Comparison among the critical velocity determined by three conventional models and anaerobic threshold in running #36

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The aim of this study was verify the use of critical velocity (CV) determined by three conventional models for prediction of the anaerobic threshold (AnT) in running. Thirteen Brazilian armed forces soldiers (age 24.6±6.6 years; body mass 74.4±7.6Kg; and body fat 17.8±5.2%) participated of the study. The CV was measured through four different intensities of running accomplished until exhaustion (tlim), it pre-adjusted to occur between 2 and 10 minutes (speed between 15km·h^{-1} and 21km·h^{-1}). The CV was determined by three mathematical models, two by linear relations (velocity versus inverse of time - $VC_{Vx1/tlim}$; and distance versus time relations - VC_{DxT}) and one by hyperbolic relation (time versus velocity - VC_{H}). The AnT was determined from incremental test on treadmill with initial speed at 7km·h^{-1} and increment of 1.5km·h^{-1} at each 3 minutes until voluntary exhaustion. Immediately after each exercise stage were collect blood samples from ear lobe to measure of lactatemia. The AnT corresponded to abrupt increase of the lactate concentration response using bi-segmented linear regression (AnT_{BI}). The three VC determinations corresponded to 13.48±0.91km·h^{-1} ($VC_{Vx1/tlim}$), 13.04±1.12km·h^{-1} (VC_{DxT}) and 12.83±0.78km·h^{-1} (VC_{H}) and only the $VC_{Vx1/tlim}$ showed statistically different of the AnT_{BI} (12.06±1.99km·h^{-1}). However, these VC results overestimate the speedy of AnT_{BI} in 11.84±1.30%, 7.7±1.3% and 5.83±1.04%, respectively. Significant correlation was not found among the three VC and the AnT_{BI}. Thus, the CV determined by three conventional models seem not be a good tool for AnT prediction in armed forces soldiers at running.

Key words: abrupt increase of lactatemia; aerobic capacity; blood lactate; prediction.

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