

The Study of Clinical Observation of Acupuncture Therapy in the Treatment of Motor Aphasia after Cerebral Infarction

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Abstract

Objective: To observe the clinical efficacy of acupuncture on post- cerebral infarction aphasia. **Methods:** The clinical study was based on the comparison of results pre and post treatment. 83 Patients, diagnosed as acute cerebral infarction with motor aphasia, were enrolled. They had 6 treatments per week with a day rest, 4 weeks treatment course. They had language abilities assessment according to the Chinese Aphasia Assessment Method by Gao Su Rong of Beijing Medical University. The Barthel Score was used to assess the ability to carry out daily activities. The degree of loss in neurological function was assessed using the National Institutes of Health Stroke Scale (NIHSS). The results were considered statistically significance at $P < 0.05$. **Results:** Acupuncture increases the language ability of the patients suffering from post-cerebral infarction aphasia; the total efficacy was 87.95%. It also increases the patients' ability to carry out daily activities, and significantly improve the neurological functions of the patients. **Conclusion:** Acupuncture is significantly increasing the language ability, communication ability in daily living, lowering the degree of aphasia and improving the neurological functions of patients. Acupuncture should be used widely in the clinical setting.

Keywords: Cerebral Infarction; Aphasia; Acupuncture

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Introduction

Language ability is the uniqueness that creates reaction of mental intelligence processes of complicated human. Center that controls language are mouth, tongue, pharynx and other organs which work together effectively. But especially the part where the cerebral artery can cause damage to the cortex structure which is the language control center, causing differences in aphasia. Research shows that stroke patients around 1/3 or more can have different co-occurring symptoms and different levels of speech loss. The most common language loss are patients that have communication obstacles often comes with some symptoms like irritability, short temper, self-deprecation, depression etc. patients might have negative thoughts. If not treated immediately or wrong treatment have been given, aphasia may be life-long. This will reduce the quality of daily life and mental health of patients. Currently, the mechanism on post- cerebral infarction aphasia has not been fully explained. Clinically has not yet been approved or agreed on efficacy of the treatment. There are still lack of drugs use to treat aphasia. Currently medical treatment of this disease is in use of language as a basis for practice and rehabilitation to stimulate and replace some of the abilities of the language control center. Originally this intervention although it has definite result but it is low efficiency it takes a long time so as to shorten the disease. For higher medical performance it was focus on the research in the past year for Traditional Chinese Medicine. It has gained widespread attention and has been developed in this research study using of Chinese Traditional Medicine technique theory and modern medicine as the guideline. Based on clinical trials through research study comparison, analysis, examination and experimentation. Using acupuncture to awaken the mind and open orifices effects together Acupuncture is a commonly used, simple and safe therapy, easily acceptable by most patients. Acupuncture can improve circulation, balance yin and yang, increase immunity to dispel external pathogenic factors.(Tosaeng,M., Hadsamad,S., Buahom,W,Putak,A,. & Buranatawonsom,T,2018).With treating with medicinal capsules (Danqipiantan). Rehabilitation therapy with speech practice as well as treated loss of speech after stroke for clinical effectiveness and increase in clinical rehabilitation.

Information and Methods

1. Design and Experimental

In patients with post- cerebral infarction aphasia in study before and after

Acupuncture treatment has been use to open orifices and awaken the mind. Information available from June 2012 to December 2013 from Tianjin University of Chinese Medicine, Specialized acupuncture department and out-patient clinic. Patients treated with cerebrovascular disease in total of 192 patients.

2. Diagnostic Criteria

2.1. Thicken of the arteries wall and less elasticity according to the research criteria of western medicine

According to "Chinese approach to treatment of acute cerebral ischemia 2010"

(Chinese Traditional Medicine Association of Neurological and acute stroke with stroke treatment guidelines author).

(Chinese ischemic stroke and transient ischemic attack,2010)

- (1) Onset of acute symptom
- (2) Specific damage of Nervous system
- (3) Symptoms and how long will the symptoms last?
- (4) CT scan or MRI scan or proven non-hemorrhage in the brain or other diseases.
- (5) Photos from CT scan or MRI scan that have clear image of stroke.

2.2. Diagnostic criteria of stroke

Refer to "Clinical Research Guidelines of Traditional Chinese Medicine" edition 2002. (Smith WS, Johnston SC, Easton JD. Cerebrovascular diseases. In: Kaspers DL, Fauci As, Longo DL, 2005).

- (1) Main symptoms: Hemiplegia, weakness of the four limbs, loss of control in the speech or disable to speak, deviation of the mouth.
Secondary symptoms: headache, dizziness, change of the size of pupils, chock, tilted eyes no blinking, hemiplegia and poor balance.
- (2) Onset of acute symptoms
- (3) Before symptoms occurs usually are due to cause
- (4) Age of 40 years old and above

2 or more of the above main symptoms or 2 secondary symptoms according of the occurrence the disease. Factor that causes the signs and symptoms of age-related diagnosis. Image of (CT scan or MRI scan) an obvious view of vessel constriction leading to stroke so it can be diagnose.

2.3. Standard disease stage

- (1) Acute phase within 2 weeks after onset of symptoms occurs.
- (2) Rehabilitation phase within 2 weeks to 6 months after onset of symptoms occurs.
- (3) Complications that persist beyond 6 months after onset symptoms has occurs.

2.4. Diagnostic criteria for post- cerebral infarction aphasia

According to Professor Gao Su Rong, uses "The method to check the Chinese language for motor aphasia condition" (Gao, SR.,1993). (Aphasia Battery of Chinese, ABC) content includes: easy and understandable conversation, repeating of words, calling of an objects, reaction when calling, capability to read the character or write the letters, use of language to calculate and scoring orderly so it can be finalize to diagnosis of aphasia.

The diagnostic criteria for aphasia are as follows:

- (1) Inability to speak fluently, Stuttering;
- (2) After hearing the language there are good understanding, but as soon as the conversation starts there will be wrong grammar to make it hard to understand;
- (3) Language that was heard when repeating, there are difficult;

- (4) There are obstacles in calling the name of the objects;
- (5) Difficulty to read;
- (6) Difficulty to write.

3. Admission Criteria

- (1) To comply with criteria for Western medicine diagnosis of cerebrovascular disease.
- (2) In accordance with Chinese Traditional Medicine diagnosis criteria for diagnosis (中风) in Jing Luo type (中 经络)
- (3) For the first time, the disease period is between 15 and 180 days.
- (4) The criteria for diagnosis of aphasia.
- (5) Age between ≥ 40 years to ≤ 75 years
- (6) Clear conscience mind test to show the size of MMSE shown no dementia and no mental disorders.
- (7) Before the onset of symptoms, obstructive vision and unclear hearing occurs;

4. Selection Criteria

- (1) Does not meet the criteria for admission.
- (2) Severe vision and hearing impairment;
- (3) There is aphasia proficiency from other causes before stroke;
- (4) Serious complications such as: respiratory failure, heart attack, acute myocardial infarction, renal failure, liver failure, severe pulmonary infiltrates, and cancer, etc;
- (5) Basic treatment can not be performed. Heading towards the bad prognosis.

Do not follow admission criteria, or in cases patient are selected mistakenly and do not follow acupuncture rules or incomplete information and other factors that affect the treatment should be eliminated.

5. Quitting Criteria

If the symptoms of the disease get more severe. The physician should ask the patient to stop clinical trials and withdraw from the study;
Patients with severe illness and complications should be judged. Any non-suitable participant in the study should be withdrawn from the research;
Patients who are reluctant to continue treatment on clinical research study, if the acupuncturist leaves the clinical trial the patient have rights to leave the clinical trial as well.

6. Termination Criteria

Serious adverse events. Clinical research design or performance deviation causing difficulty to evaluate the treatment result.

Treatment Patterns

1. Basic Treatment according to the formulas

Refer to the "Chinese Prevention Stroke Manual Guide" for blood pressure control, control of glucose in blood, control cholesterol in the blood and blood coagulation.

The treatment using medicine to prevent thrombosis

2. Acupuncture technique for opening orifices and awaken the mind. (醒脑开窍针刺法)

Treatment: Opening orifices and awaken the mind, nourish the liver and kidneys and dredge the meridians.

Indication:

Main point ; 内关 (Neiguan, PC6) (both sides), 水沟 (Shuiguo, DU 26), 三阴交 (Sanyinjiao, SP 6) (both sides), 金津 (Jinjing, EX-HN 12), 玉液 (Yuyue, X-HN 13), 上廉泉 (Shanglianquan, X-HN21)

Secondary point; 极泉 (Jiquan, HT 1), 委中 (Weizhong, BL 40), 尺泽 (Shizhe, LU 5) (affected side)

Extra points; 风池 (Fengshi, GB 20), 翳风 (Yifeng, SJ 17), 完骨 (Wangu, GB 12) (both sides)

Muscle spasm or paralysis on the upper limbs: 肩髃 (Jianyu, LI 15), 合谷 (Hegu, LI 4), 八邪 (Paxue, EX-UE 10) (affected side)

Muscle spasm or paralysis on the lower limbs: 阳陵泉 (Yanglingquan, GB 34), 丘墟 (Qiuqu, GB 40), 照海 (Zhaohai, K 16) (affected side)

Methods:

At first puncture Neiguan on both sides, embedded needle perpendicular in 0.5-1 inches, using the method of sedation technique by rotating the needle together with pulling the needle up and down for 1 minute.

Puncture Yingtang oblique upward of 0.3-0.5 inches use sedation technique by pulling the needle up and down, give the acupuncture area a tight feeling.

Puncture Sanyinjiao, obliquely along the inner bone with the skin making the an angle of 45 degree with the depth of 1-1.5 inches using the reinforcing method of pulling the needle down causing the affected leg to contract 3 times.

Puncture Jiquan avoid the axilla hair, embedded needle along the same meridian down from the same point 1 inches below, puncture perpendicular 1-1.5 inches, using

the sedation method of pulling up and down the needle making the arm muscle contracted 3 times. Puncture Shije arm bent and insert the needle in a straight line 1 inch, using the sedation method of pulling the needle up and down, causing the muscle to contract 3 times.

Puncture Weizhong, patients lay facing upward straighten the leg and put it higher insert 0.5-1 inches using the sedation method by pulling the needle up and down, make the muscle on the affected leg contract 3 times.

Puncture Fengshi, Wangu, Tianju, insert the needle in the opposite direction to the outer canthus, in-depth of 2-2.5 inches choose the reinforcing method of rotate the needle in small degrees with high speed, in 1 minute.

Puncture Jianju, embedded the needle obliquely in the direction of towards down side in depth of 1.5-2 inches, use of reinforcing needle by pulling the needle up and down, stimulate the needle to make the sensation down to the Hegu together with rotate the arm outwards, make the arm muscle contract for 1 minute.

Puncture Hegu, insert the needle in the direction of the San Jia point depth of the needle is 1-1.5 inches using the sedation method and make the patient's fingers wiggle by its own.

Puncture Baxue 0.5- 1 inches in-depth using the reinforcing method by pulling the needle up and down make the sensation down to the tip of the fingers and make the patient's fingers wiggle by its own.

Puncture Yanglingquan insert the needle obliquely in the direction downwards to the skin making an angle of 45 degrees, depth of 2-2.5 inches make the needle sensation down to the tip of the toes.

Puncture Qiuqu and make it pierce through Zhaohai shifts the patient's affected feet to straight post, insert 2-2.5 inches deep and making the end of the needle point to Zhaohai and withdraw the needle back to 1.5 inches.

2.3 Chinese patent medicine

Danipiantan capsule (丹芪偏瘫胶) 4 tablets / time 3 times / day

2.4 Rehabilitation with practice. (Zhong, DL. ,2001)

2.4.1 Muscle Training by Pronunciation: Choose one of the pronunciation methods when training focus on the use of tongue and oral muscles. Exercise the tongue, the patient put the tongue in and out then up and down, left and right respectively, follow the steps from slow to fast practice every day 6-9 times, 6-10 minutes each time. Repeat by pronouncing "ah" or other expressions such as blow the air out, blow the cheeks with close mouth, bending up the tongue, showing the teeth etc..

2.4.2. Language training: The key to restore speech is to let the patient open the mouth and speak simple word that use in daily life like sit down, thank you, hello, goodbye and so on. Besides also set up a simple problem for the patient to solve.

Patients should be careful when talking slowly and clearly, giving the patient time to think and be prepared to answer the question.

2.4.3. Analyze and understanding: Looking at an image and analyze and speak out can be used. Patients will remember familiar names, colors, or what patients are interested in. It also allows patients to view newspapers, magazines, or singing, to help in restoring memory function.

2.4.4 Body language training: The body refers to the human body in accordance with the expression, including the external body, gesture, facial expression, movement of the eyes and posture.

2.4.5 Language training at the same time with total rehabilitation: Combined therapy is very important including rehabilitation and training of limbs, language, psychological and other aspects. Rehabilitation in combination with other methods along the way.

Standard of treatment effect

1. Speech assessment: By Beijing Hospital " Method to Check Chinese Language

Speech Loss" (ABC Measurement Table), patient evaluation; listening, repeating lecture, reading aloud, understanding of writing and calculating.

2. Evaluation of the ability to communicate in everyday life

Method use to examine the capability of communication skills (The Chinese functional communication) CFCP, communication skills of patients in everyday life is divided into 5 parts. 25 listed

CFCP scoring:

Mild loss should have the total score of less than 200 points.

Moderate loss should have the total score of less than 150 points.

Severe loss should have the total score of less than 100 points.

3. Assessment of aphasia level

By using standard aphasia grading (Boston Diagnostic Aphasia Assessment. BDAE) (Grades 0-5):

Level 0: Expression and understanding are both obstacles.

Level 1: Ability to speak and understand little vocabularies.

Level 2: Ability to express and understand simple words, but often make grammar mistake.

Level 3: Expressions and understanding of everyday vocabulary are rarely wrong. Level 4: Extreme complex language is expressed well through patients. Level

5: Expression and understanding have a little difficulty, but the patients are able to noticed by themselves.

Evaluation of treatment

Patient pre- post treatment with all methods has been use “The Chinese functional communication test” method. The CFCP scoring method.

Proceeded the test to evaluate the language proficiency assessment. Basic treatment: Score 90% or more, CFCP total score of 50 points or more. Clear results: Score between 60-90%; CFCP total score of 36 points. Effective: Score between 30-60% CFCP total score of 26 points, or language spoken 10 points and above.

No result: Score less than 30%, CFCP total score of 10 points and below or no spoken language.

1. Criteria for assessing daily activities:
Using Barthel index score

(People’s Republic of China and Ministry of Public Health “Chinese Clinical Standard For Medical Rehabilitation” Beijing: Publisher. Huaxia 1999: 220-231) Assessing daily activities 100 is normal score: ≥ 60 points basic self-care, 41-59 points moderate score for abnormal life that need assistance, 21-40 points severity disorder life must rely on, ≤ 20 points life are fully to rely on.

2. Evaluation of neurological impairment:

Use of United States, National Health Facility Evaluation of National Institution of Health Stroke Scale (NIH)

Statistical

Microsoft Excel was used to collect data to create a database containing all of the input data into SPSS13.0 for statistical analysis. Mean \pm Standard deviation ($\bar{x} \pm s$) pre-post treatment using the t-test, $p < 0.05$ was considered statistically.

Results

1. General conditions of the patient: 192 patients

In patients with stroke in the hospital that consistent with the diagnosis according to standard admission criteria and ejection criteria 83 patients were enrolled. Out of 83 patients, 47 were male patients and 36 female patients. The mean age was (65.32 ± 9.63) years old. Mean disease duration was (42.77 ± 13.26) days.

2. Improved speech skills after treatment.

Language Assessment: See Table 1.

Table 1 Change in heaviness in speech using ABC score pre-post treatment of patients.

List	Before Treatment	After Treatment	P Value
Listening Understandable	51.72±15.36	65.77±21.42	<0.05
Repeating	46.53±9.72	74.91±13.61	<0.01
Speaking	21.37±5.74	34.03±12.56	<0.05
Reading aloud	29.98±10.13	42.72±18.33	<0.05
Reading	48.22±20.05	57.88±23.42	<0.05
Calculating	42.70±21.11	58.41±22.76	<0.05

From table 1 It is clearly shown that post treatment of patient's with aphasia have been improved.

Patient comparison pre-post treatment in using of speech skills: Table 2

Table 2 Pre-post CFCP treatment ($\bar{x} \pm S$)

No. Of patients	Before Treatment	After Treatment	P Value
83	119.67±68.29	188.77±81.30*	<0.05

Note: * Before treatment P <0.05

The statistical analysis after CFCP treatment has improved significantly compare to before treatment (P <0.05).

Evaluation pre-post treatment for aphasia condition: Table 3

Table 3 Comparison of scores pre-post treatment for aphasia.

	Level 0	Level1	Level2	Level3	Level4	Level5
Before treatment	11	19	22	14	6	11
After treatment	3	6	11	13	25	25

Table 3 can be seen that post treatment of patients with aphasia have been improving significantly.

Evaluation: Table 4

Table 4 Performance Testing

n	Fully recovered %	People (%)		Not Affective %	Rate of Effectiveness %
		Obvious Result %	Affective %		
83	4 (50.60)	21 (25.30)	10 (12.05)	10 (12.05)	87.95 %

3. Daily Use (BI Index) to improve the situation: Table 5

Table 5. After treatment change in patients with BI index ($\bar{x} \pm S$)

No. of patients	Before Treatment	After Treatment	Variable Value	P Value
83	50.2±20.4	86.2±19.0	36.0±20.5	<0.05

From Table 5 It can be seen that after the treatment the quality of daily life have been improved.

4. Improvement of nervous system (NIHSS): Table 6

Table 6 after treatment in patients with changes NIHSS scores ($\bar{x} \pm S$)

No. of patients	Before Treatment	After Treatment	Variable Value	P Value
83	8.1 ±3.0	3.8 ±2.7	4.3 ±2.3	<0.05

Table 6 can be seen. After treatment for impaired vision. The nervous system is clearly improved.

Discussion

1. Condition on post- cerebral infarction aphasia in the Western Medicine perspective

Cerebral infarction also known as Cerebral Ischemic Stroke is caused by several reasons of brain damage that further causes cerebral thrombosis, obstruction or vessel narrowing leading to lack of blood and oxygen. As a result the affected brain tissue get lack of blood and oxygen supply making the brain cells around the area become dead cell. It is a bad prognosis and high mortality rate.

After stroke occurs it usually accompanies with destruction of the nervous system, aphasia disorder is commonly found. When the disease has taken place language is defected and brain tissue is destroyed resulting in impediments, understanding and the loss of ability to communicate. (Zhang, Y. , W , YJ . , Zhu , YL . , Ma, RH. ,2005).

The key is to reduce the ability to use terminology, the use of grammatical errors etc. Condition of aphasia can be divided to Broca type and Wernicke type. Patients have inability both in spoken and written languages, difficulty in speaking and inability to speak at all, difficulty in repeating words and unable to follow the instruction, inability to call an object or unable to call an object at all. Broca is most commonly seen language impairment after a high risk of stroke both domestic and foreign reports are up 30% and above. (Pedersen PM, et al. ,1997; Li , HL. , LIU, YL. , Ren,L., and other. ,2003; Xu, ZY. , Chen, JL. ,2001).

Language barriers affecting the ability of patients to communicate also reduce the quality of life of patients and social skills. Currently, medical research in treating of aphasia disorders majority use rehabilitation with language training together with psychology to measure. Using of photography (iconography) bring the disease condition to aphasia with anatomy. Traumatic brain injury are link together. (Zhou Y, Chen HY , Wang LM, the column Han , Wang ,YJ. ,2006).

Traditional Chinese Medicine treatment of this disease in the past year are considered successful. Most treatments include Chinese medicine and acupuncture etc. without pausing to do research study on Chinese medicine. Traditional Chinese Medicine for the treatment of post- cerebral infarction aphasia make it even more acceptable. (Chang, JL., Gao,L., 2006).

2. Causes and mechanisms of post- cerebral infarction aphasia occurs according to Chinese Medicine point of view

Chinese medicine considered occurrence of Zhong feng (中 风) or stroke of the patient usually caused by the weakness of the body, deficiency of qi, blood, heart, liver, kidney, yin and yang. Along with anxiety, anger, alcohol, too much consuming or too much sexual activity, excessive work. Invasion of pathogens from outside causes impairment of qi and blood, skin and tendons lose of nourishment. Hyperactivity of liver yang and yang transformed into wind causing adverse flow of qi and blood. Fire and phlegm close the orifices leading to upper excess and lower deficiency. Yin Yang does not work together making it dangerous. Condition of aphasia "comes from modern western medicine main symptom of stroke which cause is aphasia symptoms of hemiplegia of one side. Which is not mentioned in ancient Chinese literature. However, the disease of speech impediment after stroke happen in Chinese Medicine is known as "stiff tongue", "stuttering", "cerebrovascular disease", "stiff jaw", and so on.

3. Analysis of Acupuncture Treatment and Therapies of Condition of post-cerebral infarction aphasia

3.1 Acupuncture to open orifices and awaken the brain. (醒脑 开窍)

The concept of Professor Shi Xue Min emphasizes on "Shen" (神), especially "shen", in the broad sense refers to the brain, mind, spirit including other expression of the body which is control by "Shen". The basic mechanism of the disease occurrence is blood stasis, liver wind, phlegm turbidity is the factor that causes the closure of orifices. " When the orifices close shen are hidden it does not bring the qi with (窍 闭

神匿, 神不导气) "and" Brain is the sea of the bone marrow, and it is home of shen (脑为髓海, 为元神之府) ", and the brain in the skull is the source of the yang. All Yang meridian will flow through the head as well as Yin meridian also passes this way. All the meridians are interconnected in the head. The tongue is the window of the heart (舌为心之苗). Spleen and heart qi flow through the tongue. Heart meridian are connected especially with the tongue not just deficiency or excess wind, fire, qi and phlegm that causes post- cerebral infarction aphasia occurs making lack of malnutrition to shen leading to deficiency of bone marrow finally the original shen has been damage.

Intelligent brains can not function normally causes condition of aphasia. It is the causes of disease like stroke. Acupuncture point that are chosen is Neiguan which belongs to pericardium meridian this point helps to calm the shen and help qi flow. Adjust the tongue control with the use of Renzhong point to awaken the brain and open orifices. Sanyinjiao point to tonify liver, spleen and kidney yin meridian of all three and to dredge the orifices of the tongue. Fengshi, Wangu and Yifeng point are use to tonify the brain and spinal cord, it has the properties to open orifices. Changelianquan point is a special meridian point, the position is near the pharynx, useful for the tongue and to open the orifices, eliminate wind and phlegm. To tonify qi and blood, Jinjing and Yuye point are use. These two points are located near the veins under the tongue, left is Jinjing and right is Yuye, it properties is to dissolve phlegm, open orifices to help the speech.

3.2 Danqipiantan Capsules

Based on clinical experience over 10 years of Professor Shi Xue Min in the treatment of Stroke in ischemia condition. Ingredients in the formula are Huangqi, Renshen, Chuanxiong, Leech, Niuhuang, Xiyangjiao, Antelope bugs and Shichangpu (黄芪, 丹参, 川芎, 水蛭, 人牛黄, 羚羊角, 全蝎, 石菖蒲). This formulas has special effects on tonifying qi and blood, promote the flow of blood and break stasis, calm the wind and dissolve phlegm, open orifices and treat spasms. Outstanding feature of stroke is deficiency, blood stasis, wind and phlegm.

3.3 Rehabilitation of language communication training

Rehabilitation in practicing the speech, the most important is training the lips, tongue, throat and other organs associated with the use of sounds along with practice of listening, observing and writing. In order to rehabilitate language communication to stimulate loss of centralized language control. To increase the level of language and communication. (Shi ,XJ., Fang, JR. ,2006; Meijun, R. (2006). In this research study is the method of repeated stimulation. From light to heavy stimulation gradually, recognition of patients and combination in a variety of ways, lastly continue to balance.

This study included treatment with acupuncture using the technique of awaken the brain and open orifices. Medicinal use of Danqipiantan capsule and rehabilitation with speech training. Starting from speaking, listening, repeating, reading aloud, pronunciation, reading understandable, copying, depiction, dictation, and calculations

etc. to improve the language communication skills of the patients. Reduce the level of speech loss and increase the quality of life.

Conclusion

Therapeutic treatments include Acupuncture to awaken the brain and open orifices. Medicinal use of Danqipiantan capsules and rehabilitation with speech training. Can improve the function on post- cerebral infarction aphasia significantly. Enhances communication in everyday life and improved neurological function and clinical effectiveness.

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