

EXAMPLE OF A STRUCTURED SCIENTIFIC ABSTRACT

TITLE: RELIABILITY OF PEAK CARDIORESPIRATORY RESPONSES IN WHEELCHAIR ATHLETES WITH SPINAL CORD INJURY

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INTRODUCTION: Physiological fitness testing should be an essential component in the preparation of athletes participating in elite Paralympic Sport. It is important, therefore, that the reliability of the fitness parameters be examined, so that exercise prescription and changes resulting from training can be objectively evaluated.

PURPOSE: The purpose of this study was to examine the test-retest reliability of the peak cardiorespiratory and metabolic responses in athletes with spinal cord injury (SCI). It was hypothesized that the peak physiological responses during wheelchair exercise would be highly correlated in this population.

METHODS: Informed consent was obtained from 12 male Paralympic athletes with SCI having complete lesions between T1 to T12. The physical characteristics of the subjects were: age (mean \pm SD) = 27.8 yr \pm 3.5, body mass = 76.5 kg \pm 6.2, height = 1.74 \pm 4.1cm; body mass index = 25.3 \pm 2.5, peak oxygen uptake = 28.5 \pm 5.3 ml/kg/min). After an initial familiarization session, each subject completed two symptom-limited incremental wheelchair exercise tests to voluntary fatigue within one week. Each subject performed the test in their individual racing wheelchair which was mounted on a frictionless roller system interfaced with a computer. The test was initiated at a velocity of 4 kmh and increased by 2 kmh until voluntary fatigue. The cardiorespiratory responses were continuously measured with a metabolic cart interfaced with an electrocardiogram (Vmax, SensorMedics, CA). Blood samples were withdrawn from the finger tip prior to and following each test to measure the blood lactate (La) concentration using an Accusport analyzer.

RESULTS: The 't' test results indicated no significant differences ($p > .05$) between the two tests trials for the peak values of the following variables: wheeling velocity (Vel: 14.7 vs 14.9 kmh); absolute oxygen uptake (VO_2 : 2.27 vs 2.31 L/min); relative oxygen uptake (VO_2 : 27.9 vs 29.1 ml/kg/min), heart rate (HR: 182 vs 184 bpm), ventilation rate (VE: 81.7 vs 84.8 L/min), and respiratory exchange ration (RER: 1.23 vs 1.29). Intra-class correlations for the peak values between the two trials were as follows: Vel = 0.96, VO_2 , (L/min) = 0.98, VO_2 , ml/kg/min = 0.97, HR, bpm = 0.92, VE, L/min = 0.90, and RER = 0.87. Bland-Altman plots revealed that all the data points were within the 95% confidence limits of the mean value of the two trials for each variable.

CONCLUSIONS: The reliability of the peak cardiorespiratory responses in wheelchair athletes with SCI in a controlled laboratory setting is high. Therefore, aerobic exercise

programs can be accurately prescribed and changes resulting from such interventions can be confidently evaluated in this population.

KEY WORDS: oxygen uptake, heart rate, ventilation rate, wheelchair exercise, reproducibility.

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