Microcurrent Therapy: "Wave" of the Future?

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Microcurrent therapy is one of the most controversial. Confusing. Frustrating. Amazing and fascinating modalities available to the physical therapist. How can one modality create so many different emotions in one clinician? Each day therapists working with microcurrent became amazed with the clinical results in some cases and frustrated with the results in others, Probably the greatest frustrations encountered are the dearth of professional research and the difficulty in determining the ideal protocol of use for a specific patient.

Microcurrent is a much smaller current than was previously available for clinical use. Historically, the approach has been that if some electricity is good, perhaps more is better the microcurrent original thinkers and investigators have recently challenged this concept. Among them Dr. Robert Becker and Dr. Bjorn Nordenstrom. It has been demonstrated that trauma will affect the electrical potential of cells is tile damaged tissue.

Because electricity will always take the path of least resistance. Traditional electrical charges placed on the body will travel around the traumatized cells. A smaller current - one that can penetrate the cell and balance the cell electrically - can restore a more normal physiological state to the damaged cells. Small electrical charges may be helpful in initiating and perpetuating the numerous electrical chemical reactions in the healing process. Microcurrent Therapy: "Wave" of the Future?

Becker found a constant direct-current control system in his investigation of animals. It appears that repair occurs after an injury in response to signals that emanate from this electrical system. Becker refers to this as the current-of-injury, It has been suggested that the current of injury has become less efficient with evolution; therefore. Many animals have a greater capacity for self-healing than do humans. For example the starfish who is able to generate a new limb after injury. The

seemingly amazing results that we can obtain with microcurrent therapy may just be a matter of throwing an electrical switch that allows the heating to commence. (I) Nordenstrom also believes in the human electrical potential. He states that the human body has the equivalent of electrical circuits that play a very important role in healing. (2) Like transcutaneous electrical nerve stimulation (TENS). microcurrent is capable of decreasing or eliminating pain. In addition to the treatment of pain, microcurrent also appears to have a capacity for stimulating the healing process. Clinical observation clearly shows that microcurrent therapy does more than just block pain, because microcurrent is such a small current. Typically less than 600 microamps, there is no patient discomfort or even sensation during application. The various modes of application

adjustable treatment variables, and relatively few contraindications make it the modality of choice for a large variety of clinical problems.

Nocioceptive fibers, the free nerve endings sensitive to tissue dysfunction are found in variety of tissues including skin, fibrous capsule periosteum intra-muscular arteries, blood vessel walls, and in abundance In the blood vessels of adipose tissue. Deformation of Nocioceptive fibers may cause stimulation and therefore reporting of' pain to the brain specifically. for example, if nocioceptive fibers are located in a joint capsule and are reporting pain, it is usually due to a joint effusion. In order for this pain to be reduced, one of three courses must be he taken;

I. Medications - block the brain's realization of the pain.

2. TENS - block the afferent input of the pain to the brain..

3. Reduction of the joint effusion get rid of the cause of the pain. It is speculated that microcurrent works to decrease pain by reducing the cause of pain and altering the electrical activity surrounding the injured area- Microcurrent 5 very effective on areas of increased blood supply and therefore increased Nocioceptive fibers.

Muscle tissue. Periosteum, and joint capsule are areas often easily affected by microcurrent therapy A study of Cheng found that microcurrent is able to increase adenosine triphosphate (ATP) production three to five fold, augment membrane transport, which increases nutrients into the area and boost protein synthesis. This was found in animal skin studies using 50-1000 microamps of electricity. Interestingly ATP production actually decreases with 5000 microamps of electricity. (3)

The most versatile units available allow for the most variability in choice of frequency, current, and ramp. The ideal units for clinical use allow the therapist to treat with both pads and probe applicators. for more specific techniques. One of the units displaying this versatility is the Intellect 600MP. The intellect 600MP offers the therapist the desired variability of functions as well as a feedback mode wherein the therapist is able to search diagnostically for high conductance points in the body. Once the area is located, it may he treated to help reduce pain and muscle spasm. According to clinical research by Lynn Wallace, Ph.D.. P.T. (4). there are two general modes of treatment which produce maximum effectiveness. The pain mode is used to reduce pain in a patient. The pain mode consists of a short ramp of .01 seconds. a frequency of 30 Hz, and a current of 80-100 microamps. The pain mode is always followed by the ETR (Enhancement of Tissue Repair) or healing mode. The ETR mode consists of a longer ramp of 2 seconds. a frequency of .3 Hz and a current of 20-40 microamps. An average treatment includes 10 minutes on the pain mode followed by 10-20 minutes on she ETR mode. Treatment should be performed every other day, or daily for optimal results.

There are a variety of different methods and techniques to try when using microamp current. Most importantly when treating a body part with microcurrent. the placement of pads must follow an electrical pathway within the body. Pads may he placed from the origin to the insertion of a muscle following muscular electrical flow, down the pathway of radiating nerve pain. through acupuncture or trigger points, or medial/lateral through a swollen joint.

Microcurrent works best in combination with mechanics and therapeutic exercise. When used with a stretching program microcurrent therapy can encourage relaxation of the musculature causing a mechanical deformation. Microamp in

conjunction with exercise can encourage muscle re-education.

The effectiveness of microcurrent therapy has recently been clinically documented by Wallace ins study of 1,531 patients with a large variety of diagnoses 94% of the patients experienced a reduction in pain during the first treatment. The average number of treatments to achieve a zero/one pain level (zero to ten scale) was 3.8. Ninety percent of the subjects studied achieved a zero/one pain level in less than ten treatments. (4)

All the physiological rationale behind the clinical effects of this instrument has not been ascertained. It would appear to be more clinically effective than other form of electrical stimulation for the following reason

1. -The microcurrent unit is biologically more compatible.

2. -It is more effective in neutralizing the oscillating polarity of injured cells.

3. -The current under 600 microamps has a positive effect on increasing local availability of ATP.

4. Microcurrent has a positive effect on increasing cell permeability.

3. Microcurrent increases local protein synthesis Microcurrent therapy will continue to he controversial until a substantial number of clinical research studies are published. In order for confusion and controversy to rest. supportive scientific research in this area must be encouraged.

References

1) Becker.RO: The Body Electric. New York

William Morrow and Co. Inc. 1983

2) Nordenstrom.B: Biologically Closed Electrical Circuits, Nordic Medical Publications. Uppsala. 1983.