

CASE REPORT

Electroacupuncture and Low-Level Laser Therapy for the Management of Ménière's Disease—Case Report

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Abstract

Introduction: Ménière's Disease (MD) typically presents with the classic triad of symptoms of vertigo, tinnitus, and hearing loss. MD significantly impacts a patient's quality of life and their ability to carry out basic daily functions. This case report describes how electroacupuncture and Low-Level Laser Therapy (LLLT) were used concurrently to assist a patient suffering from MD to achieve substantial recovery and improve her subjective quality of life.

Case Presentation: A 62-year-old female patient was diagnosed with MD by her otolaryngologist in July 2020. She received pharmaceutical therapies, including oral prednisone and round window membrane dexamethasone infusion. Her vertigo symptoms initially improved but deteriorated gradually since the initial treatment. She came to the Meridian Integrative Medicine (MIM) acupuncture clinic in October 2021,

with chief complaints of vertigo, tinnitus, and hearing loss. At that time, the patient had been suffering from severe vertigo attacks averaging two to three attacks per week with progressively worsening hearing disorders. The patient had a total of 28 vertigo attacks during the two months before coming to MIM for treatment. After 9 sessions of electroacupuncture and LLLT treatments in 2 months, the patient's episodic vertigo attacks were eliminated.

Discussion: Treating MD with acupuncture and LLLT can help reduce or eliminate the severity and frequency of episodic vertigo attacks, relieve the severity of tinnitus symptoms, and improve the patient's quality of life.

Keywords: Ménière's disease, episodic vertigo attacks, tinnitus, hearing loss, acupuncture, electroacupuncture, low-level laser therapy, case report

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Introduction

Ménière's disease (MD) typically presents with the classic triad of symptoms of episodic vertigo, tinnitus, and hearing loss. MD can occur at any age, but symptoms typically begin between the ages of 20 and 40 years.¹ The National Institute on Deafness and Other Communication Disorders estimated that "approximately 615 000 individuals in the United States are diagnosed with MD and that 45 500 cases are newly diagnosed each year."²

The classic pathological lesion of MD is endolymphatic hydrops, characterized by excessive accumulation of endolymph in the inner ear. The distention of the membranous labyrinth disrupts normal cochlear and vestibular function, producing the episodic vertigo, fluctuating sensorineural hearing loss, tinnitus, and aural fullness that typify the disorder. Factors that affect fluid buildup may include improper fluid drainage, abnormal

immune response, viral infection, and genetic predisposition. Clinically, MD often results from a combination of these factors. Vertigo attacks and the prospect of permanent hearing loss are the most challenging problems for a patient suffering from MD. The disease can also cause hearing disorders, fatigue, stress, and loss of balance, which increases the risk of falls and accidents.³ Additionally, economic loss due to job interruption is a significant concern.

Case Study

Case Presentation

A 62-year-old female patient presented to the acupuncture clinic in Scottsdale, Arizona, on October 1, 2021, with chief complaints of vertigo, tinnitus, and hearing loss. These symptoms seriously interfered with her work capabilities and negatively impacted her quality of life. According to the patient's medical records, she had a history of hearing loss in the left ear in 2016 (Table 1). An MRI of the internal auditory canal at that time was negative and non-contributory. The result of the Electrocochleography test performed in July 2020 was abnormal, with the left ear testing positive and the right ear borderline for MD. Videonystagmography showed a 20% vestibular caloric paresis on the left side. She started on oral prednisone in

Table 1. Timeline

Date	Event	Additional Notes
2016	History of hearing loss in the left ear	MRI of the internal auditory canal was negative
July 2020	Diagnosed with Ménière's disease	Electrocochleography and Videonystagmography tests
January 2021	Started prednisone	Vertigo improved temporarily
March 2021	Dexamethasone round window infusions (twice)	-
July–September 2021	Progressively worsening Vertigo attacks	28 attacks in 2 months
October 2021	First visit to the acupuncture clinic	-
October–December 2021	Weekly acupuncture + Low-Level Laser Therapy treatments	Vertigo was eliminated after 9 treatment sessions
January 2022–June 2023	Weekly or every two weeks maintenance follow-up treatments	Vertigo-free >18 months

January 2021 for an episode of vertigo and hearing loss. With the medication, her vertigo symptoms initially subsided, but her hearing dysfunction remained the same. She underwent two treatments of round window membrane dexamethasone infusion on the left ear in March 2021. She had progressively worsening vertigo attacks between July and September 2021 (Table 1). An examination by her otolaryngologist in September 2021 indicated that her external auditory canals had no obstructing cerumen, debris, or purulent secretions; the tympanic membrane was intact in both ears; and there was no middle ear fluid. Acoustic immittance audiometry was normal (Type A Tympanometry). Her hearing and understanding test scores showed notable functional deterioration of the left ear (see Table 1). Work-related travel in the subsequent few months led to more vertigo attacks.

Presenting Concerns

During the initial examination at the acupuncture clinic, this patient reported that since her diagnosis of MD in July 2020 (Table 1), she had been experiencing vertigo attacks at increasing frequency and severity. The frequency of attacks increased to a total of 28 attacks in the previous two months. During the attacks, she experienced nausea, vomiting, and a spinning sensation, lasting for a duration from 2 to 8 hours. She had a stressful job as a project management executive assistant. She followed a low-sodium diet, did not smoke, and consumed alcohol two to three times per week. She had a history of hypertension, asthma, squamous carcinoma of the skin, and two C-Section operations. Her height was 64 inches, and her weight was 208 lbs. Her vital signs were within normal limits. She was taking Amlodipine Besylate 5 mg, Losartan Potassium 100 mg, and Triamterene-HCTZ 37.5-25 mg.

Therapeutic Interventions and Treatment

After reviewing the patient's case, a treatment plan was established, aiming to reduce the frequency and severity of her vertigo attacks and to stabilize or slow down the progress of her tinnitus and hearing loss. The treatment plan included acupuncture treatments and low-level laser treatments (LLLTs). The treatments were mostly provided once a week, except when the patient had to take prolonged business trips out of town. The patient continued her pharmaceutical medication during this treatment plan.

The acupuncture treatments were based on the underlying Traditional Chinese Medicine (TCM) pattern differentiation diagnosis of the patient, which was a combination of the Phlegm Turbidity Obstruction pattern and the Liver Yang Rising pattern. These two TCM patterns often correlate with symptoms of internal dampness, inflammation, and stress-induced pathology commonly associated with MD, including vertigo, tinnitus, and hearing loss. Treatments were administered using sterile single-use disposable stainless-steel needles. The needle size, along with the depth and angle of insertion, varied depending on the acupuncture points selected. Electrical stimulation was applied to two or three pairs of points, selected based on the patient's presentation at the time of the treatment. The electrical stimulation was set at an intensity just above the level detectable by the patient and at a frequency of 180 Hz. The needle retention time was 20 minutes. The main acupuncture points used for the Phlegm Turbidity Obstruction pattern were zusanli (ST-36), fenglong (ST-40), sanyinjiao (SP-6), and yinlingquan (SP-9); for the Liver Yang Rising pattern, baihui (GV-20) and taichong (LR-3); for the vertigo symptoms, sishencong (EX-HN1), shuaigu (GB-8), chengling (GB-18), and fengchi (GB-20); and for the tinnitus and hearing loss symptoms, waiguan (TE-5), yifeng (TE-17), and ermen (TE-21). Additional points, including auricular points, were also selected based on the patient's presentation at the time of the treatment.

LLLT works through photobiomodulation, producing enhanced mitochondrial function, improved cellular energy (ATP), modulated inflammatory pathways, increased tissue repair and regeneration, reduced pain, and improved nerve function. LLLT treatments consisted of sessions lasting from 5 to 15 minutes. The equipment used was FX635 and EVRL Laser units, manufactured by Erchonia Corporation, USA.⁴ The FX635 unit utilized three separate low-level laser beams of red light with a wavelength of 635 nm. The areas treated by the FX635 were the bilateral temporal areas. The EVRL unit utilized two separate low-level laser beams, one of red light with a wavelength of 635 nm, and the other of violet light with a wavelength of 405 nm. The area treated by the EVRL unit was the left ear and the surrounding area. The multi-beam capabilities of these units allowed the treatment to be applied to a small area, the area of involvement, rather than just a single acupuncture point. The simultaneous application of acupuncture and LLLT was intended to help the patient achieve maximized recovery.

Table 2. Audiology Examination Summary

Date	Pure Tone audiometry - Sensorineural Hearing Loss (SNHL)		Word discrimination score – Hearing Loss in decibels (dBHL)		Change since the last exam
	Left	Right	Left	Right	
09/07/21	Mild sloping to severe	Normal sloping to severe	88% at 85dBHL	100% at 65dBHL	
10/20/21	Severe	Normal sloping to moderate	40% at 80dBHL	100% at 70dBHL	Reduced
11/04/21	Moderate	Normal sloping to moderate	100% at 80dBHL	100% at 65dBHL	Improved
01/04/22	Moderate sloping to profound	Normal sloping to moderately severe	40% at 85dBHL	100% at 60dBHL	Reduced
01/17/22	Moderate sloping to profound	Normal sloping to moderately severe	36% at 85dBHL	100% at 60dBHL	Stable
01/31/22	Moderate sloping to profound	Normal sloping to moderately severe	40% at 85dBHL	100% at 60dBHL	Stable
02/09/22	Mild sloping to severe	Normal sloping to moderate	44% at 85dBHL	100% at 60dBHL	Stable
02/16/22	Mild sloping to severe	Normal sloping to moderate	48% at 85dBHL	100% at 60dBHL	Stable
03/03/22	Moderate sloping to profound	Normal sloping to moderately severe	60% at 85dBHL	100% at 60dBHL	Improved
04/25/22	Moderate sloping to profound	Normal sloping to severe	44% at 85dBHL	100% at 60dBHL	Reduced
07/19/22	Moderate sloping to profound	Normal sloping to moderately severe	48% at 85dBHL	100% at 60dBHL	Stable

Follow-up and Outcomes

The patient had a total of 28 vertigo attacks during the two months before coming to the Meridian Integrative Medicine acupuncture clinic for treatment. After 9 sessions of acupuncture and LLLT treatments in 2 months, the patient's episodic vertigo attacks were eliminated. With regular weekly follow-up treatments, the patient remained free from vertigo attacks. The hearing loss test scores fluctuated slightly during this period, as shown in Table 2. The tinnitus symptoms changed from a high-pitched nature to a low-pitched nature, making it more tolerable according to the patient.

Although there was no noticeable improvement in hearing functions, the patient was happy that the episodic vertigo attacks were eliminated, as these attacks were the most debilitating among her symptoms. Improvement in this aspect enabled her to continue her professional work and improved her quality of life.

Discussion

Conventional biomedical treatments for MD include medication, dietary modification, and surgery. Medication and dietary modification often form the first line of treatment. Medications for MD include diuretics to reduce the amount of sodium in the body; drugs to relieve symptoms such as motion sickness, nausea, vomiting, and vertigo; systemic or local corticosteroids to reduce inflammation within the inner ear and prevent immune reactions; and antibiotics. The most recommended dietary modification is the adoption of a low-sodium diet, with a limited consumption of sugar, monosodium glutamate, caffeine, alcohol, and tobacco. Surgery, being the treatment with the greatest risk, is the last resort of conventional medicine for MD. Some MD patients explore the potential of complementary and alternative medicine therapies to alleviate their symptoms, including acupuncture and LLLT.

In the context of TCM, the presentation of MD can be attributed to several disease patterns based on the Zang Fu theories. The relevant disease patterns include Phlegm Turbidity Obstruction, Liver Yang Rising, Qi and Blood Deficiency, and Kidney Essence Deficiency. Clinically, MD often involves a combination of these patterns. Acupuncture points selected for treatment are based on

the overall presentation of the patient, including the severity of the symptoms, the patient's constitution, and tongue and pulse presentation.⁵

A published systematic review assessed the evidence base for acupuncture treatment of MD. This review searched studies in both English and Chinese from six research databases. Many of these studies demonstrated the beneficial effects of acupuncture treatment for both acute and chronic cases of MD.⁶

Several studies demonstrated that LLLT is beneficial in preventing vertigo spells and relieving tinnitus symptoms. A pilot study compared the efficacy of LLLT to the pharmaceutical treatment of taking betahistine for the treatment of MD. Ten patients were randomly assigned to each group. The LLLT group received LLLT treatments once daily, with 5 mW power for 20 minutes. The betahistine group received betahistine 16 mg twice daily. The results showed that in both groups, the number and duration of vertigo spells of these patients were significantly reduced after a 6-month treatment period.⁷

Another study found that out of 65 patients treated with LLLT for tinnitus, "mild improvement was reported in 33.8% of patients, moderate improvement was reported in 16.9%, and full improvement was reported in 6.15%. Of the patients who reported dizzy spells as a symptom of their tinnitus condition, 27.7% reported mild improvement and 16.9% reported full improvement."⁸

Despite the valuable findings, a limitation of this report is that it describes a single case, and the patient was concurrently on pharmaceutical medications, making it impossible to isolate the exact contribution of the electroacupuncture and LLLT. However, the dramatic cessation of vertigo attacks after the integrative treatment began, following the failure of prior conventional therapies, suggests a synergistic effect from the acupuncture and LLLT intervention.

Patient Perspective

The patient described the change as "life-changing," noting that the elimination of severe vertigo attacks was the most important clinical outcome for her. She expressed high satisfaction with the treatment as it allowed her to return to her full-time work and resume a near-normal social life.

Conclusion

For this patient, symptoms of vertigo and tinnitus secondary to Ménière's disease were improved with electroacupuncture and LLLT, in addition to her conventional treatment comprising medication and diet modification. After nine sessions of acupuncture and LLLT treatments in 2 months, the patient's episodic vertigo attacks were eliminated. With regular weekly follow-up treatments, the patient remained free from vertigo attacks. The tinnitus symptoms changed from a high-pitched nature to a low-pitched nature, making it more tolerable according to the patient. Although the exact mechanism of this combined approach was not fully understood, the results were beneficial to the patient. This case demonstrated that the simultaneous use of acupuncture and LLLT was a safe and effective integrative strategy to eliminate debilitating vertigo attacks and improve the subjective quality of life for this patient with Ménière's Disease.

Conflict of Interest Statement

The authors declare no conflicts of interest.

Funding Statement

No external funding was received.

Patient Consent

The patient provided verbal consent for the publication of this Case Report, including the use of clinical and audiology data. No identifiable information (e.g., patient's name) resides within the Case Report.

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