

Treatment of sudden hearing loss using electro-acupuncture

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Abstract

Objectives: Sudden neurosensory deafness is the second debilitating disease in China. In fact, the current treatment is limited to hearing aids, assistive devices and cochlear implants. However, some patients might not be suitable for surgery or even hearing aids.

Methods: Hereby, we report a pediatric case of sudden sensorineural hearing loss accompanied by otalgia and blocked ear sensation.

Results: He firstly failed with conventional treatment but later his hearing symptoms were improved with our electro-acupuncture therapy according to pure tone audiometry findings and clinical responses.

Conclusions: It may be worth trying in patients with sudden neurosensory deafness, who do not respond to routine medical treatment. In line with previous studies, the current report indicates that future observational studies or even clinical trials are needed to prove the efficacy of acupuncture on hearing loss and the accompanying symptoms.

Keywords

Otolaryngology, deafness, electro-acupuncture

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Introduction

Sudden sensorineural hearing loss (SSHL) is an acute condition, accompanied by a hearing loss of 30 dB with a subjective sensation of hearing impairment occurring in one or both ears.¹ A variety of medical treatments have been used in clinical practice, but the effectiveness of these treatments remains controversial.² Hereby, we report a child with onset of SSHL and responded well to acupuncture with good health outcomes achieved.

Case report

A 9-year-old primary school student came to our acupuncture department with moderately severe hearing loss, accompanied by otalgia and blocked ear sensation in the right ear. Two months ago, the patient caught a cold. One day before he came to the pediatrician, when getting up in the morning, he suddenly found that he could not hear anything in his right ear, accompanied by otalgia and blocked ear sensation. The pediatrician started him on a course of amoxicillin and then referred him to an otolaryngologist. He was then confirmed to have moderately severe hearing loss by pure tone audiometry (PTA; blue line in Figure 1).

In addition to testing his hearing, blood test result revealed unremarkable complete blood count, sedimentation rate and negative for antineutrophil cytoplasm antibodies, antibodies

for proteinase 3 and myeloperoxidase. Magnetic resonance imaging (MRI) brain findings were normal. The otolaryngologist diagnosed unilateral high-frequency SSHL after performing otoacoustic emission test and auditory brainstem response audiometry. He was then given oral prednisolone (1 mg/kg) for 7 days. However, the boy did not feel any improvement in ear symptoms of right ear and complained of restlessness during the steroid treatment. The subsequent PTA showed that his hearing loss became even worse. And prednisolone was then stopped. Because the patient did not have any improvement in any symptoms, his parents decided to use acupuncture for his child. A physical examination at our acupuncture department showed that the patient had neither tenderness nor vesicles. The patient mentioned that he sometimes suffered from headache. Electro-acupuncture (EA) was applied to the following acupuncture points: GB20, GB8, GB2, SJ21, SI19 and SJ17. In addition, based

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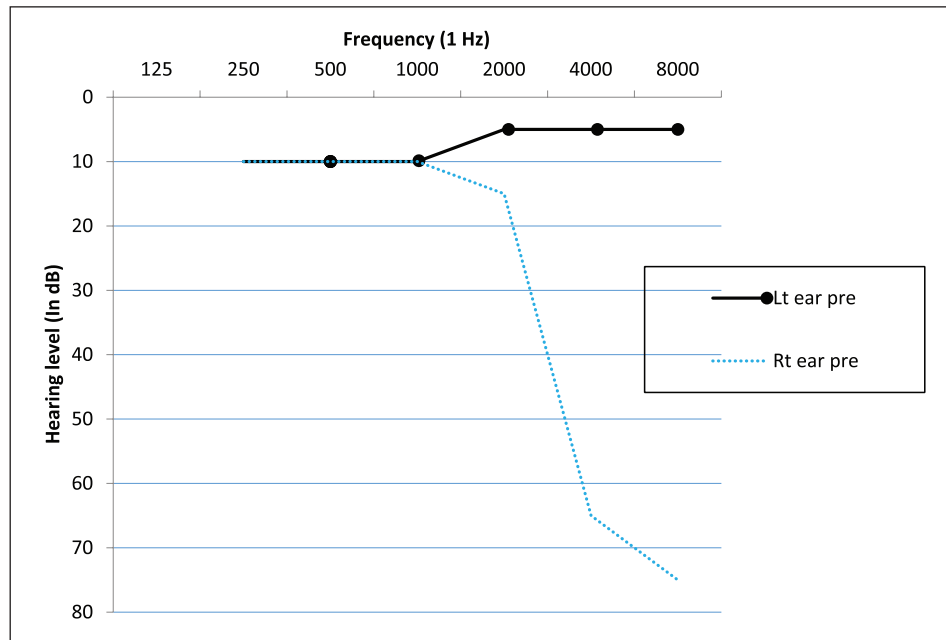


Figure 1. Hearing level before acupuncture treatment.

Lt ear pre and Rt ear pre: left ear and right ear hearing levels before receiving acupuncture treatment.

on our previous treatment experience, we also treated headache using other acupuncture points (DU20 and DU24, apart from GB20) on the head. Each treatment session lasted 60 min. The frequency of stimulation was 60 Hz, and the intensity was tolerated even at maximum stimulation. During the first treatment, the patient felt significant relief of the blocked ear sensation and great improvement in right otalgia. After the fourth treatment, the patient felt great improvement in hearing. After the eighth treatment, the patient reported that he felt his hearing became normal when he talked with his parents by telephone. The last PTA (Figure 2) showed that the patient's hearing returned to normal.

Acupuncture procedure

Fine hair-sized stainless steel needles of 32 and 30 gauges from China were used for this procedure under aseptic conditions. Unilateral points were stimulated using needles in a session. Needles (0.25-mm diameter and 40-mm length) were manually inserted subcutaneously or intramuscularly with the depth of around 0.5 inches and subsequently connected to EA device by a continuous wave frequency of 100 beats/min. The needles were left in-situ with each session which lasted for 1 h. No medications were administered throughout the course of therapy. The patient was also instructed on usual management strategies including lifestyle and advice to abstain from overexertion.

The acupuncture practitioner completed a 15-year full-time didactic and practicum course of traditional medicine where acupuncture is one of the major modalities, with

clinical experience in the field of pediatric acupuncture and neurologic conditions for more than 10 years. Acupuncture treatments were usually scheduled about two times a week and allowed to be increased to three times a week or decreased to once a week in frequency when clinically suggested as necessary.

Discussion

SSHL in the pediatric population continues to be not well understood, and it affects as many as 160 per 100,000 people per year.³ Causes are often not identified and are assumed to be either viral or idiopathic. It can be unilateral or bilateral.

Only about 10% of cases have an identifiable cause.⁴ Besides hearing loss, most patients have tinnitus, otalgia and blocked ear sensation.⁵ The prognosis of SSHL is generally good, and it is common that patients experience hearing improvement within days.⁶ Patients with no improvement in hearing within 2 weeks are unlikely to recover, and those having hearing loss for more than 2–3 months are likely to become permanently deaf.⁷ Prognosis is also poor for those with severe hearing loss, down-sloping shape of loss on an audiogram, vertigo and evidence of systemic infection.⁸ Oral corticosteroids are the most commonly used treatment for SSHL.⁶ Intratympanic dexamethasone has also been used in patients who did not respond to systemic steroid therapy. However, the efficacy of this treatment is controversial.⁹

There are various acupuncture points along these meridians stimulated by needles or moxibustion.¹⁰ Acupoints distribute over both the adjacent and distal areas of the disease.

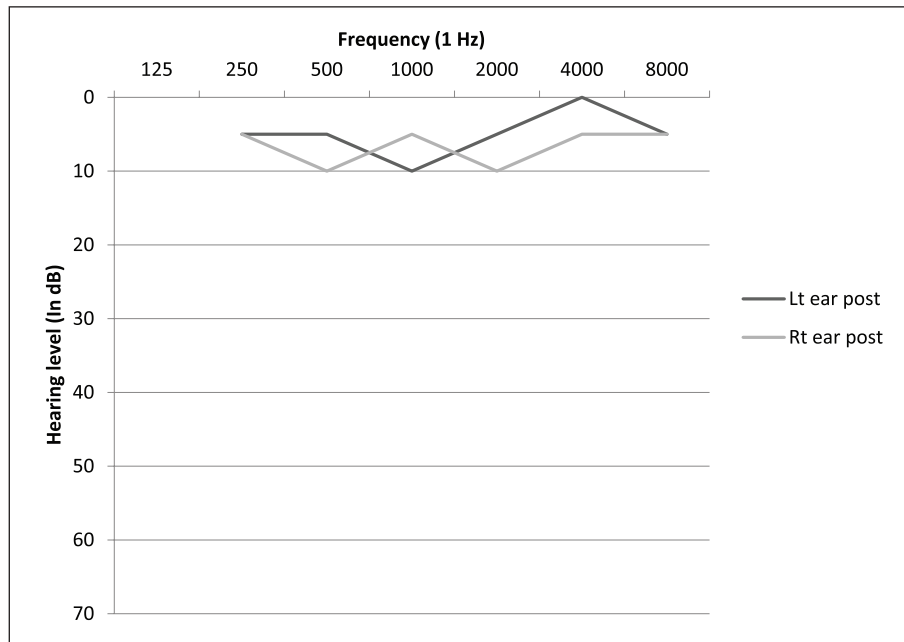


Figure 2. Hearing level after acupuncture treatment. Left ear post and Rt ear post: left ear and right ear hearing levels after receiving acupuncture treatment.

Numerous clinical studies indicated that acupuncture therapy of excitation-focus transfer was one of the most significant techniques of balancing the meridians.

Previous studies have documented that acupuncture could improve hearing for adults with late SSHL. Yin et al.¹¹ reported significant improvement of more than 20 dB in a series of SSHL cases by EA after conventional therapy was failed. In another study by Zhao,¹² 63 patients with SSHL for at least 1 month were recruited. After 14 treatments by EA, the average hearing threshold increased by 17 dB, and 63.5% of the patients had an increment of at least 15 dB. These two studies clearly show that acupuncture may be effective in treating adult patient with late SSHL. Thus, it is likely that acupuncture could also apply to pediatric patient with late SSHL, as shown in the current case. However, the two studies^{11,12} did not report the effect of acupuncture on otalgia and feeling of ear blocking, both being strong factors right after the treatment in both cases, especially in the case of blocked sensation of the affected ear. Our patient experienced improvement in the feeling of blocked sensation after the first treatment, and hearing loss became much better within four treatments. Although the beneficial effect could be due to the natural course of SSHL or the carry-over effect of steroid treatment, the prompt response of ear symptoms is likely related to therapeutic effect by acupuncture. It is also interesting to know that SSHL may be triggered by tiredness, as seen in previous cases.¹³ There are also other studies revealing the benefit of acupuncture on hearing loss in adults.^{14,15}

In our case, it was found that EA therapy for headache may help relieve SSHL symptoms, but further studies were warranted to confirm its association with SSHL.

In adults, steroids, systemic and intratympanic are the only interventions that have shown any reproducible efficacy although there is disagreement regarding the degree of effectiveness.³ The lack of standardization of approaches to the diagnosis and management of SSHL usually leaves children without treatment during a critical window. The use of acupuncture seems a reasonable alternative if conventional treatment failed or parents worried about side of steroid treatment, for example, prednisolone. Similar success could be seen in patients with refractory pruritus.^{16,17} But caution is need when choosing suitable Chinese acupuncture therapist since there is large variation of standard of care.

Conclusion

This pediatric case of late SSHL showed satisfactory response to acupuncture while conventional medical treatment failed to help. In addition, acupuncture seems to be very effective in eliminating the otalgia and blocked ear sensation. It may be worth trying in patients with SSHL who do not respond to routine medical treatment. In line with previous studies on late SSHL, the current report indicates that future observational studies or even clinical trials are needed to prove the efficacy of acupuncture on hearing loss and the accompanying symptoms among pediatric SSHL patient who do not respond to routine medical treatment. Advantage of EA is an alternative medical treatment, and it can be used with medical treatment as we present here.

Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

Ethical approval

Our institution does not require ethical approval for reporting individual cases or case series.

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Informed consent

Written informed consent was obtained from a legally authorized representative(s) for anonymized patient information to be published in this article.

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