

## Effects of Naodekang pills 3<sup>rd</sup> on Patients with Cognitive Dysfunction after Cerebral Infarction

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### Abstract

**AIM:** To observe the effects of Naodekang pills 3<sup>rd</sup> on the patients with cognitive dysfunction after cerebral infarction. **METHODS:** A total of 121 massive cerebral infarction patients with cognitive dysfunction after decompressive craniectomy from Jan. 2012 to Jan. 2017 were randomly divided into treatment group and control group, 56 patients in each group. The patients in the control group were given conventional cerebral infarction treatment as well as cognitive improvement intervention. The treatment group was given Naodekang pills 3<sup>rd</sup> 9 g, tid with oral or nasal feeding on the basis of conventional treatment for 12 weeks. The survival and functional prognosis, cognitive function, memory and neurological function of patients were evaluated by Glasgow outcome scale (GOS), mini-mental state examination (MMSE), Montreal-cognitive assessment (MoCA), National Institute of Health stroke scale (NIHSS) scores after 12 weeks. **RESULTS** Compared with before the treatment, the scores of GOS, MoCA and MMSE in both groups increased significantly and the NIHSS scores decreased significantly after 12 weeks treatment ( $P > 0.05$ ). And the changes in the treatment group were more significant than those in the control group ( $P < 0.05$ ). **CONCLUSION** Naodekang pills 3<sup>rd</sup> assisted conventional treatment and cognitive function training can improve the survival and functional prognosis, cognitive function, memory and nerve function of patients with cognitive dysfunction after cerebral infarction.

### Keywords

Brain infarction; Cognition disorders; Naodekang pills 3<sup>rd</sup>; Prognosis; decompressive craniectomy.

## 1. INTRODUCTION

Cognitive impairment of cerebral infarction is mainly manifested as perception disorders (such as dullness, hypersensitivity, internal discomfort, hallucination, etc.), memory disorders (such as memory errors, defects, etc.) and thinking disorders (such as delusions, logic disorders, etc.), which will interfere with patients' limb rehabilitation training, seriously affect the quality of life, and affect patients' limb function recovery and survival time[1-2]. Naodekang pills 3<sup>rd</sup> is a hospital preparation developed by Jiaozhou people's Hospital of Shandong Province. Its main ingredients are radix rehmanniae, Rhizoma Coptidis, Prunella vulgaris, radix paeoniae rubra, Angelica sinensis, earthworm, Rhizoma Chuanxiong, ginseng, Uncaria rhynchophylla, Rhizoma acori tatarinowii, tendon stretching, etc. Compared with naodekang pill, Naodekang pills 3<sup>rd</sup> improves the compatibility, boldly reuses Shengdi, aiming at regulating the balance of yin and Yang of heart, liver and kidney. At the same time, Shenjincao, borneol, red peony root and earthworm are used to clear phlegm, remove blood stasis, unblock obstruction, smooth Qi and blood, and balance yin and Yang. From January 2012 to January 2017, the Department of

Neurosurgery of our hospital included 121 patients with cognitive impairment after decompressive craniectomy in patients with large area cerebral infarction for a control study of Naodekang pills 3rd adjuvant treatment, which is reported as follows.

## 2. MATERIALS AND METHODS

### 2.1. Research Object and Group

121 patients with cognitive impairment after emergency decompression craniectomy in neurosurgery department of our hospital from January 2012 to January 2017 were randomly divided into control group (n = 60) and treatment group (n = 61). The experimental group was 46-77 years old, and the control group was 46-78 years old. There was no significant difference in general condition, clinical manifestations and complications between the two groups (P > 0.05).

### 2.2. Treatment Plan

The patients in both groups were treated with large bone flap decompression, and MoCA score was performed on the second day after operation. The control group was given routine treatment such as nutrition, blood pressure, hypoglycemia, lipid-lowering, anti platelet aggregation, while the treatment group was given Naodekang pills 3rd (90g per bottle, Luyao Zhizi z0220030012, provided by pharmacy department of Jiaozhou people's Hospital, batch number 121001-171001) 9g, TID on the basis of routine treatment for 12 weeks. Both groups were given attention, memory, orientation, judgment and reasoning ability, executive ability, visual perception and spatial perception training at the same time, 30 minutes each time, once a day, 5 days a week.

### 2.3. Observation Index

According to Glasgow Outcome Scale (GOS) [3], patients were divided into good recovery, moderate disability, severe disability, persistent vegetative survival and death. The cognitive function score was based on MoCA, including visuospatial and executive function, memory, naming, language, attention, delayed recall, abstraction, orientation, etc. the total score was 30 points, and  $\geq 26$  points were considered as normal. The memory score was based on the items of memory and recall in mini mental state assessment (MMSE) [4], 3 points for each, 6 points in total. The neurological function score was judged according to the National Institutes of Health Stroke Scale (NIHSS) [5]. After 12 weeks, MoCA, MMSE, GOS, NIHSS scores were recorded.

### 2.4. Statistical Methods

SPSS17.0 statistical software was used for data processing. Ridit analysis was used for general grade data, and  $(\bar{x} \pm s)$  was used for normal distribution measurement data. Independent sample t test was used for count data.  $\chi^2$  test was used for count data. P < 0.05 was considered as significant difference.

## 3. RESULT

3.1 Effect of Naodekang pills 3rd on postoperative GOS score of patients with cognitive impairment after cerebral infarction 12 weeks after administration: 6 cases died in the control group and 4 cases died in the treatment group, all died of multiple organ failure. According to Ridit analysis, the GOS score of the treatment group was significantly higher than that of the control group (P < 0.05), as shown in Table 1.

**Table 1.** Glasgow Outcome Scale (GOS) evaluation results of two groups 3 months after operation

Group	good recovery	moderate disability	severe disability	persistent vegetative survival	death	Ridit value
Control (n=60)	10	22	15	7	6	0.5
treatment (n=61)	16	31	7	3	4	0.379 <sup>b</sup>

Ridit analysis: compared with the control group, <sup>b</sup>P<0.05

3.2 Before treatment, there was no significant difference in MoCA score, MMSE score and NIHSS score between the two groups ( $P > 0.05$ ). After 12 weeks of treatment, NIHSS score of control group and treatment group decreased significantly ( $P < 0.01$ ), MMSE score increased significantly ( $P < 0.01$ ), and the change of treatment group was more significant than that of control group ( $P < 0.05$ ), as shown in Table 2.

**Table 2.** Comparison of cognitive function, memory and neurological function scores between the two groups

Group		MoCA	MMSE		NIHSS
			Memory	recall	
control (n=54)	before treatment	18.1±4.5	1.3±0.4	1.2±0.5	27.4±4.8
	after treatment	24.4±4.1 <sup>c</sup>	2.0±0.4 <sup>c</sup>	2.1±0.6 <sup>c</sup>	17.1±4.5 <sup>c</sup>
treatment (n=57)	before treatment	18.2±4.3 <sup>d</sup>	1.3±0.5 <sup>d</sup>	1.3±0.6 <sup>d</sup>	27.3±4.7 <sup>d</sup>
	after treatment	27.5±3.2 <sup>ce</sup>	2.5±0.5 <sup>ce</sup>	2.6±0.5 <sup>ce</sup>	13.0±3.7 <sup>ce</sup>

Compared with before treatment, <sup>c</sup>P < 0.01; compared with the control group, <sup>d</sup>P > 0.05, <sup>e</sup>P < 0.05

#### 4. DISCUSSION

Previous studies of our group showed that naodekang pill group, which is based on the increase or decrease of Buyang Huanwu Decoction, can assist in the treatment of patients with large-area cerebral infarction complicated with brain swelling, and can significantly improve the prognosis in the recovery of daily living ability, neurological function and mental state, without obvious adverse reactions. On the basis of naodekang pill, Naodekang pills 3rd has adjusted its compatibility by adding radix rehmanniae, Rhizoma Coptidis, Prunella vulgaris, Uncaria rhynchophylla, Acorus tatarinowii, Shenjincao and borneol. It has the functions of clearing away heat and dampness, purging fire and detoxification; Radix Paeoniae Rubra has the functions of removing blood stasis, relieving pain, cooling blood and detumescence; Angelica sinensis can activate blood, nourish blood, remove blood stasis without damaging blood; ginseng can tonify five zang organs, calm spirit, calm soul, stop palpitation, eliminate evil Qi, brighten eyes, make people happy and increase intelligence; Borneol has the functions of clearing away heat and dampness, Purging Heat and dampness, purging fire and detoxification. It can disperse stagnant fire, treat wind and mouth, heat disease, dizziness, convulsion and phlegm; it can dispel wind, dissipate phlegm and dredge collaterals; it is especially good at dredging meridians and collaterals. According to modern pharmacology, angelica can inhibit the phosphorylation of phosphatidylinositol on platelet membrane and has antiplatelet aggregation effect. Ligusticum chuanxiong can rapidly penetrate the blood-brain barrier, expand blood vessels, improve microcirculation and inhibit platelet aggregation in the brain.

The antithrombotic effect of Ligusticum chuanxiong combined with Radix Paeoniae Rubra is stronger than that of single use. It has obvious dilating effect on cerebral vessels, has the effect of increasing cerebral vascular flow and anti platelet aggregation. Earthworm is rich in fibrin and fibrinogen activator, has a certain thrombolytic effect, and can reduce C-reactive protein, reduce inflammatory reaction, improve hemorheology, effectively reduce blood viscosity, improve brain blood circulation, reduce brain tissue necrosis, and promote tissue repair of ischemic injury. The results of this study show that Naodekang pills 3rd may play the role of antioxidation, promoting microcirculation and other functions, relieve the symptoms of ischemia and hypoxia after cerebral infarction as soon as possible, improve blood circulation, increase the cerebral blood flow at the focus, so as to alleviate the symptoms of cognitive impairment and promote the prognosis of the disease.

In this study, MoCA scale, which is widely used in the screening of cognitive impairment, was used to evaluate the curative effect of the traditional Chinese medicine with GOS, MMSE and NIHSS scoring methods. The recovery of cognitive function, ability of daily living, memory and neurological impairment were judged by the scores before and after the treatment. The results showed that the patients treated with naodekang pill were in cognitive impairment. The cognitive function, life ability, memory and mental state of the patients in the control group were significantly better than those of the patients in the control group.

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