Determination of critical power using a straight bench press with a test protocol #43

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The purpose of this study was to investigate the validity of critical force test from maximal lactate steady state (MLSS) during resistance test using straight bench press (SBP). Five healthy male volunteers aged (22.6 ± 2.88 years), weight (76.3 ± 11.49 kg) e height (182.6 ± 7.54 cm), trained in resistance exercise, performed four diferent tests to determine: one maximal effort (1RM), critical force using the critical power model (force vs 1/time limit – 20.25 and 30% of 1RM). The CF was the linear coefficient and the anaerobic impulse capacity (CIA) was the angular. MLSS was determined using loads of 80, 90, 100 and 110% of critical force. Blood lactate samples were abtained at each 300sec between each stage of total 1200sec. Maximal 30s test (M30) was accomplished with load of 25% of body weight in SBP. The results showed that the 1 RM was 79.4 Kgf (± 16.98), CF 10.1N (± 2.25), CIA 1756.82 N.s (± 546.96) and the R^2 0.984 (± 0.02). The MLSS occurs at 100% CF load. The lactate concentration at the MLSS was 2.2 mmol/L (± 0.77). Significant correlation was observed between MLSS and CF on SBP (r = 0.88, p = 0.05). In M30 the minimum, mean and peak power were (25.0 ± 4.9, 28.0 ± 4.9, and 30.0 ± 4.6 kgf.rps, respectively). The fatigue index was 18.0% (± 6.8). The M30 was significantly correlated with Ppeak and Pmean (r = 0.98 for both, p = 0.003). The CF means has been validated to predict the resistance training and the CIA, showing to be a representative anaerobic parameter in straight bench press.

Key words: critical force, maximal 30s test, lactate threshold, bench press.