

Clinical Efficacy of Damol Injection Combined with Nimodipine in Cerebral Small Vascular Cognitive Dysfunction

Liyan Zhang, Wei Qin*

Department of Integrative Medicine, Affiliated Hospital of Hebei University, Baoding, Hebei, China.

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***Corresponding author:** Wei Qin, Department of Integrative Medicine, Affiliated Hospital of Hebei University, Baoding, Hebei, China.

Abstract

Objective: To analyze the clinical efficacy of ginkgo damol injection combined with nimodipine in treating cerebral small vascular cognitive dysfunction. **Methods:** 73 patients with cerebral microvascular cognitive dysfunction admitted to our hospital from June 2022 to October 2023 were selected, which were divided into an observation group and a control group according to the case grouping method, with 36 cases and 37 cases, respectively. The observation group was treated with Ginkgo damol injection combined with nimodipine, and the control group compared the mental status (Brief Mental State Examination Scale, Mini-Mental State Examination, MMSE) and cognitive condition (Montreal Cognitive Assessment Scale, Montreal Cognitive Assessment, MoCA). **Results:** After treatment, mental status and cognitive status in both groups improved, while the observation group showed a more significant improvement trend, with statistically significant significance ($P < 0.05$). **Conclusion:** Combined with nimodipine treatment can effectively improve their clinical efficacy and improve their cognitive status and mental state, which is worth promoting.

Keywords

Cerebrovascular cognitive dysfunction, ginkgo dam, nimodipine

Cerebrovascular small vessel disease refers to the pathological state involving small intracranial blood vessels, which often causes deep small infarction and chronic hypoperfusion, leading to cognitive dysfunction in patients. The main reason is the damage to the white matter, especially the subcortical and deep white matter, as well as the periventricular white matter [1]. With the increasing trend of population aging and the increasing risk factors of cerebrovascular diseases, the number of patients with small cerebrovascular diseases is increasing. The treatment often uses nimodipine, nimodipine is not a venous blood steal drug, safe and reliable [2]. Ginkgo biloba damo injection especially contains ginkgo biloba flavonoid glycoside, which has a strong antioxidant effect, can reduce free radical damage, and help to improve cerebral edema and microcirculation conditions [3]. Modern pharmacological studies show that ginkgo damo injection has multiple functions, such as protecting vascular endothelial function, dilating cerebral blood vessels, and eliminating oxygen free radicals. Therefore, from June 2022 to October 2023, 36 patients, with ginkgo dammo injection with nimodipine as the main treatment, discusses the effect of ginkgo dammo injection with nimodipine in the treatment of cerebral small vascular cognitive dysfunction, and provide the basis for clinical rational drug use. The report is as follows:

1. Data and methods

1.1 General information

A total of 73 patients with cerebral microvascular cognitive dysfunction admitted to our hospital from June 2022 to October 2023 were selected and divided into an observation group and a control group according to the case grouping method, with 36 cases and 37 cases respectively. In the observation group, 21 males and 15 females; age 61-75 years, mean (69.21 ± 3.11) years; disease course 2-10 years, mean (5.87 ± 1.54) years; control group, 20 men and 17 women; age 60 to 76 years, mean (69.46 ± 3.07) years; disease course 2 to 12 years, mean (5.94 ± 1.48) years. There was no significant difference in the basic information between the two groups ($P > 0.05$). All participants and their members identified the study and voluntarily signed the consent form. It was approved by the hospital ethics committee.

Inclusion criteria (1) cognitive dysfunction caused by brain CT and MRI; (2) patients should have relevant diagnostic criteria, be conscious, and actively cooperate with clinical testing and treatment; (3) patients with complete previous medical records.

Exclusion criteria (1) cognitive dysfunction caused by non-cerebral small blood vessel disease, such as cranio-cerebral trauma; (2) allergy to ginkgo damol and nimodipine; (3) severe organ insufficiency, such as cirrhosis or renal failure; (4) mental illness or other medical records affecting cognitive function.

1.2 Method

The control group received nimodipine: three daily oral nimodipine (manufacturer: Tianjin Central Pharmaceutical Co., Ltd.; Chinese drug approval: H20043915; specification: 30mg), 30mg each time.

In the observation group in the control group: 20 mL of damol injection (manufacturer: Shanxi Pude Pharmaceutical Co., LTD.; Chinese drug approval: H14023516; specification: 10 mL) was injected into 250 mL of sterile saline, mixed evenly, and intravenous drip once a day.

Both groups lasted for one month.

1.3 Observational indicators

1.3.1 mental state

The concise mental condition test checklist (Mini-Mental State Examination, MMSE). A total score of 30 ranging from 27 to 30 is cognitively normal; a score below 27 indicates cognitive dysfunction.

1.3.2 Cognitive condition indicators

The Montreal Cognitive Level Assessment Form (Montreal Cognitive Assessment, MoCA) was used to monitor and compare their cognitive situations before and after treatment. The total score of this scale is 30, and a score between 26 and 30 indicates cognitive stability; below 26, cognitive impairment (if high school or below, another point is added).

1.4 Statistical method

$\bar{x} \pm s$ Use SPSS 21.0 statistical package to analyze the survey results, present the measurement data in ($\bar{x} \pm s$), and identify the differences between groups by t-test; display the counting data by χ^2 . The test was found for differences between groups, and the conclusion criterion was set to $P < 0.05$, meaning there was a significant difference.

2. Results

2.1 Comparison of mental state levels in the two groups

Before the intervention, there was no statistical difference in the mental status scores ($P > 0.05$); however, after the treatment, the observation group showed a more significant trend with statistically significant improvement ($P < 0.05$) (see Table 1).

Table 1. Comparison of mental state levels before and after treatment between the two groups ($\bar{x} \pm s$)

divide into groups	Example number (n)	MMSE	
		pretherapy	post-treatment
observation group	36	23.17±2.69	28.15±1.42*
control group	37	23.68±2.19	25.34±2.27*
<i>t</i>	-	0.889	6.320
<i>P</i>	-	0.377	<0.001

Note: Compared with those prior to treatment in the same group, * $P < 0.05$

2.2 Comparison of mental state levels between the two groups

Before interventional treatment, there was no statistical difference in cognition between the two groups ($P > 0.05$); however, after treatment, both groups improved, while the observation group showed a more significant trend with statistically significant improvement ($P < 0.05$) (see Table 2).

Table 2. Comparison of mental status levels before and after treatment in ($\bar{x} \pm s$)

divide into groups	Example number (n)	MoCA	
		pretherapy	post-treatment
observation group	36	18.42±2.37	26.49±1.24*
control group	37	19.14±2.54	23.15±2.26*
<i>t</i>	-	1.251	7.798
<i>P</i>	-	0.215	<0.001

Note: Compared with those prior to treatment in the same group, * $P < 0.05$

3. Discussion

Cerebrovascular disease refers to a pathological state involving small intracranial blood vessels, often caused by the occlusion of arterioles and cerebral arterioles, leading to deep small infarctions and chronic hypoperfusion. This stage of the disease can cause damage to neurons, affecting cognitive function [4]. The main reason for cognitive impairment in cerebral small vessel disease is the prominent feature of cerebral small vessel disease, which is damage to white matter, especially subcortical and deep white matter, as well as periventricular white matter. This type of white matter forms related peripheral circuits around the ventricles and connects nerve fibers involved in cognitive functions such as memory and emotion. If the disease spreads to the ventricles and subcortical white matter, it will seriously damage the continuity of white matter nerve fibers, Resulting in limited cognitive function [4]. The early symptoms of cerebral small vessel disease are usually not obvious and may include mild headaches, dizziness, limb numbness, weakness, language disorders, memory loss, etc. These symptoms are similar to the manifestations of other diseases, such as cervical spondylosis, hypertension, etc., so they are easily misdiagnosed in the early stage. With the increasing trend of an aging population and the increasing risk factors of cerebrovascular diseases in China, the number of patients with cerebrovascular diseases is increasing day by day. Normally, nimodipine is used as a treatment option. This drug is a dihydropyridine-type calcium channel blocker, which is a powerful calcium channel blocker that easily penetrates the lipid layer and binds to calcium channel receptors, hindering the entry of calcium ions into cells and inhibiting the flow of calcium ions within smooth muscle cells. It achieves the goal of relaxing vascular smooth muscle, expanding cerebral arteries, and improving cerebral blood flow, Furthermore, it supplies local blood to the brain tissue and reduces damage to small blood vessels in the brain [5]. At the same time, nimodipine can prevent calcium overload in nerve cells, hinder neuronal apoptosis, prevent lipid accumulation and fiber deformation in cerebral vascular tissue, and help improve cognitive function. Importantly, nimodipine is not a venous steal drug, and its safety is relatively reliable. Ginkgo biloba damole injection is a composite supplement based on the purification of Ginkgo biloba leaves, composed of Ginkgo biloba leaf extract and dipyrindamole. Its unique

Ginkgo flavonoid glycosides have strong antioxidant effects, such as promoting blood circulation, removing blood stasis, unblocking collaterals, and relieving pain. It can reduce free radical damage, improve microcirculation, dilate blood vessels, and enhance cerebral perfusion, thereby reducing myocardial oxygen consumption, protecting ischemic myocardium, and improving myocardial and brain tissue ischemia The state of hypoxia [6]. According to the Institute of Modern Pharmacology, Ginkgo Biloba and Damo Injection have multiple functions such as protecting endothelial function, expanding cerebral blood vessels, and eliminating oxygen free radicals, which can help improve cerebral edema and microcirculation.

4. Conclusion

From the research, it can be seen that after receiving treatment, both groups showed an improvement in their mental state and cognitive status, while the observation group showed a more significant improvement trend, with statistical significance ($P < 0.05$). This is similar to the research results of Hou Jinyi et al. [6]. The reason for this is that Ginkgo biloba Damo injection can effectively dilate cerebral blood vessels, increase cerebral blood flow, improve cerebral microcirculation, and thus have a positive impact on cognitive function. In addition, its ginkgo flavonoid glycosides have strong antioxidant effects, can eliminate oxygen free radicals, protect brain cells from damage, and further improve cognitive function. On the other hand, this drug can enhance the biological activity of neuronal mitochondria, promote neuronal metabolism, and thus improve cognitive function.

In summary, the treatment of patients with cognitive impairment caused by cerebral small vessel disease with Ginkgo biloba injection combined with Nimodipine can effectively improve their clinical efficacy, cognitive status and mental state, and is worth promoting.

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