The Acute Effects of Microhydrin on Blood Lactate a During Exercise Test

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Introduction

During an exercise bout, aerobic energy comes from oxidative phosphorylation. When the intensity exceeds the body's ability to utilize oxygen, the body switches over to anaerobic sources for energy production. Adenosine Triphosphate (ATP) is now formed through the breakdown of phosphocreatine to replenish ATP and the conversion of pyruvate to lactate following the breakdown of glycogen and glucose. The lactate decreases the pH level intramuscularly causing an environment that is not optimal for exercise and leads to exhaustion and decreased performance. Microhydrin, a supplement developed to release reduced hydrogen or hydride ions (H^-) into the blood stream acting as an hydrogen ion trap. This is possible through Microhydrin's active ingredient, Silica Hydride. The few studies that have been done on this particular supplement required an ingestion of four pills daily.

Purpose

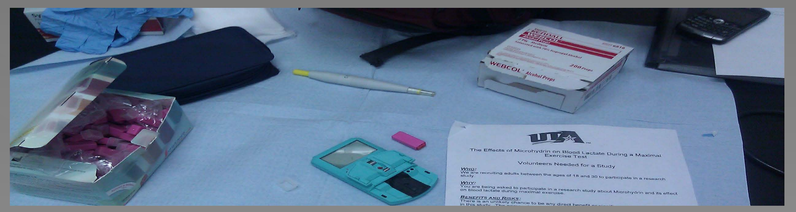
The purpose of this study was to evaluate the acute effect of Microhydrin on blood lactate during a maximal exercise test.

Methods

Six college students (age 24.33 $\pm$ 3.01 yrs, height 172.58 $\pm$ 9.65 cm, weight 66.47 $\pm$ 9.15 kg) volunteered to participate in this study. They were randomly placed into two groups, three subjects began by taking the active ingredient while the other three took placebos. The studies were spread over two visits to allow adequate rest between tests.

Methods (cont'd)

The participants were asked not consume any food two hours prior to the test as well as any caffeine products 12 hours prior to the test to assist in a controlled environment. Upon entering the cardiovascular lab in the Maverick Activity Center, the subjects ingested two of the previously assigned capsules and sat for 30 minutes to allow the active ingredients to be absorbed. During the waiting period, a heart rate monitor was attached to the chest as well as a sphygmomanometer to the arm in order to measure the heart rate and blood pressure, respectively. A mouth piece similar to that used to snorkel was attached to a headgear that was fitted to the subject's head. This mouth piece was connected to a metabolic cart used to measure oxygen consumption. Blood lactate levels were measured immediately before the start of the exercise test. The protocol increased speed and grade every three minutes until the subject was unable to go any further. At the end of every stage, heart rate, blood pressure and the rate of perceived exertion was recorded. Once the participant had reached the maximum stage, the treadmill slowed to a speed of three and a grade of zero until heart rate was below 120 bpm and they recovered. At the three minute mark of the recovery period, blood lactate was taken to obtain the post measurement.



Results

There were no significant differences found between the supplementation with Microhydrin and the placebo in blood lactate ($p=0.113828$). In the control group (placebo), post blood lactate measurements were 14.47 $\pm$ 2.16 mmol/L and 11.77 $\pm$ 2.70 mmol/L in the Microhydrin group.

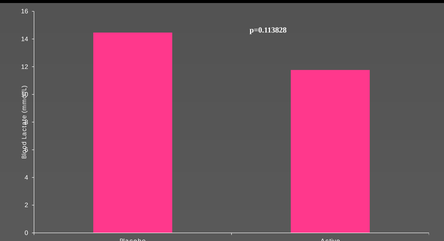


Figure 1: Average of six subject's preexercise and postexercise blood lactate levels for placebo and active conditions.

Conclusions

Although blood lactate was lowered in the Microhydrin group, when compared to a placebo, there was no significant difference, probably due to the high variances. With more participants in future studies, results may be different.

Reference

1. Beneke, R., LeithÃ¤user, R. M., & Ochentel, O. (2011). Blood Lactate Diagnostics in Exercise Testing and Training.*International Journal Of Sports Physiology & Performance*, *6*(1), 8-24.
2. Glazier, L. R., Stellingwerff, T., & Spriet, L. L. (2004). Effects of Microhydrin® Supplementation on Endurance Performance and Metabolism in Well-Trained Cyclists. *International Journal Of Sport Nutrition & Exercise Metabolism*, *14*(5), 560-573.
3. Goldfarb, A. H., Bloomer, R. J., & McKenzie, M. J. (2004). Effect of Microhydrin® on Blood Lactate, Protein Carbonyls, and Glutathione Status in Rats Before and After Aerobic Exercise. *International Journal Of Sport Nutrition & Exercise Metabolism*, *14*(5), 550-559.
4. Howard, C.H., Loyd, K. (2002) Microhydrin® Effectively Lowered Blood Lactic Acid Levels During Strenuous Exercise. *Journal of Medical Foods.*
5. Lloyd K.P., Wasmund W., Smith L., and Raven P.B. (2001) Blood Lactate Diagnostics in Exercise Testing and Training. *Journal of Medicinal Food*. September 2001, 4(3): 151-159. doi:10.1089/109662001753165738.
6. McKenzie M.J., Goldfarb A.H,. Bloomer R.J and L.A. (2002) Microhydrin® Supplementation reduces Latic Acid after strenuous Exercise. *Consitt Department of exercise and Sport Science*, University of North Carolina, greensboro, N.C.
7. Nielsen, H., Hein, L., Svendsen, L., Secher, N., & Quistorff, B. (2002). Bicarbonate attenuates intracellular acidosis. *Acta Anaesthesiologica Scandinavica*, *46*(5), 579-584. doi:10.1034/j.1399-6576.2002.460516.x