Acupuncture therapy on apoplectic aphasia rehabilitation

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OBJECTIVE: Acupuncture has often been used for aphasia rehabilitation in China. The purpose of this paper was to: 1) provide a historic overview of acupuncture for aphasia due to stroke; 2) summarize the commonly used acupuncture approaches; and 3) objectively comment on the effectiveness of acupuncture for the rehabilitation of this type of disorder.

METHODS: The Elsevier database and a Chinese database (CNKI) were searched through December, 2010 with the key words "aphasia, acupuncture" in English and Chinese, respectively. Case reports, uncontrolled clinical observations and controlled clinical trials were all included if acupuncture was the sole treatment or the main component of complex intervention for the rehabilitation of aphasia caused by cerebrovascular disease.

RESULTS: More than 100 relevant articles were found. After analyzing these articles, we found that acupuncture for apoplectic aphasia most often included tongue, scalp, body and combination acupuncture. Tongue bleeding, deep insertion and strong stimulation were adopted by many practitioners. The ten most frequently used acupoints (or areas) were Lianquan (RN 23), Jinjin (EX-HN 12), Yuye (EX-HN 13), Tongli (HT 5), Fengchi (GB 20), Neiguan (PC 6), Baihui (DU 20), No. 1, 2 and 3 language sections, Sanyinjiao (SP 6) and Yamen (DU 15).

CONCLUSIONS: Controlled clinical studies and a systematic literature review demonstrate that acupuncture has therapeutic effects on aphasia after stroke.

INTRODUCTION

Aphasia is an acquired language disorder in which language modalities are impaired. The disorder usually results from lesions in the language-relevant areas of the frontal, temporal and parietal lobes of the brain and the neural pathways between them, and may include difficulty in producing or comprehending spoken or written language. Stroke is a common cause of damage to these areas that leads to aphasia. According to some reports, about 1/3 stroke survivors suffer speech or language disorders, and 30%-42% of these patients have long-term aphasic symptoms; as a result, they often need long-term care, which is a major burden for all involved.

Currently, speech-language therapy is considered the most effective method for the management of aphasia and is used by most therapists. Acupuncture has also been widely used for this type of disorder in China, in both ancient and modern times. In the past few de-
decades, many clinical observations and trials of acupuncture for post-stroke aphasia have been conducted, aimed at determining whether this technique can aid in decreasing recovery time or increasing the degree of recovery.

Although several general reviews\(^3\)\(^-\)\(^7\) of the effects of acupuncture on apoplectic aphasia are available, all of them summarize articles published within only a limited period of time, and most of have duplicate contents. The objective of the present paper is comprehensively to review the history of the development of acupuncture for apoplectic aphasia, to summarize frequently utilized acupuncture methods (e.g. acupuncture points or areas and manipulation) and objectively to evaluate the effectiveness of acupuncture for post-stroke aphasia rehabilitation.

**METHODS**

**Data sources**

A Chinese database (CNKI) was searched from its inception through December, 2010 with the key words “acupuncture, aphasia and (stroke or apoplectic or cerebrovascular attack or cerebrovascular accident or cerebrovascular* or cerebral infarction or cerebral hemorrhage or cerebral*)” in Chinese. Relevant articles in the Elsevier database were also searched with the same key words in English. Soft copies of all articles were obtained and read in full.

**Study selection**

More than 360 relevant articles were retrieved. Case reports, clinical observations and prospective clinical trials that utilized acupuncture as the main therapy for post-stroke rehabilitation were all selected to review the history of acupuncture for apoplectic aphasia and to summarize the methods that have been adopted. Only controlled clinical studies with clear diagnostic and evaluation criteria and employing acupuncture as the sole treatment or an adjunct to speech-language therapy were selected to assess the effectiveness of acupuncture for apoplectic aphasia rehabilitation. Those with similar content conducted by same authors were excluded.

**Data extraction**

All articles were read fully and relevant data were collected and analyzed in terms of the characteristics of the content and the acupuncture methods used, including acupuncture points or areas and manipulation.

**RESULTS**

**General information**

One hundred and four relevant articles published during last three decades were identified. Most of the articles published in the early part of this period were case studies, whereas those published during last two decades were mainly clinical observations or controlled clinical trials (Figure 1).

The first article about acupuncture treatment of post-stroke aphasia was published by Jiwen, who claimed to have cured a 55-year-old woman with aphasia after cerebral infarction within one month by puncturing Yongquan (KI 1) with strong stimulation. Subsequently, case reports\(^9\)\(^,\)\(^10\) of different acupuncture methods for aphasia related to cerebrovascular disease were also published. Lizhong\(^11\) published the first clinical observation, in which nine patients with aphasia resulting from cerebral infarction or cerebral hemorrhage were treated with acupuncture; most experienced different levels of recovery. At the same time, the first controlled clinical trial\(^12\) showed that acupuncture was equally or more effective than other techniques in aiding recovery from aphasia. In this study, 75 participants with acute cerebral infarction were involved, 45 of which had various types of unspecified aphasia. The subjects were divided into three groups that received acupuncture, VNRT (an undefined pharmacologic agent) or vitamin B. Up to 73% of the acupuncture group, 70% of the VNRT group and 33% of the vitamin B group were described as being essentially cured (disappearance of hemiplegia and aphasia) or markedly improved (hemiplegia and aphasia obviously improved).

![Figure 1](https://example.com/figure1.png)

**Figure 1** Numbers of relevant articles published in different periods

CRs: clinical reports; UOSSs: uncontrolled observational studies; CCTs: controlled clinical trials
Figure 1 demonstrates that research on the use of acupuncture to treat apoplectic aphasia made great progress in terms of quantity and quality in the last two decades. Thirty-three relevant articles were published between 1991 and 2000, whereas from 2001 to 2010 the number almost doubled, rising to 65. Moreover, more scientific designs were utilized and more participants were involved in these studies. From 1991 to 2000, eight controlled trials were performed, including three randomized controlled trials, whereas 39 controlled trials were conducted between 2001 and 2010, of which 34, or almost 90%, were randomized. Dozens of subjects were involved in almost all studies, and some studies even recruited hundreds of subjects.

Acupuncture approaches for apoplectic aphasia

Tongue acupuncture, scalp acupuncture and body acupuncture, or combinations of two or even three of these, with the exception of combined scalp and body acupuncture, were frequently used (Figure 2). The probable reason why integrated scalp and tongue acupuncture was rarely used might be the difficulty of performing these two types of manipulation at the same time. Selection of appropriate acupuncture points (or areas) plays an important role in achieving a good therapeutic effect. Although various acupoints were selected by different therapists for apoplectic aphasia, Lianquan (RN 23), Jinjin (EX-HN 12), Yuye (EX-HN 13), Tongli (HT 5), Fengchi (GB 20), Neiguan (PC 6), Baihui (DU 20), No. 1 and 2 and 3 language sections, Sanjinjiao (SP 6), Yamen (DU 15), Zusanli (ST 36) and Shangljanfquan (LI 9) were most frequently utilized (Table 1). Different acupuncturists tended to adopt different procedures, but tongue bleeding was generally considered to be an effective manipulation and was widely applied.

Tongue acupuncture

As mentioned above, swift pricking to cause bleeding was the most frequently used approach for tongue acupuncture. Most acupuncturists did not leave the needle in place and used acupoints beneath the tongue, such as Jinjin (EX-HN 12) and Yuye (EX-HN 13), to manage aphasia after acute stroke. In contrast, others punctured the surface of the tongue. Both obtained good therapeutic effects. Horizontal and deep puncturing approaches were also commonly used to aid recovery from apoplectic aphasia. Horizontal puncture refers to piercing the tongue from one side to the other; deep puncture uses long needles punctured deep toward the root of the tongue from acupoints at the tip or sides or from beneath. In addition, special procedures were also applied by some acupuncturists. For instance, Cuiping used “Guan’s tongue acupuncture” as the main measure for patients with apoplectic aphasia.

Scalp acupuncture

Several scalp acupuncture methods have been applied for the rehabilitation of apoplectic aphasia. Puncturing of different language sections according to the type of aphasia was most commonly used. Reviewing the relevant articles, we found that most acupuncturists utilized No. 1 language section for motor aphasia, No. 2 for anomic aphasia, No. 3 for sensory aphasia, and No. 1 combined with No. 2 for mixed aphasia. Some practitioners connected needles left in place with low frequency electric waves to increase the rehabilitation effect on different regions of the cerebral cortex. Furthermore, some innovative scalp acupuncture approaches have been introduced in the last 10 years. Ganghui and colleagues punctured around the area of the scalp shown by CT to correspond to the focus of aphasia due to stroke, and found that this new method had a better therapeutic effect than traditional scalp acupuncture (i.e. acupuncture of No. 1, 2 and 3 language sections). A similar method was employed by Hongying, who used CT or MRI to define the area of projection of the focus on the scalp and punctured this area from four directions (front, rear, left and right) toward the center with one needle each. Cluster-needling stimulation, another new method in which scalp acupoints are punctured intensively within a limited area or along a certain line, was also applied recently. Wei and Xiuli adopted an approach in which catgut
was buried under the Baihui (DU 20) acupoint and No. 1, 2 and 3 language sections, also with good therapeutic effect.

**Body acupuncture**

Two types of body acupuncture were commonly used for treating aphasia after stroke. In the first, the acupuncturist selected appropriate acupoints based on his clinical experience. For instance, the Xingnaokaiaojiao (inducing resuscitation) therapy developed by Xuemian,\(^3\) principally punctured the Neiguan (PC 6), Sanyinjiao (SP 6) and Shuigou (DU 26) acupoints.\(^{59-62}\) Various other acupoints have been selected by different acupuncturists. Yuhua\(^6\) and colleagues selected Juque (RN 14), combined with Neiguan (PC 6) and Renzhong (DU 26); Yanhong\(^6\) punctured Lianquan (RN 23) deeply (to 2 cun) with a long needle to treat a patient with aphasia due to stroke and obtained a good therapeutic effect; Taiyuan (LU 9), Taixi (KI 3), Shangliqian (LI 9) and Zusanli (ST 36) were selected by Fengying;\(^6\) Yamen (DU 15), Fengfu (DU 16) and Xianzhuo (DU 17), located along the Governor Vessel Meridian, were punctured by Fei\(^6\) with a warming needle to treat aphasia caused by cerebral diseases; and Hong\(^6\) punctured Fengchi (GB 20), Neiguan (PC 6), Sanyinjiao (SP 6), Fenglong (ST 40), Taichong (LI 3), Fengfu (DU 16), Yamen (DU 15), Lianquan (RN 23) and Qihai (RN 6) to treat aphasia caused by cerebral infarction.

In the second approach, acupoints were selected by differentiation (a comprehensive analysis of all symptoms to determine the patient’s syndrome according to traditional Chinese medicine (TCM)). This was frequently used to increase the therapeutic effect of scalp or tongue acupuncture.\(^{23,28,72}\) These acupuncturists usually chose certain acupoints for initial puncturing, then punctured other acupoints on the basis of the patient’s syndrome. Although diverse acupoints were selected by different therapists, particular acupoints were often adopted for certain syndromes. Fenglong (ST 40), for example, was always punctured at patients with the syndrome of up-attacking of wind-phlegm; Taixi (KI 3) and Fuliu (KI 7) were often used for kidney deficiency syndrome; Taichong (LI 3) was frequently utilized for the syndrome of hyperactivity of liver yang; Zusanli (ST 36) was applied for the syndrome of insufficiency of Qi and blood; and Xuehai (SP 10) was usually punctured to remove blood stasis.

**Combination therapy**

In recent years, the simple therapies mentioned above were rarely used as sole treatments for aphasia after stroke; increasingly, therapists prefer to combine two or three of these methods. As shown in Figure 2, combinations of therapies were common, except for scalp plus tongue acupuncture. Some acupuncturists,\(^{21,31,36,73}\) combined scalp with body acupuncture, some\(^{22,50,60,74}\) preferred to integrate tongue and body acupuncture, and others\(^{30,28,75-78}\) tended to use all three together. Additionally, it was noted that speech-language therapy, a widely recognized treatment for aphasia in Western medicine, was increasingly used by TCM practitioners, and increasing numbers of acupuncturists\(^{75,73,31,36,55,56,79,80}\) are integrating acupuncture therapy with language training for the treatment of aphasia caused by cerebral diseases.

<table>
<thead>
<tr>
<th>Table 1</th>
<th>The most frequently used acupuncture points (or areas)</th>
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<tr>
<td>Location of acupuncture</td>
<td>Acupuncture point (or area)</td>
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<tr>
<td>Head</td>
<td>Baihui (DU 20)</td>
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<td></td>
<td>No. 1, 2 and 3 language sections</td>
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<tr>
<td>Tongue</td>
<td>Sishencong (EX-HN1)</td>
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<tr>
<td>Neck</td>
<td>Jinjin and Yuye (EX-HN12; EX-HN13)</td>
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<td></td>
<td>Lianquan (RN 23)</td>
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<tr>
<td></td>
<td>Fengchi (GB 20)</td>
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<tr>
<td>Limbs and trunk</td>
<td>Yamen (DU 15)</td>
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<td></td>
<td>Shangliqian (LI 9)</td>
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<td></td>
<td>Fengfu (DU 16)</td>
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<td></td>
<td>Tongli (HT 5)</td>
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<td></td>
<td>Neiguan (PC 6)</td>
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<td>Sanyinjiao (SP 6)</td>
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<td>Shuigou (DU 26)</td>
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<td></td>
<td>Fenglong (ST 40)</td>
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<td></td>
<td>Zusanli (ST 36)</td>
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<td></td>
<td>Taichong (LI 3)</td>
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<td></td>
<td>Hegu (LI 4)</td>
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<td></td>
<td>Quchi (LI 11)</td>
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<tr>
<td></td>
<td>Taixi (KI 3)</td>
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<td></td>
<td>Yongquan (KI 1)</td>
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<td></td>
<td>Zhaohai (KI 6)</td>
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</table>

**Efficacy of acupuncture for aphasia due to stroke**

Although acupuncture is widely utilized for the rehabilitation of aphasia due to stroke, its effectiveness remains unclear due to issues related to experimental design. For example, standardization of entry criteria (acute vs. chronic) and quantitative measures of language, cognitive or motor speech skills were not adopted in most of the clinical studies mentioned above. Nevertheless, some controlled clinical studies with objective measurements and large sample sizes show that acupuncture had a positive therapeutic effect.

Several controlled clinical studies with large sample sizes\(^{22,27,31,36,74,81}\) were conducted to investigate the therapeutic effect of various acupuncture therapies. In these studies, patients with aphasia due to stroke were usually randomly divided into two groups receiving two different acupuncture therapies and their language ability scores were assessed using the Chinese Language Test of Aphasia\(^5\) before and after treatment. The results show that either therapy could significantly raise patients’ language ability score.
Many clinical research studies have confirmed acupuncture to be an effective adjuvant therapy to language training in the management of apoplectic aphasia. For instance, Jiao et al. conducted a randomized controlled clinical trial to observe the effect of Xingnao Kaiqiao acupuncture plus language rehabilitation training for motor aphasia caused by cerebral infarction. In their study, 90 patients with motor aphasia, 15-90 days after cerebral infarction, were randomly divided into an acupuncture plus language training group, an acupuncture alone group and a language training group, with 30 patients in each. The patients’ aphasia quotient (AQ), four basic speaking functions (spontaneous speech, auditory comprehension, repetition and object naming) and communicative ability in daily life (CADL) were evaluated with the Western Aphasia Battery before and after treatment. After five days’ treatment, AQ, CADL and scores for all four basic speaking functions were significantly improved in all three groups ($P<0.05$ or $P<0.01$). Compared with the language training group, the AQ, CADL and spontaneous speech, repetition and object naming were significantly improved in the acupuncture plus language training group ($P<0.05$ or $P<0.01$). Scores for CADL, repetition and object naming were also significantly increased in the acupuncture alone group ($P<0.05$). Weiping et al. observed the therapeutic effects of tongue acupuncture combined with language training on motor aphasia induced by ischemic apoplexy. Using a table of random digits, they divided 60 subjects, within half a year of onset, into a tongue acupuncture (swift prickling at the surface of the tongue to cause bleeding) with language training group and a control group treated with simple language training (including speech organ training, mouth shape and voice training, spoken language expression training and practical communication ability training). The Aphasia Battery of Chinese (ABC) was used to evaluate the patients’ language ability before and 30 days after treatment. The scores for the ABC items, including information content, speech fluency, repetition, vocabulary denomination, color naming, response denomination, confirmation or negation, acoustic recognition and carrying out instructions, were significantly increased in the treatment group compared with the control group ($P<0.05$). Similar studies were performed to investigate the effect of scalp acupuncture (or electroacupuncture). Puncture combined with language rehabilitation training; all of their results demonstrate that the combined therapy was more effective than simple language training in improving basic language skills such as spontaneous speech, auditory comprehension, repetition, object naming and communicative ability.

To obtain a more accurate and objective evaluation of the therapeutic effect of acupuncture for apoplectic aphasia, Yong et al. performed a systematic review of the relevant randomized controlled trials using Cochrane systematic assessment methods (extracting qualified data and conducting meta-analysis). The results indicate that there was a statistically significant difference between acupuncture and language training in terms of cure rate; acupuncture combined with language training was statistically superior to language training alone, supporting the conclusion that acupuncture (or acupuncture combined with language training) is effective for aphasia due to apoplexy. However, the authors pointed out that the quality of the included literature was low, and suggested that more randomized controlled trials of high methodological quality needed to be conducted.

With regard to the efficacy of different acupuncture therapies, many of the reviewed studies demonstrated that combination acupuncture therapies were more effective than simple body acupuncture in improving language ability. A randomized controlled clinical trial with 160 participants performed by Ming indicated that electronic scalp acupuncture therapy was more useful than body acupuncture, and another study with 62 participants showed that tongue acupuncture was more effective than body acupuncture.

**The mechanism of the effect of acupuncture for aphasia due to stroke**

Possible mechanisms of the effect of acupuncture on apoplectic aphasia were also explored. Shengxiu confirmed that acupuncture significantly improved most hemorheology indices in patients with aphasia after acute stroke, suggesting that lowering of blood viscosity might be a possible mechanism. Weihong et al. found that tongue acupuncture shortened the latency times of N2 and P3 waves in P300 and increased the amplitude of P3. N2 and P3, as components of the event-related potential (an electrical physiological index reflecting high-grade mental activity), are closely related to the recognition and processing of certain stimuli in the brain. These authors inferred that acupuncture might accelerate the classification, coding and discrimination of external signals in the brain, influence the strength of processing perception and reduce the time taken for processing, thereby improving overall ce-
Acupuncture therapy for aphasia caused by stroke made significant progress in the past two decades. Various approaches were developed and their efficacy was confirmed. Combination acupuncture therapy and the combination of acupuncture with language training had the best curative effect. Increased cerebral blood flow and shortening of the P300 latency time are possible mechanisms. However, we should be aware of the possible flaws and limitation of the above studies. For example, the duration of study, intensity of treatment, standardization of entry, reliability of measurements, and acupoints and procedures used differed between researchers, which prevents solid conclusions and limits generalization. Additionally, few studies compared the effectiveness of different acupuncture therapies for a particular type of aphasia, or of one acupuncture therapy for different aphasia types. For this reason, it is unknown which types of aphasia benefit most from which types of acupuncture therapy. To resolve these problems, it will be necessary to conduct multicenter clinical trials with rigorous design, the same duration and intensity of treatment, standardized entry criteria, quantitative measures, and standardized acupoints and procedures.

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