



StemEnhance® improves physical performance of weight training in non-professional participants

Introduction

StemEnhance (SE), a novel mobilizer of Bone Marrow Stem Cells (BMSC), has been shown in a previous double blind placebo controlled cross over study to support the natural release of BMSC, increasing the number of circulating stem cells by 25% with one gram consumption. BMSC are known to migrate to sites of tissue in need of repair and renewal. Anecdotally many people have reported improved skeletal muscle strength, stamina, overall performance and speed of recovery while consuming SE. It is known that training causes delayed onset muscle soreness (DOMS). DOMS is due to micro tears of the muscle fibers and reduces one's ability to train to the fullest, thereby reducing the benefits gained from workout sessions. Accelerated recovery from such small injuries by stem cells would lead to improvement in overall muscle function. The goal of this study was to document improvements in physical performance with the use of SE.

Methods

This pilot project was an open-label study with men and women between 21 and 60 years of age, with unspecified fitness level at the time of entry to the study.

Using high-tech equipment, a group of 5 exercises, namely Leg Extension, Bench Press, Pull Downs, Overhead Press and Two-Arm Curl were used at the first session to establish the participant's one repetition maximum strength level (One-Rep Max), and their active, pain free range of motion. This established baseline was used to re-evaluate a

participant’s improvement during the course of the study. During the second session, muscle endurance was established for each participant using typically 70-80% of the participant’s One-Rep Max. In this study, muscle endurance was defined as the ability to perform safe movements against resistance until one cannot perform another complete-range-of-motion. For the rest of the study, participants completed two supervised 30-minute sessions per week. The supervision was limited to insuring safe and consistent exercise routines. For each exercise, the total weigh lifted was quantified every session. At Week 9 and 20, participant were asked to do as many repetition using the One-Rep Max established during the first session.

StemEnhance (SE) was consumed, according to the schedule shown in Table 1. The first two weeks served to establish a baseline, without consumption of SE. At the onset of the third week, participants were randomly separated in two groups. Each group consumed SE for a period of 6 weeks: Group 1 began consuming SE in the 3rd week and stopped after the 8th week, Group 2 began in the 5th week and stopped after the 10th week. The amount suggested was 4-8 capsules per day.

Table 1.

Number of SE capsules per day										
	Wk 1	Wk 2	Wk 3	Wk 4	Wk 5	Wk 6	Wk 7	Wk 8	Wk 9	Wk 10
Group 1	0	0	4	5-7	8	8	8	8	0	0
Group 2	0	0	0	0	4	5-7	8	8	8	8

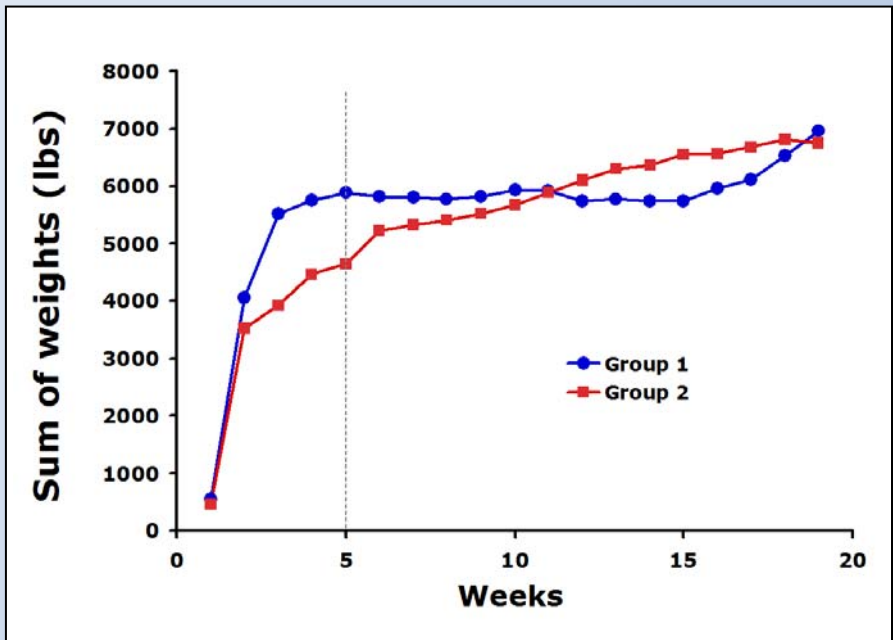
Results

One-Rep Max

When asked to do one repetition with the maximum amount of weight doing curl, squat, bench press, overhead and rowing, globally the participants lifted an average total of 545 pounds. When asked to use the same weight and make as many lifts as possible, on average participants could lift the same One-Rep Max weight 10 and 14 times after 9 and 20 weeks, respectively.

Weekly Progression

Every week, participants were asked to use 70% to 80% of their One-Rep Max established at day 1, and make as many repetitions as possible. The number of repetitions was recorded and the total number of weight calculated. Group 1 began consuming SE from day 1 whereas Groups 2 began consuming



SE from Week 5 and on. During the first six weeks, Group 1 lifted significantly more weights than Group 2. At Week 2, Group 1 lifted on average 1.5 times the amount of weight lifted by Group 2. This difference between the two groups disappeared two weeks after group 2 began consuming SE. During the study, a few participants revived old injuries and had to abstain from working out for a few sessions. These participants all reported that they recovered from their injury much faster than previously and could rapidly return to the gym.

Discussion

It is now well known that BMSC migrate to sites of injury in the body. This has been shown in most tissues including brain, liver, pancreas, heart and skeletal muscle. In the case of skeletal muscle, severe injuries were shown to trigger significant BMSC migration and BMSC-derived regeneration. In a recent study, SE was shown to support the repair of muscle tissue following a severe injury. Although no measurements were made to assess the actual migration of BMSC in the muscles of the participants, it is fair to assume that BMSC-derived repair took place. Accelerating the rate of repair process is

likely to be the reason why the participants in Group 1 showed more rapid progress at first, until Group 2 began consuming SE.

Stress to a muscle or muscle group can also cause micro tears. Athletes refer to it as the “good soreness or good pain” because as the body repairs the micro tears in the muscle fiber, this results in the subsequent improvement in the function of the muscle. Unlike a large tear which will in general result in a weakened muscle even after healing, the micro tears are small enough that the subsequent repair will improve the function of the muscle.

The ability of a person who is training to improve is partially dependent on their ability to recover quickly from the micro tears so they can continue to train. Improvement in any sport is not only dependent on muscular endurance and strength but also cardiovascular endurance, flexibility, balance, coordination, agility and the ability to integrate all these components so that the desired effective movement is achieved.

When a person is doing less activity during the recovery from micro tears they are losing the ability to train all the other components involved in participating in sport. At the level of the highly competitive elite athlete this loss is crucial. The more quickly a person can recover from these micro tears, the more quickly they can build up to a higher level of sports performance.

In addition to allowing the body to resume a higher level of performance more rapidly, assisting in the repair process also reduces the risks of injuries associated with muscles weakened by lingering micro tears. So the rate limiting factor is generally the ability for an athlete to recover enough so that they continue to train without increasing the possibility of serious injury.

For the amateur athlete, fitness enthusiast, and professional athletes SE constitutes a unique strategy not only for improved physical performance but also to reduce the risk of injury.