Dynamic Chiropractic

EVIDENCE / RESEARCH / SCIENCE

Monochromatic Infrared Energy for Diabetic Neuropathy?

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WHAT YOU NEED TO KNOW

- Theoretically, devices delivering this therapy are used to increase circulation, reduce pain and improve neuropathology symptoms.
- Currently, five randomized clinical trials with placebo controls have investigated the effects of monochromatic infrared energy. Unfortunately, four found no clinical benefit compared with placebo and the fifth found conflicting results.
- A conservative package of care using six main strategies (three lifestyle interventions, one topical intervention and two oral interventions) is recommended instead.

As clinical research director for numerous chiropractic clinics, I am asked to consult in some very interesting cases. A recent patient had been experiencing chronic painful diabetic neuropathy for over three years and had been treated with monochromatic infrared energy for six months. None of her symptoms had improved. In fact, the patient reported that her feet were more painful and her paresthesia had worsened since she began care. The patient wanted our opinion on the treatment she had received and, more importantly, what treatments we would recommend.

Diabetic Neuropathy: The Stats

The natural history of diabetic neuropathy is progressive and irreversible loss of sensibility in the feet, leading to ulceration and/or amputation in 15% of patients. The prevalence of neuropathy is more than 50% in those who have been diabetic for 20 years.[1] Worldwide, more than 420 million patients currently have diabetes.

A five-year follow-up study of community patients with chronic painful diabetic neuropathy demonstrated that 23% of patients can experience complete remission of neuropathic symptoms,

but most patients will continue to experience pain and paresthesia.[5]

Clinical Assessment

Clinical history alone is an insufficient screen to for diabetes-related peripheral neuropathy, because half of patients with diabetes-related peripheral neuropathy are asymptomatic.[14] Once there is a clinical suspicion of diabetic neuropathy, a thorough clinical assessment must exclude other causes of neuropathy, and should involve a comprehensive history and examination including: 10 g monofilament, 128 Hz tuning fork, Ipswich touch test, temperature perception, vibration perception threshold, pinprick, proprioception and ankle reflexes. You should use a measure to help monitor patient progress.

The Neuropathic Pain Symptom Inventory has been designed specifically to monitor effects of therapy on neuropathic pain.[2]

Monochromatic Infrared Energy: Poor Research Support

Over the past 20 years, monochromatic infrared energy has gained popularity in health care. Theoretically, devices delivering this therapy are used to increase circulation, reduce pain and improve neuropathology symptoms.

The initial evidence regarding the benefit of monochromatic infrared energy has been limited, because early studies used poor research methods that produced clouded findings. Early uncontrolled studies failed to account for placebo effects or the natural history.

It is important to note that the newer studies with a placebo arm have demonstrated a strong placebo effect for monochromatic infrared energy. The placebo effect and natural history explain why early studies (case reports, uncontrolled studies) and clinical observations mistakenly found evidence of effectiveness for monochromatic infrared energy.

Currently, five randomized clinical trials with placebo controls have investigated the effects of monochromatic infrared energy.[4, 8-11] Unfortunately, four of the five studies found no clinical benefit compared with placebo controls, and the fifth study found conflicting results.

A Better (Conservative) Protocol

We could not endorse monochromatic infrared energy for this patient with chronic, painful diabetic neuropathy. Instead, we recommended a conservative package of care using six main strategies (three lifestyle interventions, one topical intervention and two oral interventions), strict control of diabetes, smoking cessation, exercise, topical capsaicin, acetyl-L-carnitine and α-lipoic acid.

ASSESSMENT OF SHOCKWAVE, ELECTRO-STIMULATION, AND LOW-LEVEL LASER IN PATIENTS WITH DIABETIC NEUROPATHY

Although shockwave, electrostimulation and low-level laser are effective for many musculoskeletal disorders, evidence is lacking for their use in patients with diabetic neuropathy.

This assessment excluded studies with fatal research fl aws [i.e., absence of randomized clinical trial design with either active or placebo control group comparison, small samples (20%)]. Serious fl aws erode the fi ndings of a study; thus, fi ndings of fl awed studies should be demoted when making clinical decisions for our patients.

Shockwave: Animal studies using shockwave demonstrate a benefi t. However, there are no human trials demonstrating a benefi t.[3-6]

Electrostimulation: Most electrostimulation studies suffer from poor research quality and yield mixed results (some demonstrate improved pain and quality of life, and others do not). Two quality randomized clinical trials demonstrated confl icting outcomes. Bosi, et al., showed improvements in pain reduction and quality of life; but Khalil, et al., found that electrostimulation was not better than a placebo for changes in sensory nerve function.[2,4]

Low-Level Laser: Most low-level laser studies suffer from poor research quality. Two quality randomized clinical trials examined laser and showed inconsistent results. Swislocki, et al., showed mixed results: there were improvements in quality-of-life items, but not in pain intensity.[5] However, Bashiri demonstrated that laser had a beneficial effect on both pain and quality-of-life patient outcomes.[1]

Note: Sidebar citations are separately numbered from in-text citations (both reference lists accompany the web version of this article).

Strict control of diabetes has robust evidence in reducing the risk of developing diabetic peripheral neuropathy. The mainstay of modern management is glycemic control to manage and prevent diabetes complications.[17] There is a positive association between smoking and the prevalence and incidence of diabetic peripheral neuropathy.[3] It has been demonstrated that smoking cessation improves neuropathy symptoms.[15]

A systematic review shows that a combination of aerobic and sensorimotor training also is beneficial in improving symptoms.[13] The aerobic exercise can be of moderate-intensity (40–70%

max heart rate), 30 minutes per day, performed three to six times per week.

Overall, randomized clinical trials support the effects of topical capsaicin applied to the feet in improving pain and other neuropathy symptoms.[7] The studies used four applications/day for eight weeks, which can be extended. Capsaicin cream is well-tolerated, but local skin reactions were common and, if severe, you prompt discontinuation of treatment.

Multiple randomized clinical trials found that acetyl-L-carnitine at doses greater than 1,500mg/day reduced pain more than placebo.[6, 12] Alpha-lipoic acid was well-tolerated in randomized clinical trials and was associated with improvement of neuropathic impairments and deficits.[18-19] A Mayo Clinic review recommends the following dosing: acetyl-L-carnitine 1,000 mg, 3x/day; and α-lipoic acid 600 mg/day.[16]

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Sidebar References

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