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Research article

Critical Velocity and Anaerobic Paddling Capacity Determined by Different Mathematical Models and Number of Predictive Trials in Canoe Slalom

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ABSTRACT

The purpose of this study was to analyze if different combinations of trials as well as mathematical models can modify the aerobic and anaerobic estimates from critical velocity protocol applied in canoe slalom. Fourteen male elite slalom kayakers from Brazilian canoe slalom team (K1) were evaluated. Athletes were submitted to four predictive trials of 150, 300, 450 and 600 meters in a lake and the time to complete each trial was recorded. Critical velocity (CV-aerobic parameter) and anaerobic paddling capacity (APC-anaerobic parameter) were obtained by three mathematical models (Linear1=distance-time; Linear 2=velocity-1/time and Non-Linear = time-velocity). Linear 1 was chosen for comparison of predictive trials combinations. Standard combination (SC) was considered as the four trials (150, 300, 450 and 600 m). High fits of regression were obtained from all mathematical models (range - R^2 = 0.96-1.00). Repeated measures ANOVA pointed out differences of all mathematical models for CV (p = 0.006) and APC (p = 0.016) as well as R^2 (p = 0.033). Estimates obtained from the first (1) and the fourth (4) predictive trials (150 m = lowest; and 600 m = highest, respectively) were similar and highly correlated (r=0.98 for CV and r = 0.96 for APC) with the SC. In summary, methodological aspects must be considered in critical velocity application in canoe slalom, since different combinations of trials as well as mathematical models resulted in different aerobic and anaerobic estimates.

Key words: Canoe slalom, critical velocity, sports performance, aerobic parameter, anaerobic parameter, elite athletes

Key Points

- Great attention must be given for methodological concerns regarding critical velocity protocol applied on canoe slalom, since different estimates were obtained depending on the mathematical model and the predictive trials used.
- Linear 1 showed the best fits of regression. Furthermore, to the best of our knowledge

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