Non-invasive laboratory test used to predict aerobic and anaerobic performances in army runners #57

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The velocity test is theoretically a non-invasive cheap method for evaluating aerobic capacity (Vcrit) and anaerobic work capacity (AWC). Various authors have validated Vcrit, generally in the field, for predicting aerobic performance. However, the validity of AWC as an anaerobic evaluation tool is still controversial. This study evaluated the capacity of laboratory determined Vcrit and AWC in predicting aerobic and anaerobic performance. Thirteen runners, aged 20.1±2.1 years, height 170±0.1 cm, and weight 66.0±3.7 kg from the 13th Armoured Infantry Battalion (Brazilian Army) based in Ponta Grossa, PR, Brazil were submitted to three exhaustive random efforts on a treadmill at 100%, 110%, and 120% VO_2peak (previously determined) to set time limits (tlim). Points obtained from the velocity versus 1/tlim ratio were linearly adjusted so that their linear and angular coefficients corresponded to Vcrit and AWC, respectively. They later performed three maximum effort tests on an athletics track over 1200m (P1200), 2400m (P2400), and 2800m, and 10 x 35m separated by 1min rest periods. This last test was to determine maximum ($Vmax_{35}$) and mean ($Vmed_{35}$) velocities. Possible associations between Vcrit and P1200, P2400, and P2800, and between AWC and $Vmed_{35}$ and $Vmax_{35}$ were evaluated using the Pearson correlation test (p<0.05). Vcrit (3.96±0.32m/s) significantly correlated with P1200 (r=0.71), P2400 (r=0.81), and P2800 (r=0.83). In contrast AWC (252.47±91.99m) did not significantly correlate with Vmax (4.81±0.15m/s) or Vmed (4.64±0.22m/s) from 10x35m. It can be therefore concluded that laboratory determined Vcrit can be used to predict field aerobic

performance. However, AWC is not an adequate tool for predicting short duration performances.

Key words: critical velocity; anaerobic work capacity; aerobic performance; runners.