

Delayed Onset Muscle Soreness Attenuation by Acute Consumption of Essential Amino Acids

ANDI JOHNSON, KLAUDIA SZYCH, ARIEL GOMEZ, ANNAJITA RUBIO, SARAH MASSEY, ABRAHAM GOMEZ, LORENZO JUAREZ, SHANNON JACKSON and MATTHEW A. BARLOW

Human Physiology laboratory, Department of Biology, Eastern New Mexico University, Portales, NM.

Category: Undergraduate

Advisor / Mentor: Barlow, Matthew (Matthew.Barlow@enmu.edu)

ABSTRACT

BACKGROUND: Essential amino acids have been known to be necessary for protein nutrition whether they are obtained by eating proteins or by a formula of the essential amino acids. Studies have consistently demonstrated the acute benefits of protein supplementation on post-exercise muscle anabolism, which may facilitate the recovery of muscle function and performance. However, when protein supplements have been provided in research studies, acute changes in post-exercise protein synthesis and anabolic intracellular signaling have not resulted in measureable reductions in muscle damage and enhanced recovery of muscle function. **PURPOSE:** The aim of this study is to implement a specific content of essential amino acid supplements combined with a resistance and aerobic exercise routine and quantify the difference in strength, endurance and flexibility, during the time commonly associated with delayed onset muscle soreness (DOMS), between the first and last days of exercise. **METHODS:** In this study, 24 participants (12 EAA and 12 Controls) completed an exercise routine (sit and reach, shoulder flexibility distance, Maximum Voluntary Contraction Isometric Handgrip, 20 meters sprint (timed), push-ups (reps), 5 minutes rest (¼ bottle consumption of drink), chin-ups (reps) or flexed arm hang (time), 5 minutes rest (¼ bottle consumption of drink), dips (rep), 10 minute rest (¼ bottle consumption of drink), and a 1.5 mile run) for three consecutive days. At the end of first and last exercise visit, a venipuncture was performed to measure Creatine Kinase levels to be later measured by a commercial ELISA kit. The study participants were randomly assigned to either the EAA (6.6g) per day (EAA + Gatorade) group or the control (Gatorade) group. The study design is a double blind as neither the recording analysis researchers or study participants were aware of the assigned group. **RESULTS:** Both groups maintained the initial flexibility respectively throughout the three days of exercise. However, the EAA group randomly was more flexible ($p > 0.05$ Sit and Reach) at the first visit. For the resistance/power activities, the EAA group improved over the three day in the repetitions for push-ups and dips compared to the controls and from day 1. The control group had no significant change from day 1 to 3 in dips and chin-ups. The EAA group was faster in the 20-meter sprint and 1.5 mile run on the last day of exercise compared to the first while the control group was slower ; however, both group's changes were not significant. **CONCLUSIONS:** The EAA group had an improvement over the three days of exercise compared to the placebo group. The data given in the results supports the initial claim that acute ingestion of this amino acid supplement provides increased athletic performance in sedentary participants as well as decreases the DOMS symptoms accompanied with the commencement of a new exercise regime. Research reported in this publication was supported by a research contract with Calwood Nutritionals.