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ORIGINAL RESEARCH

COMPARISON OF A DOUBLE POLING ERGOMETER AND FIELD TEST FOR ELITE CROSS COUNTRY SIT SKIERS

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ABSTRACT

Background. Sport specific ergometers are important for laboratory testing (i.e. peak oxygen consumption (VO_2)) and out of season training.

Objectives. The purpose of this study was to compare cardiorespiratory variables during exercise on a double poling ergometer to a field test in elite sit skiers.

Methods. Three male and four female athletes from the Canadian National / Developmental team (17-54 years of age, six with complete paraplegia and one with cerebral palsy) completed a field test and a double poling ergometer protocol separated by at least 24 hours. Both protocols consisted of three maximal trials of skiing of three minutes duration separated by 1.5 minutes of rest. A wireless metabolic system and heart rate monitor were used to measure cardiorespiratory responses [peak heart rate, peak VO_2, and peak respiratory exchange ratio (RER)] during each test. Arterialized blood lactate was measured before the beginning of exercise, after each trial and at 5, 10 and 15 minutes post exercise.

Results. No significant differences existed between the field and ergometer tests for peak oxygen consumption (VO_2) (field = 34.7 ± 5.5 $mL \cdot kg^{-1} \cdot min^{-1}$ vs. ergometer = 33.4 ± 6.9 $mL \cdot kg^{-1} \cdot min^{-1}$). Significantly higher peak heart rate and RER were found during the ergometer test. Significantly higher lactates were found during the ergometer test after trial 2 and trial 3.

Conclusion. The double poling ergometer is similar to a field test for evaluating peak VO_2 in elite cross country sit skiers; however, the ergometer test elicits a higher heart rate and anaerobic response.

Key Words: spinal cord injury, aerobic power, lactate.

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