AN INFORMAL DOUBLE-BLIND STUDY TO EVALUTATE MUSCLE STRENGTH

In Athletes Treated with the MYOPULSE

(Impedance-Controlled Micro-Current Muscle Stim)

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Preliminary Discussion

Both authors of this study were competitive track and field athletes in college (Stanford and Northwestern) approximately twenty years ago, and are still active in sports and physical fitness. Dr. Scott, for fifteen years, worked as a sport psychologist helping athletes to maximize their performance; and Dr. Picker, using a holistic, nutritional approach to medicine, has also helped athletes reach their maximum level of performance. Drs. Scott and Picker have a private practice together in Berkeley, California. The core of their practice revolves around their use of the Electro-Acuscope, a transcutaneous electrical nerve stimulation instrument. They have had over 90% success rate using the Electro-Acuscope for problems ranging from headaches, asthma, menstrual cramps, chronic pain, tendonitis, and a wide assortment of athletic injuries.

Despite the extraordinary success the authors have had working with the Electro-Acuscope, they greeted with skepticism claims that the inventor of the Acuscope had developed a new ìnstrument, the Myopulse, which could significantly increase strength levels in athletes. The authors had heard all too many similar claims during their twenty-five years involvement in competitive athletics. However, when a ten-minute treatment with the Myopulse significantly improved a fifteen year old injury to Dr. Scott's left quadricep, "the injured leg felt better than the good one", the authors agreed to use the Myopulse on several athletes they were seeing in their private practice.

INITIAL RESULTS: Anecdotal Background

Two top bodybuilders and a world record-holder in the 400 meter dash were treated. The following is a summary of Dr. Scott's experience treating these three athletes.

CASE # 1 - Bodybuilder, Barry Morris

Barry Morris is a thirty-five year old attorney with a law practice in Oakland, California. He has been a serious bodybuilder for the past three years. Over a two week period, Morris received one-half hour Myopulse treatments on his major muscle groups. Here are some excerpts from a diary he kept at the request of the authors:

Dec 29: "I received my second treatment 1/2 hour before today's workout. 1 did 220 lbs for 6 reps with the close grip bench press; previously the most I had been able to do was 4.I then did 240 for one repetition. This is the first time I've ever done 240. The last time I tried it, the weight didn't budge from my chest. In the same workout I also did 3 repetitions in the seated curls with 60 lbs.; I had never been able to use 60 Ib. dumbbells in this exercise."

Jan. 3: “Today was the first time I had my legs treated. The treatment was right before my workout. The last time I worked on my legs, I squatted with 425 lbs., but was unable to do 435.Today I did. 435 Ibs. and then 450 Ibs. - a 25 Ib. increase. It’s hard to describe exactly the subjective feelings following the treatment exclusive of the difference in the weight I handled. Most prominent among the effects seems to be a feeling of increased smoothness as I do the workout, but I suspect that’s because it’s easier to handle the weights, and therefore one can do the exercise more smoothly.”

Four weeks after his last treatment, Barry had still maintained his strength increases.

CASE # 2 - Bodybuilder, Dennis Karp

Dennis Karp is a twenty-five year old former college football player who recently finished law school. He’s also Barrv Morris’ training partner. Dennis, like Barry, received six 1/2 hour treatments spread over two weeks. Here are some excerpts from his workout diary:

Dec. 27: “Medium heavy workout. Felt like my legs were more in the groove. Didn’t burn out as fast. My injured knee which had been very sore felt fine after the treatment.”

Jan 2: “Had that in the groove feeling again. Felt strong and lifted heavy; e.g., 285 lbs. incline bench. I felt much stronger on all my benches. I am impressed!”

Jan. 5: “Was very strong in the arms. Did a close grip bench with 260 Ibs. - a 20 Ib. increase over my previous best. Good strong workout. My injured forearm hardly bothered me at all - seems to be healing due to the Myopulse.”

Jan 7: “Treatment on my legs. They felt great – loose, strong, and full of energy.”

Four weeks after his treatment, Dennis, like Barry, had maintained his strength increases. He also found that the treatments with the Myopulse were very effective on several weight lifting related injuries that had previously interfered with his ability to lift.

CASE #3 - Gold Medalist, Lee Evans

Lee Evans won two gold medals in track and field competition in the 0lympic Games in Mexico City. He was the world record holder for the 400 meter dash. After being retired from competition for several years, Evans began preparing for a comeback. “Treatments from Dr. Scott with the Myopulse after a hard workout immediately took away all the fatigue and soreness in my legs. This allowed me to train hard two days in a row just like I did when I was in college.” Evans commented that three days before his first competition race at the San Francisco Foot Locker Classic, he had badly strained his right calf during a hard training session. “My calf had a knot inside it”, grimaced Evans. “It was too tight to even touch.” Dr. Scott treated Evans for approximately one-half hour shortly after the injury occurred, and then gave him two fifteen minute treatments daily for the next two days. Evans competed in the 600 yard run in the Foot Locker Classic with no pain in his calf. “Throughout my career I’ve received the best sports medicine treatments all over the world, and there’s no other treatment I know of that would have enabled me to run tonight” Evans told an ABC television reporter moments after his race. The authors were sufficiently impressed by the anecdotal evidence of the above mentioned athletes that they undertook the following double-blind study.

BACKGROUND to DOUBLE-BLIND STUDY:

The Various Methods of Increasing Athletic Performance.

When the authors were competitive high school athletes, the consensus of opinion among coaches, trainers and medical doctors was that an athlete's strength level was determined primarily by heredity and that littIe could be done to significantly improve muscle strength. Weight training was frowned upon - for the most part - as an activity that would create muscle-bound athletes. It was thought that weight training would decrease rather than improve sports performance. Today, it would be next to impossible to compete on the national or international level in a sport where muscle strength is a primary factor without the benefit of weight training. It is now widely accepted that a properly designed weight training program can significantly improve muscle strength and sports performance. Professional football teams, for example, have strength coaches whose job it is to design weight training programs to increase strength and improve performance.

WEIGHT TRAINING is a safe, non-invasive, drugless approach to enhancing muscle strength. These features are important reasons why it has become accepted as a natural part of the training system for nearly all top level competitive athletes.

SPECIAL DIETARY PROGRAMS and certain drugs have been promoted at various times as means for enhancing strength and improving performance, but even today this remains an area of considerable controversy. For every doctor and trainer who advocates a high protein diet, for instance, there is an equal number who will point out the perils of such a diet.

The most controversial strength enhancing technique widely used today is ANABOLIC STEROIDS. While the medical community is still debating whether anabolic steroids can actually increase muscle strength, nearly all the international governing bodies for amateur and professional athletics have banned the use of steroids. But while there is still debate over whether steroids can increase muscle strength, there is no doubt over the serious side effects they can have on the user's health.

More recently, sport psychologists have begun to play an important role in the sports world. MENTAL ATTITUDE has always been recognized as a key factor in sports performance, but only recently have specia l techniques been developed that are supposed to increase strength and improve performance. Sport psychologists differ widely among themselves, however, and this is still a controversial area of expertise.

The authors believe the use of a transcutaneous electrical nerve stimulation instrument such as the Myopulse is worthy of serious study for, if effective, it would be a safe drugless, non-invasive approach to increasing muscle strength and improving sports performance. An earlier instrument, the Electro-Acuscope, also developed by the same manufacturer, Biomedical Design Instruments, Inc., has proven to be an extremely effective form of treatment for athletic injuries. It is currently used in training rooms of professional and college athletic teams. It is being actively used by members of every medical profession and especially in sports medicine.

DOUBLE BLIND STUDY

THE DESIGN

The study was designed to experimentally evaluate the claim that the Myopulse, a form of transcutaneous electrical muscle stimulation, increases muscle strength in athletes. The authors feeI that, if it is effective in increasing muscle strength, the Myopulse could also play an important role in helping athletes recover from injuries as well as in rehabilitative medicine in general. It was with these hopes and concerns that the authors undertook this study.

THE INSTRUMENTATION: PRINCIPLES OF OPERATION

The Myopulse is designed to “communicate” electronically with the musculature of the human body. This occurs while it is receiving (monitoring) input, from the tissue and transmitting corrective electrical stimulation. The effects are accomplished through various equilibrium principles that are stored in a very unique, patented, integrated circuit chip and other discrete components. The instrument monitors the actual values or conditions of the soft tissue in the treatment area through input from contact electrodes. The internal micro-processors of the Electro-Acuscope measure the accumulated feedback as electrical impulses are sent from the brain and spinal cord, to the contractile tissue of the muscles. By a unique filtering and amplification process within the Myopulse, the electrical firing potentials of the contractile tissue is compared to the standard equilibrium stored in memory. The Myopulse then adjusts its own sinusoidal waveform output accordingly, thus bringing the parameters monitored in the muscle fibers to within the optimal range.

TIIE SUBJECTS

Thirty subjects were randomly divided into two groups: both groups had 15 people. One group received actual treatment (read/treat stimulation by the Myopulse), and the other, placebo (no input or output from the equipment). The thirty subjects were males ranging in age from 18 to 35. lt was required that they had been working out with free weights, Nautilus. or Universal equipment a minimum of one hour, three times a week for al least three months. Because of the diversity of exercise equipment being used by the participating athletes, and the variety of muscle groups being treated, it was impossible to establish a true universal baseline. It is generally agreed that bodybuilders are acutely aware of their own performance capability. It was requested of all participants in the study to make careful observation of their capacity during each workout. .

PROCEDURES

The subjects were instructed to continue with their regular workout routine for the first three treatments and pay particular attention to how the workout felt to them. At the completion of each of their workouts following each of their first three treatments, the subjects rated how that workout felt. (See Figure A.) Starting with the fourth treatment, the subjects were told they could try to increase the amount of weight being lifted during their workout. After each of these treatments, the number of pounds lifted was noted and compared to their individual norms. (See Figure B.)

TREATMENT PROCEDURE

The subjects and the therapist administering the treatment were both naive as to whom was receiving real stimulation. The same muscle groups were treated in the same manner in all subjects.

The subjects' hands or feet were placed on large plate electrodes; a roller electrode completes the circuit. The roller was moved very slowly over the muscle group being treated. Using the roller accessory with sufficient conductive electrolyte solution at the setting of 600 (uA) and 0.5 (Hz) causes no electrical sensation in a person being treated by the Myopulse.

Therefore, the subjects in the actual treatment group experienced the same sensation (a light but firm rolling pressure) as those in the control group. All subjects felt only the surface of the smooth brass alloy roller electrode gliding over various muscle groups.

Three one-half hour treatments were given weekly for two weeks. The setting used for all treatments given to the subjects receiving actual stimulation was one-half cycles per second and six hundred microamperes (millionths of an ampere).

The same procedure was followed for the control group except that the instrument was not turned on, thus no stimulation was administered. The instrument face (the control panel) was turned away, thus, in both cases the LEDs were not visible and the instrument's auditory feedback was not available to subjects or therapist.

All of the subjects were told there was reason to believe the Myopulse increased muscle strength in athletes thereby improving athletic capability and that they were participating in a scientific study to determine if this was true.

SUMMARY OF RESULTS

All fifteen subjects in the treatment group reported significant strength increases as well as greater performance during their workouts. The subjects in the control group reported minimal strength increases and/or performance enhancement. These results positively support the claim that the Myopulse can improve strength in athletes.

After the first treatment, all fifteen subjects in the group receiving real stimulation were excited about how good they felt:" I felt great"; "Much stronger"; "More in the groove", were comments regularly heard from all of the subjects in this group. The fifteen subjects in the treatment group came for all six treatments. None of the subjects in the control group made remarks similar to those mentioned above, although three of the subjects in this group did indicate they felt a little better. Two of the subjects in the control group dropped out complaining "the equipment didn't work", before completing the six treatments.

GRAPH ONE shows how the responses of the members of the treatment group compared to those of the control group in evaluating how they felt during their workouts after the first three treatments. It is clear there is a dramatic difference between the two groups.

GRAPH TWO shows how the treatment group compared to the control group when subjects were told they could attempt to increase the amount of weight they were using during their last three workouts. Once again, there is a distinct difference between the two groups.

In terms of spontaneous verbal response and the two evaluation forms, there was clear evidence that the Myopulse increased strength level by approximately 15% in the subjects receiving real stimulation. Subjects in the control group reported strength increases of approximately 2%.

CONCLUDING REMARKS

There is no doubt in the authors' minds that the evidence is conclusively impressive. We (Drs. Scott and Picker) continue to use the Electro-Acuscope and Myopulse in combination in our practices. We continue to see consistent results in pain management and rehabilitation cases. We are convinced that a serious study in a more closely controlled clinical setting would even further support the claim that the Myopulse increases muscle strength in athletes. It is our expressed personal conviction that the Electro-Acuscope and Myopulse in combination with weight training can provide a safe, effective, noninvasive approach to rehabilitation and improvement of sports performance.