USEFUL EFFECT OF APPLICATION OF HELIUM-NEON LLLT ON AN EARLY STAGE CASE OF *HERPES ZOSTER*: A CASE REPORT

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Low reactive-level laser therapy (LLLT) has been reported as effective in treating the intractable pain of chronic post herpetic neuralgia, but no reports have appeared on the use of LLLT on the acute phase of *Herpes zoster*. A case report is presented on a 37-year-old female who presented with an early stage atack of *Herpes zoster*. HeNe laser LLLT was applied in the scanning mode, in combination with epidural block therapy. The patient was taken off all forms of treatment after only 3 weeks, with no residual pain. The normal period is a minimum of 4 weeks, with some residual pain. The authors suggest that LLLT is a valid, easily applied and noninvasive adjunctive therapeutic technique to speed recovery from *Herpes zoster* attacks, especially when applied in the early stages of the attack.

KEY WORDS *Herpes zoster* virus Post herpetic neuralgia Sympathetic block Adjunctive LLLT

Introduction

Herpes zoster, commonly referred to as shingles or the 'ring of fire' (*zonna ignea*), is a painful and debilitating condition, occurring at almost any age, which is usually self-limiting but which can, especially in patients of advanced years, be followed by post herpetic neuralgia (PHN). Current therapy for *Herpes zoster* includes antiviral agents, steroid agents, sympathetic nerve blocks and topical aspirin.[1–4] It is commonly agreed that the earlier treatment can be started after the onset of the condition, the better the prognosis, especially as far as transition to PHN is concerned. The *varicella-zoster* virus may lie latent for years, but on activation, it attacks the ganglia and dorsal nerve roots of the affected nerve, causing inflammation and the typical neuralgiform pain, accompanied by an eruptive erythematous rash over the affected nerve endings. There is local vasoconstriction and skin ischemia as a result of the viral involvement of the sympathetic nervous system,[1] and so sympathetic nerve block has often been used as the treatment of choice. Low reactive-level laser therapy (LLLT) has been recognized as acting on the sympathetic system in a similar manner, and has been reported as being very effective, especially for pain attenuation in chronic post herpetic neuralgia (PHN).[5, 6] There has not been any publication to date, however, on the effect of LLLT on the acute phase of *Herpes zoster*. We report in the present study on the effect of helium-neon (HeNe) LLLT (8.5 mW, scanned mode, power density of 2 W/cm^2) on an early-stage case of *Herpes zoster*, with an apparent acceleration in the course of healing and pain reduction.

Case Report

Laser Therapy

The laser system used was a HeNe laser, (Mera Soft Laser, Senko Ika Kogyo, Japan) with a continuous wave output power of 8.5 mW at 632.8 nm, applied in a scanned mode, with a spot size giving an incident power density of 27 W/cm^2 (manufacturer's figures). The scanned area was set at 20 cm × 20 cm, with an irradiation time per session of 5 min, giving a scanning energy density of 6.4 mJ/cm^2.

Patient

The patient was a 37-year-old female, diagnosed as having Sjörgen's syndrome associated with systemic lupus erythematosus (SLE). She was taking prednisolone and endoxan. One year prior to presenting with the attack described in the present report, she had had a previous attack of *Herpes zoster*. She was admitted to the Department of Dermatology, diagnosed as having neuralgiform *Herpes zoster* of the left 6th intercostal nerve. Figure 1 shows her condition on admission. Painful red spots and

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Figure 1.

blisters were apparent on the left side over the affected nerve.

Treatment

After being admitted to the Department of Dermatology, two 5-min sessions of HeNe LLLT were immediately applied as described above (daily, at 10:00 and 14:00, 5 days a week, 12 sessions), and an epidural block was simultaneously applied using a Baxter Infuser® (0.25% bupivacaine, 2 ml/h).

On the following day, inflammation was seen to have improved, and the deep pain had progressed to a superficial pain only (Figure 2). Five days later, her pain score, evaluated using a standard visual analogue scale (VAS) had reduced from 10 to 2, and the red spots had almost disappeared (Figure 3). On the eight day postadmission the concentration of the bupivacaine was lowered to 0.125% (Baxter Infuser®). Two weeks thereafter, the inflammation and erythema had almost completely disappeared, and her pain score was zero. All treatment was stopped and the patient discharged (Figure 4).

Figure 3.

Discussion

Light-mediated reactions in LLLT-irradiated tissue are referred to as biological photoactivation effects.

Figure 2.

Figure 4.

LLLT has been reported as being effective for pain attenuation and acceleration of wound healing, as seen in Table 1.[7–14] It has been reported that the visible light HeNe laser is more effective in modulating the superficial blood flow than the near infrared GaAlAs diode laser. The patient in the present study was receiving both immunosuppressive and steroid medication. It has also been reported that *Herpes zoster* tends to appear in systems with some degree of immunoincompetency, and recovery from *Herpes zoster* attacks has been strongly linked to the level of cellular immunity.[15] HeNe LLLT has been reported as improving the level of cellular immunocompetence in immunoincompetent cancer-inoculated rats.[9] In addition, LLLT has also been shown to have anti-inflammatory and analgesic effects,[16] and from these points, it would appear advantageous to apply LLLT in the acute phase of *Herpes zoster*, and as early into the attack as possible. In addition, a report has appeared on the virocidal effect of 904 nm laser on *Herpes simplex* virus (HSV) inoculated into Vero cells.[17] HSV is also a member of the herpetovirus family, and thus bears many morphological similarities to the *varicella-zoster* virus.

The HeNe system used was capable of scanning a large area in the noncontact method (200 mm × 200 mm, or a circular area with a maximum diameter of 200 mm, probe-tissue distance of 50 cm). In the case of the acute phase of *Herpes zoster*, contact with the affected area is often extremely painful, and it is more effective to treat larger areas of the inflamed and erythematous tissue, and so a scanned, noncontact delivery system is ideal in these conditions.

The inflammatory and eruptive stage of *Herpes zoster* usually takes at least one month to heal.[3] In the present study, healing was complete in just over three weeks, with no residual pain. Although the present study concerns only one patient, other patients have since been effectively treated in the acute phase of a *Herpes zoster* attack using HeNe LLLT as an adjunctive therapy together with other conservative modalities.

Table 1. Recorded effects of LLLT and laser bioactivation

1. Improving blood flow[7]
2. Producing biostimulant agents[8]
3. Improving immunocompetence[9]
4. Activating cell division[10, 11]
5. Accelerating collagen generation[12, 13]
6. Accelerating revascularization[7, 14]
7. Normalization of cell and tissue
8. Others

Conclusion

In addition to the well-documented applications of LLLT for the treatment of the pain of chronic postherpetic neuralgia, the authors therefore propose HeNe laser therapy as an effective and noninvasive adjunctive method in the treatment of *Herpes zoster*, especially in the early stages. The authors also recognize that this is only a case report, but hope in the future to present controlled data with a more meaningful patient population, backed up by experimental studies.

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