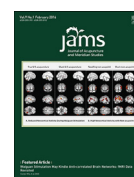


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## CLINICAL CASE REPORT

# Amblyopia: Can Laser Acupuncture be an Option?

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Available online ■ ■ ■

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### KEYWORDS

acupuncture;  
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ultralow-light-intensity  
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### Abstract

This paper describes the results of the treatment of amblyopia in young patients using an unconventional laser-acupuncture technique. After obtaining satisfactory results in the treatment of a 14-year-old amblyopic girl, the treatment was applied to 13 amblyopic children aged 3–11 years, with an encouraging outcome. An ultralow-light-intensity laser with a square-wave modulated emission was applied over a sequence of acupuncture points. Each session lasted <15 minutes, and the treatment was performed once a week in 6-week cycles. Patients were followed for several years to evaluate the long-term results and/or to extend the treatment. All except two of the treated patients showed a rapid increase in visual acuity after several treatment sessions. Some required retreatment for regressions in visual acuity. The need for medium-term treatment cycles seems, however, to suggest that results may not be stable for all individuals. Although acupuncture has already been proved to be effective in the treatment of amblyopia, the results reported in this paper suggest that acupunctural stimulation using a novel type of ultralow-light-intensity laser can provide similar, if not better, results to conventional acupuncture stimulation, but with higher patient compliance.

## 1. Introduction

Although it is widely accepted that it is very difficult to achieve functional improvement of the visual system at the end of its complete development—age 10/12 years at the latest—a traditional Chinese medicine (TCM) approach was used to treat a teenage (14-year old) girl with reduced

visual acuity. As she suffered from a congenital depigmentation of the retina, her visual acuity of 20/40 in both eyes (BE) was considered to be the highest visual acuity possible. Traditional techniques had not provided any significant benefit. It was, therefore, decided to apply unconventional TCM techniques [1].

The girl had best corrected visual acuity (BCVA) BE of 20/40 and after 15 sessions of treatment with a variety of

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TCM techniques (needle acupuncture, laser acupuncture, and Ma Litang hammer) over a 10-month period, to our surprise and enthusiasm, she achieved a BCVA BE of 20/25 with the same slight optical correction.

She was further treated (4 sessions) over 2 months in the autumn of 2008. BCVA BE was 20/25 at the beginning of treatment, and at the end, BCVA was 20/28 in the right eye and 20/22 in the left eye.

Over a further 2-year period (March 2009–May 2011), she was treated 28 times: BCVA BE was 20/25 at the beginning, and by the end it was 20/22.

Without any further treatment after 2011, she was examined again at the end of 2014 when her BCVA BE measured 20/33.

While the deficit was not fully compensated or stable, the observed modifications encouraged us to study and test the possibility of treating amblyopia with protocols derived from acupuncture theory, without any exceptions in the selection of patients and with better results expected in younger ones.

Since then the technique has been simplified, and the most effective and repeatable form investigated, based on a theoretical approach and through the analysis of significant reported experiences.

The use of a novel type of ultralow-light-level laser (ULLLL) was deemed to be particularly interesting, rather than either needle insertions or the Ma Litang hammer, for the purpose of achieving higher compliance by young patients and shortening treatment session length.

The American Academy of Ophthalmology [2] has quite recently (2012) carried out a survey of the pathology and, in the framework of the "Preferred Practice Patterns," proposed optical correction, patching, pharmacological penalization, optical penalization, Bangerter filters, surgery to remove the causes of amblyopia, acupuncture, and vision therapy for the treatment of amblyopia.

The above-mentioned document reports the use of acupuncture for amblyopia treatment in two clinical trials: The first study found acupuncture over a 15-week period to be as effective as occlusion for 88 children aged 7–12 years who had anisometropic amblyopia [3]. In this randomized controlled trial, children had 20/40–20/125 BCVA and no strabismus. The second study examined the effect of adding acupuncture to refractive correction for 83 children aged 3–7 years who had untreated anisometropic amblyopia (20/40–20/200) [4]. At 15 weeks, there was a greater improvement in visual acuity using refractive correction with

acupuncture compared with refractive correction alone. In both studies, the acupuncture technique consisted of five acupuncture needles placed and manipulated for 15 minutes 5 times/wk for 15 weeks. In both the above studies, the selected acupoints, needle insertion, manipulation of the needles, and application protocol are indicated.

Five acupoints, unilateral GV20 (baihui), bilateral EX-HN5 (taiyang), bilateral BL2 (cuanzhu), unilateral LI4 (hegu), and bilateral BL59 (fuyang), were selected on the basis of the theory and literature reports of TCM as referenced by the authors. The locations of the acupoints are shown in Table 1 and Fig. 1.

## 2. Case Presentation

### 2.1. Materials and methods

#### 2.1.1. Patients

Thirteen young patients (2 males and 11 females), with a mean age of 7 years (range 3–11 years), were recruited into the study after obtaining formal written consent from their parents, and the patients underwent treatment. All patients were amblyopic or had BCVA < 20/20 (Snellen fraction).

Patients with any of the following conditions were excluded from the present study:

- eye diseases
- vision deficits not previously corrected
- use of optimal correction spectacles for <6 months
- absence of stabilized BCVA
- patch occlusion of the best eye
- strabismus
- a previous history of conventional treatments

These patients, inhomogeneous for clinical conditions and/or applied treatment, were not included in the present report that deals with patients receiving laser-acupuncture treatment only.

#### 2.1.2. Measurements

Visual acuity was measured via the Snellen fraction, always by the same operator, in the same ward, by the same visual acuity tester, and under identical conditions. All patients wore the prescribed spectacles when needed.

**Table 1** Acupuncture points in the published trials [3,4].

Acupoint	Location (see Fig. 1)	
GV20	Baihui (unilateral)	On top of the head, 7 cun above the occipital hairline and 5 cun behind the frontal hairline
EX-HN5	Taiyang (bilateral)	At the temporal dimple and 1 cun behind the midpoint of a line from the lateral end of the eyebrow to the external canthus
BL2	Cuanzhu (bilateral)	In the supraorbital notch and at the median end of the eyebrow
LI4	Hegu (unilateral)	At the dorsum of the hand, and between the first and second metacarpal bones
BL59	Fuyang (bilateral)	3 cun above the site between the Achilles tendon and the lateral malleolus

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