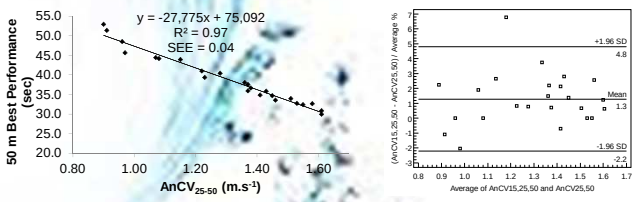

Figure 1. Linear regression of performance in 50 m (in seconds) on $AnCv_{25-50}$ and Bland-Altman plot between $AnCV_{25,50}$ and $AnCV_{15,25,50}$

4. CONCLUSIONS

The present study evidenced that AnCV can be determined using two swimming distances (25 and 50 m) to application in day-to-day training basis. From our point of view, masters coaches and swimmers may use AnCV as a race-pace training reference to monitoring and prescribing anaerobic training. Further research should be conducted to deepen the meaning of AnCV.

5. REFERENCES

Marinho, D.A., Amorim, R.A., Costa, A.M., Marques, M.C., Pérez-Turpin, J.A., Neiva, H.P. (2011). Journal of Human Sport & Exercise; 6(1): 80-86.