

AN ASSESSMENT OF PHYSIOLOGICAL CHANGES DUE TO RESPIRATOR WEAR DURING ANAEROBIC CYCLING

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Workers wearing respirators in various situations, such as emergency response, may be required to work at maximal or near-maximal workloads. Respirators alone increase both physiological and psychological stress. When combined with an intense workload, respirator wear may cause a critical overload or impairment that could endanger the worker and others. The goal of this study was identification of respirator-induced differences in heart rate blood pressure oxygen saturation and blood lactate levels during maximal exertion by comparing measurements during trials wearing no-respirator and two different half face respirators. Twenty-eight college athletes 18-24 years of age rode a cycle ergometer, as per the Wingate Anaerobic Test protocol, which calls for a maximal effort for 30 seconds, in three randomly ordered individual trials. The trials were performed wearing no respirator, a half-face negative pressure respirator and a half face powered air purifying respirator connected to an air compressor. Heart rate and oxygen saturation were continually monitored with a pulse oximeter. Blood pressure was measured at rest, after the warm-up, after the Wingate Test and when the heart rate reached 100 beats per minute. Blood lactate measurements were collected at rest, after the Wingate test and after the cool down when heart rate reached 100 beats per minute. Data compilation and statistical analysis is in process. Measurements among and between the three trials (no respirator and both types of respirator) will be analyzed for statistically significant differences ($p < .05$) in heart rate, blood pressure, oxygen saturation and blood lactate levels. Conclusions will be drawn upon completion of analysis.