The Use of Electronic Biofeedback for the Management of Post-Herpetic Neuralgia – A Report of 3 Cases

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Abstract

The purpose of these case reports is to describe treatment of three consecutive patients with post-herpetic neuralgia using a bioelectronical device (SCENAR). The instrument is approved as a Class II device in the United States. The electrode of the device was stroked gently over the involved skin area for up to 15 minutes per session. No more than 5 sessions over a 3-week period was required. All patients experienced substantial relief of pain from the first treatment. One patient required only 1 treatment lasting 10 minutes. The other 2 patients required 4 to 5 treatments over a 3-week period. One patient required a treatment for skin itch after one year with a follow up period of 6 months to 24 months. An electronic biofeedback device (SCENAR) may be successfully utilized in the management of post-herpetic neuralgia.

Introduction

Herpes zoster is a relatively common disease with an incidence of 1 to 5 per 1000 patients per year. The disease affects the ophthalmic branch of the trigeminal nerve in 20% of cases and is known as herpes zoster ophthalmicus. Typically, the first division of the trigeminal nerve involving sensory innervation of the brow, forehead, and scalp is affected on one side with blister skin lesions extending to the midline. If blisters appear along the nose it is often associated with eye inflammatory involvement. However, after the blisters disappear, the patients may experience persisting neuropathic pain that, if it persists more than 1 month, it is termed chronic post herpetic neuralgia (PHN). The risk of developing PHN is higher with increasing age of the patient and represents a major public health issue. Various types of medicinal treatment plans have been utilized with varying success. [2] These medicines include off-label uses of anti-depressants, opiods, anti-convulsants and topical analgesics. There have been a limited number of randomized trials with mixed results. Additionally, symptoms from medication include anti-cholinergic effects, sedation, postural hypotension from tricyclic anti-depressants and dizziness, and somnolence.[3] Constipation and sedation from opiods make these drugs poorly tolerated in the elderly. Topical medication, such as Lidocaine patches (local anesthesia) and capsaicin extracts have also been utilized to treat PHN with limited success. It is generally acknowledged that post herpetic neuralgia is difficult to treat with usual analgesics.

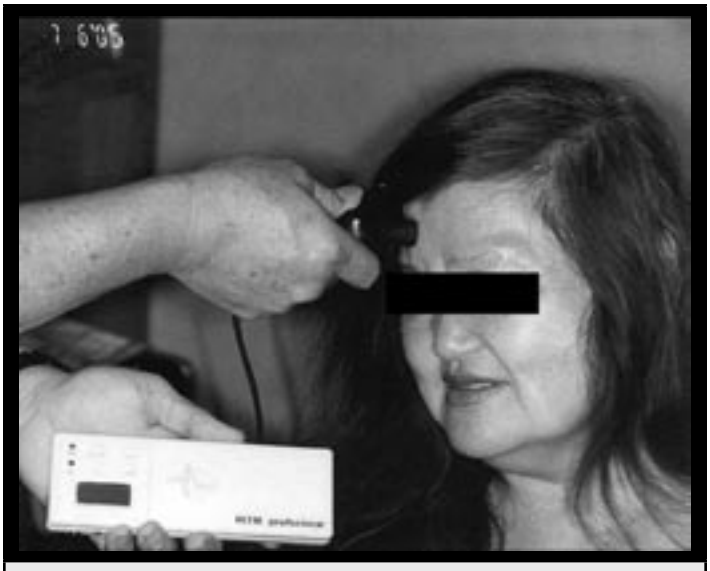
Biofeedback

Biofeedback as defined by the National Library of Medicine, medline database, is a process that utilizes instrumentation to give a person immediate and continuous signals of change in his/her body.

Biofeedback is a well-accepted therapeutic modality. Electronic devices are often utilized in biofeedback therapy. With the development of computers, instrumentation has improved. As the instruments became more sophisticated, it has become possible to develop a cybernetic loop between the device and the body. The body's electronics can be measured in response to a signal sent from the instrument, and the instrument can then send back a signal designed to modify the body's abnormal signal. The resulting response signal can then be measured and a new modifying signal returned with a continuous dialogue being established. Therefore, with modern biofeedback, the body's abnormal electronics can be modified. A team of physicians and scientists in Russia based at Sochi University and led by Alexander Revenko, MD, a neurologist, and Alexander Karasev, an electronics expert, in the late 1970's developed a computerized method of treatment biofeedback that was compact, efficient, and non-invasive.

Electronic biofeedback (EB)

The establishment of a biofeedback mechanism led to the development of a device in which output was dependent on the electric response of the skin. The term SCENAR, which stands for self-controlled neuro adaptive regulation, was applied to this new technology. It has been said that SCENAR is a brilliant marriage of Western electronic technology and Eastern energetic healing skills.[4] The device is similar to a hand-held massager. A small amount of electrical current is applied at the affected area. During the treatment the patient experiences a mild tingling sensation as a result of the biofeedback process.



SCENAR Photo.

Federal Regulations regarding EB

The Scenar/EB is currently accepted for FDA as a class 2 biofeedback muscle relaxation and re-education device. Federal law requires EB devices to be distributed by or on the order of a licensed health care practitioner. EB devices are regulated by the United States Food and Drug Administration under the provision of the US Code of Federal Biofeedback Device, Product Cod HCC, Class II. The maximum current is 70MA and the peak voltage is 250 powered by a 9 volt battery. The power output can be set by the operator to be detectable but comfortable to the patients. The random variations of the pulse amplitude from zero to a chosen comfort limit assure that no 2 impulses are the same. This feature discourages adaptation. A feedback mechanism is provided by the constant monitoring of the skin impedance.

The patient feels a gentle tingling, and all sensations are reported to the health practitioner. At no time is the level of electrical energy allowed to cause sustained pain because the health practitioner can instantly reduce the intensity at any report of an adverse sensation.

This report describes the outcome of the use of electronic biofeedback (SCENAR) in the management of post-herpetic neuralgia in 3 consecutive patients.

Case Reports

CASE 1: A 63-year-old Caucasian man had a history of severe left-sided brow and scalp pain following ophthalmic zoster. This patient received anti-viral medication within the first day of the skin lesions, with clearing of the blisters in 10 days. Despite anti viral treatment with acyclovir, the patient was unable to return to work because of the continued skin discomfort, despite use of opiod pain medication. He received electronic biofeedback treatment over the affected area for 10 to 15 minutes on July 9, 2004, 3 weeks after the clearing of the skin blisters. The patient reported a 90% reduction of pain within 12 hours of treatment, and he was able to return to work that next day without needing any oral pain medication. He continues to be pain-free 2 years since his affliction.

CASE 2: An 84-year-old Asian man presented with a history of continued debilitating pain over his right brow and scalp for 2 years following ophthalmic zoster. His management included 300 mg of gabapentin (Neurontin) twice daily, but he reported that he could not sleep through the night because of recurrent bouts of severe skin pain. He also complained the medication made him drowsy. The first treatment with the bioelectrical device was applied on August 12, 2004. After 12 hours, the patient noted a 50% improvement, and he was treated 3 more times over a 9-day period, during which time, the pain reduced to a level less than 10% of the original pain and he could sleep throughout the night without awakening to any skin pain. He was able to discontinue gabapentin. The patient has not experienced return of pain for 2 years following his treatment.

CASE 3: A 55-year-old Caucasian woman had severe persistent pain over the left brow and scalp for 1 month following a bout of ophthalmic zoster. This patient was treated with an anti-viral as soon as the skin lesions appeared, and the lesions had healed. However, the patient was unable to sleep through the night because of intermittent bouts of burning sensation in the skin. She tried capsaicin topically without relief of her symptoms. She was treated with electronic biofeedback on May 19, 2005. The next day she reported she was able to sleep through the night, and said that there was an 85% decrease in the pain level. She received four additional treatments over a 1-month period for a slight persistence of symptoms. Each treatment was administered for a decreasing intensity of residual symptoms, the last being applied for only a "mild itching." She was 100% pain free for 12 months, but required a single additional treatment for "itchy sensation" over the same area 1 year after the initial treatment. She continues to be symptom free at this time, 15 months after the initial treatment.

Discussion

The pathway for pain relief is said to be the simulation of the C-fiber neural system. According to developers of this mode of electronic biofeedback, the C-fibers, which comprise 85% of all the nerves of the body, react most readily to electronic stimulation.[5] These fibers are responsible for the production of neuropeptides and other regulating peptides. The body apparently can become accustomed to a stable pathological state, which may be caused by illness or injury. The device is said to catalyze the process to produce regulatory peptides by stimulation of the C-fibers. It is these neuropeptides that, in turn, re-establish the body's natural physiological state and are responsible for the muscle retraining and relaxation. As the device is moved over the skin a tingling prickly sensation is felt. Most patients report a relaxed state of well being after the treatment with subsequent reduction in pain.[6] All 3 patients in this study had experience with other pain relief modalities such as narcotics, capsaicin skin treatment, and gabapentin without success prior to treatment by electronic biofeedback.

Although the response to EB has been favorable in 3 consecutive cases of PHN, this report is considered preliminary and anecdotal at this time. A standardized pain scale was not utilized in the present study. A controlled study with the instrument and a sham device and a standardized pain scale is required for full evaluation of this treatment modality.

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