

Clinical Study of Xingnaojing Injection Combined with Craniocerebral Hypothermia Apparatus in the Treatment of Acute Hemorrhagic Stroke

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Abstract: Objective: To investigate the clinical effect of Xingnaojing injection combined with craniocerebral hypothermia apparatus in the treatment of acute hemorrhagic stroke. **Methods:** Seventy-two patients with acute hemorrhagic stroke admitted to our hospital from March 2018 to September 2019 were randomly divided into two groups, with 36 cases in each group. The control group (n=36) was treated with craniocerebral hypothermia apparatus, and the observation group (n=36) was treated with Xingnaojing injection combined with craniocerebral hypothermia apparatus. The clinical efficacy, the National Institutes of Health Stroke Scale (NIHSS) score and the activity of daily living (MBI score) after 1 month of treatment were compared. **Results:** The effective rate of treatment in the observation group was higher than that in the control group ($P < 0.05$); NIHSS score was decreased in both groups ($P < 0.05$); MBI score was increased in both groups, and the change range of the observation group was greater than that of the control group, showing statistically significant differences ($P < 0.05$). **Conclusion:** Xingnaojing injection combined with craniocerebral hypothermia apparatus can improve the clinical efficacy, the neurological impairment and activity of daily living in the treatment of acute hemorrhagic stroke, which is worthy of clinical application.

Keywords: Acute hemorrhagic stroke; Xingnaojing injection; Craniocerebral hypothermia apparatus

Publication date: March, 2020

Publication online: 31 March, 2020

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1 Introduction

Acute cerebrovascular diseases are characterized by the clinical manifestations of sudden fainting, facial distortion, hemiplegia and dysphasia. Stroke can be divided into hemorrhagic stroke and ischemic stroke, which is a disease manifested by the local cerebral blood circulation disorder, mainly caused by cerebrovascular diseases. Drowsiness, severe headache, mania, vomiting, coma and hemiplegia are the main manifestations of hemorrhagic stroke, including hypertensive cerebral hemorrhage and subarachnoid hemorrhage^[1]. Craniocerebral hypothermia apparatus can reduce brain temperature and metabolic rate of brain cells. Xingnaojing injection is used for disordered Qi and blood, stroke coma caused by cerebral vein stasis, which can cool blood and promote blood circulation, and awake brain and induce resuscitation. Based on this, the present study was conducted to analyze the clinical efficacy of Xingnaojing injection combined with craniocerebral hypothermia apparatus in the treatment of acute hemorrhagic stroke.

2 Materials and methods

2.1 General data

Approved by the medical ethics committee of our hospital, this study included 72 patients with acute hemorrhagic stroke admitted to our hospital from March 2018 to September 2019, and randomly divided them into two groups, with 36 patients in each group. The control group included 24 males and 12 females aged

49-78 years old, with the average age of (63.72 ± 4.19) years, and weighed 54-67 kg, with the average weight of (61.38 ± 2.75) kg. The observation group included 23 males and 13 females aged 50-78 years old, with the average age of (63.78 ± 4.15) years, and weighed 53-67 kg, with the average weight of (61.31 ± 2.85) kg. There was no statistically significant difference in the general data of the two groups ($P > 0.05$), which was comparable.

2.2 Inclusion criteria

(1) Inclusion criteria: Patients who met the criteria for the diagnosis of acute hemorrhagic stroke in *Neurology*^[2]; patients who diagnosed by MRI; patients without major mental diseases; and patients who signed and provided the informed consent were included.

(2) Exclusion criteria: Patients who were allergic to the drugs of this study; patients who accompanied with severe liver and kidney dysfunctions; patients with malignant tumors; and patients who accompanied with severe primary diseases were excluded from this study.

2.3 Methods

Both groups were given mannitol to reduce intracranial pressure and eliminate cerebral edema.

2.3.1 Control group

Craniocerebral hypothermia apparatus (Model No.: ZJT, Hebei Seenmed Medical Instrument Co., Ltd., Qinhuangdao, China) was used in the control group. According to the input temperature control parameters of the computer control circuit and the feedback of the sensor to the actual temperature of the ice cap, the refrigeration unit is automatically controlled to start and stop. The refrigerant (adopting the environmentally-friendly fluorine-free refrigerant Tsinghua No. 1) sends cool air into the ice cap through the pipeline system and acts on the patient's head for cooling treatment. The instrument can be moved to the bedside. Power supply: 220V \pm 22V; temperature control range: cap temperature: -12 °C to +18 °C ; temperature control error: ± 1 °C ; temperature display error: ± 1 °C ; structural composition: computer control cabinet (cross arm), refrigeration unit, head cover (ice cap), base, lifting mechanism, column, caster and other components.

2.3.2 Observation group

The observation group was treated with Xingnaojing injection (Wuxi Jemincare Shanhe Pharmaceutical Co.,

Ltd., Approval No. Z32020564, Specification: 5ml) through intravenous drip on the basis of the treatment in the control group. 10-20ml of Xingnaojing injection was diluted with 250-500ml of 5%-10% glucose injection for intravenous drip, once daily.

2.4 Evaluation indicators

(1) The efficacy of the two groups was compared. Markedly effective: patients were awake, with better intelligence, memory and clinical symptoms than before treatment, and were able to take care of themselves; Effective: the clinical symptoms of patients were better than before treatment, but they were unable to take care of themselves and needed their families' help; Ineffective: the clinical symptoms of patients were unchanged or more severe than before treatment or died. Total effective rate = cure rate + markedly effective rate + effective rate.

(2) Before and one month after treatment, the neurological impairment of the two groups was compared. The National Institutes of Health Stroke Scale (NIHSS) score was used to evaluate the patient's level of consciousness, facial paralysis, field of vision, gaze, upper and lower limb movement, and language, with the total score of 45 points. Higher scores indicate more severe neurological impairment.

(3) Before and one month after treatment, the activity of daily living of the two groups was compared. The MBI scale was used for evaluation, with a total of 10 items and a score of 100 points. Higher scores indicate stronger activity of daily living.

2.5 Statistical analysis

The measurement data are expressed as mean \pm standard deviation ($\bar{x} \pm s$). *t* test was used for comparison between groups in the case of normal distribution. Non-parametric test was used for non-normal distribution. The enumeration data were tested by Chi-square (or χ^2) test. $P < 0.05$ means that the difference is statistically significant. SPSS 20.0 statistical software was used for data statistical analysis.

3 Results

3.1 Efficacy

The treatment effective rate of the observation group was higher than that of the control group, indicating the statistically significant difference ($P < 0.05$, Table 1).

Table 1. Comparison of the efficacy between the two groups n (%)

Group	Cure	Markedly effective	Effective	Ineffective	Effective rate
Control group (n=36)	5 (13.89)	7 (19.44)	13 (36.11)	11 (30.56)	25 (69.44)
Observation group (n=36)	15 (41.67)	9 (25.00)	9 (25.00)	3 (8.33)	33 (91.67)
χ^2	-	-	-	-	5.675
<i>P</i>	-	-	-	-	0.017

3.2 NIHSS score

There was no significant difference in NIHSS score between the two groups before treatment ($P > 0.05$). After treatment, NIHSS scores were reduced in both

groups; and the NIHSS score in the observation group was lower than that in the control group, showing statistically significant difference ($P < 0.05$, Table 2).

Table 2. Comparison of the NIHSS score between the two groups ($\bar{x} \pm s$, points)

Group	Before treatment	After treatment	<i>t</i>	<i>P</i>
Control group (n=36)	32.37±5.49	21.59±4.87	8.814	0.000
Observation group (n=36)	32.41±5.43	13.26±2.51	19.207	0.000
<i>t</i>	0.031	9.123		
<i>P</i>	0.975	0.000		

3.3 MBI score

There was no significant difference in MBI score between the two groups before treatment ($P > 0.05$). After treatment, the MBI scores were increased in

both groups; and the MBI score in the observation group was higher than that in the control group, indicating statistically significant difference ($P < 0.05$, Table 3).

Table 3. Comparison of the MBI score between the two groups ($\bar{x} \pm s$, points)

Group	Before treatment	After treatment	<i>t</i>	<i>P</i>
Control group (n=36)	41.58±7.64	51.37±6.48	5.864	0.000
Observation group (n=36)	41.63±7.59	69.91±5.23	18.409	0.000
<i>t</i>	0.028	13.359		
<i>P</i>	0.978	0.000		

4 Discussion

Hemorrhagic stroke is an acute space-occupying injury in the brain parenchyma caused by rupture and hemorrhage of microaneurysms in the case of sudden increase in blood pressure. It is a primary and spontaneous parenchymal hemorrhage of the brain, while most microaneurysms are caused by atherosclerosis, hypertension, intracerebral arterioles lesions and necrosis. The clinical manifestations are

headache, vomiting and other symptoms of increased intracranial pressure and hemiplegia, as well as neurological pathological signs such as language and consciousness disorders. The common causes of this disease include emotional excitement, climate change, increased abdominal pressure, *etc*^[3].

The results of this study showed that the effective rate of treatment in the observation group was higher than that in the control group; the NIHSS scores were decreased in both groups, and that of the observation

group was lower than the control group, while the MBI scores were increased in both groups, and that of the observation group was higher than the control group. These indicate that Xingnaojing injection combined with craniocerebral hypothermia can improve the clinical efficacy, the neurological impairment and the activity of daily living in the treatment of acute hemorrhagic stroke. In patients with acute hemorrhagic stroke, due to injury of the hypothalamus thermoregulatory center, when the hematoma breaks into the cerebral ventricle and affects the hypothalamus, it often manifests as high fever clinically, mainly due to severe hemorrhage affecting the hypothalamus, resulting in increased intracranial pressure, accelerated organ failure, and aggravated brain cell damage. Craniocerebral hypothermia apparatus can lower body temperature, promote the recovery of neurological function and brain injury, reduce cerebral edema, control intracranial pressure, reduce complications, and improve the quality of life^[4].

Traditional medicine believes that the internal causes of the disease are attributed to functional imbalance of internal organs, deficiency of Qi and blood, and formation of pathological products (wind, fire, phlegm, blood stasis, *etc.*); the external causes include extreme changes of emotions, disorder of internal organs caused by overexertion, improper diet, *etc.* The combination of internal and external causes leads to the patient's blood circulating away from normal passage and disordered Qi and blood. Among the components of Xingnaojing injection, musk is warm-natured, non-toxic, bitter taste, and has the effects of inducing resuscitation and eliminating evil as well as dredging collaterals and dissipating blood stasis through entering the channels of heart, spleen and liver; radix curcumae can distribute to the channels liver, heart and lung, promote blood circulation to arrest pain, promote Qi circulation to remove obstruction in the collateral, clear away the heart fire and cool the blood, and normalize gallbladder to cure jaundice; borneol is pungent, bitter, and cool

taste, and can distribute to the channels of heart, liver and lung, with a faint scent, and has the efficacies of inducing resuscitation, clearing heat and dispersing poison, and removing nebula for improving eyesight; gardenia can clear heat, purge fire and cool blood. Combination of the drugs above can exert the effects of clearing heat and removing toxicity, cooling blood and invigorating the circulation of blood, and awaking brain and inducing resuscitation. Modern pharmacology shows that musk can directly act on the central nervous system through the blood-brain barrier and has a strong cardiac effect on the heart; borneol has an analgesic effect; gardenia can stimulate the proliferation of aortic endothelial cells, so as to repair the vascular intima^[5].

In conclusion, Xingnaojing injection combined with craniocerebral hypothermia apparatus can improve the clinical efficacy, the neurological impairment and activity of daily living in the treatment of acute hemorrhagic stroke, which is worthy of clinical application.

References

- [1] Huang WZ. Correlation analysis of acute hemorrhagic stroke involving the meridian, vsi cera symptom comp lex and craniocerebral CT signs[J]. Modern Journal of Integrated Traditional Chinese and Western Medicine, 2016, 25(22): 2395-2398.
- [2] Wang YJ. Neurology. Beijing: Peking University Medical Press; 2009, p. 204-205.
- [3] Li Y, Li JX, Zhao Y, et al. Evaluation of Intestinal Function in Patients with Acute Hemorrhagic Stroke and Its Relationship with Brain Injury[J]. Journal of Emergency in Traditional Chinese Medicine, 2018, 27(12): 2089-2091.
- [4] Mao DP. Application of mild hypothermia therapeutic instrument in nursing of central hyperthermia patients with cerebral hemorrhage[J]. Chinese Journal of Medical Device, 2019, 32(19): 156-157.
- [5] Zhang HX, Yang Y, Ma YJ, et al. Therapeutic efficacy of Xingnaojing injection as an adjuvant treatment in operation for acute severe traumatic brain injury[J]. Chinese Remedies & Clinics, 2019, 19(23): 4044-4047.