

Clinical Research Progress on Acupuncture Treatment of Peripheral Facial Paralysis

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Abstract: *This article provides a comprehensive review of clinical research literature on acupuncture treatment for peripheral facial paralysis from 2020 to 2026, aiming to provide scientific evidence for optimizing clinical protocols and individualized diagnosis and treatment. Existing studies indicate that the advantages of early acupuncture intervention in the acute phase are continuously supported by clinical evidence. Different acupuncture techniques, such as meridian acupuncture, fire needle therapy, and electroacupuncture, each have their specific therapeutic focuses. Multimodal approaches combining acupuncture with massage, cupping, traditional Chinese medicine, and modern neuroregulation techniques show potential for synergistic enhancement. Acupuncture exerts therapeutic effects through multiple pathways, including regulating inflammation and immunity, improving local microcirculation, promoting nerve regeneration, and inducing central brain functional reorganization. Simultaneously, this article analyzes the shortcomings of current research, such as inadequate methodological quality, difficulties in implementing blinding, unclear descriptions of randomization methods, inconsistent outcome measures, and difficulties in distinguishing specific effects. It proposes that future research should rely on neuroelectrophysiology to establish individualized decision-making models, deepen mechanistic translational research by combining multimodal imaging and multi-omics technologies, standardize clinical trial design, and construct an individualized acupuncture diagnosis and treatment model.*

Keywords: Peripheral facial paralysis, Acupuncture treatment, Clinical research, Review.

1. Introduction

Peripheral Facial Paralysis (PFP) is a disorder of facial muscle movement caused by damage to the facial nucleus or its surrounding nerves. Clinically, it manifests as the disappearance of frontal wrinkles on the affected side, incomplete eyelid closure, shallow nasolabial fold, deviated mouth corner, etc., severely affecting patients' facial functions and psychosocial status [1-2]. The incidence rate of this disease is approximately 20-30 per 100,000 people [3], and it can occur in people of all ages. The etiology involves various factors such as viral infection, autoimmune disease, trauma, and tumors [2]. After appropriate treatment, most patients can gradually recover within 1-3 months, but some cases still leave varying degrees of sequelae.

Acupuncture and moxibustion, as the core method of traditional Chinese medicine for treating peripheral facial paralysis, has a long history and is widely used clinically. Numerous studies have confirmed that acupuncture has significant advantages in promoting the recovery of facial nerve function, shortening the duration of the disease, and reducing sequelae [5]. However, issues such as the optimal intervention timing, acupoint selection rules, comparison of acupuncture methods, and underlying biological mechanisms of acupuncture treatment for peripheral facial paralysis are still under continuous exploration [5]. In recent years, the introduction of evidence-based medicine concepts into acupuncture and moxibustion research has facilitated the production of high-quality randomized controlled trials and systematic reviews [6], providing more reliable clinical evidence for acupuncture treatment of facial paralysis.

Based primarily on relevant literature published both domestically and internationally from 2020 to 2026, this article provides a comprehensive review from four perspectives: the timing of acupuncture intervention, the

comparative clinical efficacy of different acupuncture methods, the synergistic effects of acupuncture combined with other therapies, and the biological mechanisms underlying acupuncture. The aim is to organize the research trajectory in this field, uncover existing core issues and academic disagreements, and offer insights for clinical practice and future research.

2. Controversy and Progress on the Timing of Acupuncture Intervention

2.1 Theoretical Basis and Clinical Feasibility of Acupuncture in the Acute Phase

The timing of acupuncture intervention is one of the most controversial theoretical issues in this field. Traditional views hold that during the acute phase (within 7 days of onset), the facial nerve is at the peak of inflammatory edema, and acupuncture stimulation may exacerbate nerve damage. Therefore, it is advocated to wait until the acute phase has passed before administering acupuncture and moxibustion treatment. However, in recent years, an increasing number of studies have challenged this viewpoint, arguing that appropriate acupuncture intervention during the acute phase is not only safe and feasible but may also shorten the duration of the disease and reduce the incidence of sequelae by alleviating facial nerve edema and improving local microcirculation [1].

Neuroedema is a common pathological feature of peripheral facial paralysis in the acute phase. The facial nerve runs within a narrow bony canal (facial nerve canal), and inflammation-induced edema compresses the nerve within the bony canal, creating a pathological state akin to compartment syndrome, leading to ischemia and dysfunction. Clinical studies suggest that acupuncture can alleviate facial nerve edema in the acute phase by reducing inflammation, improving facial microcirculation, and regulating

neurotransmitters [1,5].

2.2 Evolution of Staging Treatment Strategies

Currently, most scholars tend to adopt a staged acupuncture treatment strategy, which involves adjusting the acupuncture prescription and technique according to different stages of the disease (acute phase, quiescent phase, recovery phase, and sequelae phase). In the acute phase, distal acupoints are mainly selected, with shallow or minimal puncture at local acupoints to avoid excessive stimulation. In the recovery phase, local acupoints are primarily chosen, and stronger stimulation methods such as deep puncture and electroacupuncture can be added. This staged treatment approach has been preliminarily validated in systematic reviews [1].

Cheng et al. designed a systematic review protocol aimed at including all randomized and quasi-randomized controlled trials on acupuncture treatment for peripheral facial paralysis in the acute phase. The objective was to evaluate the efficacy and safety of different acupuncture methods during the acute phase and determine the most suitable acupuncture approach for use in this phase [1]. The proposal of this research protocol reflects the urgent need in the academic community to resolve the controversy surrounding acupuncture in the acute phase.

2.3 The Core Tension of the Controversy Over Intervention Timing

In summary, the debate on the timing of acupuncture intervention essentially reflects the contradiction between two theoretical hypotheses: the “quiet repair hypothesis” - which suggests that nerves need a resting environment for self-repair during the acute phase, and external stimuli can interfere with this process; and the “early intervention hypothesis” - which posits that early restoration of neurotrophic support and reduction of inflammatory edema can create better tissue conditions for subsequent recovery. Existing meta-analyses and clinical studies increasingly support the latter, but high-quality, large-sample, multicenter randomized controlled trials are still lacking. The ultimate resolution of this controversy depends on more rigorous evidence-based evidence.

3. Comparison of Clinical Efficacy of Different Acupuncture Methods

3.1 Meridian Acupuncture

The meridian-muscle acupuncture technique is a distinctive acupuncture method developed based on the meridian-muscle theory of traditional Chinese medicine, emphasizing the selection of acupoints along the meridian-muscle distribution to improve the contractile function of facial muscles. Kang et al. included 19 randomized controlled trials involving a total of 1436 patients and conducted a systematic review and meta-analysis on the treatment of peripheral facial paralysis with meridian-muscle acupuncture. The results showed that the overall efficacy rate of meridian-muscle acupuncture was significantly higher than that of conventional acupuncture (OR=3.93, 95% CI [2.78, 5.56], Z=7.75, P<0.00001), and the cure rate was also superior to that of the control group

(RR=1.69, 95% CI [1.51, 1.90], Z=8.89, P<0.00001) [7]. This study provides strong evidence-based support for the clinical promotion of meridian-muscle acupuncture.

The theoretical explanation for the advantages of meridian-muscle acupuncture lies in the fact that the way facial nerves innervate facial expressive muscles determines that the repair of “nerve-muscle junctions” is a crucial step in the recovery of facial function. Meridian-muscle acupuncture, by directly stimulating the meridian-muscle system (i.e., at the facial muscle-fascia level), may more effectively promote the functional reconstruction of denervated muscles. Its level of action differs from conventional acupuncture, which is based on meridian circulation.

3.2 Electroacupuncture Therapy

Electroacupuncture is a therapeutic method that involves inserting traditional filiform needles into acupoints and then connecting them to a low-frequency pulse current. It features controllable stimulation intensity and stable therapeutic effects. Gao et al. conducted a systematic review on the treatment of peripheral facial paralysis using electroacupuncture combined with TDP (specific electromagnetic wave therapy device), which included 15 articles and approximately 1,568 patients. The meta-analysis results showed that there was no significant difference in the overall efficacy between electroacupuncture combined with TDP and other treatment methods (RR=1.05, 95% CI [0.97, 1.12], P=0.226), but electroacupuncture combined with TDP was superior in terms of cure rate (RR=1.14, 95% CI [1.05, 1.24], P=0.002) [8]. This result suggests that electroacupuncture combined with TDP may have an advantage in improving the cure rate, but the overall improvement in efficacy is limited.

A retrospective study on the treatment of facial paralysis using electroacupuncture combined with modified Qianzheng Powder also demonstrated good clinical effects. Chen et al. reported that the electroacupuncture combined with Qianzheng Powder treatment group was superior to the control group in terms of overall efficacy (P=0.04), facial nerve function scores (P<0.01), and electromyographic indicators (P<0.01) [9].

The contradictory result of the “limited advantage” of electroacupuncture efficacy (no difference in effective rate but improvement in cure rate) warrants theoretical reflection: Is there an optimal matching relationship between the parameters of electrical stimulation (frequency, waveform, intensity) and different stages of facial nerve repair? This question has not yet been answered by systematic dose-response studies in existing literature.

3.3 Fire Needle Therapy

Sun et al. conducted a meta-analysis on the clinical efficacy and safety of filiform needle therapy for peripheral facial paralysis. The results showed that compared with conventional acupuncture, filiform needle therapy had significant advantages in terms of overall efficacy (RR = 1.14, 95% CI [1.07, 1.21], P < 0.0001) and cure rate (RR = 1.59, 95% CI [1.29, 1.97], P < 0.0001). The improvement value of

Sunnybrook facial nerve function score was 17.85 points (95% CI [15.72, 19.97], $P < 0.00001$), and the improvement value of facial disability index physical function score was 4.16 points (95% CI [3.15, 5.16]) [10].

The theoretical uniqueness of fire needle therapy lies in its introduction of an additional physical parameter, the “thermal effect,” through thermal stimulation. Related research on warm acupuncture and moxibustion also reveals the positive role of thermal effects in the treatment of facial paralysis - numerous clinical studies have shown that warm acupuncture and moxibustion is effective in treating peripheral facial paralysis with minimal side effects. Thermal stimulation may exert a synergistic effect by promoting local blood circulation, reducing muscle tension, and regulating the inflammatory microenvironment.

3.4 Catgut Embedding Therapy and Special Acupuncture Techniques

Acupoint catgut embedding, as a long-term stimulation method, has been increasingly applied in the treatment of sequelae of facial paralysis in recent years. Yu et al. designed a patient-assessor double-blind, randomized, sham-controlled trial to evaluate the efficacy and safety of catgut embedding therapy for atrophy of facial expression muscles after facial paralysis [4]. Ji et al.’s systematic review included multiple studies, and the results showed that the efficacy of acupoint catgut embedding in treating sequelae of facial paralysis was significantly higher than that of the control group (RR=1.32, 95% CI [1.18–1.47]), with a low incidence of adverse reactions [11].

3.5 Network Meta-analysis of Different Acupuncture Methods

To further compare the advantages and disadvantages of various acupuncture schemes, Li et al. conducted a network meta-analysis, utilizing the SUCRA ranking method to rank the efficacy of different acupuncture treatments for adult Bell’s palsy [12]. This study provides a quantitative reference for selecting the optimal acupuncture scheme in clinical practice. However, due to the heterogeneity of the included studies, the conclusions still need to be interpreted with caution.

Li et al. further expanded the scope of their study to compare acupuncture combined with various traditional Chinese medicine therapies. Their network meta-analysis results indicated that acupuncture combined with tuina and cupping demonstrated the best overall efficacy (SUCRA=99.33%) [13]. This finding suggests that the synergistic application of multiple traditional therapies may produce a cumulative effect, but the underlying mechanism requires further exploration.

3.6 Theoretical Integration of the Efficacy Comparison of Various Acupuncture Techniques

Based on aforementioned studies, the therapeutic differences among various acupuncture methods may be attributed to their mechanisms of action, stimulation intensity, and duration. The specific activation of the meridian-muscle system by meridian-muscle acupuncture is the key to

superiority other than conventional acupuncture. Electroacupuncture’s electrical pulse stimulation aids in promoting nerve regeneration and muscle function recovery. Acupoint catgut embedding achieves long-term regulation through continuous stimulation. Future research is needed to further clarify the indications and optimal application timing for each method, in order to construct individualized treatment plans.

4. The Synergistic Effect of Acupuncture Combined with Other Therapies

4.1 Acupuncture Combined with Tuina (Chinese Massage and Manipulation)

Deng et al. conducted a comprehensive study that incorporated both traditional meta-analysis and network meta-analysis to compare the efficacy differences between acupuncture combined with tuina and pure acupuncture in treating facial paralysis. The study included randomized controlled trials targeting patients with facial paralysis, with intervention measures encompassing various protocols such as acupuncture combined with tuina, pure acupuncture, pure tuina, placebo, pure western medicine, and hormone combined with western medicine [14]. The core finding of this study is that the clinical efficacy of acupuncture combined with tuina may be superior to pure acupuncture, but the degree of difference and its boundary conditions (such as the stage and severity of facial paralysis) still need further clarification [14].

4.2 Acupuncture Combined with Traditional Chinese Medicine

Acupuncture combined with oral administration of traditional Chinese medicine is a commonly used comprehensive treatment scheme in clinical practice. Guan et al. systematically reviewed relevant studies on the combined treatment of acupuncture and medication for facial paralysis caused by herpes zoster virus infection, pointing out that the combined treatment scheme can restore facial function to near normal levels in approximately 70% of patients [15]. This result suggests that for viral facial paralysis with a clear etiology, the combined application of antiviral drugs and acupuncture may form a complementary mechanism - drugs targeting the etiology (viral replication), while acupuncture targeting the pathological process (inflammatory edema and nerve repair).

4.3 Acupuncture Combined with Moxibustion

Zhou et al. conducted an overall evaluation of systematic reviews on the treatment of peripheral facial paralysis with acupuncture and moxibustion (acupuncture combined with moxibustion), using the AMSTAR-2 tool to assess methodological quality and the GRADE system to evaluate the level of evidence [16]. Their study revealed an important issue: despite the large number of existing systematic reviews, the overall methodological quality is relatively low, and there is a lack of high-quality evidence. This finding sets higher requirements for the design standards of subsequent research in this field.

4.4 Acupuncture Combined with Cupping

Cao et al. included multiple clinical studies to evaluate the efficacy and safety of cupping therapy as an adjunctive treatment for intractable facial paralysis. The results showed that cupping therapy significantly improved patients' recovery, with high safety and no serious adverse events [17]. Li et al.'s network meta-analysis further confirmed that the multimodal treatment regimen combining acupuncture, massage, and cupping ranked the best in terms of overall efficacy for facial paralysis [13].

4.5 Acupuncture Combined with Modern Rehabilitation Techniques

In addition to traditional combined therapies in Chinese medicine, the integration of acupuncture and modern rehabilitation techniques has also become a research hotspot in recent years. Liu et al. conducted a prospective cohort study to compare the efficacy differences between central (cranial targets) and peripheral (facial targets) repetitive transcranial magnetic stimulation (rTMS) combined with conventional treatment (medication + acupuncture) for peripheral facial paralysis. The study included 97 patients with unilateral facial paralysis who had onset within one month. After 2 weeks of treatment, assessments were made using the House-Brackmann grading, Sunnybrook facial scoring, and the modified Portmann scale [18]. This study represents a new direction in the integration of acupuncture and neuromodulation techniques.

Li et al. reported a case of peripheral facial paralysis following COVID-19 infection treated with a comprehensive traditional Chinese medicine approach, utilizing acupuncture combined with various traditional Chinese medical therapies, achieving favorable clinical outcomes [2]. This suggests that the comprehensive acupuncture regimen also holds potential for application in facial paralysis caused by emerging etiologies, such as COVID-19 infection.

5. Biological Mechanism of Acupuncture in Treating Peripheral Facial Paralysis

5.1 Overall Framework of Mechanism Research

Duan et al. published a comprehensive review on the biological effects of acupuncture in the treatment of peripheral facial paralysis, systematically reviewing multiple pathways of action involved in existing research, including regulation of inflammatory response, immune regulation, neurotransmitter regulation, immune response, improvement of facial microcirculation, regulation of oxidative stress, changes in neural structure and function, acupoint specificity, and acupuncture intervention time [5]. The review points out that although the clinical efficacy has been confirmed by numerous studies, its underlying biological mechanisms are still in the exploratory stage [5].

5.2 Anti-inflammatory and Immune Regulatory Mechanisms

The anti-inflammatory mechanism of acupuncture in treating facial paralysis may involve the following pathways: firstly,

inhibiting the release of local pro-inflammatory factors to alleviate inflammatory reactions within the facial nerve canal; secondly, regulating the activation and differentiation of immune cells to balance pro-inflammatory/anti-inflammatory immune responses; thirdly, reducing nerve edema and alleviating the compressive effect within the bone canal [5]. From the perspective of neuroscience, the main therapeutic effect of acupuncture can be understood as a neural regulatory process, which influences pain perception and regulates bodily functions by altering the activity of the nervous system.

5.3 Neural Repair and Regeneration Mechanisms

The repair of peripheral nerve injury is a complex biological process. Due to the high differentiation of nerve tissue and the slow regeneration of peripheral nerve fibers, the repair effect after injury is often unsatisfactory [19]. Studies have found that the inflammatory response after injury has a dual effect on the repair of nerve defects - moderate inflammation is beneficial for clearing necrotic tissue and promoting the establishment of a regenerative microenvironment, while excessive inflammation hinders repair [19].

It is worth noting that successful facial nerve functional reconstruction is time-sensitive, as facial muscles undergo irreversible atrophy within approximately 12 to 18 months after losing innervation. The existence of this time window provides theoretical support for early intervention with acupuncture - restoring neuro-muscular connections as early as possible may help prevent muscle atrophy from entering an irreversible stage.

5.4 Brain Functional Reorganization and Acupoint Specificity

Chen et al. utilized functional magnetic resonance imaging (fMRI) technology to investigate the brain activation patterns during the treatment of peripheral facial paralysis with electroacupuncture at Hegu (LI4) and Dichang (ST29) acupoints. They found that both acupoints elicited similar brain functional activation, supporting the acupoint-brain mapping hypothesis based on meridian theory rather than simple anatomical correspondence [20]. This discovery provides important clues for neuroimaging studies on acupoint specificity, suggesting that acupuncture may promote the recovery of facial nerve function by regulating the functional networks of the central nervous system.

5.5 Theoretical Model of Multi-mechanism Collaboration

Comprehensively, the biological effects of acupuncture in treating facial paralysis are not achieved through a single mechanism, but involve a multi-level synergistic action between peripheral and central systems, anti-inflammatory and repair-promoting effects, immune regulation, and neural plasticity. This multi-target and multi-pathway mode of action may be the fundamental reason for the good clinical effects of acupuncture in treating facial paralysis, and it also constitutes the main difficulty in mechanism research.

6. Evidence Quality and Methodological Reflection

6.1 Methodological Limitations of Existing Research

Despite the rapid increase in the number of clinical studies on acupuncture treatment for peripheral facial paralysis in recent years, there is still considerable room for improvement in the overall methodological quality. Zhou et al. evaluated relevant systematic reviews using the AMSTAR-2 and GRADE systems and pointed out that the published systematic reviews generally exhibit deficiencies in methodological rigor and evidence level [16]. The main issues include: small sample size; difficulty in implementing blinding (the specificity of acupuncture treatment makes patient blinding and operator blinding difficult to achieve); unclear description of randomization methods; and inconsistent outcome measures.

6.2 Challenges of Placebo-controlled Design

The design of placebo control (sham acupuncture) in acupuncture research has always been a methodological challenge. From the perspective of scientific philosophy, a considerable part of the clinical benefits of acupuncture may stem from situational effects and placebo effects, and the treatment ritual itself can activate the brain's self-repair pathways. This makes distinguishing between the "specific effects" and "non-specific effects" of acupuncture a fundamental theoretical and methodological challenge. The sham acupoint embedding control trial designed by Yu et al. represents a beneficial attempt to apply the sham control method in acupuncture research for peripheral facial paralysis [4].

6.3 The Transformation Path from Experience to Evidence

Integrating acupuncture and moxibustion into the framework of evidence-based medicine requires translating ancient Chinese medicine concepts into testable scientific hypotheses and addressing complex methodological challenges. Over the past decade, the concept of evidence-based medicine has been introduced into acupuncture and moxibustion research, driving technological improvements and the generation of high-quality clinical evidence [6]. The inclusion of acupuncture and moxibustion in multiple international clinical practice guidelines also reflects its continuously strengthening evidence base [6].

7. Future Research Directions

Based on the aforementioned literature analysis, the author believes that the following directions deserve special attention: First, precise definition of the intervention timing in the acute phase. The current debate on acute-phase acupuncture lacks a precise time window definition based on the pathophysiological staging of facial nerve. Future research should combine electrophysiological detection methods such as Electroencephalogram (ENoG) to establish a three-in-one individualized decision-making model of "pathological state-acupuncture parameters-intervention timing", rather than simply staging based on the number of days since onset. Second, acupoint specificity and brain network regulatory mechanisms. fMRI studies have preliminarily revealed the patterns of brain regions activated by acupoints [21], but longitudinal brain functional changes research on acupoint

specificity in patients with facial paralysis is still very scarce. Future research needs to conduct multi-time point and multi-modal neuroimaging studies to explore the central plasticity changes during the process of acupuncture promoting facial nerve recovery. Third, deepening mechanism research towards translational research. Current mechanism research mostly remains at the descriptive level (such as "acupuncture can regulate a certain pathway"), lacking clear causal chains and dose-effect relationships. In the future, with the help of technologies such as genomics, proteomics, and metabolomics, combined with bidirectional verification of animal models and clinical samples, a complete mechanism explanation framework from "acupoint stimulation-signal transduction-effect target-clinical outcome" should be established [5]. Fourth, standardization of research design. It is urgent to develop reporting standards for acupuncture treatment of facial paralysis research (refer to STRICTA standards), unify the outcome evaluation index system (such as House-Brackmann grading and Sunnybrook system selection), increase the proportion of multi-center large-sample RCTs, and explore improved blinding designs suitable for the characteristics of acupuncture research. Fifth, construction of individualized treatment plans. Current research is mostly focused on efficacy comparisons at the population level, ignoring the regulatory role of individual differences (such as age, etiology, severity, comorbidities, etc.) on treatment response. In the future, with the help of machine learning and other methods, a classification model for patients with facial paralysis should be established based on large-sample clinical data to guide the formulation of individualized acupuncture prescriptions.

8. Conclusion

This review is based on domestic and international literature published from 2020 to 2026, systematically summarizing the research progress on acupuncture treatment for peripheral facial paralysis in terms of intervention timing, method comparison, combined therapies, and biological mechanisms. The core findings are as follows: Firstly, the safety and effectiveness of acupuncture intervention in the acute phase have gained increasing evidence support, but further verification by high-quality RCTs is still needed; secondly, meridian acupuncture is superior to conventional acupuncture in clinical efficacy [7], electroacupuncture has advantages in improving the cure rate [8], and multimodal combined treatment schemes may yield the best results [13]; thirdly, the biological mechanisms of acupuncture involve the synergistic effects of multiple pathways such as anti-inflammation, immune regulation, nerve repair, and central reorganization [5], but the causal relationship chain is still incomplete; fourthly, the methodological quality of research in this field needs to be improved overall [16].

Overall, acupuncture treatment for peripheral facial paralysis has gradually transitioned from the era of empirical medicine to the era of evidence-based medicine. However, significant challenges remain in terms of the depth of mechanism explanation, the height of evidence level, and the precision of individualized application. Only by conducting hypothesis-driven mechanism research under the guidance of theoretical frameworks and enhancing methodological standards in clinical research can we truly achieve the leap

from “knowing what it is” to “knowing why it is”, providing a solid scientific foundation for clinical decision-making in acupuncture treatment of facial paralysis.

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