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Effects of Stress on Lactate Levels and Other Physiological Variables During Exercise

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Stress is a normal and common occurrence in college students and athletes' lives. Stress is also known to cause a rise in many physiological variables in day-to-day life. However, the response of these variables during exercise, under stressful conditions, is unclear. **PURPOSE:** To examine the effect that psychological stress has on blood lactate levels and other physiological variables while exercising. **METHODS:** Twenty subjects (Age: 20.6 ± 1.5 yrs, 8 Male, 12 Female) were randomly assigned into two different conditions, stress (ST) and no stress (NS), which were tested on two separate occasions with a week in between. Baseline, post-exercise, and recovery data were collected for blood lactate (BL), heart rate (HR), blood pressure (BP), and rate of perceived exertion (RPE) for both conditions. For the exercise protocol, each subject performed a 5-6 minute graded exercise test on a cycle ergometer, where initial workload was standardized to body mass. Workload was then increased by 0.25 kp every minute for the first two minutes, then every 30 seconds thereafter up to 1.5 kp of additional resistance. Subjects continued to exercise until 2 km was reached. Two minutes into exercise, the N-Back test was administered for the ST only, which took approximately 2 minutes to complete. Dependent t-tests were used to compare differences in these measures between the two conditions.

RESULTS: There was no significant difference in post exercise BL between ST and NS conditions, respectively (7.96 ± 3.2 vs. 9.63 ± 4.3 mM, $p=0.12$). HR did not show any significant difference between the two conditions either (136.7 ± 21.5 vs. 142.4 ± 24.9 bpm, $p=0.38$). Systolic BP also showed no significant difference between the two conditions (158.9 ± 17.7 vs. 155.6 ± 13.7 mmHg, $p=0.43$). The RPE for both conditions revealed no significant difference (14.6 ± 1.9 vs. 14.8 ± 1.6 , $p=0.68$). **CONCLUSION:** Based on the results of the study, inducing mental stress during brief bouts of exercise does not seem to affect cardiovascular and physiological measures.