

## CLINICAL VIGNETTE

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# Combined Electroacupuncture and Massage for the Symptomatic Management of Peripheral Neuropathy

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### *Introduction*

Peripheral neuropathy can be sensory, motor, and/or autonomic. Identifiable causes include diabetes mellitus, alcohol, hereditary, vitamin deficiency, physical injury, immune-mediated, environmental, and drug or toxin-induced. However, idiopathic cases account for up to 46% of cases.<sup>1</sup> Treatment is aimed at identifying and treating an underlying mechanism with pharmacologic and non-pharmacologic options available to help manage symptoms. Unfortunately, as many cases are either idiopathic or have causes that are irreversible, many patients are left with debilitating symptoms. We present a patient with painful peripheral neuropathy, who showed clinical improvement with combined electroacupuncture and massage therapy.

### *Clinical Case*

A 70-year-old man with type 2 diabetes mellitus presented to the Center for East-West Medicine with a 25-year history of peripheral neuropathy. He experienced numbness and tingling in both feet with recent development of daily, dull, achy, foot pain was rated 3 out of 10 in severity. The pain was aggravated by walking, prolonged standing, and hot or cold temperatures. Family history was notable for peripheral neuropathy in his father.

Physical examination revealed decreased vibration sense up to the knees, intact motor strength, down going toes, and increased sway on Romberg test. Laboratory studies were unremarkable with the exception of a hemoglobin A1c of 6.4%. Nerve conduction study showed moderate right axonal peroneal neuropathy at the fibular head and bilateral distal axonal tibial neuropathies. He declined medications due to concerns over possible side effects.

At the Center for East-West Medicine, he received electroacupuncture 5/100Hz at the acupuncture points Bafeng (EX-LE10), Taixi (KI3), Zhaohai (KI6), Sanyinjiao (SP6), Xuehai (SP10), Zulinqi (GB41), Yanglingquan (GB34), and Zusanli (ST36), as well as feet massage with topical methyl salicylate (Hong Hoa oil, Koong Yick, Singapore). After the first treatment, he reported decreased ache and tingling lasting two days. After six weekly treatments, he reported a 50 percent

decrease in numbness with no further pain or tingling. He was also able to tolerate prolonged standing without worsening pain.

### *Discussion*

Peripheral neuropathy encompasses a host of etiologies that damage the peripheral nervous system. Treatment depends largely on the type of nerve damage that has occurred, typically focused on addressing the underlying cause either by reversing the process or decreasing exposure to the causative factors. Unfortunately, oftentimes symptoms persist and can be debilitating. Medications that are available to manage the symptoms include gabapentin, pregabalin, tricyclic antidepressants, serotonin-norepinephrine reuptake inhibitors, and several anticonvulsants. If severe, nerve blocks or surgery can also be effective depending on the etiology. Unfortunately, treatments are often inadequate, and patients are left searching for additional treatment for symptom control, including acupuncture, massage, and transcutaneous electric nerve stimulation.

Acupuncture has been widely used for peripheral neuropathy in China and there have been several studies conducted over the last two decades looking into its efficacy. In a randomized controlled trial by Shin, et al in 2018, 126 patients with painful diabetic neuropathy were randomized to electroacupuncture and control of no treatment. The electroacupuncture group was treated with electroacupuncture at 2 Hz/120 Hz two times a week for eight weeks and showed significant improvement in the Pain Intensity Numeric Rating Scale compared to the control group. The electroacupuncture group also had a greater number of responders defined as achieving  $\geq 50\%$  reduction on Pain Intensity Numeric Rating Scale. Neither placebo nor sham acupuncture or electroacupuncture were used as control in this study.<sup>2</sup> Additionally, in a systematic review and meta-analysis by Dimitrova, et al. in 2017, 13 original randomized controlled trials, along with a long-term follow up and re-analysis of a prior randomized controlled trial, were reviewed with acupuncture shown to have benefit compared to control in diabetic neuropathy, Bell's palsy, and carpal tunnel syndrome. Possible effectiveness for HIV-related neuropathy was observed, but there was insufficient evidence for the benefit of acupuncture for idiopathic neuropathy. Acupuncture was found

to improve nerve conduction study findings for both sensory and motor neuropathies.<sup>3</sup>

Proposed mechanisms for electroacupuncture on peripheral neuropathy are unclear, but may involve nerve growth factor, reduced nerve cell apoptosis, and endorphins. Peripheral sensory stimulation from electroacupuncture may improve the availability and utilization of brain nerve growth factor, a neurotrophin that regulates the survival and function of peripheral sensory nerves.<sup>4,5</sup> In a study of streptozotocin-diabetic rats, electroacupuncture resulted in the downregulation of glucose-related protein 78 and caspase-12 with significant increase in sensory nerve conduction velocity and motor nerve conduction velocity in rats with diabetic peripheral neuropathy.<sup>6</sup> The study of acupuncture-induced analgesia has also shown that naloxone can block the analgesic effect of electroacupuncture supporting the role of endorphins in pain management.<sup>7,8</sup>

Small trials with manual foot massage have shown improvement in balance, foot mobility, and foot sensation in diabetic patients with peripheral neuropathy.<sup>9,10</sup> In a systematic review and meta-analysis by Fu, et al in 2020, 31 randomized controlled trials totaling 3,284 participants were reviewed showing combined traditional Chinese medicine foot bath and acupoint massage having better sensory nerve conduction velocity, motor nerve conduction velocity, total effective rate, and neuropathic syndrome score compared to control. However, these studies were limited by low methodological quality.<sup>11</sup>

## Conclusion

We presented a patient with painful peripheral neuropathy treated with combined electroacupuncture and massage resulting in pain reduction and symptom improvement. Studies suggest potential efficacy from acupuncture and massage for certain types of peripheral neuropathy. There is a need for larger high-quality studies for acupuncture and massage to determine their potential role as non-pharmacologic alternatives for the symptomatic management of peripheral neuropathy.

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