Acupoint Stimulation for Acne: A Systematic Review of Randomized Controlled Trials

Hui-juan Cao, PhD,* Guo-yan Yang, BSMed,* Yu-yi Wang, BSMed, and Jian-ping Liu, PhD

ABSTRACT

Background: Acupoint stimulation—including acupuncture, moxibustion, cupping, acupoint injection, and acupoint catgut embedding—has shown a beneficial effect for treating acne. However, comprehensive evaluation of current clinical evidence is lacking.

Objective: The aim of this review was to assess the effectiveness and safety of all acupoint stimulation techniques used to treat acne vulgaris.

Design: A systematic review was conducted. It included only randomized controlled trials on acupoint stimulation for acne. Six electronic databases were searched for English and Chinese language studies. All searches ended in May 2012. Studies were selected for eligibility and assessed for quality. RevMan 5.1 software was used for data analysis with an effect estimate presented as risk ratios (RR) or mean difference (MD) with a 95% confidence interval (CI).

Patients: Studies with subjects who were diagnosed with acne vulgaris, or papulopustular, inflammatory, adolescent, or polymorphic acne—regardless of gender, age, and ethnicity—were included.

Intervention: Interventions included any acupoint stimulation technique—such as acupuncture, moxibustion, cupping, acupoint injection, and acupoint catgut embedding—compared with no treatment, placebo, or conventional pharmaceutical medication.

Main Outcome Measure: Reduction of signs and symptoms and presence of adverse effects were examined.

Results: Forty-three trials involving 3453 patients with acne were included. The methodological quality of trials was generally poor in terms of randomization, blinding, and intention-to-treat analysis. Meta-analyses showed significant differences in increasing the number of cured patients between acupuncture plus herbal medicine and herbal medicine alone (RR: 1.60; 95% CI: 1.19–2.14; $P=0.002$), and between acupuncture plus herbal facial mask and herbal facial mask alone (RR: 2.14; 95% CI: 1.29–3.55; $P=0.003$). Cupping therapy was significantly better than pharmaceutical medications for increasing the number of cured patients (RR: 2.11; 95% CI: 1.45–3.07; $P<0.0001$). Serious adverse events were not reported in all included trials.

Conclusions: Acupoint stimulation therapies combined with other treatments appears to be effective for acne. However, further large, rigorously designed trials are needed to confirm these findings.

Key Words: Acne, Acupoint Stimulation, Systematic Review

INTRODUCTION

ACNE IS A CHRONIC INFLAMMATORY CONDITION of the skin. This condition most commonly affects areas where the sebaceous glands are largest and most abundant:

the face; anterior trunk; and upper back.¹ Mild acne is characterized by comedones, or blackheads, which are dilated pores with a plug of keratin. Moderate-to-severe acne is characterized by whiteheads (small cream-colored, dome-shaped papules), red papules, pustules, or cysts. Scars, both

Centre for Evidence-based Chinese Medicine, Beijing University of Chinese Medicine, Beijing, China.

*Both authors contributed equally.

those on the skin and emotional scars can last a lifetime. Acne affects 80% of adolescents (most commonly from 12 years of age), but it can also affect 54% of adult women and 40% of adult men (primarily those in their early or mid-20s).²

Acne treatment is aimed at decreasing inflammation of the lesions and accompanying discomfort with the ultimate goals of improving appearance and preventing or minimizing scarring and emotional distress.³ Effective prescription medications are available, although side-effects—such as local irritation, teratogenicity, dry skin, hyperlipidemia, and increased risk of depression—are reported.^{4,5} Over-the-counter preparations and herbal remedies, as well as skin-hygiene routines and dietary modifications may be recommended by dermatologists or, more often, are self-prescribed.⁴

In China, in addition to prescription medications, traditional Chinese therapies are used to treat acne. One such therapy is acupoint stimulation. Several methods can be applied: acupuncture with needles; moxibustion, which involves the controlled burning of material, typically mugwort (*Artemisia vulgaris*) herb, at certain points or areas of the body surface; cupping therapy, which involves applying suction by placing a vacuumized, usually by fire, cup or jar on acupoints or affected body surfaces to induce local hyperemia or hemostasis; acupoint injection, which involves injecting medication into an acupuncture point; and acupoint embedding, which involves embedding in the skin over the acupoint a small needle(s), or medicated catgut.

Acupoint-stimulation methods are based on the Traditional Chinese Medicine (TCM) view that acne is caused by any or a combination of several pathogenic factors. These include intense Lung Heat or Stomach Heat, Damp-Heat with Blood Stasis, and Qi (vital energy) Stagnation. As the condition becomes protracted, pathogenic Heat rises and accumulates in the skin and tissues, which brings on the lesions.⁶

Potential mechanisms of acupoint stimulation for acne are to relieve Heat toxicity, eliminate Dampness, regulate the Qi and Blood, and enhance immunologic function.⁶ Some studies also mention that acupuncture can stimulate and balance androgen levels to inhibit excess secretion of the sebaceous gland.⁷

Articles with clinical observations have reported the efficacy of acupoint-stimulation therapies for acne. A systematic review⁷ assessing seventeen TCM randomized controlled trials (RCTs) suggests that acupuncture and moxibustion are better than conventional pharmaceutical medication for reducing symptoms of acne. Another systematic review⁸ involving twenty-three trials of topical and oral complementary and alternative medicines (CAMs) concluded that, poor methodological quality aside, the evidence suggests that many of these therapies are biologically plausible. However, there has been no systematic

review that evaluated the clinical evidence of all types of acupoint-stimulation therapies. This systematic review was performed to assess the effectiveness and safety of all acupoint-stimulation techniques used to treat acne vulgaris.

METHODS

Inclusion Criteria

Parallel-group RCTs were included in any data analysis with interventions for the treatment of acne vulgaris using any acupoint stimulation technique—such as acupuncture, moxibustion, cupping, acupoint injection, and acupoint catgut embedding—compared with no treatment, placebo, or conventional pharmaceutical medication. Comparisons also included a combination of acupoint-stimulation techniques, plus other therapies, versus the same other therapies alone. Participants who were diagnosed with acne vulgaris, or papulopustular, inflammatory, adolescent, or polymorphic acne—regardless of gender, age, and ethnicity—were included. Primary outcome measures were reduction of signs and symptoms and presence of adverse effects. Secondary outcome measures included post-treatment evaluation, participants' self-assessment of change in lesions after treatment, psychosocial outcomes, and quality of life (QoL) measurements.

Identification and Selection of Studies

Searches were conducted in the China Network Knowledge Infrastructure (CNKI, 1979–2012), Chinese Scientific Journals Database (VIP, 1989–2012), Wan Fang Database (1985–2012), Chinese Biomedicine (CBM, 1978–2012), Cochrane Central Register of Controlled Trials (CENTRAL, 1999–2012), and PubMed (1966–2012). All searches ended in May 2012. Search terms included acupuncture, electroacupuncture, auricular therapy, acupoint, meridian, combined with acne vulgaris and acne. Unpublished postgraduate theses in Chinese databases were also searched. No language restrictions were imposed. Three authors (H.-j.C., G.-y.Y., and Y.-y.W.) independently selected studies for eligibility and checked against the inclusion criteria.

Data Extraction and Quality Assessment

Three authors (H.-j.C., G.-y.Y., and Y.-y.W.) independently extracted population and intervention characteristics using self-designed data extraction templates. Disagreements were resolved by discussion with another author (J.-p.L.).

Risk of bias for each study was conducted in accord with the *Cochrane Handbook for Systematic Reviews of Intervention*.⁹ Six criteria were applied, as follows: (1) selection bias (random-sequence generation and allocation

concealment); (2) performance bias (blinding of participants and personnel); (3) detection bias (blinding of outcome assessment); (4) attrition bias (incomplete outcome data); (5) reporting bias (selective reporting); and (6) other bias. There were three potential bias judgments: (1) low risk; (2) high risk; and (3) unclear risk. A study was rated unclear risk when insufficient details were reported regarding what happened in the study. A judgment of unclear risk was also made when what happened in the study was known but the risk of bias was unknown or when an item was not relevant to the study, particularly for assessing blinding and incomplete outcome data or when the outcome assessed by the item had not been measured in the study.

Data Analysis

Dichotomous data were expressed as risk ratios (*RR*) with a 95% confidence interval (*CI*). Continuous data were expressed as mean differences (*MDs*) with 95% *CI*s. Statistical heterogeneity was tested by the I^2 test. RevMan 5.1 software (Cochrane Collaboration) was used for data analyses. Meta-analysis was used if the trials had acceptable homogeneity ($I^2 < 85\%$) of study design, participants, interventions, controls, and outcome measures. Meta-analyses were performed using fixed-effect⁹ models ($I^2 < 25\%$) for homogeneous studies and using random-effects methods prior to fixed-effect models when there was substantial heterogeneity ($25\% < I^2 < 85\%$).

RESULTS

Description of Studies

After primary searches of six databases, 535 citations were identified. We excluded 484 studies because they did not meet inclusion criteria. Full-text articles for 51 studies were retrieved. Finally, 43 trials^{10–52} were included in this review (Fig. 1). Characteristics of included trials are listed in Table 1. Among the included trials, fourteen studies^{11–15,19,21,26,31,35,42,43,45,46} were unpublished master's theses.

The forty-three trials involved a total of 3453 patients, with an average of 40 participants in each group. Age ranged between 13 and 43, and duration of disease varied from 1 week to 17 years. Ten trials^{22,23,25,27,29,38,39,47,48,50} did not report diagnostic criteria, two trials^{10,30} used international diagnostic criteria, and thirty-three trials reported using one of four TCM diagnostic criteria.^{53–56} Of the thirty-three trials, six trials^{24,36,40,41,43,52} did not report sources for diagnostic criteria, and eight trials^{11,15,17,20,31,34,37,51} used self-established diagnostic criteria for acne.

Interventions included acupuncture (electroacupuncture, auricular acupuncture, and ear point pressure), cupping therapy, acupoint injection, acupoint catgut embedding,

FIG. 1. Search strategy flow chart.

moxibustion, and combination of acupoint-stimulation therapies and herbal medicine. Controls included pharmaceutical medications and herbal medicine alone. Courses of treatment ranged from 1 to 12 weeks.

Degree of reduction in clinical symptoms (known as the cure rate) as the major outcome measurement was reported in all forty-three included trials. Responses to interventions were classified as *cure*, *markedly effective*, *effective*, and *ineffective*.⁵³ *Cure* was defined as lesions totally faded (or >95% faded) and only mild pigmentation and scars remaining. *Markedly effective* was defined as lesions faded >60% and severity of lesions was alleviated. *Effective* was defined as lesions faded 20%–59% and severity of lesions was reduced. *Ineffective* was defined as lesions faded <20% or worsening of lesions. Four trials^{13,19,43,45} counted the number of skin lesions, three trials^{14,42,45} reported QoL scores, two trials^{42,43} reported recurrence rates, and three trials^{14,42,43} listed laboratory test results.

Methodological Quality

According to the current authors' predefined quality-assessment criteria, all forty-three trials were evaluated as having a high risk of bias (Fig. 2). Study sample size varied from 20 to 112 participants, with an average of 40 patients per group. None of the trials reported sample-size calculation methodology. Fifteen trials^{11,12,14,15,19,21,26,30,32,35,42,44–46,48} described randomization procedures, using random number tables or computer generation of random numbers, but only 1 trial¹⁴ reported adequate allocation concealment. The majority of trials

TABLE 1. CHARACTERISTICS OF 43 INCLUDED TRIALS

<i>Study 1st author & ref.</i>	<i>Diagnostic criteria</i>	<i>Sample size (M/F)</i>		<i>Sample age (range, y)</i>		<i>Disease duration (average)</i>		<i>Baseline data comparable?</i>
		<i>I</i>	<i>C</i>	<i>I</i>	<i>C</i>	<i>I</i>	<i>C</i>	
Chen 2007 ¹⁰	Chinese criteria & Western criteria	10/26	8/22	22.13	21.63	2.61 y	1.96 y	Yes
Chen 2009 ¹¹	Nonstandard Chinese criteria	30*	60*	22.93 ± 6.03	21.83 ± 6.07	4.31 ± 3.24 y	2.60 ± 1.92 y	Yes
Cheng 2010 ¹²	Chinese criteria ⁵⁶	27/23	26/24	21.2 (14–35)	21.5 (13–36)	6.5 m (1 w–5 y)	6.3 m (1 w–6 y)	Yes
Fan 2010 ¹³	Chinese criteria ⁵³	15/10	11/15	22.24 ± 4.087	22.32 ± 4.534	1 y–3 y	1 y–3 y	Yes
Gong 2005 ¹⁴	Chinese criteria ⁵³	9/11	6/14	21.3	21.5	2.89 y	3.57 y	Yes
Han 2010 ¹⁵	Nonstandard Chinese criteria	18/28	14/33	25.83	24.68	2.35 y	2.15 y	Yes
He 2009 ¹⁶	Chinese criteria ⁵⁴	8/16	10/12	25.2 (17–41)	23.6 (16–38)	20 d–16 y	1 m–17 y	Yes

TABLE 1. (CONTINUED)

<i>Intervention</i>	<i>Control</i>	<i>Duration of treatment (w)</i>	<i>Outcome</i>	<i>Adverse events</i>
Warm needling & moxibustion at: CV 4, CV 6, ST 36, BL 20, & BL 23; additional points according to syndrome differentiation, 30 minutes, 1×/2 d	Acupuncture applied to same acupoints as for treatment group, 1×/every other d	9	Response to intervention	Yes (3 patients in intervention group had dry stools, thirst, irritability)
Bloodletting, followed by cupping at BL 13 & BL 21, combined with body acupuncture 2×/w; herbal medicine, twice per d	Herbal medicine 2×/d	4	Response to intervention	No
<i>Bai Xian Xia Ta Re</i> tablet, 5 pills (adolescents, 3 pills), 3×/d; ear acupressure with vaccaria seed; main points: CO 14, CO 4, LO 5,6i; additional points according to syndrome differentiation; patients instructed to press 1–2 min 1×/w	<i>Bai Xian Xia Ta Re</i> tablet, 5 pills (adolescents, 3 pills) 3×/d	4	Response to intervention	NR
Fire needling & acupuncture on the lesion area, 1×/every 5 d	Tazarotene cream applied to lesions at bedtime every night, clindamycin gel applied to lesions 1×/every morning	3	Skin-lesion count; response to intervention; adverse effects	Yes (24 cases in acu group & 9 cases in control group had pain; 24 cases in acu group & 6 cases in control group had redness & swelling of portions of lesion area; 13 cases in acu group & 15 cases in control had itching in acupoint areas)
Acupuncture on skin-lesion area, 30 min 1×/every 2; ear acupressure with vaccaria seed on CO 18, TG 2p, AH 6a, CO 14 & LO 5,6i; patients instructed to press 3–5 min 2×/d	Licorsinc capsule, 0.25 g, 3×/d	4	Laboratory tests; QoL—Acne; GAGS; response to intervention	NR
Acupuncture of abdominal acupoints: CV 12, CV 10, CV 6, CV 4, ST 24, ST 26, KI 13 for 30 min, 3 ×/w, 1×/ every 2 days	Isotretinoin, 10 mg, 2×/d for 1 m, then 10 mg 1×/d	8	Response to intervention	NR
Acupuncture of abdominal acupoints: CV 12, CV 10, CV 6, CV 4 ST 24, ST 26; facial acupoints EX-HN 3, “ouch” point 30 min; TDP mineral lamp 15–20 min 1×/d for 7 d, then 1×/every 2 d	Topical metronidazole solution 2×/d	3	Response to intervention	NR

(continued)

TABLE 1. (CONTINUED)

<i>Study 1st author & ref.</i>	<i>Diagnostic criteria</i>	<i>Sample size (M/F)</i>		<i>Sample age (range, y)</i>		<i>Disease duration (average)</i>		<i>Baseline data comparable?</i>
		<i>I</i>	<i>C</i>	<i>I</i>	<i>C</i>	<i>I</i>	<i>C</i>	
Hong 2011 ¹⁷	Nonstandard Chinese criteria	8/11	7/11)	24 (15–36)	23 (14–35)	2.5 (1–10) y	2.2 (1–11) y	Yes
Hou 2009 ¹⁸	Chinese criteria ⁵⁵	21/24	18/24	16–38	17–38	2 m–5 y	3 m–4 y	NR
Huang 2011 ¹⁹	Chinese criteria ⁵⁴	7/23	7/23	19.23 ± 3.05	19.03 ± 3.18	11.57 d ± 7.55 d	11.47 d ± 6.72 d	Yes
Huang 2010 ²⁰	Nonstandard Chinese criteria	76*	50*	23 (16–35)		2 m–5 y		Yes
Huang 2009 ²¹	Chinese criteria ⁵⁴	12/18	10/20	15–45		2 m–2 y		Yes
Huang 2011 ²²	NR	14/16	15/15	21.3	19.9	24.7 m	26.0 m	Yes
Jin 2009 ²³	NR	14/18	12/14	24.5 (18–24)	23 (16–30)	(4.7 ± 1.2) y	(4.8 ± 1.14) y	Yes
Lan 2004 ²⁴	Chinese criteria without source	0/38	0/34	NR		NR		Yes
Li 1995 ²⁵	NR	35/21	25/15	NR		3 m–6 y		NR

TABLE 1. (CONTINUED)

<i>Intervention</i>	<i>Control</i>	<i>Duration of treatment (w)</i>	<i>Outcome</i>	<i>Adverse events</i>
Bloodletting at HX 6,7i, GV 14, BL 13, BL 21 & BL 20 3–5 ×; cupping on GV 14, BL 13, BL 21 & BL 20 for 10–15 min 2×/w; Chinese medicinal facial mask 2×/w	Chinese medicinal facial mask 2×/w	5	Response to intervention	NR
Bloodletting, followed by cupping at GV 14, BL 28, BL 25, BL 21 & BL 13; Blood Stasis point, 1×/every 2 d; ear acupoint needle embedding 3–5 d at acupoints TF 4, TF 2, CO 18 & TG 2	Bloodletting, followed by cupping at GV 14, BL 28, BL 25, BL 21 & BL 13; Blood Stasis point 1×/every 2 d	2	Response to intervention	NR
Acupuncture at “ouch” point, 30 min 1×/every 2 d, 3×/w; <i>Pi Pa Qing Fei</i> decoction, 250 mL, 2×/d; Chinese herbal facial mask, 30 min 1×/d	<i>Pi Pa Qing Fei</i> decoction, 250 mL, 2×/d; Chinese herbal facial mask, 30 min 1×/d	4	Skin-lesion count; response to intervention; adverse effects	Yes (6 patients in acu group reported black & blue of some skin areas after acupuncture)
Bloodletting, followed by cupping at GV10, GV14, BL13, BL15, BL20 for 5–10 min 2×/w; herbal preparation, 50 mL, 3×/d; topical facial cream	Herbal preparation 50 mL, 3×/d; topical facial cream	4	Response to intervention	NR
Autologous blood injection at acupoints LI 11 & BL 13; EA at skin-lesion area for 30 min, 3×/w	Autologous blood injection at acupoints LI 11 & BL 13 for 30 min, 3×/w	4	Response to intervention	NR
Autologous blood injection, 4 mL, at bilateral acupoint ST 36, 1×/w	Viaminate capsules, 0.025 g, 3×/d; tetracycline, 0.25 g, 3×/d	3	Response to intervention	NR
Body & facial acupuncture 30 min once every 2 days; herbal facial mask applied for 20 min 1×/every 2–3 d	Herbal facial mask applied 20 min once every 2–3 d	4	Response to intervention	NR
Acupuncture at lesion area, LI 4, SP 36, 30 min 3×/w, 3 w/cycle for 2 cycles; <i>Qing Shen Fen Ci Qing</i> oral liquid, 20 mL, 3×/d	<i>Qin Shen Fen Ci Qing</i> oral liquid, 20 mL, 3×/d.	6	Response to intervention; adverse events	NR
Use point-detection device to test/stimulate ear points TG 2p, CO 7, CO 14 & CO 4 for 30 min for 1 m; herbal decoction 1×/d for 1 m	Herbal decoction 1×/d for 1 m	4	Response to intervention	NR

(continued)

TABLE 1. (CONTINUED)

Study 1st author & ref.	Diagnostic criteria	Sample size (M/F)		Sample age (range, y)		Disease duration (average)		Baseline data comparable?
		I	C	I	C	I	C	
Li 2009 ²⁶	Chinese criteria ⁵³	0/29	0/30	25.48 ± 4.09	25.57 ± 4 .67	<13 y	<13y	NR
Li 2011 ²⁷	NR	48*	48*	22.8 (14–32)		22 m (2 m–10 y)		Yes
Li 2011 ²⁸	Chinese criteria ⁵³	10/13	10/12	25.3 (18–39)	24.5 (18–35)	19.17 (1–65 m)	19.36 (2–67m)	NR
Liu 2008 ²⁹	NR	60*	60*	14–41		2 m–10 y		Yes
Liu 2009 ³⁰	Chinese Criteria & Western criteria	14/29	39*	23.6	24.1	2 w–5 y	3 m–4 y	NR
Lu 2011 ³¹	Nonstandard Chinese criteria	21/39	18/42	20.17 ± 4.48 (13–34)	22.17 ± 4.12 (14–30)	1 m–10 y	1 m–10 y	Yes
Mao 2008 ³²	Chinese criteria ⁵⁴	16/25	43*	16–21		1 w–2 m	1 w–3 m	Yes
Mi 2011 ³³	Chinese criteria ⁵³	14/16	18/12	22.31 (31–32)	25.27 (16–30)	NR		Yes

TABLE 1. (CONTINUED)

<i>Intervention</i>	<i>Control</i>	<i>Duration of treatment (w)</i>	<i>Outcome</i>	<i>Adverse events</i>
Herbal decoction, 50 mL, 2×/d; <i>Cuo Ling Ding</i> applied topically to lesions; acupoint injection with 1 mL of <i>danshen</i> extract at ST 36, 1×/every 3–5 d; ear acupuncture at TF 4, TG 2p, AH 6a & CO 18, 1×/every 7 d	Herbal decoction, 50 mL, 2×/d; <i>Cuo Ling Ding</i> applied topically to lesions; acupoint injection with 1 mL of <i>danshen</i> at ST 36, 1×/every 3–5 d	4	Response to intervention	NR
Acupuncture at LI 4, SI 3 & PC 8; herbal decoction; <i>She Dan</i> cream applied topically to lesions	Herbal decoction; <i>She Dan Shuan</i> applied topically to lesions	12	Response to intervention	No
Fire needling at “ouch” point, BL 13, BL 15, BL 18, BL 23, CV 4, CV 6, CV 12 & S 25 1×/w for 8 w; <i>Yang He</i> decoction	<i>Yang He</i> decoction	8	Response to intervention	NR
Autologous blood injection, 5 mL, injection at bilateral ST 36, 1×/w; medications same as control group	Vitamin B tablet, zinc gluconate tablet, <i>Luo Hong</i> enzyme capsule, <i>Pi Pa Qing Fei</i> decoction; topical acne tincture; skin hygiene; <i>Qing Da</i> enzyme injection or triamcinolone injection 1×/w	6	Response to intervention	NR
Acupuncture for 30 min, followed by flash cupping mainly at ST 3, ST 4, ST 6, ST 7 & SI 18; 10 sessions per course, 2 courses total (1×/d for the first course, every other day for the second course)	Acupuncture mainly at ST 3, ST 4, ST 6, ST 7 & SI 18, 10 sessions per course, 2 courses total (1×/d for the first course, every other d for the second course)	4	Response to intervention	No
Flash cupping at DU 14, followed by needling for 5–10 min & cupping for 5 min, 1×/every 2–3 days; herbal decoction 2×/d	Herbal preparation 2×/d	4	Response to intervention	No
Acupuncture at Ex-B 2, ST 36 & LI 4 for 15–30 min, 1×/d for 5 d	Oral minocycline, 50 mg, 2×/d	1	Response to intervention	NR
Acupuncture at CV 12, CV 10, CV 4, ST 26, ST 25 or 30 min, 1×/every 2 d, 1 m/course for 2 courses; warm needling at skin lesion area; acupoint injection with <i>danshen</i> injection at ST 36 & LI 11	Warm needling at skin lesion area; acupoint injection with <i>danshen</i> injection at ST 36 & LI 11	8	Response to intervention	NR

(continued)

TABLE 1. (CONTINUED)

Study 1st author & ref.	Diagnostic criteria	Sample size (M/F)		Sample age (range, y)		Disease duration (average)		Baseline data comparable?
		I	C	I	C	I	C	
Song 2011 ³⁴	Nonstandard Chinese criteria	34/26	36/24	20.3 (14–30)	21.1 (13–31)	389 d (7 d–3 y)	392 d (5 d–3 y)	Yes
Wang 2011 ³⁵	Chinese criteria ⁵³	10./14	11/13	22.58 (18–32)	22.33 (18_33)	> 2 w	> 2 w	Yes
Wang 2009 ³⁶	Chinese criteria without source	35/33	30/30	26.5	25	6 m–7 y	5 m–8 y	Yes
Wang 2007 ³⁷	Nonstandard Chinese criteria	30*	30*	18 d–37 d		10 d–6 y		Yes
Wu 2010 ³⁸	NR	30*	28*	16–25	15–25	4 m–6 y	3 m–6 y	NR
Wu 1998 ³⁹	NR	34*	34*	19.5 (16–24)		6 m–4 y		NR
Wu 2008 ⁴⁰	Chinese criteria without source	9/21	7/23	26.13 ± 2.54	24.83 ± 3.07	15.20w ± 136 w	14.53 w + 187 w	Yes
Xie 2009 ⁴¹	Chinese criteria without source	16/22	18/12	15–38	14–36	1 m–9 y		Yes

TABLE 1. (CONTINUED)

<i>Intervention</i>	<i>Control</i>	<i>Duration of treatment (w)</i>	<i>Outcome</i>	<i>Adverse events</i>
Bloodletting, followed by cupping at GV 14, BL 13, BL 18, BL 20 & BL21	Vitamin B tablet, oral metronidazole, or oral erythromycin; topical metronidazole 1%–5%, cream; topical benzoyl peroxide gel; topical sulfur preparation; topical <i>Mei Lu Xiao Cuo</i> cream	4	Response to intervention	NR
Acupuncture & <i>guasha</i> at GB 14, SI 18, GV 14, LI 4, LI 11 & S 44 1×/every 2 d; scraping the first lateral of BL meridian, once per w	Scraping the first lateral of BL meridian, once per w	4	Response to intervention	NR
Acupoint catgut embedding at BL 13 & ST 36 as main points; additional points selected according to syndrome differentiation, 1×/m; oral herbal decoction	Oral herbal decoction	8	Response to intervention	Yes (distending pain during the acupoint catgut embedding)
Acupuncture & moxibustion + acupoint bloodletting & moving cupping (acupuncture for 30 min, 1×/d; cupping for 5–10 min, 1×/every 3 d; 10 sessions as 1 course	Acupuncture & moxibustion, 1×/d	4	Response to intervention	NR
Bloodletting, followed by cupping at BL 13, BL 15, BL 18, BL 20, BL 21 & BL 23 for 10–15 min, 1×/every 5–7 d	Oral tanshinone 1 g, 3 ×/d for 3 w	4	Response to intervention	NR
Acupoint injection at L I4, LI 11, SP 6 & ST 36 of extracts of <i>yu xing cao</i> & <i>dang gui</i> , 4 mL each, alternating at 1–2 acupoints, 1×/every 2 d	Metronidazole tablet, 0.2g, 3×/d; minocycline tablet, 0.05 g, 2×/d	3	Response to intervention	NR
Bloodletting, followed by cupping once daily at “ouch” points, the BL channel & at BL 13 until 7–8 mL of blood is let	Tetracycline, 0.25 g, 4×/d; ketoconazole, 2% ,cream 1×/d	4	Response to intervention	NR
Acupuncture at BL 13, GV 14, LI 11, L I4 & SI 18, with additional points BL 12, LU 11, ST 36 & SP6 for 30 min 1×/d; medicinal facial mask for 30 min 1×/d	Medicinal facial mask 30 min 1×/d	3	Response to intervention	NR

(continued)

TABLE 1. (CONTINUED)

Study 1st author & ref.	Diagnostic criteria	Sample size (M/F)		Sample age (range, y)		Disease duration (average)		Baseline data comparable?
		I	C	I	C	I	C	
Xie 2011 ⁴²	Chinese criteria ⁵⁵	7/22	6/22	25.6 (29.6–21.5)	25.3 (29.3–21.3)	6 m–10 y	5 m–10 y	Yes
Xie 2008 ⁴³	Chinese criteria without source	23/7	25/5	20.70 ± 4.35	22.20 ± 4.27	1.70y ± 2.46 y	2.30y ± 2.59 y	Yes
Xu ⁴⁴ 2009	Chinese criteria ⁵⁴	37/25	17/13	21.3	21.5	1.72 y	1.67 y	Yes
Xu ⁴⁵ 2010	Chinese criteria ⁵⁵	5/27	6/26	22.97	22.63	2 m–13 y		Yes
Yan ⁴⁶ 2006	Chinese criteria ⁵³	5/27	6/26	22.97 (17–43)	22.63 (18–38)	2 m–13 y	2 w–13 y	Yes
Yang ⁴⁷ 2008	NR	31*	31*	22		5 m–7 y		NR
Yang ⁴⁸ 2008	NR	16/52		16–35		3 m–2 y		Yes
Zhang ⁴⁹ 2007	Chinese criteria ⁵⁴	29/27	28/28	22.4 (16–34)	22.1 (15–35)	2.2 y (15 d–10 y)	2.3 y (16 d–11 y)	Yes

TABLE 1. (CONTINUED)

<i>Intervention</i>	<i>Control</i>	<i>Duration of treatment (w)</i>	<i>Outcome</i>	<i>Adverse events</i>
Acupuncture at GB14, SI18, LI4, LI11, ST44, SP6, GB34, 30 min once every 2 days; acupoint injection of <i>dan shen</i> extract 4mL each at BL 13 & BL 18 or BL 20 & BL 23 1×/every 2 d	Acupuncture at GB14, SI18, LI4, LI11, ST44, SP6, GB34, with additional points BL13& BL18 or BL20 & BL23, 30 min once every 2 days.	8	Clinical symptom; response to intervention; recurrence rate; quality of life; adverse events	No
Minocycline capsule, 100 mg, daily at bedtime; catgut embedding LI 4, LI 11, ST 36, ST 37, BL 25 & BL 21 1×/w; tretinoin cream, 0.025%, applied to lesions daily at bedtime; clindamycin gel, 0.1%, applied to lesions 1×/d in daytime	Minocycline capsule, 100 mg, daily at bedtime; tretinoin cream, 0.025%, applied to lesions daily at bedtime; clindamycin gel, 0.1%, applied to lesions 1×/d in daytime	6	Skin lesion count; Response to intervention; adverse effect; recurrence rate; IgG test	Yes (3 cases in intervention group & 6 cases in control group reported dizziness; 2 cases in control reported mild stomach ache)
Herbal decoction, 150 mL, twice daily; acupuncture around the lesion area 30 min once every 2 days	Herbal decoction, 150 mL, twice daily	4	Response to intervention	NR
Acupuncture on skin lesion area 20 min, three times weekly; <i>Pi Pa Qing Fei</i> herbal decoction, 50 mL, 2×/w	<i>Pi Pa Qing Fei</i> herbal decoction, 50 mL, twice daily	4	Response to intervention; WHO QOL-BREF; lesion count	No
Facial acupuncture on lesion area, body acupuncture at LI 11, SP 6, LR 3 & KI3, 20 min, 3×/w, 10 sessions as 1 course; herbal decoction, 50 mL, 2×/d; topical <i>San Huang</i> lotion applied to lesions	Herbal decoction, 50 mL, 2×/d; topical <i>San Huang</i> lotion applied to lesions	4	Response to intervention	NR
Compound Betamethasone injection, 1 mL with 2% lidocaine 1–5 mL injection, at 2 of 4 acupoints: ST 8, EX-HN 5, SJ 17, ST 6, ST 2, ST4, CV 24; viamine 25–50 mg, 3×/d; roxithromycin 150 mg 2×/d	Viamine, 25–50 mg, 3×/d; roxithromycin, 150 mg, 2×/d	8	Response to intervention	Yes
Autologous blood injection, 1 mL, at LI 11 & ST 36 1×/every 3 d	Erythromycin tablets, 0.5 g, 3×/d; ketoconazole cream applied to lesions 1×/d	4	Response to intervention	NR
<i>Pi Pa Qing Fei</i> decoction modified according to syndrome differentiation, twice daily; <i>dan shen</i> injection 1mL at bilateral ST 36 1×/w.	<i>Pi Pa Qing Fei</i> decoction modified according to syndrome differentiation, 2×/d	6	Response to intervention	NR

(continued)

TABLE 1. (CONTINUED)

Study 1st author & ref.	Diagnostic criteria	Sample size (M/F)		Sample age (range, y)		Disease duration (average)		Baseline data comparable?
		I	C	I	C	I	C	
Zhang ⁵⁰ 2008	NR	25/18	28/15	15~ 38	13~ 35	1 w~8 y	1 w~6 y	NR
Zhang ⁵¹ 2006	Nonstandard Chinese criteria	27/51	30/52	24.2	22.7	1 y~10 y	6 m~ 7 y	Yes
Zhang ⁵² 2010	Chinese criteria without source	57/55	51/47	22.5 ± 4.3	21.3 ± 4.5	3.3 m ± 2.1 m	3.6 m ± 2.3 m	Yes

compared acupoint stimulation therapies and pharmaceutical medication; thus, blinding could not be applied for patients and researchers. Six trials^{13,25,26,32,45,46} reported the number of dropouts, but none used intention-to-treat (ITT) analysis. None of the trials mentioned sources of financial support.

Effect Estimates

Because of variations in study quality, participant characteristics, intervention types, controls, and outcome measures, results of most trials could not be synthesized by quantitative methods. Therefore, qualitative methods were used (Table 2).

Therapeutic effect of acupuncture. Therapeutic effect of acupuncture for acne was evaluated in 22 studies. Five studies^{13–16,32} compared acupuncture with pharmaceutical medications. Nine trials^{12,19,24,25,27,28,44–46} compared acupuncture plus herbal medicine with herbal medicine alone. Two trials^{21,33} compared acupuncture plus acupoint injection with acupoint injection alone. Two trials^{23,41} compared acupuncture plus a herbal facial mask with a facial mask alone. One trial¹⁸ compared acupuncture plus cupping therapy with cupping therapy alone. One trial³⁵ compared acupuncture plus *guasha* (scraping) with *guasha* alone. One trial²⁶ compared acupuncture plus herbal medicine and acupoint injection with herbal medicine and acupoint injection alone.

Nineteen trials^{12–16,18,19,21,23–25,27,28,32,33,41,44–46} were included in four meta-analyses. There were a significant dif-

ference in the number of cured patients between acupuncture plus herbal medicine and herbal medicine alone (*RR*: 1.60; 95% *CI*: 1.19–2.14; *P*=0.002; random model; *I*²=46%; 9 trials), and between acupuncture plus herbal facial mask and herbal facial mask alone (*RR*: 2.14; 95% *CI*: 1.29–3.55; *P*=0.003; fixed model; *I*²=0%; 2 trials). No difference was seen in the comparison between acupuncture and pharmaceutical medications (*RR*: 1.49; 95% *CI*: 0.82–2.73; *P*=0.19; random model; *I*²=54%; 5 trials), and in the comparison between acupuncture plus acupoint injection and acupoint injection alone (*RR*: 2.00; 95% *CI*: 0.64–6.29, *P*=0.24; fixed model; *I*²=0%; 2 trials).

Three trials^{13,19,45} reported changes in skin-lesion count. One study¹³ that used a skin-lesion scoring system,⁵³ showed that acupuncture was superior to pharmaceutical medication for reducing the skin-lesion area (*MD*: –26.95; 95% *CI*: –31.84 to –22.06; *P*<0.00001; 1 trial). The remaining two trials compared acupuncture plus herbal medicine with herbal medicine alone. One of the trials⁴⁵ found that a combination of acupuncture and herbal medicine was better than herbal medicine alone for reducing skin lesions (*MD*: –13.88; 95% *CI*: –19.17 to –8.59; *P*<0.00001, 1 trial), while the other trial¹⁹ showed no difference between the comparison treatments (*MD*: –0.97; 95% *CI*: –3.06 to 1.12; *P*=0.36; 1 trial).

QoL (Acne-QoL)⁵⁷ was assessed in one trial,¹⁴ finding that, compared with pharmaceutical medication, acupuncture appeared to significantly improve self-perception (*MD*: 3.40; 95% *CI*: 2.16–4.64; *P*<0.00001; 1 trial), social

TABLE 1. (CONTINUED)

<i>Intervention</i>	<i>Control</i>	<i>Duration of treatment (w)</i>	<i>Outcome</i>	<i>Adverse events</i>
Bloodletting, followed by flash cupping & 15 min of cup retention at at tender Transporting points, at GV 14 & at additional points according to syndrome differentiation; treat 1×/every 2 d	Tetracycline tablets 500 mg 1×/d; <i>Cuo Chuang Ping</i> ointment applied to lesions 2×/d	4	Response to intervention	No
Acupuncture & moxibustion, 1×/every other d; 5 sessions as 1 course; 3 courses total	Acupuncture 1×/every other d; 5 sessions as 1 course; 3 courses total	9	Response to intervention	NR
Acupoint catgut embedding at BL 13, BL 15, BL 18, BL 16, BL 20, BL 21, ST 36, LI 11, & SP10; additional points selected according to syndrome differentiation; treat 1×/every 2 w	Viaminate capsules, 50 mg, 2×/d; fusidic acid cream applied to lesions 2×/d	12	Response to intervention	Yes (5 cases in intervention group & 4 cases in control reported dry lips)

*Gender numbers not reported.

M, male; F, female; y, year(s); m, month(s); w, week(s); d, day(s); min, minutes; I, intervention group; C, control group; acu., acupuncture; NR, not reported; EA, electroacupuncture; QoL or QOL, quality of life; GAGS, Global Acne Grading System; TDP, a specific electromagnetic spectrum; WHO, World Health Organization; IgG, immunoglobulin G.

function (MD: 2.30; 95% CI: 1.23–3.37; $P < 0.0001$; 1 trial), and emotional function (MD: 2.30; 95% CI: 0.74–3.86; $P = 0.004$; 1 trial).

Therapeutic effect of cupping therapy. Ten trials evaluated the effectiveness of cupping therapy for acne. Of the ten trials, four^{34,38,40,50} compared cupping therapy with pharmaceutical medications, three trials^{11,20,31} compared cupping therapy plus herbal medicine with herbal medicine alone, two trials^{30,37} compared cupping plus acupuncture with acupuncture alone, and one trial¹⁷ compared cupping plus a herbal facial mask with herbal facial mask alone.

Meta-analysis showed that cupping therapy was significantly better than pharmaceutical medications, such as tanshinone, tetracycline, and ketokonazole (RR : 2.11; 95% CI: 1.45–3.07; $P < 0.0001$; fixed model; $I^2 = 6\%$; 4 trials). Furthermore, cupping therapy combined with herbal medicine (RR : 1.91; 95% CI: 1.32–2.74; $P = 0.0005$; fixed model; $I^2 = 0\%$; 3 trials) or acupuncture (RR : 1.79; 95% CI: 1.12–2.86; $P = 0.01$; fixed model; $I^2 = 6\%$; 2 trials) was superior to herbal medicine or acupuncture alone. However, no difference was found between cupping plus a facial mask and a facial mask alone (RR : 1.58; 95% CI: 0.72–3.45; $P = 0.25$; 1 trial). As each comparison had fewer than five trials, it was not meaningful to conduct a funnel-plot analysis.

Therapeutic effect of acupoint injection. Seven trials evaluated the effect of acupoint injection for acne. Of the seven trials, three^{22,39,48} compared acupoint injection with pharmaceutical medication, and four trials compared acupoint injection plus other treatment with other treatment alone (pharmaceutical medication,^{29,47} acupuncture,⁴² and herbal medicine⁴⁹).

Meta-analysis showed that acupoint injection used alone (RR : 1.51; 95% CI: 1.13–2.03; $P = 0.006$; fixed model; $I^2 = 0\%$; 3 trials) and combined with pharmaceutical medication (RR : 1.49; 95% CI: 1.12–1.99; $P = 0.007$; fixed model, $I^2 = 0\%$; 2 trials) were significantly better than

FIG. 2. Risk of bias graph shows the review authors' judgments about each risk of bias item, presented as percentages across all included studies.

TABLE 2. EFFECT OF ESTIMATES OF ACUPOINT STIMULATION TREATMENT FOR ACNE ON INCREASING NUMBERS OF CURED PATIENTS IN 43 RANDOMIZED CONTROLLED TRIALS

<i>Study 1st author and ref.</i>	<i>Comparisons</i>	<i>Effect estimates [95%CI]</i>	<i>P</i>
1. Acupuncture			
<i>1.1 Acupuncture versus pharmaceutical medications</i>			
Fan 2010 ¹³	Acupuncture with fire needling versus topical tazarotene cream & clindamycin gel	2.43 [0.74, 7.99]	
Gong 2005 ¹⁴	Body acupuncture + ear acupressure versus licorsinc capsule	2.00 [0.20, 20.33]	
Han 2010 ¹⁵	Abdominal acupuncture versus isotretinoin capsule	0.80 [0.50, 1.27]	
He 2009 ¹⁶	Abdominal & facial acupuncture versus topical metronidazole solution	1.38 [0.45, 4.24]	
Mao 2008 ³²	Acupuncture versus minocycline	2.34 [1.23, 4.47]	
Overall (random, $I^2 = 54\%$)		RR 1.49 [0.82, 2.73]	0.19
Overall (fixed, $I^2 = 54\%$)		RR 1.36 [0.97, 1.89]	0.07
<i>1.2 Acupuncture + other treatments versus other treatments alone</i>			
<i>1.2.1 Acupuncture + herbal medicine versus herbal medicine alone</i>			
Cheng 2010 ¹²	Ear acupressure + <i>Bai Xian Xia Ta Re</i> tablet versus <i>Bai Xian Xia Ta Re</i> tablet alone	1.33 [1.02, 1.74]	
Huang 2011 ¹⁹	Acupuncture + <i>Pi Pa Qing Fei</i> decoction & herbal facial mask versus herbal decoction & facial mask alone	2.00 [0.78, 5.15]	
Lan 2004 ²⁴	Acupuncture + <i>Qin Shen Fen Ci Qing</i> oral liquid versus <i>Qin Shen Fen Ci Qing</i> liquid alone	1.49 [0.75, 2.96]	
Li 1995 ²⁵	Auricular therapy + herbal decoction versus herbal decoction alone	2.86 [1.17, 6.97]	
Li 2011 ²⁷	Acupuncture + herbal decoction and <i>She Dan</i> cream external application versus herbal decoction & topical <i>She Dan</i> cream alone	1.07 [0.79, 1.44]	
Li 2011 ²⁸	Acupuncture + <i>Yang He</i> decoction versus <i>Yang He</i> decoction alone	5.10 [1.72, 15.11]	
Xu 2009 ⁴⁴	Acupuncture + herbal decoction versus herbal decoction alone	1.37 [0.60, 3.12]	
Xu 2010 ⁴⁵	Acupuncture + <i>Pi Pa Qing Fei</i> decoction versus <i>Pi Pa Qing Fei</i> decoction alone	2.00 [0.67, 5.98]	
Yan 2006 ⁴⁶	Body & facial acupuncture + herbal decoction & topical <i>San Huang</i> lotion versus herbal decoction & topical <i>San Huang</i> lotion alone	2.00 [0.67, 5.98]	
Overall (random, $I^2 = 46\%$)		RR 1.60 [1.19, 2.14]	0.002
Overall (fixed, $I^2 = 46\%$)		RR 1.56 [1.30, 1.89]	<0.00001
<i>1.2.2 Acupuncture + acupoint injection versus acupoint injection alone</i>			
Huang 2009 ²¹	Electroacupuncture plus autologous blood injection versus autologous blood injection alone	2.00 [0.40, 10.11]	
Mi 2011 ³³	Acupuncture plus acupoint injection versus acupoint injection alone	2.00 [0.40, 10.11]	
Overall (random, $I^2 = 0\%$)		RR 2.00 [0.64, 6.29]	0.24
Overall (fixed, $I^2 = 0\%$)		RR 2.00 [0.64, 6.29]	0.24
<i>1.2.3 Acupuncture + cupping therapy versus cupping therapy alone</i>			
Hou 2009 ¹⁸	Auricular therapy + wet cupping versus wet cupping alone	1.47 [1.00, 2.18]	0.05
<i>1.2.4 Acupuncture + herbal facial mask versus herbal facial mask alone</i>			
Jin 2009 ²³	Body & facial acupuncture + herbal facial mask versus herbal facial mask alone	2.17 [0.64, 7.35]	
Xie 2009 ⁴¹	Acupuncture + herbal facial mask versus herbal facial mask alone	2.13 [1.24, 3.68]	
Overall (random, $I^2 = 0\%$)		RR 2.14 [1.30, 3.52]	0.003
Overall (fixed, $I^2 = 0\%$)		RR 2.14 [1.29, 3.55]	0.003
<i>1.2.5 Acupuncture plus guasha (scraping) versus guasha alone</i>			
Wang 2011 ³⁵	Acupuncture + guasha versus guasha alone	3.00 [0.92, 9.74]	0.07

(continued)

TABLE 2. (CONTINUED)

<i>Study 1st author and ref.</i>	<i>Comparisons</i>	<i>Effect estimates [95%CI]</i>	<i>P</i>
<i>1.2.6 Acupuncture plus herbal medicine and acupoint injection versus herbal medicine and acupoint injection</i>			
Li 2009 ²⁶	Auricular therapy + herbal decoction, topical medicine, acupoint injection versus herbal decoction, topical medicine, & acupoint injection	1.38 [0.55, 3.49]	0.50
2. Cupping therapy			
<i>2.1 Cupping + other interventions versus other interventions alone</i>			
<i>2.1.1 Cupping + herbal medicine versus herbal medicine alone</i>			
Chen 2009 ¹¹	Wet cupping + herbal decoction versus herbal decoction alone	2.33 [0.67, 8.18]	
Huang 2010 ¹⁹	Wet cupping + herbal preparation, topical cream versus herbal preparation & topical cream	2.06 [1.33, 3.18]	
Lu 2011 ³¹	Wet cupping + herbal decoction versus herbal decoction alone	1.44 [0.67, 3.12]	
Overall (random, $I^2 = 0\%$)		RR 1.92 [1.34, 2.76]	0.0004
Overall (fixed, $I^2 = 0\%$)		RR 1.91 [1.32, 2.74]	0.0005
<i>2.1.2 wet cupping plus acupuncture versus acupuncture alone</i>			
Liu 2009 ³⁰	Flash cupping plus acupuncture versus acupuncture alone	1.91 [0.99, 3.72]	
Wang 2007 ³⁷	Moving and wet cupping + acupuncture versus acupuncture alone	1.67 [0.87, 3.20]	
Overall (random, $I^2 = 0\%$)		RR 1.79 [1.12, 2.86]	0.01
Overall (fixed, $I^2 = 0\%$)		RR 1.79 [1.12, 2.86]	0.01
<i>2.1.3 wet cupping plus facial mask versus facial mask</i>			
Hong 2011 ¹⁷	Wet cupping + herbal facial mask versus herbal facial mask alone	1.58 [0.72, 3.45]	0.25
<i>2.2 wet cupping versus pharmaceutical medication</i>			
Song 2011 ³⁴	Wet cupping versus vitamin B/metronidazole/erythromycin, metronidazole cream/benzoyl peroxide gel/sulfur/Mei Lu Xiao Cuo cream	2.00 [0.80, 4.98]	
Wu 2010 ³⁸	Wet cupping versus tonshinone	1.07 [0.45, 2.56]	
Wu 2008 ⁴⁰	Wet cupping versus tetracycline & ketoconazole cream	2.50 [1.31, 4.77]	
Zhang 2008 ⁵⁰	Wet cupping versus tetracycline	2.75 [1.38, 5.48]	
Overall (random, $I^2 = 6\%$)		RR 2.10 [1.42, 3.11]	0.0002
Overall (fixed, $I^2 = 6\%$)		RR 2.11 [1.45, 3.07]	<0.0001
3. Acupoint injection			
<i>3.1 Acupoint injection versus pharmaceutical medication</i>			
Huang 2011 ²²	Autologous blood acupoint injection versus viaminate capsule & tetracycline tablet	2.13 [1.09, 4.16]	
Wu 1998 ³⁹	Yu xing cao & dang gui acupoint injection versus metronidazole tablet & minocycline tablet	1.67 [1.09, 2.56]	
Yang 2008 ⁴⁸	Autologous blood acupoint injection versus erythromycin tablet & topical ketoconazole	1.29 [0.71, 2.36]	
Overall (random, $I^2 = 0\%$)		RR 1.51 [1.13, 2.03]	0.006
Overall (fixed, $I^2 = 0\%$)		RR 1.64 [1.20, 2.24]	0.002
<i>3.2 Acupoint injection + other treatment versus other treatment alone</i>			
<i>3.2.1 Acupoint injection + pharmaceutical medication versus pharmaceutical medication alone</i>			
Liu 2008 ²⁹	Autologous blood acupoint injection + vitamin B/zinc gluconate tablet/Luo Hong enzyme capsule/Pi Pa Qing Fei decoction/acne tincture & acupoint injection versus pharmaceutical medication & acupoint injection	1.43 [1.03, 1.98]	
Yang 2008 ⁴⁷	Compound betamethasone injection with 2% lidocaine acupoint injection + viaminate & roxithromycin versus viaminate & roxithromycin	1.78 [0.93, 3.40]	
Overall (random, $I^2 = 0\%$)		RR 1.49 [1.12, 1.99]	0.007
Overall (fixed, $I^2 = 0\%$)		RR 1.79 [1.12, 2.86]	0.01

(continued)

TABLE 2. (CONTINUED)

Study 1st author and ref.	Comparisons	Effect estimates [95%CI]	P
3.2.2 Acupoint injection + acupuncture versus acupuncture alone			
Xie 2011 ⁴²	Acupoint injection with <i>danshen</i> extract + acupuncture versus acupuncture alone	1.45 [0.46, 4.59]	0.53
3.2.3 Acupoint injection + herbal medicine versus herbal medicine alone			
Zhang 2007 ⁴⁹	Acupoint injection with <i>danshen</i> extract + <i>Pi Pa Qing Fei</i> decoction versus herbal decoction	1.08 [0.83, 1.41]	0.55
4. Acupoint catgut embedding			
4.1 Acupoint catgut embedding versus Western medication			
Zhang 2010 ⁵²	Acupoint catgut embedding versus viaminate capsules & fusidic acid cream	1.57 [1.15, 2.15]	0.004
4.2 Acupoint catgut embedding + other treatment versus other treatment alone			
4.2.1 Acupoint catgut embedding + pharmaceutical medication versus pharmaceutical medication alone			
Xie 2008 ⁴³	Acupoint catgut embedding + minocycline capsule, tretinoin cream/ clindamycin gel versus minocycline capsule, tretinoin cream/ clindamycin gel	1.40 [0.50, 3.92]	0.52
4.2.2 Acupoint catgut embedding + herbal medicine versus herbal medicine alone			
Wang 2009 ³⁶	Acupoint catgut embedding + herbal decoction versus herbal decoction alone	1.85 [1.24, 2.77]	0.003
5. Moxibustion			
5.1 Moxibustion + acupuncture versus acupuncture alone			
Chen 2007 ¹⁰	Moxibustion + acupuncture versus acupuncture alone	1.67 [0.33, 8.48]	
Zhang 2006 ⁵¹	Moxibustion + acupuncture versus acupuncture alone	1.46 [1.04, 2.05]	
Overall (random, $I^2 = 0\%$)		RR 1.47 [1.05, 2.05]	0.03
Overall (fixed, $I^2 = 0\%$)		RR 1.47 [1.05, 2.07]	0.03

CI, confidence interval; RR, risk ratio.

medication alone. However, no difference was found between acupoint injection combined with herbal medicine (RR: 1.08; 95% CI: 0.83–1.41; $P=0.55$; 1 trial) or acupuncture (RR: 1.45; 95% CI: 0.46–4.59; $P=0.53$; 1 trial) compared with herbal medicine or acupuncture alone. As each comparison had fewer than five trials, it was not meaningful to conduct a funnel-plot analysis.

One trial⁴² reported QoL scores and recurrence rate. Results showed no difference between acupoint injection plus acupuncture and acupuncture alone in improving QoL (MD: -1.76 ; 95% CI: -3.80 to 0.28 ; $P=0.09$; 1 trial) and in reducing recurrence rate (RR: 0.22; 95% CI: 0.03–1.60; $P=0.13$; 1 trial).

Therapeutic effect of acupoint catgut embedding. Three trials^{36,43,52} evaluated the therapeutic effect of acupoint catgut embedding for acne. One study⁵² showed acupoint catgut embedding was superior to pharmaceutical medication in increasing the number of cured patients (RR: 1.57; 95% CI: 1.15–2.15; $P=0.004$; 1 trial) and in reducing recurrence rate (RR: 0.22; 95% CI: 0.08–0.62; $P=0.004$; 1 trial). One trial³⁶ showed acupoint catgut embedding combined with herbal medicine was superior to herbal medicine

alone in increasing the number of cured patients (RR: 1.85; 95% CI: 1.24–2.77; $P=0.003$; 1 trial). One study⁴³ showed no difference between acupoint catgut embedding plus pharmaceutical medication and pharmaceutical medication alone in increasing the number of cured patients (RR: 1.40; 95% CI: 0.50–3.92; $P=0.52$; 1 trial), reducing skin-lesion area (MD: 2.67; 95% CI: -0.07 to 5.41 ; $P=0.06$; 1 trial), and reducing recurrence rate (RR: 0.48; 95% CI: 0.12–1.88; $P=0.29$; 1 trial).

Therapeutic effect of moxibustion. Meta-analysis of two trials^{10,51} showed that a combination of moxibustion and acupuncture was better than acupuncture alone for increasing the number of cured patients (RR: 1.47; 95% CI: 1.05–2.07; $P=0.03$; fixed model; $I^2=0\%$; 2 trials).

Adverse events. Twenty-nine trials did not mention adverse events. Of the fourteen trials^{10,11,13,19,27,30,31,36,42,43,45,47,50,52} that did report adverse events, seven trials^{11,27,30,31,42,45,50} found no adverse events in both intervention and control groups. The remaining seven trials reported mild adverse events in the intervention and control groups (Table 1), such as thirst, dizziness, redness and swelling of the treated site,

FIG. 3. Funnel plot of eight trials for the outcome of number of patients cured of acne. SE, standard error; RR, relative risk.

and pain or itching in the acupoint area. Serious adverse events were not reported.

Funnel-plot analysis. Funnel-plot analysis of eight trials showed significant asymmetry (Fig. 3).

DISCUSSION

This study's data demonstrated that, in the studies that were evaluated, acupuncture and cupping therapy used alone or in combination with pharmaceutical medication appeared to be more effective than pharmaceutical medication alone in increasing the number of cured patients with acne. However, further studies are needed to confirm this finding. The therapeutic effects of acupoint injection, acupoint catgut embedding, and moxibustion were unclear because there was insufficient evidence from the available studies.

Results of nine meta-analyses found that acupoint-stimulation therapies combined with other treatments were significantly more efficacious than other treatments applied alone. Cupping therapy and acupoint injection appeared to be superior to pharmaceutical medication, whereas no difference in efficacy was seen between acupuncture and pharmaceutical medication. Although across studies, the use of pharmaceutical medication was not guideline-based or dosage-consistent (Table 1), acupoint-stimulation therapies, including acupuncture, cupping, and acupoint injection may have an equivalent therapeutic effect as medication (antibiotics, antiprotozoal, licorsinc, isotretinoin) for acne. Given that no severe adverse events were reported in the included studies, the current authors believe that it would be worthwhile to conduct further, rigorously designed trials on acupoint-stimulation therapies for the treatment of acne.

This current review revealed that there remains a lack of well-designed studies on the treatment of acne using acu-

point-stimulation therapies. Methodological quality of the studies included in this review was generally poor, indicating a high risk of bias. Inadequate application of randomization and absence of blinding were evident in the majority of trials, causing potential performance bias and detection bias, because patients and researchers were aware of the therapeutic interventions. Applying proper blinding methodology remains a challenge for studies on manual-healing therapies. Even so, at the very least, blinding of outcome assessors is highly recommended in such studies. ITT analysis was not applied in most of the trials and the funnel-plot indicated that these data may have publication bias. Intervention response using the ambiguous and subjective terminology of *cure*, *markedly effective*, *effective*, and *ineffective* was difficult to interpret and validate across studies. Consequently, any positive finding needs to be interpreted cautiously. Researchers of future studies should consider applying more robustly defined intervention response measurements, such as one of the existing acne grading scales.⁵⁸ None of the trials reported sample-size calculation. The current authors strongly recommend that future RCTs include sample-size estimates to ensure adequate statistical power. Furthermore, sample-size calculation and analysis of outcomes should be based on the principle of ITT.

Twelve trials^{13,14,16,19,21,23,24,30,44–46,50} used skin-lesion ("ouch" point) areas as the main targets for stimulation, while other studies^{10–12,15,17,18,20,22,25–29,31–43,47–49,51,52} established acupoint prescriptions that were followed throughout the duration of the trials. The limited number of trials precluded the current authors from ascertaining the differences in therapeutic effects among these three types of acupoint-selection methods.

The potential asymmetry of the funnel-plot test (Fig. 3) of eight trials that examined acupuncture plus herbal medicine, compared with herbal medicine alone may have been caused by small study effects or even heterogeneity in intervention effects. Furthermore, as ongoing trials were not included, and, as all trials were conducted in China, there is a high potential for publication bias in the current review.

In summary, most of the existing trials were of small size and had a high risk of bias. Further high-quality, large-scale studies are needed to confirm the effectiveness of acupoint-stimulation therapy for treating acne. Randomization methods need to be described clearly and reported fully. Blinding of outcome assessors should be attempted as feasibly as possible to minimize performance and assessment biases. Outcome (response) measures utilizing acne-grading scales should be applied and should include contiguous data, such as skin-lesion scores from baseline to study completion. Analysis of outcomes based on the ITT principle is vital as is the application of sample-size calculation. Reporting of trials should adhere to the *Consolidated Standards Of Reporting Trials (CONSORT)*⁵⁹ to ensure clarity and completeness of reporting.

CONCLUSIONS

Acupoint-stimulation therapy—especially when it is combined with other treatments—appears to be effective for treating acne. However, further large, rigorously designed trials are needed to confirm these findings.

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DISCLOSURE STATEMENT

No competing financial interests exist.

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Address correspondence to:

Jian-ping Liu, PhD

Centre for Evidence-based Chinese Medicine

Beijing University of Chinese Medicine

88# Mail Box

Bei San Huan Dong Lu 11

Chaoyang District, Beijing 100029

China

E-mail: jianping_1@hotmail.com