



Case Study

Effect of pain scrambler therapy on antineuralgic pain and quality of life after shingles

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Abstract. [Purpose] The aim of this study was to analyze the effect of pain scrambler therapy on antineuralgic pain and quality of life after shingles. [Subjects and Methods] Daily pain scrambler therapy was administered to antineuralgic patients for 10 days, with each session lasting approximately 40 minutes. Pain was measured using the visual analog scale, and quality of life was assessed with the short form 36-item (SF-36). [Results] After 10 sessions of pain scrambler therapy, pain had significantly reduced compared to that experienced prior to treatment. The quality of life had also improved following completion of 10 treatment sessions. [Conclusion] Pain scrambler therapy decreased patients' post-shingles antineuralgic pain and improved quality of life.

Key words: Pain scrambler treatment, Pain, Quality of life

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INTRODUCTION

Shingles is a disease caused by the varicella zoster virus, a type of herpes viral infection, and is characterized by lateral vesicular exanthema accompanied by pain across a nervous dermatome¹⁾. While skin hypersensitivity, itchiness and causalgia occur near skin lesions, various late-onset or post-shingles complications may also occur, including encephalomyelitis, visual impairment, viral infection, pneumonia, and post-herpetic neuralgia^{1, 2)}. The most often reported, and the most severe, complication of shingles is antineuralgia, which results in continuous pain for more than four weeks after vesicular exanthema disappears³⁾. It is thought that if the pain and inflammation caused by the shingles virus can be controlled early, complications may be prevented and the patient's quality of life may be improved^{2, 3)}. However, although antiviral agents, steroids, nerve block, laser therapy, and transcutaneous electrical nerve stimulation (TENS) have been tried in the treatment of antineuralgic shingle pain, a suitable and effective method is yet to be developed⁴⁻⁷⁾.

Pain scrambler therapy is achieved by 'scrambling' the sensation of pain; that is, after it has been recognized as a form of sensory pain information, it is artificially altered into non-analgesic information and delivered by A-delta and C-fiber afferent pathways⁸⁾. As an alternative method to existing drugs, injections and surgery, this method was originally developed to create a new solution for patients who either do not respond to previous therapies or who experience severe pain, such as chronic pain and cancer pain^{8, 9)}. This study was designed to identify how pain scrambler therapy influences the perception of pain in antineuralgic patients, and whether it improves patient quality of life after shingles.

SUBJECTS AND METHODS

This study was carried out on a woman who has antineuralgic after shingles. The mean general characteristics of the

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patients enrolled in this study were as follows: age: 54 years; weight: 55 kg; height: 160 cm. Patients with normal blood pressure, pulse, and breathing, and absence of any consciousness disorder or dysesthesia were selected to participate. Prior to conducting the study, the objectives and methods of this research were explained to the patients. All of the subjects provided written informed consent prior to participation in the study, as per the ethical standards described in the Declaration of Helsinki.

Pain scrambler therapy was performed by using a special type of electrode with five channels. The electrode was attached 4 cm away from the most painful areas and a frequency of 43–52 Hz, with a stimulation of 5mA, was applied. This strength was considered quite harmless and was used to mimic a natural electric signal. The non-pain information in the pain scrambler was composed of 16 waveforms. The subjects received the pain scrambler treatment once per day for 40 minutes for a period of 10 days.

Pain was measured using the visual analog scale (VAS). VAS is a commonly used instrument for measuring pain intensity. Subjects used this method to visualize the pain level, and were asked to assess the intensity of pain experienced using a 10-point scale. Absence of pain was scored as 0 and unbearable pain was scored as 10. Quality of life was evaluated using SF-36 (short form 36-item). SF-36 comprises 36 mental health aspects (vitality, social function, restriction on emotional role function, and mental health) and eight physical health aspects (physical function, restriction on physical role function, pain, and general health) and other quality of life factors, which were determined after the subjects, had been questioned about their health and functional state. A higher SF-36 score indicated better health.

RESULTS

Prior to pain scrambler therapy, the mean VAS score was 7 points; this reduced to 1 point after completion of 10 therapy sessions. The average quality of life score before pain scrambler therapy was 102 points; this increased by 128 points after the 10 therapy sessions had been completed.

DISCUSSION

This study was conducted to assess whether pain scrambler therapy eased the antineuralgic pain and quality of life experienced by patients after shingles. Our findings established that this treatment decreased the pain and improved quality of life. Pain scrambler therapy creates an artificial, non-pain signal at the neuronal level and converts this into a non-analgesic electrical signal which is delivered to the brain by an electrode attached to healthy (i.e. not pain-generating) cells that are localized near the area where pain is experienced⁸). The underpinning theory is that the pain is alleviated because non-pain information is transmitted via A-delta and C-fiber neurons to the brain^{8,9}). Non-pain information, consisting of 16 waveforms, is encoded and then recognized naturally by the nervous system⁹). The frequency applied is approximately 43–52 Hz, with stimulation strength of 5mA⁸). This stimulus induces artificial neuronal information and delivers it as a percutaneous electrical signal to enable autonomic recovery of neural function in the brain and to decrease pain sensation; it has previously been used to treat chronic pain, cancerous pain, nerve disorder, and other types of pain^{8–11}). Existing pain therapies, including drugs, injections and surgery, are designed to block the stimulation of A-beta neurons, thus bypassing the delivery of pain sensations to the brain^{10,11}). Pain scrambler therapy does not block the pain pathway, but instead transmits non-analgesic signals through the nervous system. Numerous studies have reported that pain reduces quality of life. Based on our results, pain scrambler therapy appears to have a positive influence in reducing the pain experienced by antineuralgic patients after shingles and by improving their quality of life. The limitation of this study is its small sample size. Furthermore, we were unable to perform follow-up research to determine the duration of effectiveness of pain scrambler therapy. Long-term studies and follow-up surveys are needed to establish whether pain scrambler therapy is a viable treatment for antineuralgic patients after shingles.

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