The Management of Neuropathic Pain and the Physiotherapeutic Rehabilitation of Patients with Chronic Post-Herpetic Neuralgia

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ABSTRACT

Post-herpetic neuralgia (PHN) is a quite common chronic painful condition occurring as a direct complication of herpes zoster infection. PHN is triggered when the patient is infected with the varicella zoster virus (VZV). Patients with PHN often experience multiple types of pain such as burning pain, paroxysmal pain, aching, hyperalgesia and allodynia over a long period of time. The aim of this review was to evaluate how modern medicine confronts PHN, which types of medications can more efficiently relieve patients' symptoms, how physical therapy can provide the necessary tools for analgesia and prevention, and what other types of physical rehabilitation can be used to integrate those people back to a more painless and sustainable reality. This review was based on articles found on different online databases such as Google scholar and PubMed using keywords as: post-herpetic neuralgia; medicament; neuropathic pain; physiotherapy; TENS; LLLT; rehabilitation; pain relief. Patients suffering from constant neuropathic pain have the right to live with dignity and rejoice. Different medications can be quite helpful and physical therapy can work as a tool for prevention and management of neuropathic pain.

Key Words: post-herpetic neuralgia, medicament, physiotherapy, neuropathic pain, rehabilitation.

Introduction

Post-herpetic neuralgia (PHN) is a neuropathic pain syndrome which produces persisting pain over a long period of time (few weeks to years) after the development of herpes zoster (HZ) rash [1]. One specific characteristic of PHN is that it is age related [2]. The incidence of PHN in patients infected with herpes zoster seems to increase rapidly over the age of 50 [3]. Indeed, the frequency and seriousness of PHN is increased in elderly patients with acute HZ infections, manifesting in 20% of patients between 60 and 65 years old and in more than 30% of patients over 80 years old [4]. Patients with PHN have a decreased quality of life and cannot participate in daily activities, which affects them on a physical, psychological, and social level, as they feel unable to function properly [5].

Skin infection with herpes zoster leads to a rapid production of varicella zoster virus (VZV) specific T-cells, while the production of interferon A promotes the resolution of the infection. Lesions are cre-

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ated within a certain dermatome. Dermatomes commonly infected are thoracic (53%), cervical (20%), trigeminal (15%) including ophthalmic, and lumbosacral (11%) [6]. The HZ rash is usually accompanied by pain and dysesthesia. The rash evolves rapidly to clear vesicles similar to the original chickenpox lesions. Those kinds of vesicles are quite visible to the naked eye. After 2 to 3 days, pustules form, ulcerate, and eventually scab over. Scabs fall off in a couple of weeks and scarring settles [7]. The PHN type of pain can be steady, spontaneous, throbbing or burning, constant or intermittent, and can be sharp or shooting. Allodynia is another common feature of PHN [1].

The goal of therapists is to determine which type of pain the patient is experiencing and find the suitable type of treatment. The most common type of treatment in order to manage PHN is oral or topical medications. However, there are other modalities such as physical therapy alone or in combination with medications which give promising results.

The aim of this study was to review the use of different medications and physiotherapy protocols in the treatment and rehabilitation of patients suffering from PHN. For this reason, a review of the current literature was conducted using the online Pubmed and Google Scholar databases and following the PRISMA Guidelines. Article titles were searched by using the following keywords: post-herpetic neuralgia; medicament; neuropathic pain; physiotherapy; TENS; LLLT; rehabilitation; pain relief; treatment. Inclusion criteria in the review were: studies that evaluated the treatment and rehabilitation of patients with PHN, published after 2000 in English language. Studies in other than English language, animal studies, reviews, case reports, and clinical protocols were excluded from the study. The initial search resulted in 93 articles. After reviewing titles and abstracts, 15 studies were rejected as irrelevant. Of the remaining 78 studies evaluated, 49 were rejected for not meeting the study criteria. Eventually, 29 full text articles were assessed for eligibility. Out of those 9 were excluded for being irrelevant, giving insignificant results or evaluating vaccination techniques for early prevention. Finally, 20 randomized controlled trials were included in this review (Table 1).

Discussion

Pain management with Medication

Prescription medicine has always been the most certified way to treat painful conditions. Post-herpetic neuralgia is one of those conditions and is mostly treated by drugs. Tricyclic antidepressants (TCAs), pregabalin, and gabapentin are generally the drugs that are recommended for the treatment of PHN [1]. Treating patients with a daily dose of 1800mg of Gastroretentive Gabapentin, is a well-tolerated and effective way for treating PHN, in patients of all age groups [8], [9]. In addition, pain reduction has been observed with the use of a topical Xylocaine pump spray, when applied over the painful region in patients who suffer from PHN, showing superior results when compared to a placebo pump spray [10]. The use of liquid nitrogen (LN spray) is another form of pain reduction treatment called cryoanalgesia. In a recent study, it was observed that the application of LN spray on the affected dermatome for 30 seconds produces good or excellent results in terms of pain reduction in 94% of patients, right before the sixth session [11]. Furthermore, it has been shown that the therapy with a combination of amitriptyline, a tricyclic antidepressant, and LN spray is an alternative which can easily replace a combined therapy of gabapentin and amitriptyline, producing the same results in patients with PHN [12].

A recent clinical trial conducted in Asian patients evaluated a specific drug called mirogabalin for its safety and efficacy as a long-term medication in patients with PHN. This study elucidated the safety and the stable pain relief of a long-term flexible dosage of 10 or 15mg mirogabalin given twice daily, for 52 weeks in patients with PHN [13]. In another study, NGX-4010, a high concentration capsaicin dermal patch (capsaicin 640 mg/cm2), was used as topical treatment applied for 1 hour in PHN patients. Patients were able to receive up to 3 treatments with a break of 12 weeks between each treatment. NPRS was used as a benchmark to determine pain fluctuations during the study. Pain decreased by 33.8% during weeks 2 to 12 in the treatment group. The authors concluded that their approach can reduce PHN pain and that this outcome can be maintained for up to 1 year [14].

Noninvasive Therapies

There can be different approaches when it comes to

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pain management in patients with PHN. Some of those include Spinal Cord Stimulation, Scrambler therapy and Repetitive Transcranial Magnetic Stimulation (rTMS). In a recent study, it was shown that Spinal Cord Stimulation (SCS) and Pulsed radiofrequency (PRF) can effectively relieve PHN symptoms even though PRF was used on the controlled group. NRS-11 was used to determine pain fluctuations and in the end pain relief ranged from 37% to 71% [15].

A study published in 2012, showed that Scrambler therapy relieves chronic neuropathic pain better than alternative drug therapy even in PHN patients [16]. In 2013, another specific study focused only on whether Scrambler therapy is efficient on PHN patients. The authors concluded that Scrambler therapy given in 30 minutes sessions for 10 days has a promising effect on relieving PHN symptoms. There were no side effects and pain reduction was more than twice compared to any other conservative approach [17].

Moreover, in another recent study, the authors concluded that 10 sessions of rTMS targeted over the painful region on primary motor cortex, with a stimulation of 300 pulses per 5sec (f=10 Hz) with a 3sec interval between each train, were efficient in reducing pain acting complementary to medical treatment. VAS has been used to determine pain fluctuations [18]. A similar study to the previous one, with a related protocol, concluded that both 10-Hz rTMS and 5Hz rTMS are safe, effective and can partake in relieving pain in patients with PHN [19].

Physical therapy

Physiotherapy can a be a part of the rehabilitation program when it comes to PHN patients. Physiotherapeutic approaches like the use of TENS (transcutaneous electrical nerve stimulation) or LLLT (Low level laser therapy) can be quite promising.

Transcutaneous Electrical Nerve stimulation

TENS is a technique used to relieve pain by stimulating nerves with electrical currents applied through patches attached to the skin. TENS is also used as a prevention tool against PHN. The majority of patients with PHN that received TENS therapy as an analgesic, showed a significant drop to their pain scores when compared to other patients that received a sham device [20]. In terms of prevention, a study published in 2012 showed that among the treatment groups, patients who were treated only with TENS did not develop PHN. On the other hand, 28.6% of the patients who received only antiviral drugs developed PHN [21]. The authors of another similar study published in 2013, based on the fact that a group of patients with acute herpes zoster infection who received TENS didn't express PHN symptoms, suggested that TENS was superior to antiviral drug therapy on preventing PHN [22]. In another study evaluating combined treatments, TENS in combination with a local injection of cobalamin produced a significant analgesic effect in a group of patients with PHN. Indeed, 28 of 30 patients in this group experienced 30% or greater pain reduction while patients in other groups receiving different therapies showed inferior results [23].

Low level laser therapy (LLLT)

Low level laser therapy (LLLT) is a therapy using a low intensity laser machine. The laser light triggers a biochemical reaction within the cell, which leads to chemical changes. It is used as anti-inflammatory and analgesic therapy. In a recent study, published in 2016, LLLT was used as a means of prevention against PHN. The study showed that the application of LLLT within the first five days of HZ symptoms reduces the chances of developing PHN [24]. Additionally, in another study, the use of 830 nm diode laser for 20 minutes per treatment (Group A), produced a significant reduction in pain score by 80% in the first four sessions, in contrast to the control group (Group B) that only showed 10% reduction [25].

C.A.M Therapy (Complementary and Alternative Medicine)

Complementary and Alternative Medicine is a type of rehabilitation approach that is not a part of standard medical care. Techniques like acupuncture, which can be applied by a physical therapist, and TCM (Traditional Chinese medicine) are often used for pain relief. In a recent study, the use of a CAM protocol led to a significant reduction of chronic post-herpetic neuralgia pain within the first 3 weeks of treatment. The CAM therapies used were acupuncture, TCM herbs, neural therapy (1% procaine injection), cupping and

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bleeding. Improvements lasted for up to two years [26]. Furthermore, a recent study has shown that a treatment group, receiving as therapy a combination of acupuncture and electroacupuncture for 30 mins per session, 5 times a week for one month, had better results in terms of pain reduction compared to the control group, which was treated with acupuncture and moxibustion. (VAS and HAMA scales were measured and compared between the two groups) [27].

Conclusions

PHN is a chronic painful condition that needs to be treated accordingly. Patients suffering from constant neuropathic pain have the right to live again with dignity and rejoice. Different medications can be quite helpful and physical therapy can work as a tool for prevention and management of neuropathic pain. Physical therapy has an extensive field and should be applied according to the patient's needs.

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