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Special Topic Study

Observation on clinical effect of acupuncture for peripheral facial paralysis in acute period and facial nerve F-wave

针刺治疗急性期周围性面瘫的疗效及面神经 F 波观察

Zhang Jun-feng (张峻峰), Wu Yao-chi (吴耀持)
Shanghai Jiao Tong University Affiliated Sixth People's Hospital, Shanghai 200233, China

Abstract

Objective: To observe the clinical effect of acupuncture on peripheral facial paralysis in acute period and changes in facial nerve F-wave.

Methods: A total of 148 eligible cases were randomly allocated into an observation group (*n*=74) and a control group (*n*=74) by their visiting sequence. In addition to oral Prednisone and Aciclovir tablets, patients in the observation group received point-towards-point acupuncture therapy, whereas patients in the control group received routine acupuncture therapy. The treatment was done once a day and 6 times made up a course of treatment. The efficacy evaluation was made after 2 courses. The electromyography (EMG) F-wave was monitored before and after treatment.

Results: After 2 courses of treatment, the recovery rate and total effective rate were 47.3% and 94.6% respectively in the observation group, versus 20.3% and 82.4% in the control group, showing statistical differences ($P<0.01$). Before treatment, the facial nerve F-wave latency on the affected side was prolonged and its frequency of occurrence was decreased in both groups. After treatment, the F-wave latency and frequency of occurrence were significantly improved in both groups ($P<0.05$) and there were significant between-group differences ($P<0.05$).

Conclusion: In addition to Western medication, point-towards-point acupuncture therapy can obtain more accurate and better effect than routine acupuncture therapy for acute peripheral facial paralysis.

Keywords: Acupuncture Therapy; Point-towards-point Needling; Acupuncture Medication Combined; Facial Paralysis; Electromyography

【摘要】目的：观察针刺治疗急性期周围性面瘫的临床疗效及面神经 F 波的变化。**方法：**将 148 例急性期周围性面瘫患者根据就诊先后顺序随机分为观察组和对照组，每组 74 例。两组患者均接受口服强的松片和阿昔洛韦片治疗，观察组在此基础上接受透刺法针刺治疗，对照组接受常规针刺治疗。每日 1 次，6 次为 1 个疗程，治疗 2 个疗程后进行疗效评价，并在治疗前后进行肌电图 F 波检测。**结果：**治疗 2 个疗程后，治疗组治愈率为 47.3%，总有效率为 94.6%，对照组治愈率为 20.3%，总有效率为 82.4%，两组治愈率及总有效率差异均具有统计学意义($P<0.01$)。治疗前，两组患者患侧面神经 F 波潜伏期延长，出现频率减少。治疗后，两组患者 F 波潜伏期及出现率均较本组治疗前明显好转($P<0.05$)，且观察组改善情况优于对照组($P<0.05$)。**结论：**在口服常规西药基础上，透刺法针刺治疗急性期周围性面瘫疗效确切，可有效改善面神经功能，其疗效优于常规针刺治疗。

【关键词】针刺疗法；透针；针药并用；面神经麻痹；肌电描记术
【中图分类号】R246.6　　**【文献标志码】**A

Peripheral facial paralysis (Bell's palsy) is a common condition seen in acupuncture department. Today, the timing of needling the affected side remains controversial. We've treated this condition with oral Western medication combined with point-towards-point needling therapy between March 2013 and December 2014 and evaluated the clinical effect using electromyography (EMG) F-wave. The results are now summarized as follows.

Author: Zhang Jun-feng, attending physician
Corresponding Author: Wu Yao-chi, professor, chief physician, doctoral supervisor.
E-mail: wuyaochi@online.sh.cn

1 Clinical Materials

1.1 Diagnostic criteria

This was based on the diagnosis for facial paralysis in the *Criteria of Diagnosis and Therapeutic Effects of Diseases and Syndromes in Traditional Chinese Medicine*[1] and *Shanghai Diagnostic and Therapeutic Guidelines of Traditional Chinese Medicine*[2]: a sudden onset, commonly seen in spring and autumn seasons, a

history of contracting cold and fever or pain in one-sided facial cheek, ear and mastoid process; facial stiffness, lacrimation, numbness, absence of forehead wrinkles, shallowing of nasolabial folds, incomplete eye closure and mouth corner deviated to the healthy side; inability to close eye, expose teeth and blow cheek; and abnormal EMG findings.

1.2 Inclusion criteria

Those who met the above diagnostic criteria; aged between 20 and 60 years; duration ≤7 d; having clear consciousness and could cooperate for clinical data collection; those who were willing to participate in the trial and sign the informed consent.

1.3 Exclusion criteria

Those who failed to meet the above diagnosis or inclusion criteria; having trauma-related or iatrogenic facial paralysis; having central facial paralysis due to tumor or cerebrovascular accidents (CVA); pregnant women; having complications of diabetic neuropathy, other major diseases and mental illness; those who failed to follow the treatment protocol in this trial; and those with incomplete data for efficacy evaluation.

1.4 Statistical method

The SPSS 16.0 version software was used for statistical analysis. The measurement data was expressed as ($\bar{x}$ ±*s*). The *t*-test was used for measurement data evaluation and Chi-square test for enumeration data analysis. A *P* value of less than 0.05 indicated a statistical significance.

1.5 General materials

A total of 148 eligible cases were randomly allocated into an observation group (*n*=74) and a control group (*n*=74). There were no dropouts during the treatment. Patients in the observation group were aged between 21 and 60 years and their duration lasted from 1 to 7 d. Patients in the control group were aged between 20 and 60 years and their duration lasted from 2 to 7 d. There were no significant between-group differences in age, gender, duration and affected side ($P>0.05$), indicating that the two groups were comparable (Table 1).

Table 1. Between-group comparison in baseline data

Group	*n*	Gender (case)		Average age ($\bar{x}$ ±*s*, year)	Average duration ($\bar{x}$ ±*s*, day)	Affected side (case)	
		Male	Female			Left side	Right side
Observation	74	45	29	42.3±10.8	3.8±1.2	41	33
Control	74	40	34	41.9±12.5	4.2±1.3	34	40

2 Treatment Methods

Patients in both groups took oral Prednisone and Aciclovir tablets (Sine Pharmaceutical Corporation, Shanghai Pharmaceutical Group, China) as well as Vitamin B_1 (Shanghai Xinpasi Pharmacy Co., Ltd., China). Specifically, patients took 1 dose of oral Prednisone a day (30 mg, 3 d; 15 mg, 3 d; 5 mg, 3 d), 3 doses of Aciclovir tablets a day (0.4 g for each dose) and 3 doses of Vitamin B_1 a day (10 mg for each dose) with warm water after meals, for a total of 9 d.

2.1 Observation group

Based on the above Western medication, patients in the observation group also received the following acupuncture therapy.

Major points: Dicang (ST 4) towards Jiache (ST 6), Dicang (ST 4) towards Xiaguan (ST 7), Dicang (ST 4) towards Sibai (ST 2), Qianzheng (Extra, 0.5-1.0 cun in front of the ear lobe), and Yangbai (GB 14) on the affected side.

Distal point: Hegu (LI 4) on the healthy side.

Points based on syndrome differentiation: Fengchi (GB 20) was combined for wind cold; Quchi (LI 11) was combined for wind heat.

Method: After sterilization using 75% alcoholic cotton ball, stainless filiform needles of 0.30 mm in diameter and 25-40 mm in length were used to puncture the above points. Qianzheng (Extra) was punctured 0.5 cun perpendicularly. Dicang (ST 4) was punctured 1.0 cun towards Jiache (ST 6), Xiaguan (ST 7) and Sibai (ST 2) respectively. Upon presence of needling sensation, even reinforcing-reducing manipulation was applied to each point. Hegu (LI 4) and Quchi (LI 11) were punctured 1.0 cun perpendicularly. Fengchi (GB 20) was punctured 0.8 cun obliquely towards the tip of the nose. The needles were retained for 20 min. The treatment was done once a day, 6 times made up a course of treatment. Patients were treated for 2 courses of treatment and there was a 3-day interval between two courses.

No electric stimulation was used during the first course of treatment. Electric stimulation apparatus (G6805-II) was connected to Dicang (ST 4) and Qianzheng (Extra) during the second course of treatment for 20 min, using a continuous wave, frequency of 4.0 Hz, and current intensity of 2 mA.

2.2 Control group

Based on the above Western medication, patients in the control group also received the following routine acupuncture therapy.

Major points: Dicang (ST 4), Jiache (ST 6), Xiaguan (ST 7), Sibai (ST 2), Qianzheng (Extra), and Yangbai

(GB 14) on the affected side.

Distal point: Hegu (LI 4) on the healthy side.

Points based on syndrome differentiation were same as that in the observation group.

Method: After sterilization using 75% alcoholic cotton ball, same stainless filiform needles were used to puncture above points. Dicang (ST 4), Jiache (ST 6), Xiaguan (ST 7) and Sibai (ST 2) were punctured 0.5 cun either perpendicularly or obliquely. Qianzheng (Extra) was punctured 0.5 cun perpendicularly. Upon presence of needling sensation, even reinforcing-reducing manipulation was applied to each point. Hegu (LI 4), Quchi (LI 11) and Fengchi (GB 20) were punctured with the same methods as that for the observation group. The treatment time, course and electric stimulation were same as that in the observation group.

3 Clinical Efficacy Evaluation

3.1 Observation indicators

Before treatment, the F-wave was detected in a quiet room with constant room temperature. The subjects were asked to take a supine lying position on the treatment table and relax for 5 min. The Dantec Keypoint digital electromyography with evoked potential (made in Denmark) was used to examine the right side first and then the left side. The surface electrode was used to record the orbicularis oculi and depressor anguli oris. The anterior auricular facial nerve was stimulated 20 times using a square wave of 0.3 ms and frequency of 1 Hz. Then gradually increased the stimulation up to intensity of 120%-130% and started to record. The filtering range was between 100-5 000 Hz and the analysis time was 50 ms. The mean F-wave latency of the facial nerve was measured and its occurrence rate was calculated (F-wave frequency/total stimulation times).

3.2 Therapeutic efficacy criteria

This was based on the scoring system for facial paralysis[3]. The following 10 items have been observed using the healthy side as reference.

Palpebral fissure: $<$3 mm, 0 point; $\geqslant$3 mm, 1 point.

Ectropion: Absence, 0 point; presence, 1 point.

Nasolabial fold: Presence, 0 point; absence, 1 point.

Drooping of mouth corner: $<$3 mm, 0 point; $\geqslant$3 mm, 1 point.

Frown (50% of the healthy side): Yes, 0 point; no, 1 point.

Complete eye closure without extra effort: Yes, 0 point; no, 1 point.

Complete eye closure with extra effort: Yes, 0 point; no, 1 point.

Exposure of the 4 canines: No, 0 point; yes, 1 point.

Exposure of the second upper incisor: No, 0 point; yes, 1 point.

Whistle blowing (diminished distance between the philtrum and mouth corner): $\geqslant$50%, 0 point; $<$50%, 1 point.

The total score is 10 points. A higher score indicates a more severe facial paralysis. Based on the lesion severity, $\geqslant$8 points: severe; $\geqslant$5 points but $<$8 points: moderate; $<$5 points: mild.

The recovery rate is calculated according to the changes in total scores before and after treatment.

Recovery rate = (Pre-treatment score − Post-treatment score) ÷ Pre-treatment score × 100%.

Recovery: Recovery rate $\geqslant$90%.

Marked effect: Recovery rate $\geqslant$50% but $<$90%.

Improvement: Recovery rate $>$0 but$<$50%.

Failure: Recovery rate $\leqslant$0.

3.3 Treatment results

3.3.1 Between-group comparison in clinical effect

After 2 courses of treatment, the recovery rate and total effective rate were 47.3% and 94.6% respectively in the observation group, versus 20.3% and 82.4% in the control group, showing statistical differences ($P<0.01$) by the Chi-square test, indicating better recovery rate and total effective rate in the observation group than that in the control group (Table 2).

3.3.2 Between-group comparison in EMG F-wave

Before treatment, there were no significant between-group differences in F-wave frequency and latency ($P>0.05$). After treatment, the F-wave frequency and latency were significantly improved in both groups ($P<0.05$) and there were significant between-group differences ($P<0.05$), indicating a better improvement in facial nerve function in the observation group than that in the control group (Table 3).

Table 2. Between-group comparison in clinical effect (case)

Group	*n*	Recovery	Marked effect	Improvement	Failure	Recovery rate (%)	Total effective rate (%)
Observation	74	35	23	12	4	47.3[1)]	94.6[1)]
Control	74	15	20	26	13	20.3	82.4

Note: Intra-group comparison before and after treatment, 1) $P<0.05$; compared with the control group after treatment, 2) $P<0.05$

Table 3. Between-group comparison in F-wave ($\bar{x}$ ±*s*)

Group	*n*	Occurrence rate (%)		Latency (ms)	
		Before treatment	After treatment	Before treatment	After treatment
Observation	74	28.67	68.88[1)2)]	6.34±1.21	2.13±1.41[1)2)]
Control	74	27.79	48.34[1)]	6.16±1.18	3.88±1.82[1)]

Note: Intra-group comparison before and after treatment, 1) $P<0.05$; compared with the control group after treatment, 2) $P<0.05$

4 Discussion

In traditional Chinese medicine (TCM), Bell's palsy falls under the category of 'deviation of the mouth corner' or 'deviation of the mouth and eye'. It often results from malfunction of muscle regions of the Large Intestine Meridian of Hand Yangming and the Stomach Meridian of Foot Yangming due to deficiency of qi and blood coupled with external contraction of wind[4]. In modern medicine, etiological factors include vasospasm[5], compression edema with ischemia of the facial nerve, viral infection and unstable autonomic nerve[6-7].

Some scholars believe it's not appropriate to apply acupuncture to acute facial paralysis, because it may aggravate inflammatory edema of the facial nerve and further damage the facial nerve[8]. Some scholars, however, believe intervention in acute stage can obtain better effect[9-10]. In our experience, it's advisable to use fewer needles with mild stimulation during an acute stage to reinforce qi, nourish and unblock meridians and remove pathogenic factors[11].

Facial nerve F-wave is a simple and sensitive objective indicator to evaluate the function of intracranial segment of facial nerve and diagnose Bell's palsy[12-16]. This study has found that the mean F-wave latency on the affected side was significantly prolonged and its frequency of occurrence was significantly decreased. After treatment, the F-wave latency was shortened and its frequency of occurrence was increased. This indicates that acupuncture, especially point-towards-point therapy can directly or indirectly stimulate afferent nerve fibers and receptors, regulate muscle innervated by sympathetic and parasympathetic nerves, promote local circulation of blood, increase oxygen supply, speed up the absorption of facial nerve edema, increase facial nerve excitability, and thus repair the damaged nerve[17].

After 2-course treatment, there were significant between-group differences in the recovery rate and the total effective rate ($P<0.01$), indicating a better efficacy in the observation group. This study has provided an objective basis for acupuncture treatment in acute Bell's palsy.

Conflict of Interest

The authors declared that there was no conflict of interest in this article.

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Statement of Informed Consent

Informed consent was obtained from all individual participants included in this study.

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Translator: Han Chou-ping (韩丑萍)

