

# Current Status and Progress in Integrative Treatment of Acute Ischemic Cerebrovascular Disease

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**Abstract:** Acute ischemic cerebrovascular disease (AICD) poses a severe threat to human health, characterized by high incidence and disability rates. Western medicine currently offers multiple treatment methods, such as thrombolysis, anticoagulation, and cerebral circulation improvement, while traditional Chinese medicine demonstrates unique advantages in herbal prescriptions, proprietary Chinese medicines, acupuncture, and massage therapies. Integrative treatment approaches combining Chinese and Western medicine have become widespread in clinical practice, yet challenges remain in optimizing specific treatment plans and elucidating mechanisms of action. This paper aims to comprehensively analyze the current status of integrative treatment for AICD, outline its developmental trajectory, and provide insights for enhancing treatment efficacy.

**Keywords:** Integrative medicine; Acute ischemic cerebrovascular disease; Treatment status; Progress

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## 1. Introduction

Acute ischemic cerebrovascular disease (AICD) is a cerebrovascular disorder that significantly threatens human health, primarily caused by impaired cerebral blood flow leading to brain ischemia and hypoxia. Clinically, patients often present with symptoms like headaches and dizziness, and as the disease progresses, motor dysfunction is common; in severe cases, consciousness disturbances or even coma may occur. The onset of this condition is exceptionally rapid, with swift progression that often catches individuals off guard. Once an attack occurs, if effective treatment measures are not promptly implemented, the patient's life is at serious risk <sup>[1]</sup>. Furthermore, patients frequently experience a range of functional impairments following AICD, including cognitive, motor, and language dysfunction. These impairments not only drastically reduce the

patient's quality of life and ability to function independently but also place substantial economic and emotional strain on their families while adding a significant burden to society <sup>[2]</sup>.

## **2. Pathological mechanisms of acute ischemic cerebrovascular disease in Western and traditional Chinese medicine**

### **2.1. Western medicine's understanding of the pathogenesis of acute ischemic cerebrovascular disease**

Acute ischemic cerebrovascular disease occurs due to changes in the vascular wall of the brain or abnormalities in hemodynamics, resulting in impaired blood supply to brain tissue <sup>[3]</sup>. From the perspective of vascular wall changes, atherosclerosis is a common cause, leading to thickening of the vascular intima, narrowing of the lumen, and, in severe cases, thrombus formation that obstructs the blood vessels. Hemodynamic abnormalities, such as cardiac dysfunction or abnormal fluctuations in blood pressure, can also alter cerebral perfusion pressure, causing insufficient blood supply to the brain. These factors interact to disrupt normal cerebral blood circulation, ultimately leading to neurological deficits.

### **2.2. Traditional Chinese medicine's understanding of the etiology and pathogenesis of acute ischemic cerebrovascular disease**

In Traditional Chinese Medicine (TCM), acute ischemic cerebrovascular disease falls under the category of "stroke." TCM posits that stagnation in the circulation of qi and blood, resulting in stasis and obstruction in the meridians, is the fundamental pathogenesis of acute ischemic cerebrovascular disease <sup>[4]</sup>. Qi and blood are essential substances that sustain life, and when their circulation is disrupted, leading to blocked meridians, nourishment to the brain is compromised. Thus, in treating this condition, the basic principle is to invigorate blood circulation, remove blood stasis, and promote the flow of qi through the use of herbs with blood-activating and meridian-unblocking effects. This approach aims to restore normal qi and blood supply to the brain, thereby alleviating the condition <sup>[5]</sup>.

## **3. Current status of integrative treatment for acute ischemic cerebrovascular disease**

### **3.1. Current status of Western medicine treatment**

#### **3.1.1. Thrombolytic therapy**

Among the numerous methods in Western medicine for treating acute ischemic cerebrovascular disease, thrombolytic therapy holds an important position. Currently, alteplase is one of the widely used thrombolytic drugs in clinical practice. This drug has unique advantages, specifically targeting blood clots without increasing the risk of bleeding for the patient <sup>[6]</sup>. Mechanistically, alteplase directly stimulates fibrinolytic plasminogen, promoting its conversion to plasmin, which in turn degrades fibrin <sup>[7]</sup>. Fibrin is a key component of clots, and its degradation by plasmin effectively dissolves the clot, restoring the patency of the obstructed cerebral vessel. Consequently, the ischemic and hypoxic condition of brain tissue is alleviated, improving the patient's clinical symptoms such as headache, dizziness, and motor function impairments <sup>[8]</sup>.

### **3.1.2. Fibrinogen-lowering drug therapy**

Fibrinogen-lowering therapy mainly targets patients with hyperfibrinogenemia. Common fibrinogen-lowering drugs in clinical practice include thrombin derived from snake venom, lumbrokinase, ancoxin, batroxobin, and fibrinolysin, among others. Fibrinolysin has shown good efficacy and high safety in treating acute ischemic cerebrovascular disease, especially in cases of large cerebral infarctions, where it is often one of the preferred treatment options. Fibrinolysin effectively reduces fibrinogen levels in the blood, improves blood viscosity, reduces the risk of clot formation, and contributes positively to disease alleviation and patient recovery<sup>[9,10]</sup>.

### **3.1.3. Antiplatelet therapy**

Antiplatelet therapy is one of the key methods for treating acute ischemic cerebrovascular disease. Common antiplatelet drugs like aspirin and clopidogrel are widely used in clinical treatment<sup>[11]</sup>. These drugs play a critical role in the prevention and treatment of ischemic cerebrovascular events by intervening in platelet function through unique mechanisms to inhibit clot formation<sup>[12]</sup>. Specifically, aspirin inhibits cyclooxygenase, thereby reducing the synthesis of thromboxane A<sub>2</sub>, a crucial factor in platelet aggregation. The reduced synthesis of thromboxane A<sub>2</sub> disrupts platelet aggregation<sup>[13]</sup>. Clopidogrel, on the other hand, inhibits adenosine diphosphate (ADP) receptors, blocking ADP signal transduction, which further inhibits platelet activation and reduces the likelihood of clot formation.

### **3.1.4. Anticoagulant therapy**

Anticoagulant drugs used in the treatment of acute ischemic cerebrovascular disease include heparin, warfarin, rivaroxaban, dabigatran etexilate, and low-molecular-weight heparin calcium. Low-molecular-weight heparin calcium is effective in inhibiting the conversion of fibrinogen, thereby reducing fibrin production and enhancing vascular resistance to maintain the normal physiological state of blood vessels. Additionally, low-molecular-weight heparin calcium decreases blood viscosity, promotes smoother blood flow, reduces blood stasis and thrombus formation, and comprehensively improves blood conditions, creating favorable conditions for the improvement of patients with acute ischemic cerebrovascular disease<sup>[14,15]</sup>.

## **3.2. Current status of traditional Chinese medicine treatment**

### **3.2.1. Herbal medicine treatment**

In the integrative treatment of acute ischemic cerebrovascular disease, traditional Chinese medicine (TCM) holds a unique position. Among TCM treatments, Buyang Huanwu Decoction is noted for its ability to tonify Qi, promote blood circulation, and unblock the meridians<sup>[16,17]</sup>. It is particularly effective in treating Qi deficiency and blood stasis syndrome resulting from stroke, alleviating symptoms such as hemiplegia, facial paralysis, frequent urination, and urinary incontinence. Another critical herbal formula in this treatment is Guizhi Fuling Pill<sup>[18]</sup>. This formula has multiple beneficial properties, including anti-inflammatory, antioxidant, sedative, analgesic, and immune-regulatory effects. It can reduce blood viscosity, protect vascular endothelial cells, and offer neuroprotection against cerebral ischemia, thereby playing a multi-dimensional role in improving the patient's condition.

### **3.2.2. Acupuncture therapy**

Modern medical studies indicate that acupuncture at the Baihui point benefits hemorheology, improves cerebral

blood circulation, and supports central nervous system function <sup>[19]</sup>. Stimulation of the Baihui point optimizes hemorheological properties, enhances cerebral blood flow, and promotes the smooth operation of the central nervous system, which is significant in treating related conditions. Additionally, acupuncture at the Jiquan point can restore proximal upper limb muscle strength and shoulder joint function due to the proximity of the ulnar, radial, and median nerves at this location. Acupuncture at Dazhui and Sishencong points promotes blood circulation, provides anti-inflammatory benefits, and enhances immunity. When combined with other points, this approach can improve blood parameters, promote cerebral collateral circulation, and aid in restoring brain function and motor function in affected limbs.

## **4. Progress in integrative treatment of acute ischemic cerebrovascular disease**

### **4.1. Conventional Western medicine + Chinese herbal injection therapy**

In treating acute ischemic cerebrovascular disease, Western medicines such as urokinase, aspirin, heparin, nimodipine, and cerebroprotein are commonly used. Additionally, Chinese herbal injection therapies—such as Mailuoning, Shuxuetong, Shuxuening, Puerarin, and Danhong injections—are applied in treatment <sup>[20]</sup>. Xueshuantong Injection, which is derived from *Panax notoginseng* extract, is a traditional Chinese medicine formulation. According to ancient Chinese medical texts, “*Panax notoginseng* can stop bleeding, open blood vessels, and promote circulation,” highlighting its properties in activating blood circulation and Qi movement <sup>[21]</sup>. Xueshuantong Injection, containing *Panax notoginseng* extract, has been shown to improve blood circulation and Qi movement <sup>[22]</sup>. Research by Zeng and colleagues found that combining Xueshuantong Injection with alteplase significantly improved outcomes in treating acute ischemic cerebrovascular disease, including better hemorheology, reduced inflammatory response, and alleviated neurological impairment <sup>[23]</sup>.

### **4.2. Conventional Western medicine + Chinese herbal decoctions**

Studies have shown that adding Buyang Huanwu Decoction to conventional lipid-lowering and anticoagulant Western treatments produces notable therapeutic results. The combined approach of traditional Chinese and Western medicine has demonstrated significant efficacy in practice, providing new insights and strong support for treating acute ischemic cerebrovascular disease. This approach underscores the advantages of integrative medicine in enhancing treatment effectiveness, warranting further promotion and in-depth research in clinical practice <sup>[24]</sup>.

### **4.3. Conventional Western medicine + Chinese patent medicines**

The combination of conventional Western medicine with Chinese patent medicines shows promising results in treating acute ischemic cerebrovascular disease. For instance, using aspirin alongside Tongxinluo Capsules significantly improves the condition and enhances patient prognosis <sup>[25]</sup>. Tongxinluo Capsules contain ingredients like ginseng, leech, scorpion, and sandalwood. In treating this disease, they improve vascular endothelial function and inhibit platelet aggregation. By protecting endothelial cells and reducing the risk of intravascular thrombosis, Tongxinluo Capsules improve cerebral blood circulation. Their mechanism may involve regulating the release of vascular-active substances, allowing for vasodilation and increased cerebral blood flow. Another example, Xinkeshu Pills, composed of *Salvia miltiorrhiza*, *Panax notoginseng*, *Pueraria lobata*, hawthorn, and costus root, when used with enteric-coated aspirin and mannitol, can significantly

improve patients' functional defect scores and high-sensitivity C-reactive protein levels <sup>[26]</sup>, thus indicating a new direction for treatment.

#### **4.4. Conventional Western medicine + external Chinese medicine therapies**

TCM offers various external treatments for acute ischemic cerebrovascular disease. Acupuncture at points such as Baihui can enhance hemorheology, provide anti-inflammatory effects, and aid in restoring brain and limb function. Tui Na massage helps regulate Qi and blood, reducing muscle tension. Chinese herbal steam therapy combines medicinal effects with heat to unblock meridians and dissipate stasis while cupping therapy improves local blood circulation and balances Qi and blood. These external therapies assist in treatment from different angles, promoting patient recovery. Research by Peng and colleagues combining enteric-coated aspirin and cytidine diphosphate-choline with acupuncture showed that acupuncture had favorable therapeutic effects for acute ischemic cerebrovascular disease, significantly improving neurological function, limb motor ability, and daily living abilities <sup>[27]</sup>.

### **5. Conclusion and outlook**

The integration of traditional Chinese and Western medicine in treating acute ischemic cerebrovascular disease has achieved some success in clinical practice. By combining Western therapies such as thrombolysis, fibrin reduction, antiplatelet, and anticoagulant treatments with traditional Chinese medicine approaches, including herbal medicine and acupuncture, this integrative approach addresses different pathological and physiological aspects, capitalizing on the strengths of each modality. This combination has shown effectiveness in enhancing treatment outcomes, improving neurological function, and enhancing patients' quality of life. However, challenges remain, such as the need for greater standardization and protocolization of integrative treatment plans, as well as a more comprehensive understanding of drug interactions. Further high-quality clinical studies are needed to validate and optimize these treatment strategies.

In the future, efforts should focus on strengthening foundational and clinical research in integrative treatments for acute ischemic cerebrovascular disease, with in-depth exploration of underlying mechanisms. This should aim to refine the standardization and protocolization of treatment plans, providing patients with safer, more effective treatment options to alleviate their suffering and reduce the social burden.

### **Disclosure statement**

The authors declare no conflict of interest.

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