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A study on effect of branch chain of amino acids on the muscle soreness of weight lifters of Karnataka state

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Abstract

Purpose of the study: The aim of the current study was to know the effect of Branch Chain of Amino Acids on the Muscle soreness of weight lifters of Karnataka state

Materials and Method: Thirty healthy male weight lifters (aged 25-27yr old) were divided in to two groups of 15 subjects each with a body mass index between 25 and 31 kg/m², A Pre and post test was conducted on both the groups, Dynamic muscle strength was determined by 1RM testing at baseline, and after the bed rest and recovery phases. A summary score for lower-body 1RM was calculated using values for leg press, leg extension, and knee flexion exercises. Upper-body 1RM was calculated using values for the chest press and lat pull-down exercises, for producing muscle soreness. Study participants of the experimental group received the BCAA supplements (5.5gms) 90mts before the workout 30mts after workout between lunch and dinner and prior to bed time, for the whole training regime daily between meals for 12weeks. After 12 weeks post test was conducted for both the groups, and the subjects were asked to explain the cycle of pain and recovery. For the study, Correlated one tailed 't' test was calculated between the pre test and post test of both the group. Subjective analysis was also done on the subjective data collected by the subjects.

Conclusion: On the basis of analysis of data finally it was concluded that, BCAA is useful in reducing muscle soreness. DOMS is a regular and painful part of progressing and overloading muscles in order to achieve changes in strength. In an effort to alleviate muscle soreness, this research indicates that BCAA supplementation may be effective in decreasing muscle soreness in many types of exercises.

Keywords: Branch chain of amino acids, weight lifters, leucine, isoleucine and valine

Introduction

Now a day for higher performances in sporting career younger generation of athletes are being smarter, working harder for an elongated hours of time. The outcome of this hardship is an increase in the level of performance, for the attainment of the desired goal. The physical and physiological strain may lead to a great amount of stress on structural function of a being; by the structure here we mean bones and muscles which initiate various types of movements and preliminary result of these intense and prolonged training processes are muscle soreness, initially it was regarded that muscle soreness is due to accumulation of lactic acid, a normal by product of muscle metabolism and leads to muscle stiffness.

In General, microscopic damage to the muscle fibers leads to muscle soreness and it lasts for two to four days after an intense workout. The mild muscle strain creates microscopic damage to the muscle fibers, this damage to muscle fibers coupled with inflammation and tears causes pain. All the people are at the risk of muscle soreness, most common in professional athletes. Normal soreness is a sign that one is getting stronger, once the muscles are stressed due to an increased intensity in the exercise. The fibers begin to break down. As the fibers repair themselves, they become stronger and larger than they were before. This means muscles become more ready to take stress.

The 30-45mins following a workout is a critical time to nourish one's body for proper recovery. Recovery aims at muscle building, replacing energy stores and preventing post workout fatigue and muscle soreness, like the aches that occur while exercising due to accumulation of lactic acid, but the majority of lactic acid removed from the muscle site, shortly after the exercise. Muscle damage is associated with morphological changes, increases in serum Creatine Kinase (CK) concentrations, increases in myoglobin, decreases in

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subsequent exercise performance, and Delayed Onset Muscle Soreness (DOMS). In particular, eccentric exercise causes myofibrillar disruption and primarily damages the fast twitch fibers, although research is beginning to show it can affect slow twitch fibers as well ^[1]. Due to the damage that follows unaccustomed, intense, or eccentrically biased exercise, a focus on recovery strategies that mitigate these unwanted effects should be pursued.

Branched Chain Amino Acids (BCAA's) include leucine, isoleucine and valine, which are essential amino acids that need to be consumed through diet or supplementation because they are not produced in the body. BCAA consumption is often associated with muscle protein synthesis and promoting an anabolic setting in the body after exercise. Because of this anabolic effect, consuming BCAA's may help alleviate muscle soreness and suppress muscle damage.

Methodology

Thirty healthy male weight lifters (aged 25-27yr old) were divided in to two groups of 15 subjects each with a body mass index between 25 and 31 kg/m², no dietary restrictions that prevented consumption of the study diet or amino acid supplement, participated in the study. A Pre and post test was conducted on both the groups, Dynamic muscle strength was determined by 1RM testing at baseline, and after the bed rest and recovery phases using MSF Equipments. A summary score for lower-body 1RM was calculated using values for leg press, leg extension, and knee flexion exercises. Upper-body 1RM was calculated using values for the chest press and lat pull-down exercises, for producing muscle soreness. Sufficient rest was provided in between the sets of exercises done for upper and lower extremities, Study participants of the experimental group received the BCAA supplements (5.5gms) 90mts before the workout 30mts after workout between lunch and dinner and prior to bed time, for the whole training regime daily between meals for 12weeks. After 12 weeks post test was conducted for both the groups, and the subjects were asked to explain the cycle of pain and recovery.

Statistical analysis

Correlated one tailed 't' test was calculated between the pre test and post test of both the group. Subjective analysis was also done on the subjective data collected by the subjects.

Findings of the study:

On the basis of analysis of data statistically and subjective analysis of experimental and individual cases the following findings have been noted. The mean value of pre-test and post-test of experimental group and the 't' ratio have been shown in Table 1.

Table 1: Mean value and 't' Ratio of Experimental group

Mean of Pre-Test	Mean of Post-test	Mean Difference	SE (DM)	't' Ratio
22.3	18.7	3.6	1.57	1.69

*significant at 0.05 level

't' needed for significance 2.13 (For one tailed test)

It is evident from the table 1 that mean differences between the pre-test and post-test of experimental group is not significant having the 't' Ratio Value =1.69. The 't' ratio needed for significance at 0.05 level for one tailed test with df(4) is 2.13 this clearly indicate that BCAA supplements had given a recovery effect on muscle soreness and the athletes recovered and performed well in post-test.

The mean value of pre and post test of placebo group and the 't' ratio has been shown in table 2.

Table 2: Mean value and 't' Ratio of placebo group

Mean of Pre-Test	Mean of Post-test	Mean Difference	SE (DM)	't' Ratio
31.4	22.4	9.0	3.76	2.34*

*significant at 0.05 level

't' needed for significance 2.13 (For one tailed test)

It is evident from the table that there is significant difference between the pre and post test means of placebo group having the 't' Ratio value = 2.34. the 't' ratio needed for significance at 0.05 level for one tailed test with df (4) is 2.13.

This indicates that placebo group did not recover with the rate of experimental group and the athletes did not perform well in the post test. The recovery cycle was analyzed, as it was found that all most all the cases of muscle soreness had reduced within one or two days. In few cases recovery was attained with a day and the athletes were able to do his daily routine work.

Conclusion

On the basis of analysis of data finally it was concluded that, BCAA is useful in reducing muscle soreness. DOMS is a regular and painful part of progressing and overloading muscles in order to achieve changes in strength. In an effort to alleviate muscle soreness, this research indicates that BCAA supplementation may be effective in decreasing muscle soreness in many types of exercises, after analyzing pain and recover cycle subjectively as it was found that all most all cases muscle soreness reduced within one or two days, as well as promoting an anabolic environment that is often desired with resistance training. While an exact amount for optimal BCAA supplementation differs from individual to individual, it is suggested that physically active individuals do not need to consume large dosage of BCAA to reduce muscle soreness. Instead, a consistent ingestion of required amount of BCAA's is helpful in reducing DOMS.

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