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Clinical Application of Fire Needle Therapy in Dermatological Diseases: A Research Progress

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Abstract

The clinical treatment of skin disorders follows the principle of "internal and external dual therapy" in traditional Chinese medicine (TCM). Fire needle therapy, as a millennium-old traditional external treatment method, has been widely used in dermatology due to its advantages of simple operation, significant efficacy, low cost, and high safety. This paper systematically reviewed relevant literature from the past five years (2020–2025) to analyze the clinical efficacy of fire needle therapy in common skin diseases such as acne, folliculitis, herpes zoster, flat warts, psoriasis, vitiligo, eczema, neurodermatitis, and nodular prurigo. The focus was on exploring its mechanisms of action and therapeutic advantages, aiming to provide theoretical evidence for optimizing clinical treatment strategies.

Keywords

Dermatosis

Fire needle

External treatment

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1. Introduction

Fire needle therapy, as a gem of traditional Chinese external treatment, traces its origins back to the era of Huangdi Neijing (Yellow Emperor's Inner Canon). The Lingshu·Guanzhen (Spiritual Pivot • Needle Techniques) documented (cui-ci) and the Suwen (Simple Questions) described (fan-zhen jie-ci), both illustrating this unique needle-heating technique. Physician Yang Jizhou in Zhenjiu Dacheng (Complete Works of Acupuncture and Moxibustion) emphasized the critical procedure of burning the needle until it glows red over a lamp, a standard that aligns with modern clinical requirements of heating the needle to a white-hot state. This method, which involves puncturing lesions with heated needles at specific temperatures, not only preserves the meridian-regulating effects of traditional acupuncture but also achieves bidirectional regulation of clearing heat-toxins and warming "Yang"-dispersing cold through thermal effects. In dermatology, fire needle therapy has become a vital treatment for stubborn skin conditions such as acne, herpes zoster, and flat warts, owing to its simple operation, low cost, and minimal adverse reactions. Recent clinical studies over the past five years have further demonstrated its significant efficacy in immune-related dermatoses like psoriasis and vitiligo. The mechanisms, involving local microcirculation promotion

and immune response modulation through thermal stimulation, are gradually being elucidated by modern medicine.

2. Herpes zoster

Herpes zoster (HZ), known as waist encircling fire cinnabar or snake-like sores in traditional Chinese medicine, exhibits distinct pathogenesis characteristics. In the early stage, the disease primarily manifests as damp-heat accumulation and fire-toxin invasion, while the later stage often involves "Qi" deficiency with concomitant blood stasis and dampness retention. The pathogenesis is typically attributed to emotional disturbances leading to liver depression and heat transformation, downward migration of damp-heat, and stagnation of "Qi"-blood circulation. Zhang Yanling et al. conducted a clinical trial on acute-phase HZ patients with liver-channel heat stagnation syndrome [1]. The control group received oral valacyclovir hydrochloride dispersible tablets, mecobalamin tablets, and gabapentin capsules for 10 consecutive days, while the intervention group underwent thread-fire needle Zan puncturing combined with cupping therapy (daily for the first 3 days, then every other day for a total of 10 sessions).

The results demonstrated that the intervention group showed significantly shorter vesicle cessation, crusting, and desquamation times compared to the control group (all $p < 0.01$). Additionally, the intervention group exhibited markedly lower VAS pain scores, PSQI sleep quality scores, and PHN incidence rates (all $p < 0.05$), suggesting that thread-fire needle Zan puncturing effectively alleviates pain, promotes lesion healing, improves sleep quality, and reduces PHN risk. Gao Ning et al. randomized 92 acute-phase HZ patients into painless thread-fire needle and conventional thread-fire needle groups [2]. Both groups received thread-fire needle shallow puncturing with bloodletting, while the painless group received lidocaine cream pretreatment. The painless group demonstrated superior outcomes in pain scores during treatment and comprehensive efficacy improvement (both $p < 0.05$), with no significant adverse reactions observed in either group.

This indicates that painless thread-fire needle therapy not only maintains therapeutic efficacy but also enhances patient compliance. These findings collectively demonstrate that thread-fire needle therapy achieves dual therapeutic effects, clearing heat-toxins and dissipating blood stasis through its thermal action, while simultaneously regulating "Qi"-blood circulation and supplementing vital "Qi" to dispel pathogenic factors. The clinical evidence confirms its significant value in acute-phase intervention for HZ.

3. Acne

Acne, known as "Fen Ci" in Traditional Chinese Medicine (TCM), is primarily attributed to lung-stomach heat accumulation, damp-heat stagnation, and phlegm-blood coagulation in the skin interstitium. Yang Wenfenget al. conducted a randomized controlled trial involving 100 children aged 8–12 years with lung-channel wind-heat pattern [3]. The treatment group received fire needle therapy (once every 4 weeks) combined with internal administration of "Acne Mixture" (derived from Pipa Qingfei Yin, 10 mL tid), while the control group only applied Qimei Huanghua Liniment externally. After 8 weeks, the treatment group demonstrated a significantly higher total effective rate of 94% compared to 70% in the control group ($p < 0.05$). Additionally, GAGS scores, VISIA red area values, and porphyrin levels were markedly reduced, with only one case of local infection due to improper postoperative care. These findings suggest that fire needle combined with Pipa Qingfei Yin can safely and effectively control childhood acne while reducing recurrence rates.

Bao Jianzheng et al. enrolled 102 patients aged 18–35 years with liver-channel stagnation-heat pattern [4]. The observation group received fire needle therapy (Ashi point scattered needling, once weekly) in addition to Fufang Huangboye wet compress and tretinoin cream, while the control group only underwent wet compress and topical medication. After 8 weeks, the observation group achieved a total effective rate of 96.08%, significantly higher than the control group's 84.31% ($p < 0.05$). Scores for papules, pustules, nodules, itching, and various skin lesion parameters (quantity, size, color, hardness, and location) were all significantly reduced, with no statistically significant difference in adverse reaction rates between the two groups. This indicates that fire needle

combined with Fufang Huangboye can significantly improve the efficacy of moderate-to-severe acne without noticeable side effects.

4. Flat warts

Flat warts, referred to as "Bian Hou" in Traditional Chinese Medicine (TCM), are primarily caused by disharmony of "Qi" and blood, disordered skin pores, and invasion of wind-heat toxins into the skin. Sheng Rong et al. treated 120 cases with coarse fire needles (ϕ2.0 mm) for single-point carbonization of warts, achieving a cure rate of 58.3% and a total effective rate of 91.7%, both significantly superior to the control group receiving intramuscular BCG polysaccharide nucleic acid ($p < 0.05$), with fewer adverse reactions [5]. Yang Guowei et al. employed flat-tip fire needles (ϕ0.35 mm) twice weekly for 3 weeks in 35 patients, resulting in a total effective rate of 94.3%, with significantly better scores for rash count, size, color, and isomorphic reaction compared to the topical tretinoin group ($p < 0.05$), along with more pronounced improvements in DLQI quality of life [6]. Both studies demonstrated that fire needles, through their mechanism of "heat guiding heat and warming meridians", can instantly destroy warts with high temperature and activate local immunity. This approach offers advantages including simple operation, rapid healing, low recurrence, safety, and cost-effectiveness, providing an efficient and feasible new external TCM treatment option for flat warts.

5. Eczema

Eczema, categorized as "Shi Chuang" (wet sores) or "Xue Feng Chuang" (blood wind sores) in Traditional Chinese Medicine (TCM), is primarily characterized by internal damp-heat accumulation and blood deficiency with wind-dryness. He Peiyi et al. conducted a randomized controlled trial involving 80 chronic eczema patients, comparing fire needle perilesional needling (once daily for 7 days) with topical triamcinolone acetonide and econazole cream [7]. The results demonstrated a significantly higher total effective rate of 95% in the fire needle group compared to 75% in the control group ($p < 0.05$). Additionally, lesion and pruritus scores, as well as inflammatory markers (CRP, IL-6, IL-4), were markedly reduced, while IFN-γ levels increased. Notably, the 12-month recurrence rate was only 2.5% in the fire needle group, significantly lower than the control group's 17.5%. Ge Hao et al. employed digitally controlled electro-fire needles (650 ℃, twice weekly for 2 weeks) to treat DNCB-induced chronic eczema in mice, comparing them with clobetasol propionate cream [8].

The study found that electro-fire needles achieved comparable reductions in EASI scores and TEWL (trans-epidermal water loss) while improving stratum corneum hydration and skin moisture. Histopathological analysis revealed significant reductions in epidermal hyperplasia and inflammatory cell infiltration. Importantly, the electro-fire needle protocol required fewer treatment sessions and avoided steroid dependence. Both studies consistently demonstrated that fire needle therapy (including electro-fire needles) exerts anti-inflammatory and immunomodulatory effects through multiple mechanisms: "warming meridians to promote circulation, activating blood to dissipate stasis, regulating Th1/Th2 balance, and repairing the skin barrier". This approach offers rapid short-term efficacy with low long-term recurrence rates, presenting a novel, safe, efficient, and reproducible external treatment option for clinical practice.

6. Neurodermatitis

Neurodermatitis, categorized as "Niu Pi Xuan" (ox-hide psoriasis) or "She Ling Chuang" (capture collar sores) in Traditional Chinese Medicine (TCM), is primarily attributed to liver depression transforming into fire, blood deficiency with wind-dryness, and damp-heat stagnation. Ming He et al. conducted a randomized controlled trial involving 60 patients, comparing fine fire needle superficial scattered needling (0.35 mm × 25 mm, 1–2 sessions weekly for 2 weeks) combined with oral loratadine against topical desonide [9]. The results demonstrated comparable total efficacy rates (93.3% vs 96.7%), but notably, the 6-month recurrence rate was significantly lower in the fire needle group (10%) compared to the steroid group (30%, $p < 0.05$). Wang Yuemei et al. expanded the study with 132 patients,

combining fire needle therapy with desloratadine for 4 weeks [10]. The intervention achieved a total efficacy rate of 97.0%, superior to the medication-only group's 84.9%. Furthermore, serum levels of pro-inflammatory cytokines (TNF-α, IL-6, IL-8) and pruritus mediators (histamine, substance P, 5-HT, β-EP) showed significantly greater reductions, accompanied by marked improvements in HAMA, HAMD, and DLQI scores (all $p < 0.05$).

These studies demonstrate that fire needle therapy exerts its therapeutic effects through multiple mechanisms: "heat guiding heat, warming meridians to promote circulation, and purging fire toxins". This approach improves local microcirculation, inhibits inflammatory and pruritogenic mediators, and modulates the immune-neuro-endocrine network. While achieving comparable or superior immediate efficacy to corticosteroids, fire needle therapy significantly reduces recurrence rates, minimizes steroid dependence, and alleviates anxiety-depressive symptoms.

7. Vitiligo

Vitiligo, termed Bai Ban Feng in Traditional Chinese Medicine (TCM), arises from liver "Qi" stagnation, constitutional cold-deficiency, or "Yin"-deficient heat, compounded by wind pathogen invasion, leading to disrupted "Qi"-blood harmony and cutaneous malnourishment. Zhao Xueqi et al. demonstrated that fine-fire needle therapy (once weekly for 12 weeks) in 26 stable vitiligo patients significantly reduced Vitiligo Area Scoring Index (VASI) scores ($p < 0.05$), restored basal layer pigment rings (69% efficacy via reflectance confocal microscopy), and lowered serum TNF-α levels by 31% compared to 0.1% tacrolimus ointment, with only 7.7% adverse events [11]. This aligns with TCM's "treating cold with heat" principle, where thermal stimulation enhances blood circulation, disperses cold, and mitigates inflammatory apoptosis of melanocytes. Li Jingjing et al. elucidated that Lingnan fire needles activated the Hippo-YAP pathway in hydroquinone-induced C57BL/6 vitiligo models, upregulating YAP1 and TP73 expression while suppressing oxidative markers (MDA, MAO) and boosting tyrosinase (TYR) activity [12]. This resulted in a 94% increase in basal melanocytes and > 50% depigmentation score reduction, outperforming clobetasol.

8. Malassezia folliculitis

Malassezia folliculitis (MF) corresponds to the traditional Chinese medicine (TCM) pattern of "lung-wind acne" and is attributed to accumulated damp-heat in the gastrointestinal tract complicated by wind-heat toxins lodging in the skin. Jiang et al. conducted a randomized trial in which 27 patients with gastrointestinal damp-heat-type MF received weekly fire-needle blood-letting plus a self-formulated dampness-purging acne decoction (DPAD) for four weeks. The marked-effective rate reached 88.89%, significantly higher than the 65.38% achieved by DPAD alone ($p < 0.05$) [13].

Compared with baseline, the combined intervention markedly reduced lesion scores, pruritus, pain and seborrhoea, and achieved an 81.48% fungal clearance rate without noticeable adverse events. In a pediatric case report, Chu et al. treated a 12-year-old boy diagnosed as "lou-gu jie" (scalp dissecting cellulitis with abscess) manifesting the same damp-heat pattern [14].

After eight sessions of multi-point superficial fire-needling plus the "old-ten-needles" abdominal regimen to fortify the spleen and eliminate dampness, nodulocystic lesions resolved completely and hair regrew; no relapse was observed during three months of follow-up.

9. Psoriasis

Plaque-type psoriasis falls under the categories of Bai Bi (white scales) and Gan Xuan (dry eczema) in Traditional Chinese Medicine (TCM). Chronic cases often involve blood stasis, closely linked to emotional distress, latent consumption of nutrient blood, and external invasion by wind-cold.Liu Jiuli et al. conducted a retrospective analysis of 221 patients with blood stasis in the stationary phase, treating them with Huoxue Sanyu Decoction as the base, supplemented respectively with fire needle, standard acupuncture, or herbal decoction alone for 8 weeks [15]. The fire needle group achieved a total effectiveness rate of 94.23%, significantly outperforming the acupuncture group (89.74%) and the herbal group (80.22%, all $p < 0.05$). Moreover, the fire needle group showed greater reductions in PASI, VAS,

and DLQI scores, suggesting that the warmth of fire needles can warm meridians, promote blood circulation, and nourish the skin by facilitating "Qi"-blood flow. Li Jingjing et al. randomized 60 plaque-type psoriasis patients into Lingnan fire needle group and calcipotriol ointment control group for 8 weeks [16]. The fire needle group achieved a cure-marked rate of 86.67%, surpassing the control group (66.67%, $p < 0.05$). Improvements in PASI, DLQI, GAD-7 scores, and dermoscopic vascular globule diameter were also more pronounced. The study highlights that fire needles, leveraging fire to invigorate "Yang", can open pores, expel heat, resolve stasis, and regenerate tissues, while also modulating immunity, reducing inflammatory factors, and alleviating anxiety.

10. Conclusion

In conclusion, fire-needle therapy stands at a pivotal crossroads between centuries-old empirical wisdom and twenty-first-century evidence-based dermatology. Its documented clinical utility across a broad spectrum of skin disorders, coupled with compelling economic and safety advantages, positions FNT as a prime candidate for integrative medicine programs worldwide. Yet realizing this potential will require a coordinated research agenda that couples rigorous mechanism-of-action studies with robust, internationally recognized clinical-trial platforms. By embracing quantitative thermal engineering, systems-immunology profiling, and AI-assisted image analytics, the field can transform an artisanal technique into a precision intervention. We therefore call for multidisciplinary consortia, uniting acupuncturists, dermatologists, biomedical engineers, and regulatory scientists to establish standardized operating protocols, biomarker-driven outcome matrices, and high-quality randomized evidence. Such efforts will not only elevate FNT to the echelons of global dermatologic therapeutics, but also enrich the broader dialogue on how traditional medicines can be systematically modernized for the benefit of patients worldwide.

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Disclosure statement

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