

## Case Report

# A New Non-Pharmacological Approach in Treatment of Post-Herpetic Neuralgia

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### Abstract

**Background:** Reactivation of varicella-zoster virus results in acute herpetic skin blistering and rash. Persistent pain after resolution of skin rash for more than 3 months is known as Post-Herpetic Neuralgia (PHN). The incidence of PHN is unknown; it increases with age, being more frequent among patients aged above 50 years old. PHN interferes with daily works and social activity. The purpose of this article is to present 2 cases with PHN that achieved good resolution with frequency specific micro-current. **Content:** Two patients have been affected with PHN. Variety of drugs were used to manage PHN, but medications failed to control PHN symptoms. Patients were treated with Frequency Specific Microcurrent using frequencies found to be effective for PHN. On the initial visit, both patients complained about persistent burning, aching and stabbing pain that rate 8-9/10 on Visual Analogue Scale (VAS). On the third session, there is significant resolution of pain for the patient with thoracic pain. For the male patient with right trigeminal pain, improvement was noted on the eighth session. **Conclusion:** Despite present-day improvement in drug therapies to treat post-herpetic neuralgia symptoms, medications are still struggling to achieve control over PHN symptoms. FSM gives hope in the management of PHN. In the reported cases, FSM has been shown to be effective in treating PHN. This case report supports the use of FSM, but randomized clinical research is needed to examine the efficacy of frequency specific microcurrent.

### Introduction

Post-herpetic neuralgia is chronic refractory neuropathic pain that persists more than three months after resolution of the dermatomal herpes zoster eruption. Studies have shown the incidence of PHN is variable and age dependent. The incidence of PHN rises steeply after the age of 50 years. The incidence of PHN is estimated around 20% of individuals affected with zoster [1]. Potential risk factors have been reviewed in different studies and revealed only advanced age and ophthalmic localization that contributed independently to the incidence of PHN [2]. Other studies have shown independent contributions of old age, female sex, presence of a prodrome, greater rash severity, and acute pain severity to the incident of PHN. It seems that each risk factor may cast back different mechanisms that contribute to the development of PHN [3].

PHN occurs in the same dermatome as herpes zoster rash. The incurring damage to peripheral and central nerve results from reactivation of the varicella-zoster virus, which triggers an inflammatory process in those nerve tissues. The injury of

peripheral nerve and central pain pathways may develop a lower threshold in action potential, discharge spontaneously and possess a disproportionate response to stimuli, leading to peripheral sensitization and allodynia (pain without painful stimuli). The symptoms of PHN are variable and it can be divided into three types of pain: constant pain without stimulus (describe as burning or aching), intermittent pain without stimuli (describe as lancinating or stabbing pain) and pain induced by a stimulus but are disproportionate to the stimulus (hyperalgesia). PHN individuals may feel abnormal sensations, including paresthesia and dysesthesia [1].

The pathophysiology of PHN is not well known, but recent changes suggest multiple modifications in the afferent pathways at both peripheral and central nervous system levels. Pathologic studies show major degenerative changes in the involved peripheral axons, spinal dorsal ganglion, and dorsal root, as well as in the dorsal horn of the spinal cord. Interestingly, some investigators found inflammatory changes at multiple levels bilaterally affecting root, ganglia and nerve. Certainly, continuous inflammation has been suggested as one of the mechanisms that provide sustenance

for the pain in PHN. Protein and DNA of varicella-zoster have been detected in immuno-nuclear cells in patients with PHN months to years after the rash has disappeared [4].

This case report documents a new method of treatment of PHN. Frequency-specific micro-current has been used for more decades for various conditions. Specific frequencies from a list that came with a 1922 electrotherapy device are used with modern microcurrent devices approved in the category of TENS devices. Microcurrent devices deliver 1000 times less current than TENS devices. Microcurrent devices are approved for use in the symptomatic relief of pain but are not generally useful in PHN [5].

Two types of FSM machines were used on both patients, Precision Care and AutoCare machines. The Precision Care is a digital battery-operated two-channel three-digit specific microcurrent device, where 236 on frequency A and 435 on frequency B could be used (Figure 1). The AutoCare machine is a digital two-channel, three-digit specific microcurrent device programmed to run a sequence of specific frequency combinations in a protocol designed for the treatment of "PHN" (Figure 2).



**Figure 1:** Precision Care Frequency Specific Microcurrent Machine.



**Figure 2:** AutoCare Frequency Specific Microcurrent Machine.

### Case 1

A 53-year-old Kuwaiti male attended an oral medicine clinic complaining of facial pain that persisted after herpes zoster infection had resolved 8 months previously. The initial lesion started with a mucosal blister on the right cheek, then the lesion propagated the whole right maxillary dermatome (Figures 3 and 4). After resolution of the herpetic rash, pain with burning, aching and stabbing quality persisted with pain at 8-9 /10 on VAS (visual analogue scale with 10 being the worst-most severe pain and 0 being painless) (Figure 5). The patient was prescribed Lyrica and tramadol in an attempt to relieve pain, the patient refused to use the medications. Instead, he applied an ice pack on the affected area to achieve temporary relief. Medically, he was healthy and fit, but he smokes cigarettes (1 pack per day). The affected area was difficult to examine as he experienced extreme sensitivity to touch. When the diseased area aggravated, the lateral side of the upper eyelid became swollen with eye tearing. The use of FSM and microcurrent devices were discussed with the patient. The Autocare unit was set up on the FSM PHN program. The PrecisionCare microcurrent device was applied using the FSM frequency 236 hertz on channel A and 435 hertz on channel B which is thought to address the effects of the herpes virus on cell signaling. He was also given a course of 10 days of injection supplement of B complex vitamin. There was some improvement after the third session with pain reduction to 2/10 VAS. On session eight, he experienced good relief with pain rated at 1-2 /10 VAS. Patient was given small FSM machine to use whenever he needs it.



**Figure 3:** Beginning of Herpes Zoster Infection.



**Figure 5:** Patient with Post-Herptic Neuralgia.



**Figure 4:** Patient with full-blown herpes zoster eruption.

## Case 2

A 73-year-old Kuwaiti female complained of severe pain (VAS 9/10) in the left thoracic dermatome nerve extending from her back to the abdomen. The pain quality was described as burning, aching and stabbing. Her symptoms markedly restricted her daily activity and social interactions for 2 months. Neurontin and Tramadol were prescribed and were not able to achieve appreciable relief. Reviewing her medical status revealed that she suffers from diabetes type 2 and high cholesterol and she is on Glucophage and Januvia and cholesterol respectively. The Autocare device was applied to the patient with the contacts for both channels applied at the spine and at the end of the affected nerve delivering the FSM PHN program. The Precision Care device was applied with the contacts in a similar position set to deliver the frequencies 235 Hertz on channel A and 436 hertz on channel B. She started to feel improvement after the second session. Her condition resolved after the fifth session when her pain was reported to be 0/10. The pain-free state was maintained for several months.

## Discussion

In spite of the contemporary improvement in medication to treat PHN symptoms, PHN continues to affect many individuals reducing their quality of life and limiting their activities. Among the most widely used medications are anticonvulsants (Pregabalin, Gabapentin, Lyrica), antidepressants (Amitriptyline, Nortriptyline and Desipramine), opioids and topical therapies (capsaicin, Lidocaine). These medications have significant adverse effects and should be used cautiously with elderly or immune-suppressed patients or patients with significant co-morbidities [6,7]. For patients who continue to have intractable pain even after conservative management, invasive interventional techniques can be applied. These techniques include Botulinum toxin A and nerve block. Both techniques can achieve pain relief, but the quality of evidence is limited [6,7]. In this case report, FSM frequencies applied with microcurrent devices were used on two patients for the first time in Kuwait. The mechanism of how FSM frequencies and micro amperage current are effective in repairing the pain of PHN is not known. FSM frequencies and micro amperage current have been shown to reduce inflammatory cytokines and substance P in fibromyalgia associated with spine trauma. The study involved 54 consecutive patients meeting the ACR diagnostic criteria for fibromyalgia who were treated with micro amperage current. Only two specific frequencies were shown to reduce pain and produce the observed response, 40 hertz on channel A and 10 hertz on channel B. 49 patients who completed the study showed reductions in VAS pain score from an average of 7.4/10 to 1.4/10 in 90-minute treatments. The biological markers for pain (Substance P) and all inflammatory cytokines were reduced by factors of 10 and 20 times in 90 minutes. Beta-endorphins and cortisol increased by a factor of 10 times. The use of these and other frequencies may play a role in affecting the inflammatory process in trigeminal and dorsal horn ganglion, resulting in pain reduction and repair of the neuron resulting in maintained pain relief [8]. There is one collected case report showing that FSM frequencies and micro amperage current are effective at reducing dermatomal nerve pain [9].

The varicella-zoster virus affects the peripheral nerve by demyelination, Wallerian degeneration and sclerosis, but changes in the central nervous system, have also been associated with PHN. There is also evidence to support the theory that a low-grade persistent infection of dorsal horn cell and trigeminal ganglion continues to PHN pain [10]. Specific frequencies delivered in an interferential pattern from a two-channel FSM device are thought to resonate with specific conditions and specific tissues. There is one published case report demonstrating that one specific frequency combination resolved the pain and the lesions of acute shingles in the ophthalmic branch of cranial nerve V in two two-hour treatments in an 85-year-old man. It is hypothesized that the frequencies might vibrate and resonate with one or more crucial

bonds in the crystalline structure of the zoster virus and change the ability of the virus to interact with the cell membrane [11].

There are specific frequencies used in one published case report to resolve scar tissue following a failed ulnar nerve transposition [12]. There is one abstract showing that specific frequencies were effective in improving the range of motion in chronic burn patients. These frequencies “to remove scar tissue” are also used in the PHN protocol applied to the patients in this case report. It is possible that these frequencies may resolve some of the scar tissue associated with the pain of PHN. These mechanisms of reducing inflammation, elongation of scar tissue and interference with viral binding to nerve tissues could explain the reduction of the spontaneous discharge of neurons and the exaggerated painful response to non-painful stimuli [13].

Despite the current advance in therapeutic medicine for postherpetic neuralgia, there is poor control over its symptoms. In these simple case reports, the FSM mechanism exhibited significant long-term pain relief in comparison to the use of medication. It furnishes the path of a future clinical study to be conducted on an FSM machine. A proper blinded clinical study with a sufficient sample size should be performed to further evaluate its effectiveness.

## Ethical Approval

Due to the nature of this study, it was granted an exemption by the Ministry of Health of Kuwait, Al-Amiri Dental Center, State of Kuwait. Written informed consent was obtained from the patient for publication of this case report and accompanying images.

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