D-Aspartic Acid Supplementation in Athletes

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Background

Dietary supplements are currently used to increase athletic performance for many types of athletes. Many new supplements come to the market every year with little research done on their efficacy in improving athletic performance. Dietary protein supplements have become a large portion of the type of supplements used and even supplementing specific types of amino acids alone for improvement of athletic performance. D-aspartic acid (Aspartate) is one such amino acid that is being sold as a supplement used to improve muscle function in athletes. Aspartate is a non-essential amino acid which is found in various foods. Foods with the highest concentration include soy and some meat products. Aspartate in the “L” form is stored in the brain.[1]

Objective

The primary aim of the study will be to observe the effect of supplementing 3 grams of aspartate per day, over a 14 day period, on luteinizing hormone and testosterone. The secondary aim of the study will be to study the effect of aspartate supplementation on athletic performance.

Visit 1
Visit 2
Visit 3

Visit 1 (screening), subjects will perform VO2 peak, 1RM Bench press, and 1RM Squat testing. The subjects will repeat the strength tests during the second visit as well as the VO2 peak. Subjects will be supplemented with either Aspartate or the Placebo and take their supplement for 14 days. Fasting blood samples will be collected and analyzed to determine the effect on hormones, and strength measures will be looked at by observing trends in the performance tests. Data will be analyzed using a 1 way repeated measures analysis.

Anticipated Results

After 2 weeks of Aspartate supplementation, we expect to see a significant increase in testosterone and luteinizing hormone levels in the athletes. Consequently, we should observe a significant increase in strength due to the elevated circulating levels of these hormones.

Previous studies have shown that aspartate supplementation has a significant effect on elevation of serum hormone levels[1].

Mechanism of Action

In the active, D form, aspartate acts as an endogenous neurotransmitter on NMDA and AMPA receptors. Aspartate is localized in the pituitary, which is the gland that secretes hormones such as Luteinizing Hormone which controls testosterone production in gonads. D-Aspartic acid also accumulates in keydgy cells, located in the testes, where they have a catalyzing role in the synthesis of testosterone.[2] Previous studies have shown that elevated testosterone in the body leads to an increase in muscle strength and faster recovery, as well as an increase in lean body mass.[3]

Mechanism of Action

The study is a double blind, placebo controlled, parallel arm study that will be completed over a 2 week period. During Visit 1 (screening), subjects will perform VO2 peak, 1RM Bench press, and 1RM Squat testing. The subjects will repeat the strength tests during the second visit as well, thus eliminating the potential of a learning effect. After 14 days of supplementation, the subjects will resume their regular training regimens.

Discussion

Positive results from this study may be beneficial to a variety of people. First, athletes will have a safe way to enhance their ability and performance. This will result in a higher level of competitiveness amongst all sports and athletic training. Secondly, significant results may show that aspartate could be used therapeutically for people with low testosterone levels. Supplementation could be a safer alternative to boost hormone levels in not only athletes, but sedentary people as well.

References