

# Research Progress in The Treatment of Cerebral Infarction with Angong Niuhuang Pill

Chuixian Zhou<sup>1</sup>, Junhui Zhao<sup>2</sup>, \*

<sup>1</sup>Department of Neurosurgery, Weifang Hospital of Traditional Chinese Medicine, Weifang, 261000, Shandong, China;

<sup>2</sup>Department of Anesthesiology, Weifang Hospital of Traditional Chinese Medicine, Weifang, 261000, Shandong, China.

\* Corresponding Author: zcxzjh78@126.com

## Abstract

Angong Niuhuang Pill is one of the three first aid treasures of traditional Chinese medicine. It has the functions of clearing heat and detoxifying, resolving phlegm and waking up the brain and opening the mind. It is often used in high fever coma, convulsions, acute cerebrovascular diseases, etc. Among them, Angong Niuhuang Pill is the most common application in acute cerebrovascular diseases, and some people use it as a standing drug for preventing and treating stroke. Studies have shown that Angong Niuhuang pill has the effects of reducing inflammatory reaction and promoting lateral microcirculation, and has a positive effect on the treatment of cerebrovascular diseases. The research progress of Angong Niuhuang pill in the treatment of cerebral infarction is summarized as follows..

## Keywords

Angong Niuhuang Pill; Cerebral Infarction; Overview.

## 1. Introduction

Cerebral infarction is a common clinical disease with high incidence rate, high disability mortality rate and high recurrence rate. It seriously endangers human health, causes heavy family and social burden, and has important clinical significance to improve the treatment effect of cerebral infarction. Angong Niuhuang Pill is one of the three first aid treasures of traditional Chinese medicine. It has been used in the treatment of high fever coma disease, but it has been gradually used in the treatment of cerebrovascular disease, and has achieved certain clinical effects [1]. Now, the research progress of Angong Niuhuang Pill in the treatment of cerebral infarction disease is summarized as follows.

## 2. Theoretical basis

Cerebral infarction belongs to the category of "apoplexy" in Chinese medicine, which is caused by the disorder of yin and yang, the disorder of qi and blood, and the invasion of the brain. Phlegm heat, phlegm turbidity, liver wind, and viscera are important pathogenesis in the acute stage. Therefore, its treatment should be based on the main principles of clearing heat and detoxicating, relieving shock and opening the mind, awakening the mind and activating blood circulation. The formulation principle of Angong Niuhuang Pill is to clear the heart and remove phlegm, open the mind and wake up the mind. The meridians are mainly the heart and liver meridians. It is applied to the treatment of cerebral infarction, reflecting the principle of "treating symptoms in an emergency" in traditional Chinese medicine. Angong Niuhuang Pill consists of 12 traditional Chinese medicines, including bezoar, rhinoceros horn, musk, pearl,

cinnabar powder, realgar, coptis chinensis, scutellaria baicalensis, gardenia, tulip and borneol [2]. In the formula, Niu Huang tastes bitter and cool, is good at clearing the heart and detoxifying, relieving phlegm and opening the mind; Musk passes through the twelve meridians and is good at opening the mind and clearing the customs. It is the medicine for opening the mind and awakening the mind. Rhinoceros horn (now replaced by buffalo horn) can clear the heart, cool the blood, detoxify and calm the shock; Coptis chinensis, scutellaria baicalensis and gardenia can help bezoar clear heat, purge fire and detoxify; The fragrance of borneol and tulip can dispel filth, open and close the orifices, and help musk to open the orifices. Both are official drugs. Cinnabar calms the mind; Pearl calms the heart and mind to eliminate restlessness; The realgar is used as an adjunct to remove phlegm and detoxify. Honey and stomach tonic are used as medicine. Gold foil is used as clothing, which has the effect of calming the nerves. The whole prescription has the effects of eliminating phlegm, opening the orifices, clearing heat and detoxicating, and corresponds to the acute pathogenesis of cerebral infarction, so it can be applied to the treatment of cerebral infarction.

### 3. Pharmacological research

Angong Niu Huang Pill is composed of a variety of traditional Chinese medicines. Studies have shown that the effective component of the main drug Niu Huang (taurine ursodeoxycholic acid) can inhibit cerebral ischemia reperfusion injury in rats, reduce the expression of endoplasmic reticulum stress-related antibodies in the hippocampus cortex of experimental rats, significantly inhibit the occurrence of cell apoptosis, and play a role in protecting brain injury. The use of borneol under normal blood-brain barrier can increase the permeability of the barrier, while the use of borneol under pathological conditions can reduce the permeability of the blood-brain barrier. Borneol can also increase the concentration proportion of other drugs entering the central nervous system. Musk can affect the expression of amino acid transmitters in rat striatum, increase aspartic acid, glutamic acid, glycine and  $\gamma$ - Content of aminobutyric acid. The combination of musk and borneol can increase the permeability of blood-brain barrier in normal brain tissue, promote the penetration of nerve growth factor through blood-brain barrier, and increase the application effect and scope of nerve growth factor. Pharmacological studies show that borneol can reduce vascular endothelial growth factor in ischemic brain tissue. Vascular Endothelial Growth Factor content, musk has down-regulated VEGF and matrix metalloproteinase-9. The trend of content. Xingnaojing Injection (composed of musk, borneol and gardenia), a simplified prescription of Angong Niu Huang Pill, is a commonly used injection in clinical practice, which has the effect of stabilizing the permeability of blood-brain barrier, reducing brain edema, and regulating nuclear factor NF- $\kappa$ B phosphorylation can reduce the apoptosis of vascular endothelial cells, inhibit the occurrence of autophagy after cerebral infarction, and also antagonize the expression of N-methyl-D-aspartate receptor, which has a clear neuroprotective effect on rats with focal cerebral ischemia. There is severe inflammatory reaction in brain tissue after ischemic cerebrovascular disease. Research shows that matrix metalloproteinase-9 (MMP-9), interleukin-1 (IL-1) and interleukin-6 (IL-6) are related to inflammatory reaction. Modern experimental research shows that Angong Niu Huang pill can inhibit the inflammatory factor IL-1 in brain tissue  $\beta$ , TNF- $\alpha$ . The expression of Angong Niu Huang Pill can improve the behavioral changes of rats after cerebral ischemia-reperfusion injury and reduce the volume of cerebral infarction, indicating that Angong Niu Huang Pill has a protective effect on cerebral ischemia-reperfusion injury, and the mechanism may be through reducing the inflammatory reaction. Under normal circumstances, the human body has a certain defense ability against oxygen free radical damage, but when the brain tissue continues to suffer from ischemia and hypoxia, a large number of reactive oxygen species are produced, which destroys the intracellular homeostasis, It leads to oxidative stress and mitochondrial dysfunction, resulting in cell damage and even cell death []. Dong Shifen and other researchers

believe that Angong Niu Huang Pill has a protective effect on cerebral ischemia in experimental rats, and the mechanism is to reduce the content of malondialdehyde, while increasing the activity of superoxide dismutase and glutathione (GSH) To improve the damage of oxidative stress to ischemic brain tissue. Ischemia and hypoxia of brain tissue after cerebral infarction can induce excessive apoptosis of nerve cells and aggravate brain injury. Wang Guohua and others found that Angong Niu Huang pill can inhibit the expression of phosphorylated Akt in neurons after ischemia, inhibit the occurrence and development of neuronal apoptosis, and thus reduce the brain tissue damage and nerve function caused by ischemia. The study also found that Angong Niu Huang Pill can effectively improve blood supply to brain tissue by inhibiting platelet aggregation, preventing thrombosis, improving the level of vascular endothelial growth factor, promoting microvascular regeneration, rebuilding microcirculation, and promoting angiogenesis [3].

#### 4. Clinical application

Xu Xiaoyu et al. studied the effect of Angong Niu Huang Pill combined with conventional western medicine on the nerve function and blood coagulation function of patients with acute cerebral infarction, and found that Angong Niu Huang Pill had a good treatment effect on patients with acute cerebral infarction, which could provide a new option for the treatment of elderly patients with acute cerebral infarction. Liu Zhixiong and others used Angong Niu Huang pills to treat the audio-visual and limb functions of patients with acute cerebral infarction. The control group was given routine treatment of acute cerebral infarction, and the observation group was treated with Angong Niu Huang pill on this basis. The results showed that the total effective rate of the observation group was 95%, which was superior to 80% of the control group, and the difference was statistically significant ( $P < 0.05$ ). It shows that this method has significant therapeutic effect. The treatment is safe. Liu Qiuyan et al. studied the clinical efficacy of Angong Niu Huang pill combined with Agatroban injection in the treatment of acute cerebral infarction. The results show that this method can improve the neurological function and quality of life of patients, regulate hematological indexes, and has good clinical efficacy, which is worthy of clinical application. Zeng Sheng et al. studied the clinical efficacy of Angong Niu Huang pill combined with urokinase thrombolysis in the treatment of acute cerebral infarction, indicating that this method can improve the symptoms of nerve function defects. Hu Xiaofei and others used Angong Niu Huang pill combined with butylphthalide injection to treat patients with severe cerebral infarction, while the control group was treated with conventional butylphthalide injection, and the test group was treated with Angong Niu Huang pill combined with conventional treatment. The results showed that after 14 days, the therapeutic effect of the test group (indexes such as stroke scale of the National Institutes of Health, neuron specific enolase and human matrix metalloproteinase) was better than that of the control group, with a statistically significant difference ( $P < 0.05$ ), indicating that this method was superior to conventional western medicine treatment, and Angong Niu Huang pill could effectively reduce central nerve injury and nerve function defect. Lin Cuicai and others were included in patients with acute cerebral infarction and severe disturbance of consciousness (syndrome of phlegm-heat internal closure). On the basis of routine treatment, different doses of Angong Niu Huang pills were used for adjuvant treatment, while the control group was used for routine treatment. Studies have shown that for patients with acute cerebral infarction (severe disturbance of consciousness), "one pill per time, two times per day" with Angong Niu Huang pill as an auxiliary treatment has better efficacy and safety in promoting awakening. Zhao Lei's research results show that Angong Niu Huang Pill combined with Xingnaojing can promote the awakening of patients with acute cerebral infarction coma and improve the nerve function. The mechanism of promoting the recovery of optic nerve may be related to reducing inflammation and brain edema.

## 5. Summary and prospect

Traditional Chinese medicine is mostly summarized from the experience of doctors of past dynasties, and Angong Niu Huang Pill is one of the representatives. How to let these valuable experiences play their due role is the responsibility of our descendants. According to relevant literature, Angong cattle and yellow cattle have antioxidant and blood protection. The effects of vascular endothelium, inhibition of neuronal apoptosis, and reduction of inflammatory reaction can be used in the treatment of cerebrovascular diseases to promote wakefulness, reduce brain edema, and inhibit the expansion of hematoma, which can improve the symptoms of patients with neurological deficits [4]. Traditional Chinese medicine has the principle of prevention before disease, prevention after disease, and prevention after disease. The current research is mostly aimed at the prevention of cerebrovascular disease, the intervention of transient cerebral ischemia, and the treatment of cerebral infarction within the time window after the onset of the disease. How to study these problems reasonably and effectively has important clinical significance.

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