



## Exercise Biochemistry Review

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### The Function of t Lycium Barbarum Juice Supplemen in Exercise Stress Regulation during Increasing Resistance Training

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**Objective** The purpose of this study was to explore the function of Lycium Barbarum juice on exercise stress regulation when male university students drank Lycium Barbarum juice during increasing resistance exercise, by observing the effects of oral Lycium Barbarum juice on the blood glucose, serum Adrenocorticotrophic Hormone (ACTH), insulin and glucagon concentration.

**Methods** 21 to 22, healthy, 28 male university students participated in the study. They were randomly divided into a control group (n=16) and an experimental group (n=12). All participants completed four-stage incremental load movement for a total of 32 days. The exercise intensity of four stages was 60% VO<sub>2</sub>max, 70% VO<sub>2</sub>max, 80% VO<sub>2</sub>max and 90% VO<sub>2</sub>max, respectively. Each stage was exercised every-other-day, 4 times per stage and 1 hour each time. During the exercise, each subject in the experimental group drank 100 ml of 100% Lycium Barbarum juice before going to bed every day.

Before the experiment and the morning after the end of each phase, a participant's elbow-venous blood was collected to separate the serum. In all serum substances, the concentrations of ACTH, insulin, glucagon were detected by ELISA system. Fasting blood glucose concentration was detected by a blood glucose meter (Kyoto GT-1640 glucose meter, Japan). SPSS 17.0 software was used for statistical analysis.

**Results 1)** The serum ACTH concentration of the subjects continually increased with the progress of the incremental load exercise and reached the highest at the end of the fourth stage. Compared with the increase in the control group ( $P < 0.05$ ), the experimental group was more significant ( $P < 0.01$ ). **2)** Compared with before the experiment, both control group and experimental group were no obvious changes of blood glucose concentration in the first and second stages, and the control group was significantly decreased in the third and fourth stages ( $P < 0.05$ ), while the experimental group was not ( $P > 0.05$ ). **3)** During the increasing load exercise, the changes of insulin in serum of the participants were basically the same. The insulin level increased significantly at the end of the first stage and decreased successively at the end of the last three stages. At the end of the fourth stage, the serum insulin level of the control group decreased more significantly ( $P < 0.05$ ) than the experimental group ( $P > 0.05$ ). **4)** The glucagon concentration in the control group continued to increase with the increase of the load. By contrast, the glucagon concentration in the experimental group gradually decreased at the end of the first stage and then increased at the end of the fourth stage. However, all of the increase and decrease are not statistically significant.

**Conclusions** During increasing resistance exercise, drinking Lycium Barbarum juice can increase the ability of the body to regulate Adrenocorticotrophic Hormone (ACTH), insulin and glucagon through the exercise stress regulation systems, the Hypothalamic-Pituitary-Adrenal Cortical Hormone system (HPA) and the Sympathetic-Adrenal Medullary system. It plays an important role in maintaining blood sugar levels during increasing resistance exercise and accelerating post-exercise function recovery after exercise.