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Clinical Applications and Effects of EDiT®* and Endosan®* Treatment on Diabetic Neuropathy and Gangrene of the Toe

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ABSTRACT

A group of 25 diabetic patients with severe diabetic neuropathy experienced relief of painful nocturnal pain and regained normal revascularization, normal sensation, and normal EMG after a series of Endosan® treatments and the alternation of Endosan/EDiT treatment. One patient with diabetic gangrene of the left foot recovered totally with revascularization and growth of new tissue.

Keywords: **EDiT; Endosan; interferential treatment; diabetic neuropathy; diabetic gangrene; revascularization**

INTRODUCTION

Interferential treatment (part of the EDiT treatment concept) was introduced by the Austrian physician Hans Nemec in 1949 as a means of applying electroceutical energy of varied therapeutic frequencies to human tissue. Two different pure unmodulated currents of medium frequencies (4000 and 4100 Hz) were crossed

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to produce electrical interference. Thus, a new frequency of summated therapeutic intensity was created at any point within the body where these two currents (waves) joined or crossed each other. The frequency of the resulting wave equalled the difference between the crossing waves, that is, 100 Hz.

Endosan is a new electroceutical treatment that was discovered by Doctors Hansjurgens and May. Endosan is accomplished by crossing two identical pure sinusoidal medium-frequency currents with specific phase orientation. This results in a new current of summated therapeutic intensity which can be unidirectionally directed into the depths of human tissue. Endosan is associated with regeneration, enhancement of metabolism, the diffusion process and analgesia. While the treatment is being applied, a complete nerve block results in potent analgesia while longer-lasting relief is accomplished through a balance of metabolic concentration differences and increased enzyme synthesis. As a result of increased activation energy and of electrovibratory response, metabolic end-products and pain and inflammation mediators are redistributed and more efficiently eliminated by the body.

Treatment application of electroceutical energy via EDiT or Endosan stimulates different physiological effects in living tissue. Lower frequencies (below 1000 Hz) have action-potential producing stimulative effects including neuropeptide (endorphin) release. Higher frequencies (above 1000 Hz) stimulate increased cyclic AMP formation necessary for enzyme synthesis and the redistribution of pain and inflammation mediators away from the pathological tissue region.

EDiT/Endosan treatment in peripheral vascular disease with an endocrine etiology has been evaluated in 25 patients with severe classic diabetic neuropathy including one with severe gangrene of the toe. In diabetes, accumulation of sorbitol in Schwann cells causes osmotic damage with segmental demyelination. Peripheral nerves are probably affected by small vessel disease. Ischemic changes in the nerve presumably result from proliferation of the endothelium in blood vessels and abnormalities of the capillaries.

Alternating stimulative treatment with different electroceutical energy frequencies results in vasoconstriction and vasodilation in muscles and nerve synapses. Such effects are reflected by the changes in the activity of acetylcholinesterase. The effect of catecholamines, which is evidenced by an anticurare effect and also by the ability to augment the repetitive firing and twitch potentiation produced by neostigmine and other drugs, is presumably due to the ability of EDiT/Endosan to increase the release of acetylcholine at nerve endings. Vasodilation produced by EDiT treatment has distinct analgesic and revascularization effects, which lead to rapid improvement of blood supply and elimination of pain in lesions of peripheral myelinated nerves. This probably accounts for the effectiveness of alternating Endosan and EDiT treatments, since Endosan applies primarily in metabolic or vascular neuropathy. The same approach is also effective in many other inflammatory clinical conditions, especially in pelvic or nephrotic cystic inflammations.

CASE HISTORIES

A 47-year old female patient with diabetes developed severe neuropathy manifested by complete bilateral loss of sensation and of vibration and position senses in the lower extremities, accompanied by deep pain characterized by throbbing. Three weeks after the appearance of these symptoms she developed gangrene of the left foot with evidence of occlusion. A blister on one toe developed into progressive gangrene, for which an orthopedist advised amputation of the toe. Antibiotics were administered as part of her routine treatment and the patient was started on Endosan electroceutical treatment twice a day, 15 minutes each session.

After eight treatments, revasculation started, characterized by complete return of sensation, cessation of pain, reduced inflammation, and arrest of the progressive gangrene. The protocol treatment was changed to an alternation between Endosan and EDiT treatment at 50 to 150 Hz (pain management program on the Nemectron EDiT® system). After 16 treatments, complete arrest of gangrene with new growth of tissue was noted. Virtually all pain was relieved and pharmaceutical analgesics were withdrawn.

EMG prior to Endosan treatment showed a reduced number of motor unit potentials during the acute and chronic stages as well as reduction in the number of polyphasic wave-forms with increased duration and amplitude. Fibrillation potential and positive sharp waves were also apparent. Repeat EMG appeared normal, with no fibrillation or denervation potentials. The patient continued to receive treatment intermittently. Fasting blood sugar level remained the same and the patient continued regular pharmacologic therapy and diet.

Twenty-one patients with characteristics of diabetic peripheral neuropathy also received a total of 15 Endosan/EDiT treatments. Patients recovered promptly with relief of nocturnal pain and cramps. Pharmaceutical analgesics were discontinued. Two patients, also continually free of symptoms, showed some abnormality of the EMG, especially denervation potentials. One patient's EMG did not change even though there was relief of 95% of symptoms. The single most common finding was the return of normal deep tendon reflexes with normal knee and ankle jerk in all patients.

DISCUSSION

Experience has shown that the application of EDiT treatment at specific frequency pulses and the new Endosan electroceutical treatment influences the peripheral vasculature promoting nerve and cell nutrition while stimulation of motor nerve fibers results in excitation of the muscle fibers and muscle contractions. This has two effects on the blood flow. Energy is used up, the metabolic rate is increased, and blood flow is enhanced in the region of stimulating muscles. In addition, through the contraction of the muscle group an active stimulation of the venous backflow occurs. Vasoconstriction also influences blood flow and lymph transport at this time. Using specific electroceuticals of ten pulses

per second (p.p.s.), nerves in the sympathetic nervous system do not lose their capacity to respond to stimulation, that is, they are not fatigued. Therefore, the vasoconstriction which is necessary to treat inflammation and edema, and to activate the smooth muscles of the vascular and lymphatic vessels occurs. Vasoconstriction achieves these effects by: pushing intravascular fluid in a central direction to the heart; reducing the influx from arteries; and enabling the extracapillary fluid to penetrate the intravascular space to improve the drainage function of the capillary system.

Vasodilation will occur with electroceuticals of less than 10 p.p.s. above motor threshold. Contradictions require more energy which must be produced by metabolism. Consequently, production of CO_2 (an important vasodilator) is increased.

Asymmetic neuropathy or mononeuropathy is due to metabolic abnormalities of the neurons of Schwann cells, whereas symmetric or focal neuropathy is due to vascular occlusion and ischemia. Ulcers on the plantar aspect of the foot in Charcot joint neuropathy are due to weakness of the intrinsic muscles of the foot and consequent abnormal pressure distribution. Therefore, the application of Endosan and EDiT treatment is not only effective with respect to peripheral vascular dilation, it appears that it improves or strengthens the intrinsic muscles of the foot, relieving abnormal pressure distributions. We have yet to evaluate the effects of these new treatments on diabetic mononeuropathy of peripheral nerves which most frequently occurs at sites of external pressure or entrapment (tarsal tunnel) with the manifestation of foot drop.

We believe, however, the results achieved with Endosan/EDiT electroceutical treatment is as effective as aldose reductase inhibitors and glycosylation.

There appears to be enough evidence to encourage the use of Endosan/EDiT treatment and the alternation of Endosan and EDiT treatment in diabetic neuropathy. These treatments, especially Endosan, have placed us at the threshold of discovery and it is time to apply our knowledge in other clinical settings.

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