The Safety of Laser Acupuncture: A Systematic Review

Juan Yang, MD, PhD,1,2 Molly J. Mallory, LAc,1 Qinglong Wu, MD, PhD,3 Sara E. Bublitz, LAc,1 Alexander Do, LAc,1 Donglin Xiong, MD,2 Christina Ying Ying Chen, MD,4 Peter T. Dorsher, MD,5 Tony Y. Chon, MD,1,* and Brent A. Bauer, MD1,*

ABSTRACT

Objective: Laser acupuncture has become increasingly attractive in clinical practice, especially for patients with needle phobias as well as elderly people and children. However, literature concerning the safety of laser acupuncture has been limited. This systematic review synthesizes the current available literature on the safety of laser acupuncture.

Methods: Ovid MEDLINE,® Epub Ahead of Print, In-Process & Other Non-Indexed Citations Daily, Ovid Embase, Scopus, and EBM Reviews—Cochrane Central Register of Controlled Trials databases were searched for available randomized controlled trials (RCTs) on laser acupuncture. Safety data were extracted from the included studies. Adverse events (AEs) data were extracted and assessed in terms of severity and causality.

Results: Of 737 articles, 21 RCTs were included. The majority of these RCTs reported that laser acupuncture was safe, without AEs; 6 trials reported AEs (including tingling, pain flare-ups, and transient fatigue). All AEs were mild and resolved spontaneously within 24 hours. The causal relationship between AEs and laser acupuncture was felt to be “certain” in 4 studies, “probable” in 1 study, and “possible” in 1 study. AEs were collected and monitored by evaluation methods in 7 trials: 5 with AE questionnaires, 1 with a checklist, and 1 with oral reports.

Conclusions: Laser acupuncture appears to be a safe therapy associated with few mild and transient AEs. However, given the heterogeneity of current studies, large, well-designed placebo-controlled RCTs with rigorous evaluation methods are needed to assess the safety of laser acupuncture more completely.

Keywords: complementary and alternative medicine, musculoskeletal pain, safety, adverse event, laser acupuncture

1Division of General Internal Medicine, Mayo Clinic, Rochester, MN, USA.
2Department of Pain Medicine, Shenzhen Nanshan People’s Hospital, Shenzhen, Guangdong, China.
3College of Acupuncture and Rehabilitation, Guangzhou University of Traditional Chinese Medicine, Guangzhou, Guangdong, China.
4Department of Community Internal Medicine, Mayo Clinic, Rochester, MN, USA.
5Department of Physical Medicine & Rehabilitation, Mayo Clinic, Jacksonville, FL, USA.

*Dr. Bauer and Chon are joint senior authors.

© Juan Yang et al., 2020; Published by Mary Ann Liebert, Inc. This Open Access article is distributed under the terms of the Creative Commons License (http://creativecommons.org/licenses/by/4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.
INTRODUCTION

LASER ACUPUNCTURE IS A PHOTONIC stimulation of acupoints and areas, initiating therapeutic effects similar to that of needle acupuncture and related therapies together with photobiomodulation. Laser acupuncture was first developed in China and Russia, and initially applied clinically by Plog on acupoints in 1973–1974. Laser acupuncture was later supplemented with keywords was used to search for studies describing laser acupuncture. Search terms used were laser therapy or laser acupuncture or electro-acupuncture or acupuncture or acupuncture points. Reference lists of review articles and included relevant studies were hand-searched for additional studies. Commentaries, letters, responses, editorials, and original articles were sought. Randomized controlled trials that mentioned safe or safety or adverse event or adverse reaction or risk were searched. Given that most articles reported AEs and were indexed poorly, search terms were not combined for safety at the cost of sensitivity. Searching was limited to the English language. Figure 1 shows the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) recommended protocol.

Inclusion/Exclusion Criteria

Trials that met the following criteria were included:

1. Had original patient data
2. Involved laser acupuncture treatment for any disease
3. Reported AEs or had safety reports
4. Randomized controlled trials (RCTs)
5. Involved with keeping records of laser acupuncture or electro-acupuncture or acupuncture or acupuncture points.

Exclusion criteria were as follows:

1. Reviews
2. Languages other than English
3. Studies related to animal and cellular research.

Data Extraction

Two authors extracted the data independently regarding article author(s), publication year, country, study design, sample size, trial type, disease, interventions, practitioners’ information, and detailed information on AEs. Any dispute was resolved by discussion between the 2 authors, and the original study author was contacted for further information by e-mail if needed.

Data Synthesis

AE data from divergent sources were summarized in a qualitative analysis instead of combining them using meta-analysis. AEs were synthesized from 3 aspects: (1) severity; (2) causality assessment; and (3) evaluation tools.

AE severity. This was assessed by two reviewers independently on the basis of the Common Terminology Criteria for Adverse Events (CTCAE) scale V.5.0. The
CTCAE Scale grades 1 through 5 refer to the severity of the AEs. The 5-point grading categories were applied as detailed in Table 1. Any differences were resolved by discussions among the 2 reviewers. If additional data or information was needed, the primary study author was contacted for clarification per Table 1 grading.

**AE causality.** This refers to causal relation between AE and LA treatment, which was assessed by 2 reviewers independently based on the World Health Organisation—Uppsala Monitoring Centre (WHO-UMC) system for standardized case-causality assessment.\(^{15}\)

**Tools.** Terminology was modified for use in a device rather than for a therapeutic product, and for clinical trial than a laboratory test. The categories for causality assessment were certain, probable/likely, possible, unlikely, conditional/unclassified, and inaccessible/unclassifiable. Any

---

**Table 1. Common Terminology Criteria for AEs**

| Grades | AEs |
|--------|-----|
| 1      | Mild; asymptomatic or mild symptoms; clinical or diagnostic observations only; intervention not indicated |
| 2      | Moderate; minimal, local, or noninvasive intervention indicated; limiting age-appropriate instrumental ADL\(^a\) |
| 3      | Severe or medically significant but not immediately life-threatening; hospitalization or prolongation of hospitalization indicated; disabling; limiting self-care ADL\(^b\) |
| 4      | Life-threatening consequences; urgent intervention indicated |
| 5      | Death related to AE |

\(^a\)Instrumental ADL refers to preparing meals, shopping for groceries or clothes, using the telephone, managing money, etc.

\(^b\)Self-care ADL refer to bathing, dressing and undressing, feeding self, using the toilet, taking medications, and being not bedridden.

AE, adverse event; ADL, activities of daily living.
discrepancy in this procedure was resolved by consensus between the 2 reviewers or by consultation with the article’s author.

RESULTS

Study Characteristics

For this review, 737 references were identified initially. Of these, 680 irrelevant records were removed based on their titles and abstracts. Of the 57 RCTs, 30 articles were excluded for irrelevance of laser acupuncture safety. After 6 of the 27 non–full-text RCT articles were also excluded, 21 RCTs full-text articles remained for this review.16–36 The geographic distribution of these RCTs trials included several countries, with 8 trials that originated in Australia,19,20,22,27–30,35 2 in in the United States,17,26 1 in Germany,21 2 in Indonesia,24,34 1 in in Denmark,31 1 in Egypt,25 1 in Scotland,16 1 in Austria,32 1 in China,23 1 in India,36 and 1 in Brazil.33 See Table 2A. All the included trials were ethically approved and informed consent was obtained from all patients and parents (when the subjects were children).

A large proportion of AEs in the literature reports originated from European and North American countries. (Fig. 2) The majority of RCTs,16,18,21–26,28,31–36 reported that laser therapy was safe without AEs. AEs varied substantially among 6 studies, mainly including: tingling17,29; pain flare-up19,20; fatigue27,30; insomnia, dry mouth, and headache20; and transient tiredness and dizziness, vagueness, and nausea.29

The treatment in 13 studies was administered by a licensed acupuncturist,18,19,21–23,26,30,32,33,35 1 study by an investigator supervised by a certified acupuncturist, 1 by experienced general practitioner therapists,20 1 by a trained physiotherapist,16 and 5 without mention of providers.17,24,25,34,36 See Table 2B. Among all the included trials, 62% reported positive outcomes of laser acupuncture’s clinical efficacy.16,18,21,24–27,30,32–36 For safety, safeguard measurements were given to medical providers; patients were instructed to wear goggles to shield their eyes16,17,21,25,27,32,34,35; and the laser probe was fully in contact with each participant’s skin surface16,18–20,26,27,30,32 to deliver active laser radiation. Characteristics of included RCTs can be seen in Table 2.

Adverse Events

Tingling. Two trials reported tingling with laser acupuncture. As a noninvasive intervention applied to the skin, laser acupuncture produced no sensation and did not burn the skin,26 but there was tingling reported at the site of laser acupuncture manipulation.

In 1 trial evaluating the efficacy of low-energy helium-neon (HeNe) laser treatment for thumb osteoarthritis (OA), 81 patients were randomized into a treatment group (n = 47, 0.9 mW continuous wave (HeNe laser) and a control group (n = 34, sham treatment). The affected thumbs of both groups were “irradiated” with a laser beam for 15 seconds, thrice weekly for 3 weeks. One participant in the treatment group reported transient tingling on the distal superficial branch of the radial nerve; this sensation disappeared spontaneously within 24-hours. The researchers concluded that HeNe laser irradiation at 0.9 mW was safe.17

In the other study, 16 healthy volunteers were randomized to receive low-intensity laser acupuncture on one side to LR 8 and needle acupuncture on the other side to LR 8. Stimulation was in alternating rest/active phases, and brain patterns were recorded by a 3T Philips Intera magnetic resonance imaging scanner. Both interventions at LR 8 produced different brain patterns. All subjects reported feeling the touch of the laser probe but only a few patients felt any sensation produced by the laser beam itself, one feeling warmth, 3 feeling tingling, and 1 reporting both sensations.29

Pain flare-up. Two trials reported pain flare-ups with laser acupuncture. Glazov et al19,20 mentioned the AE of pain flare-ups related to laser acupuncture in 2 trials of patients with chronic low-back pain.

In 1 double-blinded, 2-group parallel RCT the efficacy of a gallium–arsenide–aluminum (Ga-Al-As) laser-diode laser on pain and disability was investigated in patients with chronic nonspecific low-back pain, compared with a sham control. Results showed that 59% participants had minor pain flare-ups and 6% had major flare-ups, but there was no statistically significant difference between the 2 groups.19

In the other trial, 144 patients were randomized to sham (0 J/point), low-dose (0.2 J/point), or high dose (0.8 J/point) groups for 8 once-weekly treatments. No pain- or disability-relieving difference was found among the groups. About 28% of treatments were recorded as followed by flare-ups of low-back pain within 1 week after treatment and there were no obvious differences in the flare-up frequencies.20

![FIG. 2. Geographic distributions of randomized controlled trials related to laser acupuncture safety. Color images are available online.](image-url)
| 1st Author Year | Country | N | Condition | Laser Type | Wave type | Wavelength | Output | Density | Dose | Efficacy |
|-----------------|---------|---|-----------|------------|-----------|------------|--------|---------|------|---------|
| Basford17 1987 USA 81 | Thumb osteoarthritis | Low-energy helium neon laser | Continuous | 632.8 nm | 0.9 mW | — | — | Negative |
| Naeser26 2002 USA 11 | Carpal tunnel syndrome pain | Low level laser (Red-beam laser/ infrared laser) | Continuous | 632.8 nm or 904 nm | 15 mW & 9.4 W | 225 J/cm² or 0.81-0.04 J/cm² | 7 J/point | Positive |
| Quah-Smith30 2005 Australia 30 | Mild-to-moderate depression | Low level infrared laser | — | — | 100 mW | — | — | 0.5 J/point | Positive |
| Ebnesahadi18 2005 Iran 50 | Chronic tension-type headache | Infrared laser (Ga-As-Al) | Continuous | 830 nm | 39 mW | 13 J/cm² | 1.3 J/point | Positive |
| Stockert35 2007 Australia 17 | Pediatric asthma | Diodes soft laser | — | 670 nm | 10 mW | — | — | — | Positive |
| Gottschling21 2008 Germany 43 | Pediatric headache | Infrared laser | Continuous | 830 nm | 30 mW | 3.8 W/cm² | 0.9 J/point | Positive |
| Glazov19 2009 Australia 100 | Non-specific low-back pain | Infrared laser(Ga-As-Al) | Continuous | 830 nm | 10 mW | 0.05 W/cm² | 0.2 J/point | Negative |
| Radvanska31 2011 Denmark 31 | Monosymptomatic nocturnal enuresis | Laser acupuncture | — | 670 nm | 10 mV | — | — | — | Negative |
| Moustafa25 2013 Egypt 40 | Pediatric allergic rhinitis | Low-level infrared laser | Frequent | 905 nm | 30 W | 10,000-Hz frequency | 0.12 J/point | Positive |
| Quah-Smith28 2013 Australia 16 | Differential brain effects | Moxla prototype fibrotic infrared light laser | Continuous | 808 nm | 20 mW | — | — | Negative |
| Quah-Smith27 2013 Australia 20 | Major depression | Low-level infrared laser | Continuous | 808 nm | 25 mW | — | 0.5 J/point | Negative |
| Hinman22 2014 Australia 282 | Chronic knee pain | Low-level red light laser | — | — | 10mW | — | 1.0 J/point | Positive |
| Glazov20 2014 Australia 144 | Non-specific chronic low-back pain | Low-dose infrared laser | Continuous | 830 nm | 20 mW | 0.1 W/cm² | 0.04 J/point | Negative |
| Al Rashoud16 2014 Scotland 49 | Knee osteoarthritis | Low-dose infrared laser | — | 830 nm | 30 mW | 4 J/cm² | 1.2 J/point | Positive |
| Raith122 2015 Austria 28 | Neonatal abstinence syndrome | Infrared laser | Continuous | 675 nm | 10 mW | 17 or 34 J/cm² | 0.3 or 0.6 J/point | Positive |
| Hung23 2016 China 66 | Postpartum weight | Infrared laser | — | 810 nm | 150 mW | 5 W/cm² | 0.375 J/point | Negative |
| Srilestari34 2017 Indonesia 36 | Diabetic foot ulcer | Low-level diode laser(Red light laser) | — | 630 nm | 100 mW | — | 4 J/point | Positive |
| Mihardja24 2017 Indonesia 29 | Plasma levels of β-endorphin in healthy subjects | Infrared laser | Continuous | 785 nm | 50 mW | 20 or 35–40 mW/cm² | 4 J/point | Positive |
| Goel36 2017 India 40 | Pediatric gag reflex | Low-level laser (diode laser) | Continuous | 940 nm | 0.5 mW | — | 4 J/point | Positive |
| Sampaio-Filho33 2018 Brazil 84 | Postoperative pain in third molar surgery | Low-level laser (red diode laser) | Continuous | 660 nm (± 10 nm) | 100 mW | 35.4 mW/cm² | 1 J/point | Positive |

RCTs, randomized controlled trials; AEs, adverse events; Ga-As-Al, gallium-arsenide-aluminium.
Table 2B. Characteristics of Included RCTs: Practitioners, Safety Measures, and Patients’ Responses

| 1st Author       | Year  | Provider             | Full contact | Protective goggles | Other                      | AEs definition                          | Evaluation            | AEs report                        | Severity | Causality |
|------------------|-------|----------------------|--------------|--------------------|---------------------------|-----------------------------------------|-----------------------|-----------------------------------|----------|-----------|
| Basford          | 1987  | —                    | —            | Y                  | —                         | Good or bad pain                        | Question & normal scale | Tingling                          | Mild     | Certain   |
| Naeser           | 2002  | Acupuncturist        | Y            | —                  | —                         | —                                       | —                     | No                                | —        | —         |
| Quah-Smith        | 2005  | Acupuncturist        | Y            | —                  | —                         | Fatigue, insomnia, dry mouth & headache| AEs Questionnaire      | Transient fatigue, insomnia, dry mouth & headache | Mild     | Certain   |
| Ebneshahidi       | 2005  | Acupuncturist        | Y            | —                  | —                         | —                                       | —                     | No                                | —        | —         |
| Stockert          | 2007  | Acupuncturist        | —            | Y                  | —                         | —                                       | —                     | No                                | —        | —         |
| Gottschling       | 2008  | Acupuncturist        | —            | Y                  | —                         | Eye irradiation                         | —                     | No                                | —        | —         |
| Glazov            | 2009  | Acupuncturist        | Y            | —                  | —                         | Pain exacerbations                      | Oral report            | Pain flare-up                     | Mild     | Unlikely  |
| Radvanska         | 2011  | Investigator         | —            | —                  | —                         | —                                       | —                     | No                                | —        | —         |
| Moustafa          | 2013  | —                    | —            | Y                  | —                         | Dizziness, aches, transient fatigue, prolonged fatigue, vagueueness & nausea | 6-item scale           | Tingling, transient tiredness, dizziness, vagueueness & nausea | Mild     | Certain   |
| Quah-Smith        | 2013  | Acupuncturist        | —            | —                  | —                         | —                                       | —                     | No                                | —        | —         |
| Quah-Smith        | 2013  | Acupuncturist        | —            | —                  | —                         | Dizziness, aches, transient fatigue, prolonged fatigue, vagueueness & nausea | 6-item scale           | Minimal transient fatigue         | Mild     | Possible  |
| Hinman            | 2014  | Acupuncturist        | —            | —                  | “No pain” & “Worst pain possible” | NRS questionnaire | No                                | —        | —         |
| Glazov            | 2014  | Experienced general-practitioner therapists | Y           | —                  | “Worst pain possible” | Checklist | Pain flare-up & other symptoms | Mild     | Certain   |
| Al Rashoud        | 2014  | Trained physiotherapist | Y           | Y                  | Device routine check | Eye irradiation | —                     | No                   | —        | —         |
| Raith            | 2015  | Acupuncturist        | Y            | Y                  | Device management | Eye irradiation | —                     | No                   | —        | —         |
| Hung              | 2016  | Acupuncturist        | —            | —                  | —                         | —                                       | —                     | No                                | —        | —         |
| Srilestari        | 2017  | —                    | —            | Y                  | —                         | —                                       | —                     | No                                | —        | —         |
| Mihardja          | 2017  | —                    | —            | —                  | Pain                      | —                                       | —                     | No                                | —        | —         |
| Goel              | 2017  | —                    | —            | —                  | —                         | —                                       | —                     | No                                | —        | —         |
| Sampaio-Filho     | 2018  | Acupuncturist        | —            | —                  | —                         | —                                       | —                     | No                                | —        | —         |

RCTs, randomized controlled trials; AEs, adverse events; NRS, numeric rating scale.
**Severity and Causality Assessment of AEs**

Two trials reported transient fatigue with laser acupuncture. Quah-Smith and her colleagues reported transient fatigue after low-level laser acupuncture treatment in patients with mild-to-moderate depression.

In 1 trial, 30 participants were randomized to either active or inactive laser treatment trial groups. In the active treatment group, 0.5-J laser treatment was delivered to each of 6–8 acupuncture sites per visit, twice weekly for 4 weeks, then once weekly for another 4 weeks. About 29% of the active group reported AEs, and 17% of the inactive group reported AEs. Fatigue was the most-common complaint in the former group (60%).

In the other double-blinded RCT, 47 participants, ages 18–50, were randomized to 2 groups who received laser acupuncture or placebo laser at acupoints CV 14, HT 7, LR 14, LR 8, and KI 3, twice weekly for 4 weeks and once per week for a further 4 weeks—12 sessions in total. After the 12 sessions were completed, minimal transient fatigue was noted in the laser acupuncture group; while transient fatigue, aches, days of fatigue, and vagueness were noted in the placebo group. No significant AE differences between the 2 groups were seen.

All of the fatigue in both trials was mild and transient, which disappeared without special treatment within 24 hours after the acupuncture.

**Other adverse events.** Some other adverse events related to laser acupuncture—such as insomnia, dry mouth, and headache, transient tiredness and dizziness, and vagueness and nausea were also reported. They were mild and transient and resolved spontaneously within 1 day post treatment.

**Severity and Causality Assessment of AEs Associated with Laser Acupuncture**

AEs in the 21 RCT reports were examined in 1244 participants regarding causality. Among the trials, only 4 were evaluated as certain causality; the rest included 1 as probable, 1 as possible, and 0 were unlikely, conditional/unclassified, or inaccessible/unclassifiable cases. In addition, all of the AEs were evaluated as mild in severity assessment. Severe AEs or deaths related to AEs were all regarded unlikely to have been caused by laser acupuncture treatment.

Among the 21 analyzed trials, just 7 (33%) provided explicit information on the methods used to monitor or collect AE data. Accounting for the AE evaluation methods of the 7 trials included: 5 collected with AE questionnaires, 1 with a checklist, and 1 with oral reporting. In 1987, during a study of a low-energy He laser for thumb OA, each participant was asked if there was a “good” or “bad” effects since the last treatment, at the first, third, sixth, and last treatment. Questions were also asked about pain, stiffness, activity, and medication usage, and the responses were quantified with ordinal scales ranging from 0 to 4 or 5. After completion of treatment, questions regarding late-occurring benefits or AEs were asked in telephone follow-ups.

Quah-Smith et al. sent an AE questionnaire to participants after they completed their final treatments in 2005 and found that 29% participants of the active laser group and 17% of the placebo group reported AEs.

In two trials in 2013, after 12 sessions of treatment, all of the participants were asked to complete a scale with a score range from 0 to 6 to assess any AEs (aches, dizziness, nausea, prolonged fatigue, transient fatigue, and vagueness). In the trial evaluating the efficacy of laser acupuncture for chronic nonspecific low back pain, AEs post each treatment were documented on a checklist regarding with pain flare-ups occurrence and other symptoms. In another trial to observe AEs and pain exacerbations during treatment, the study therapist and assessors were required to not comment during the treatment, and follow-up surveys were assessed orally. Participants were asked how they were over the previous week; no side-effects were documented apart from pain variations.

**DISCUSSION**

In this review, all the identified AEs were mild and transient, suggesting that laser acupuncture appears to be safe. Despite these favorable findings, laser acupuncture might still be associated with some significant risks in certain circumstances. The laser device emits visible and/or invisible laser beams, which can cause irradiation to the eyes. High doses of radiation therapy are more likely to stimulate target tissues and cause AEs. According to European Norm (EN 60825-1), low-level lasers were classified in the category of 3R category, which was equivalent to the old classification, 3B: radiation could potentially cause serious damage to the eyes, therefore eye protection is critical and required by law.

Eye irradiation of laser acupuncture treatment was mentioned as having the potential to cause common and severe AEs, such as possible damage to the conjunctiva and retina etc., while these AEs did not occur in any included trial of our review. This might be attributed to the more-routine use of proper protective measures. All the studies were reviewed and approved by the research ethics committees of the institutions where the trials occurred.

Participants, parents, or persons having the custody of patients who are considering receiving laser acupuncture must be given accurate and detailed information about the research intervention and possibility of AEs. Safeguard measurements for laser acupuncture in the clinical setting were obviously indicated in this current review, such as before the laser was switched on, the robe of the laser device should have been perpendicularly in contact with the skin and all the people in the room had been instructed to wear protective goggles against radiation that could damage their eyes.
Newborns or infants who were receiving laser acupuncture interventions had eye protectors to cover their eyes. The effectiveness of protections, as required for Class 3B lasers, and application of the low-level laser were tested and approved by the administration departments of the institutions that carried out the studies and the research laser devices were routinely checked to ensure proper functioning.

These guideline and precautions should be addressed by other practitioners in training; regulating the operations, therapeutic dose, and protections can reduce the high risks of irradiation.

The evidence for the safety of laser acupuncture is not conclusive, but this can be improved in future trials by simple measures, such as utilizing uniform definitions of AEs for all studies. Explicitly including assessment of AEs in future studies, objectively recorded and analyzed, is also a critical step in the development of a more-robust and scientifically valid safety assessment of laser acupuncture. The specific AE questionnaires and symptom checklists as used in several of the reviewed studies may be an excellent resource for data monitoring and collecting.

**Strengths and Limitations of This Review**

To the current authors’ knowledge, this is the first systematic review to evaluate the safety of laser acupuncture therapy. Some limitations of this review should be noted. For example, the electronic search was initially conducted with the limitation to publications relevant to safety only. This may have led to the potential exclusion of some important information on the clinical efficacy of laser acupuncture. Furthermore, due to the diversity of laser parameters (such as wave types, lengths, outputs, and densities), it would be premature to try to draw conclusions about minimal effective dosages. Therefore, all the available laser parameters from the reviewed studies were included in this review, with the hope of forming a foundation for future systematic reviews of laser acupuncture efficacy. In addition, most studies did not provide appropriate information regarding AE incidence reporting. In this review, AEs were reported by only 32% of the included studies, and, due to unclear prescriptions in some of the original publications—such as vague AEs, number of sessions occurred, unclear AE case numbers, etc.—it might be difficult to draw any meaningful conclusions about AE occurrence-incidence reports. Future studies, performed rigorously—with specific emphasis on identifying and recording AEs—are needed.

**CONCLUSIONS**

Laser acupuncture, performed within standardized guidelines and in compliance with all safety precautions, seems to be a safe and well-tolerated therapy that is associated with few mild and transient AEs. Large, well-designed placebo-controlled RCTs with rigorous evaluation methods are needed in the future.

**ACKNOWLEDGMENTS**

The authors would like to thank the support by Samming Project of Medicine in Shenzhen, Shenzhen Nanshan People’s Hospital, Guangdong Medical University, Shenzhen China (01121056) for Dr. Yang’s visiting research at the Mayo Clinic.

**AUTHOR DISCLOSURE STATEMENT**

No financial conflicts of interest exist.

**FUNDING INFORMATION**

Funding received from the HEAD Foundation, Singapore.

**REFERENCES**

1. Litscher G. *Definition of Laser Acupuncture and All Kinds of Photo Acupuncture*. Basel: Multidisciplinary Digital Publishing Institute; 2018.
2. Jang I, Sun S, Jeong M. Early history of laser acupuncture: Who used it first? *Integr Med Res*. 2019;8(2):129–130.
3. Plog FMW. Biophysical Application of the Laser Beam. In: Koebner HK, ed. *Lasers in Medicine*, New York: John Wiley; 1980:21–37.
4. Law D, McDonough S, Bleekey C, Baxter GD, Tumilty S. Laser acupuncture for treating musculoskeletal pain: A systematic review with meta-analysis. *J Acupunct*. 2015;8(1):2–16.
5. Whittaker P. Laser acupuncture: Past, present, and future. *Lasers Med Sci*. 2004;19(2):69–80.
6. Ebrahimi H, Najafi S, Khayamzadeh M, Zahedi A, Mahdavi A. Therapeutic and analgesic efficacy of laser in conjunction with pharmaceutical therapy for trigeminal neuralgia. *J Lasers Med Sci*. 2018;9(1):63–68.
7. Stadler J, Avian A, Posch K, Urlesberger B, Raith W. Laser acupuncture at Large Intestine 4 compared with oral glucose administration for pain prevention in healthy term neonates undergoing routine heel lance: Study protocol for an observer-blinded, randomised controlled clinical trial. *Evid Based Complement Alternat Med*. 2018;2018:8406138.
8. Bjordal JM, Lopes-Martins RA, Joensen J, et al. A systematic review with procedural assessments and meta-analysis of low level laser therapy in lateral elbow tendinopathy (tennis elbow). *BMC Musculoskelet Disord*. 2008;9:75.
9. Glazov G, Yelland M, Emery J. Low-level laser therapy for chronic non-specific low back pain: A meta-analysis of randomised controlled trials. *Acupunct Med*. 2016;34(5):328–341.
10. National Institutes of Health. Effect of Laser Acupuncture on Obesity. Online document at: clinicaltrials.gov/show/nct02167308 Accessed March 12, 2020.
