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Review Article

Acupuncture as a Treatment Modality in Dermatology: A Systematic Review

Chelsea Ma, MD, and Raja K. Sivamani, MD, MS, CAT

Abstract

Objectives: Acupuncture is a form of Traditional Chinese Medicine that has been used to treat a broad range of medical conditions, including dermatologic disorders. This systematic review aims to synthesize the evidence on the use of acupuncture as a primary treatment modality for dermatologic conditions.
Methods: A systematic search of MEDLINE, EMBASE, and the Cochrane Central Register was performed. Studies were limited to clinical trials, controlled studies, case reports, comparative studies, and systematic reviews published in the English language. Studies involving moxibustion, electroacupuncture, or blood-letting were excluded.
Results: Twenty-four studies met inclusion criteria. Among these, 16 were randomized controlled trials, 6 were prospective observational studies, and 2 were case reports. Acupuncture was used to treat atopic dermatitis, urticaria, pruritus, acne, chloasma, neurodermatitis, dermatitis herpetiformis, hyperhidrosis, human papillomavirus wart, breast inflammation, and facial elasticity. In 17 of 24 studies, acupuncture showed statistically significant improvements in outcome measurements compared with placebo acupuncture, alternative treatment options, and no intervention.
Conclusions: Acupuncture improves outcome measures in the treatment of dermatitis, chloasma, pruritus, urticaria, hyperhidrosis, and facial elasticity. Future studies should ideally be double-blinded and standardize the control intervention.

Introduction

Acupuncture is a component of Traditional Chinese Medicine that involves stimulation of specific points on the skin using needlepoints, pressure, or heat. Its application is based on the theory that disease is caused by disruptions in the body's *qi,* or vital energy, which flows along channels, called meridians, that form a network to connect the body's organs.[1–4] Acupuncture points are generally located along these meridians and, when stimulated, are thought to restore normal circulation of *qi* to achieve balance and cure disease.[5–8]

Acupuncture holds a long history in China, where it continues to be regularly used independently and as an adjunct to modern medicine to treat a broad range of diseases, including dermatologic disorders. Over the past few decades, the interest in acupuncture has expanded to other countries, including the United States, because of the growing popularity of complementary and alternative medicine (CAM). One systematic review estimated the prevalence of CAM use in the general U.S. population to be around 38%. [9] The national prevalence of acupuncture is estimated to be between 0.6% and 1.4%, according to another systemic review.[10] CAM was used specifically to treat dermatologic conditions in 6% of participants in one large national survey, of whom 9.3% used acupuncture.[11]

An understanding of the evidence on acupuncture for the treatment of skin disease will be invaluable as dermatologists encounter an increasing number of patients seeking acupuncture as an alternative therapy. This systematic review assessed the results and quality of clinical studies and case reports on the use of acupuncture to treat a variety of dermatologic conditions. This appears to be among the first dedicated reviews to synthesize data focusing on acupuncture as a treatment modality in dermatology.

Methods

Search strategy and study selection

To identify relevant studies that used acupuncture to treat dermatologic conditions, a systematic search of MEDLINE, EMBASE, and the Cochrane Central Register was performed. In MEDLINE, the following Medical Subject Headings were used: *acupuncture therapy* in combination with (*skin diseases* or *dermatology*). In EMBASE, a combination of key words

Department of Dermatology, University of California, Davis, Sacramento, CA.

and EMTREE terms for *acupuncture therapy* and (*skin diseases* or *dermatology*) were used. In the Cochrane database, key terms (*acupuncture therapy* or *acupuncture*) and (*skin diseases* or *dermatology*) were used. All searches were limited to clinical trials, controlled studies, case reports, comparative studies, and systematic reviews published in the English language. Systematic reviews were included to identify additional articles. Articles that used moxibustion, electroacupuncture, or blood-letting as forms of acupuncture were excluded.

The initial search of all databases identified 1255 articles (Fig. 1). Two reviewers manually screened relevant abstracts, yielding 48 articles eligible for inclusion criteria. An additional 4 articles were identified from related articles and citations. Articles were excluded if they were out of scope (i.e., did not evaluate a dermatologic condition or assessed only adverse effects secondary to acupuncture); were reviews; or used moxibustion, blood-letting, or electroacupuncture as primary treatment. Case reports were included given the limited number of controlled studies in English involving acupuncture as a treatment in dermatology. After careful review of each manuscript, 24 were included in this review.[12–35]

Data extraction and quality assessment

The following data were extracted from each study (Table 1): (1) study characteristics (author, year, country, and study design); (2) study population (population size, mean or median age); (3) dermatologic condition being treated; (4) acupuncture intervention and control intervention; (5) outcome measurements; and (6) main results and conclusions.

The level of evidence was graded on a scale of I–V per guidelines used to evaluate primary research questions.[36] Studies are evaluated on the basis of study type, confidence interval size, randomization, blinding, and adherence. Level I and II studies contain stronger evidence than level III and IV studies, and level V articles are expert opinion papers.

Results

Twenty-four studies were identified. Among these, 16 were randomized controlled trials (RCTs), 6 were prospective observational studies, and 2 were case reports. Studies were conducted in inpatient and outpatient settings in China ($n=11$), Germany ($n=4$), Korea ($n=2$), Taiwan ($n=1$), the United States ($n=2$), Israel ($n=1$), Iran ($n=1$), Italy ($n=1$), and Sweden ($n=1$).

Dermatologic conditions being treated by acupuncture included atopic dermatitis ($n=6$), urticaria ($n=3$), pruritus ($n=3$), acne ($n=3$), chloasma ($n=3$), neurodermatitis ($n=1$), dermatitis herpetiformis ($n=1$), polyhidrosis ($n=1$), human papillomavirus (HPV) wart ($n=1$), breast inflammation ($n=1$), and facial elasticity ($n=1$). Three studies had level I evidence, 12 studies had level II evidence, 1 study had level III evidence, and 8 studies had level IV evidence.

Acupuncture resulted in statistically significant improvement of outcome measurements in 17 of 24 studies. Of the 7 studies that found no statistical significance in outcomes, 6 had no control group for calculation of *p*-values.

Studies on acupuncture and dermatitis, urticaria, and pruritus

Acupuncture was most commonly examined as a treatment for dermatitis, urticaria, and pruritus, with a total of 14 studies involving 559 participants. Treatment response was evaluated by using multiple objective and subjective outcome measures, described at the bottom of Table 1. For

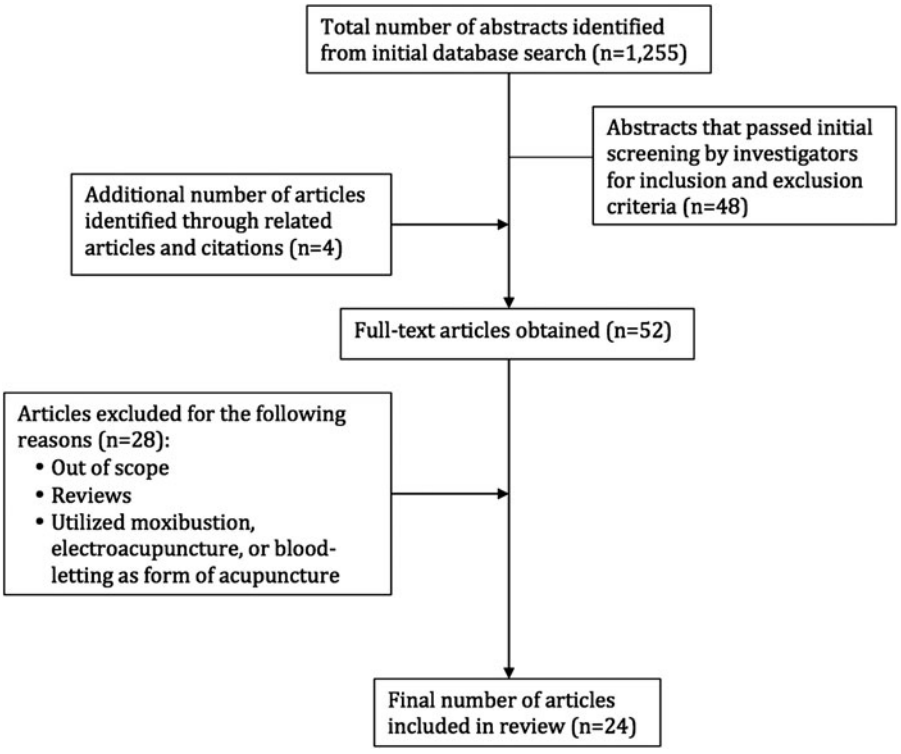

FIG. 1. Literature search and study selection.

Table 1. Study Characteristics and Clinical Characteristics of Patients Treated with Acupuncture Versus Other Modality

Study	Study setting	Study design	Total population size	Mean or median age (y)	Dermatologic condition	Intervention and location	Intervention frequency and duration	Comparison	Outcome measures	Results	Level of Evidence
Hou 2002	China	Observational study	56	NR; range, 16–42	Acne	Auricular acupuncture	1–5 sessions, each session 3–5 times per day	None	Clearance of acne	Complete clearance of acne in 70%, clearance of ≥30% of lesions in 21%	IV
Kim 2012	Korea	RCT	44 men	22.4	Acne	(1) Acupuncture at 22 classical points[a] and/or *ah shi* points randomly selected at papules and nodules on the face (2) Acupuncture plus *Keigai-rengyo-to* extract	8 sessions twice a week for 4 weeks	(1) No intervention (2) *Keigai-rengyo-to* extract only	Percentage reduction in inflammatory and noninflammatory acne lesions from baseline	No difference in inflammatory and noninflammatory acne lesions in acupuncture versus other treatment groups	II
Liu 2008	China	Observational study	85	NR; range, 15–36	Acne	Auricular plus body acupuncture at classical points	1–3 courses, each consisting of 30-min sessions 2–3 times per week, repeated 10 times	None	Clearance of acne	Clearance of >95% of lesions in 72%, ≥70% of lesions in 14%, ≥30% of lesions in 10.5%, no improvement in 3.5%	IV
Feng 2010	China	RCT	60 women	NR; range, 24–49	Chloasma	Acupuncture at classical points on face and body plus herbal medicine	Ten 30-min sessions performed every other day	Oral vitamin C and E	Clearance of local chloasma	Chloasma clearance greater in treatment than in control group ($p < 0.01$)	II
Shi 2010	China	RCT	90 women	Control, 39.3; treatment, 40.5; blank, 38.9	Chloasma	Acupuncture at various classical points depending on patient symptoms	40-minute daily sessions for first week, then twice a week for 3 mo	(1) Control: oral intake of vitamin C and vitamin E, local daily application of retinoid cream (2) Blank: no treatment	Clearance of local chloasma	(1) No difference in clearance between treatment and control groups ($p > 0.01$) (2) Significant difference in clearance between treatment and blank groups ($p < 0.01$)	I
Xun 2003	China	Observational study	30	NR	Chloasma	Auricular acupuncture plus *Vaccaria segetalis* seeds	4 courses, each consisting of fifteen 2- to 3-min sessions	None	Clearance of local chloasma	40% cured, 27% markedly effective, 20% effective, 13% ineffective[b]	IV
Lee 2012	USA	RCT with crossover	15	28.5	Atopic dermatitis	Acupressure at *Quchi* point plus standard of care	3-min sessions 3 times per week for 4 wk	Standard of care alone	Change in VAS, IGA, and EASI	Acupressure group showed significant improvement in VAS ($p = 0.04$), IGA ($p = 0.03$), and EASI ($p = 0.03$) scores compared with control	II
Pfab 2005	Germany	RCT with crossover	10	NR	Atopic eczema	Acupuncture at *Quchi* point	15-min session	(1) Placebo acupuncture (2) No intervention	VAS, itch intensity, mean wheal size	(1) Mean VAS significantly lower in acupuncture group compared with placebo ($p < 0.001$) and no intervention ($p < 0.001$) (2) Itch intensity significantly lower in acupuncture group compared with placebo ($p = 0.05$) and no intervention ($p = 0.02$) (3) Mean wheal size was significantly smaller in acupuncture group versus no intervention	II

(*continued*)

TABLE 1. (CONTINUED)

Study	*Study setting*	*Study design*	*Total population size*	*Mean or median age (y)*	*Dermatologic condition*	*Intervention and location*	*Intervention frequency and duration*	*Comparison*	*Outcome measures*	*Results*	*Level of Evidence*
Pfab 2010	Germany	RCT with crossover	30	28.6	Atopic eczema	Acupuncture at *Quchi* and *Xuehai* points	10-min session	(1) Placebo acupuncture (2) No intervention	VAS, EIQ, wheal and flare size	(1) Mean VAS significantly lower with acupuncture versus no intervention ($p=0.009$) and placebo acupuncture ($p=0.022$) (2) Wheal size was significantly smaller in acupuncture versus no acupuncture ($p=0.015$) (3) Flare size significantly smaller in acupuncture vs placebo acupuncture ($p=0.002$) (4) EIQ significantly lower in acupuncture versus no acupuncture ($p<0.0001$) and in placebo acupuncture versus no acupuncture ($p=0.01$)	I
Pfab 2011	Germany	RCT	10	25.2	Atopic eczema	Acupuncture at various classical points	20-min sessions twice per week, for 10 sessions	No intervention	SCORAD, VAS, reduction in CD63-positive basophils in atopic eczema induced by anti-FcεRI antibody, *Dermatophagoides pteronyssinus*, and Timothy grass pollen	(1) No significant difference in SCORAD score between groups (2) VAS significantly lower in acupuncture versus control group at days 15 ($p=0.024$) and 33 ($p=0.022$) (3) Significant reduction in CD63-positive basophils in acupuncture versus control group stimulated by anti-FcεRI antibody ($p=0.028$), and Timothy grass pollen at 5 ng/mL ($p=0.002$) and 0.05 ng/mL ($p=0.012$)	II
Pfab 2012	Germany	RCT with crossover	20	23.3	Atopic eczema	(1) Preventive acupuncture at classical points on arm and leg opposite of site of itch (2) Abortive acupuncture at *Quchi* and *Shao Hai* points	20-min session	(1) No intervention (2) Placebo preventive/ abortive acupuncture (3) Oral cetirizine (4) Placebo cetirizine	VAS, wheal and flare size	(1) Mean VAS significantly lower in preventive acupuncture group compared with all other groups other than cetirizine (2) Mean itch intensity significantly lower in abortive acupuncture compared with all other groups ($p<0.05$) (3) Flare size significantly smaller in preventive acupuncture compared with placebo ($p=0.034$)	I

(*continued*)

TABLE 1. (CONTINUED)

Study	*Study setting*	*Study design*	*Total population size*	*Mean or median age (y)*	*Dermatologic condition*	*Intervention and location*	*Intervention frequency and duration*	*Comparison*	*Outcome measures*	*Results*	*Level of Evidence*
Salameh 2008	Israel	Prospective clinical study	20	20	Atopic dermatitis	Acupuncture plus Chinese herbal medicine Antihistamines, topical corticosteroids, emollients not discontinued	35-min sessions twice a week for 12 wk	None	Reduction in EASI, DLQI, VAS	Significant reduction in EASI ($p=0.0003$), DLQI ($p=0.0009$), and VAS ($p=0.00008$)	IV
Iraji 2005	Iran	RCT	40	Control, 28; intervention, 30	Chronic urticaria	Acupuncture at points G31, G20, B40, L14	3 wk	Placebo acupuncture	Episode rate of urticaria and duration of each episode	Acupuncture decreased rate ($p=0.01$) and duration ($p=0.03$) of urticarial episodes	II
Tao 2009	China	Observational study	31	NR; range, 4–82	Urticaria	Acupuncture at various classical points	25-min sessions every other day for 0.5 mo to 3 mo	None	Clearance of urticaria	Complete clearance of wheals without recurrence in 25.8%, clearance of >30% or prolonged period between recurrence in 54.84%	IV
Zhao 2006	China	RCT	64	Control, 52; intervention, 51	Chronic urticaria	Acupuncture plus point-injection of Benadryl bilaterally at points *Quchi*, *Xuehai*, *Zusanli*, *Sanyinjiao*, and *Fengchi*	2 courses, each consisting of 30-min sessions daily for 10 d	Oral antihistamines	Clearance of urticaria without relapse in 6 mo	Clearance rate without relapse greater in treatment group than in controls ($p<0.05$)	II
Chou 2005	Taiwan	Controlled trial	40	Control, 63.2; intervention, 62.4	Refractory uremic pruritus	Acupuncture at *Quchi* point	1-h sessions 3 times per week for 1 mo	Acupuncture at nonacupoint sites	Pruritus score from questionnaire	(1) Acupuncture at acupoint sites significantly reduced pruritus immediately after treatment ($p<0.001$) and at 3-mo follow-up ($p<0.001$) (2) No statistical comparison between acupuncture at acupoint versus nonacupoint site	III
Gao 2002	China	RCT	68	43.6	Uremic pruritus	Acupuncture at *Quchi* and *Zusanli* points	30-min sessions twice a week for 4 wk	Oral Chlor-Trimenton and topical ointment	Alleviation of uremic pruritus	zAlleviation of uremic pruritus significantly greater in acupuncture group ($p<0.01$)	II
Jiang 2010	China	RCT	69	Control, 71.5; NAA, 69.4; AA, 66.7	Pruritus secondary to morphine anesthesia	NAA and AA	30-min session	No acupuncture	Reduction of morphine-related pruritus in patients undergoing spinal-epidural anesthesia	(1) Significant reduction in pruritus in NAA and AA groups compared with control ($p<0.05$) (2) Significant reduction in pruritus in NAA group compared with AA group ($p<0.05$)	II

(*continued*)

TABLE 1. (CONTINUED)

Study	Study setting	Study design	Total population size	Mean or median age (y)	Dermatologic condition	Intervention and location	Intervention frequency and duration	Comparison	Outcome measures	Results	Level of Evidence
Ohlsen 2011	USA	Case report	1	48	Dermatitis herpetiformis	Acupuncture at various classical points	45-min sessions 3 times per week for 12 consecutive weeks	None	Improvement in pruritus and erythema	(1) Relief from pruritus while acupuncture needles in place (2) Improvement of pruritus from 10/10 to 1/10 and fewer erythematous lesions after 12 treatment sessions	IV
Weiying 2006	China	RCT	141	Control I, 30.7; control II, 32.4; intervention, 33.2	Localized neurodermatitis	Plum-blossom needle tapping plus oral herbal medicine	30 d	Control I: Herbal medicine alone; control II: oral Benadryl plus vitamin C	Clearance of skin rash	(1) Clearance of rash in needling group significantly greater than herbal medicine alone ($p<0.05$) or oral Benadryl and vitamin C alone ($p<0.05$) (2) No difference in rash clearance between herbal medicine and Benadryl plus vitamin C groups	II
Kvist 2007	Sweden	RCT	205 breast-feeding women	Oxytocin alone, 31; acupuncture heart and gallbladder, 30; acupuncture heart, gallbladder, spleen, 31	Breast erythema, tension, and pain	(1) Acupuncture at heart and gallbladder (2) Acupuncture at heart, gallbladder, and spleen (spleen for oxytocin-like effect)	Maximum 30-min sessions, 1–4 sessions total	Oxytocin spray only	Severity index for erythema, tension, and pain	Groups treated with acupuncture had significantly reduced severity index compared to group treated with oxytocin spray alone on day 3 ($p=0.01$) and day 4 ($p<0.01$) of treatment	II
Ursini 2011	Italy	Case report	1	37	HPV	Acupuncture at left ear, abdomen, limbs, root of wart	58 thirty-min sessions over 19 mo	None	Clearance of large, chronic wart from HPV in HIV-infected patient	Complete clearance of wart after 58 treatment sessions with acupuncture	IV
Wang 2008	China	RCT	56	Control, 61; intervention, 57	Hyperhidrosis (polyhidrosis)	Acupuncture at bilateral *Huatuojiaji* points	Daily 30-min sessions	Estazolam	Improvement of polyhydrosis	Hyperhidrosis significantly improved in acupuncture group compared with control ($p<0.01$)	II
Yun 2013	Korea	Single-arm pilot study	27 women	50	Facial elasticity	Facial cosmetic acupuncture	Five 10-min sessions over 3 wk	None	Change in Moiré topography criteria for facial elasticity	Significant change in Moiré topography ($p=0.0001$) after acupuncture treatments	IV

[a]There are 361 classical acupuncture points with Chinese and numeric nomenclature. Both nomenclatures are included in the table as the authors have used them.

[b]Criteria for therapeutic effects of chloasma set by the Professional Board of Dermatology and Venereology of China Association of Combined Chinese and Western Medicine: (1) cure: visible clearance >90%, normal pigmentation, and decreased index of the scoring evaluation after treatment ≥0.8; (2) markedly effective: visible clearance >60%, lighter pigmentation, and decreased index of the scoring evaluation after treatment ≥0.5; (3) effective: visible clearance >30%, lighter pigmentation, and decreased index of the scoring evaluation after treatment ≥0.3;(4) ineffective: visible clearance <30%, no change in pigmentation, and decreased index of the scoring evaluation after treatment <0.3.

AA, acupuncture in anesthesia area; DLQI, Dermatology Life Quality Index; EASI, Eczema Area and Severity Index survey (calculated from the following components: area of involvement, erythema, thickness, excoriations, and lichenification); EIQ, qualitative assessment of itch intensity; HPV, human papillomavirus; IGA, Investigator's Global Assessment (to measure disease severity); NAA, acupuncture in nonanesthesia area; NR, not reported; RCT, randomized controlled trial; SCORAD, clinical tool developed by the European Task Force on Atopic Dermatitis for assessing the extent, severity, and subjective symptoms of atopic dermatitis; VAS, Visual Analogue Scale (to rate level of itch).

atopic dermatitis, the standard outcome measurement was the visual analogue scale (VAS) to evaluate severity of itch. In all 6 studies on atopic dermatitis, mean VAS score was statistically significantly lower in groups treated with acupuncture than in groups treated with placebo acupuncture or no intervention. Mean wheal or flare size was also statistically significantly reduced in acupuncture groups in 3 studies. However, most of these studies had small sample sizes, with 5 studies involving 20 patients or fewer.

Three studies addressed urticaria, including 2 on patients with chronic or refractory urticaria. Compared with placebo acupuncture, acupuncture statistically significantly reduced the rate and duration of urticarial episodes in 1 RCT.[24] Another RCT found that acupuncture resulted in statistically significantly greater clearance of wheals compared with oral antihistamines.[26] One observational study without a comparison group showed complete clearance of wheals in 25.8% of patients treated with acupuncture and prolongation of time between relapses.[25]

Acupuncture relieved pruritus secondary to uremia, morphine, or dermatitis herpetiformis in 3 RCTs and 1 case report.[27–30] In 1 RCT, acupuncture was superior to herbal medicine and oral diphenhydramine plus vitamin C for clearance of rash from neurodermatitis.[31]

Studies on acupuncture and acne

One RCT and 2 observational studies (185 participants total) examined the therapeutic effect of acupuncture on clearance of acne lesions. The RCT found no statistically significant difference in clearance between acupuncture and herbal medicine, or between acupuncture and no intervention.[13] The 2 observational studies reported clearance of acne lesions in most study participants, but there were no control groups for comparison.[12,14]

Studies on acupuncture and chloasma

Acupuncture therapy for chloasma was performed in 2 RCTs and 1 observational study with a total of 180 patients. Results were mixed. One RCT found statistically significantly greater clearance of chloasma in patients treated with acupuncture plus herbal medicine compared with patients treated with oral vitamin C and E.[15] Another RCT that compared acupuncture alone to oral vitamin C and E plus topical retinoid cream found no difference in chloasma clearance.[16] The observational study found greater than 90% clearance of chloasma and normal skin pigmentation in 40% of patients, and overall therapeutic effect (>30% lesion clearance and lighter skin pigmentation) in 87% of patients.[17]

Studies on acupuncture and other dermatologic conditions

Four studies found acupuncture to be effective at treating other dermatologic conditions, including breast inflammation, polyhidrosis, HPV wart, and facial elasticity. A Swedish RCT involving 205 breastfeeding women found that acupuncture statistically significantly alleviated breast erythema, tension, and pain compared with oxytocin spray alone.[32] An observational study in China involving 56 patients with hyperhidrosis found a statistically significant reduction in sweating with acupuncture treatment compared with estazolam, a benzodiazepine derivative.[34] One case report on an HIV-infected patient with a chronic HPV wart resistant to cryotherapy reported clearance of the wart after 58 sessions of acupuncture over 19 months.[33] Finally, a study of 27 women found that acupuncture resulted in statistically significant changes in Moiré topography, suggestive of improvement in facial elasticity.[35]

Discussion

This is among the first dedicated reviews to synthesize the evidence on acupuncture as a primary treatment modality for multiple dermatologic conditions. The results of this review support acupuncture as an alternative therapy in dermatology, with 17 of 24 studies showing statistically significant improvement in outcome measures compared with no intervention or other treatment options. Furthermore, in some studies acupuncture improved outcome measures statistically significantly more than placebo acupuncture, suggesting possible merit in the traditional theory of acupoints on meridians.[19,20,22,24]

Modern investigations into possible mechanisms of acupuncture have mixed results on the validity of meridians, but consistent across studies is involvement of the autonomic nervous system and hypothalamus-pituitary-adrenal (HPA) axis, recruited via peripheral sensory receptors.[37–44] Functional magnetic resonance imaging studies on humans found modulation of areas in the central nervous system involved in stress and nociception, such as the hypothalamus, nucleus accumbens, amygdala, hippocampus, and anterior cingulate gyrus.[39,41–44] The downstream release of endogenous opioids is thought to contribute to subsequent analgesic and antipruritic effects. Furthermore, the pattern of brain activation seen in acupuncture was found to be distinct from that produced by pain from needle prick, which is uncommon during acupuncture.[39,41,43]

Evidence also appears to support the role of neuromodulation of the immune system in mediating the pathogeneses of inflammatory and infectious skin conditions, such as acne, dermatitis, urticaria, and HPV. Studies on rats have shown decreased levels of pro-inflammatory cytokines—including tumor necrosis factor-α, interleukin-1β, and interleukin-6—after stimulation with acupuncture.[45–49] The underlying mechanism of these findings is unclear, but suppression of cytokine synthesis via outputs from the HPA axis has been proposed.[38]

The mechanism through which acupuncture may treat chloasma (or melasma) has not been as extensively studied. The disease is seen primarily in women and is thought to be caused by increased stimulation of melanocytes secondary to estrogen and progesterone, ultraviolet light, thyroid dysfunction, and genetic predisposition.[50–53] Chloasma lesions are also found to have increased expression of vascular endothelial growth factor (VEGF).[54–56] However, studies on acupuncture and levels of estrogen, progesterone, and VEGF in animal and human studies have not shown consistent results.[57–62]

The findings of this review must be interpreted in the context of the primary literature. There does not appear to be a consistent control group, and studies in this review used multiple comparisons, including no intervention, placebo acupuncture, and oral or topical supplements and medications.

Some studies did not have a control group, making it difficult to assess whether improvements in outcomes were attributable to acupuncture or the body's natural response. The frequency and duration of the intervention used in some studies may not be translatable to daily life. For example, it may not be practical for individuals to attend acupuncture sessions multiple times per day or receive treatments that involve multiple months. Outcome measurements also varied across studies, even within the same dermatologic condition. This heterogeneity in outcome measurements did not allow us to pool findings in a valid form for meta-analysis.

Most studies did not mention blinding of patients and acupuncturists or adjusting for confounding factors, which may bias outcomes. Our search was also limited to studies published in the English language, which excludes many studies performed in China, where acupuncture is more prevalent and widely studied. Finally, studies with small sample sizes may overestimate the effect size and lower reproducibility of results. Our evaluation of level of evidence using a valid scale enabled us to systematically identify weaknesses associated with each study.

In summary, the findings of this review reveal that acupuncture may improve outcome measures in the treatment of multiple dermatologic conditions, including dermatitis, chloasma, pruritus, urticaria, hyperhidrosis, and facial elasticity. Future studies in this area will need to consider standardizing the control intervention. For example, investigators aiming to evaluate the efficacy of acupuncture may use no intervention as the control, while investigators aiming to evaluate the validity of acupoints and meridians may consider using placebo acupuncture as the control. Blinding of participants to treatment modality and blinding of acupuncturists to disease being treated will also prevent psychological and procedural bias in an area already prone to subjectivity. More high-quality studies are needed to suggest mechanisms, clarify efficacy, and ultimately guide clinicians in this evolving field.

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Author Disclosure Statement

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Address correspondence to:
Raja K. Sivamani, MD, MS, CAT
Department of Dermatology
University of California, Davis
3301 C Street, Suite 1400
Sacramento, CA 95816

E-mail: rksivamani@ucdavis.edu