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Clinical Value of Fibrinolytic Enzyme Combined with Ginkgo Biloba Extract in the Treatment of Acute Cerebral Infarction

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Abstract: To investigate the clinical value of fibrinolytic enzyme combined with ginkgo biloba extract inhaled with oxygen in the treatment of acute cerebral infarction. Methods It were collected 106 patients with acute cerebral infarction and randomly divided into experimental group and control group from January 2014 to December 2015, 53 patients in each group. It were given conventional symptomatic treatment in the two groups. the experimental group was given fibrinolytic enzyme combined with ginkgo biloba extract with oxygen inhalation treatment and the control group was only given conventional fibrinolytic enzyme combined with oxygen inhalation treatment. to observe the difference of clinical value between the two groups after treatment. Results It were all higher than the control group that the N IH SS score, Barthel score, effective rate and quality of life of the experimental group, while the incidence of adverse reactions was lower than the control group after treatment. It were statistically significant after t-test or chi-square test ($P< 0.05$). Conclusion It has positive clinical value that fibrinolytic enzyme combined with ginkgo biloba extract with oxygen inhalation in the treatment of acute cerebral infarction. This electronic document is a “live” template. The various components of your paper [title, text, heads, etc.] are already defined on the style sheet, as illustrated by the portions given in this document.

Keywords: Plasmin; Ginkgo biloba extract; Drug oxygen inhalation; Acute cerebral infarction; Clinical value

1. Introduction

Acute cerebral infarction, or ischemic stroke, is mainly related to cerebral atherosclerosis and is one of the most common cerebrovascular diseases of the central nervous system. It is leading to cerebral tissue ischemia and hypoxia, and eventually cerebral tissue softening, ischemic necrosis, neurological dysfunction and cellulose that thrombosis forms and blocks cerebral blood vessels due to increased blood viscosity, reduced blood pressure, the adhesion and deposition of platelets. The patients showed neurological dysfunction such as hemiplegia and aphasia [1]. At present, it is to improve and restore the blood supply of ischemic brain tissue and restore its normal metabolism at an early stage that the key to the clinical treatment of acute cerebral infarction. The basic therapeutic drugs include anticoagulants, antiplatelet drugs, calcium antagonists and neuroprotectants. Fibrinolytic enzyme is the most commonly used effective thrombolytic drug and Ginkgo biloba preparation is a neurotrophic drug with wide clinical application at present. However, it have not been reported that the clinical value and significance of the two combined application based on oxygen inhalation therapy [2]. Therefore, this paper will to provide scientific decision-making for clinical treatment research via the clinical value of fibrinolytic enzyme combined with ginkgo biloba extract inhaled with oxygen in the treatment of acute cerebral infarction.

2. Materials and Methods

2.1. Clinical data

They were collected and randomly divided into experimental group and control group which 106 patients with acute cerebral infarction admitted to our hospital from January 2014 to December 2015, 53 patients in each group. 33 males and 20 females in the experimental group, they were aged between 40 to 80 years, with an average age of 58.7± 11.2 years. 32 males and 21 females in the control group were aged between 40 to 80 years, with an average age of 58.3±11.1 years. There was no statistical difference in age and gender between the two groups. according to the following inclusion and exclusion criteria. Inclusion criteria: the patients

diagnosised of acute cerebral infarction according to clinical manifestations, physical signs, the brain CT and MR imaging. Patients have oxygen inhalation treatment indications with fibrinolytic enzyme, ginkgo biloba extract. patients and their families understand the research content, clear treatment risk, treatment and willing to cooperate with the investigation and study. Exclusion criteria: patients with thrombocytopenia, coagulation dysfunction and other serious blood system diseases; patients with subarachnoid hemorrhage, intracranial aneurysm, benign, malignant brain tumors, other neurological and cerebrovascular diseases. the patient has cardiopulmonary insufficiency, liver and kidney dysfunction and other serious internal and surgical diseases.

2.2. Method

Patients in the two groups were given routine symptomatic treatment and intensive care, such as aspirin antiplatelet, heparin anti-coagulation, mannitol to reduce cranial pressure, calcium antagonist, antibiotics anti-infection when necessary and nutritional support, which were admitted to the hospital immediately after diagnosis. In the experimental group, it was given oxygen inhalation therapy that fibrinolytic enzyme combined with ginkgo biloba extract, plasmin for injection (sihuan pharmaceutical co, LTD., national drug approval code H 11022487,100 units), 100U was dissolved in 100ml 0.9% normal saline, intravenous infusion, once a day, continuous treatment for 10 days. Ginkgo biloba extract drops (German Dr. Willmar Schwabe GmbH & amp; Co) 30ml of drug oxygen solution was dissolved in 150ml distilled water and added to the humidified bottle. The medical oxygen was combined with the atomizer damper to fully mix the oxygen and drugs. The atomized mouth was contained in the patient's mouth and inhaled at a low oxygen flow rate of 1.5 L/min for 30 min. The control group was treated with conventional fibrinolytic enzyme combined with simple oxygen inhalation. It was the same as the control group that dose and method of fibrinolytic enzyme use. Simple oxygen inhalation was selected as continuous inhalation of low-flow oxygen, with oxygen flow of 1.5l /m in and inhalation time of 30m in.

2.3. Evaluation standard

It includes neurological function defect, life ability score, treatment efficiency, incidence of adverse events and quality of life analysis that clinical value of this study on acute cerebral infarction. Neurologic deficits were scored using the national institutes of health stroke scale (NIHSS). The score ranges from 0 to 45, 0 to 15 is light, 16 to 30 is medium, and 31 to 45 is heavy. Barthel index was used to evaluate the patients' daily life and activity ability, and the patients were divided into four dependent grades according to the score: mild dependence of 75~95 points, moderate dependence of 50~70 points, severe dependence of 25~45 points, and complete dependence of 0~20 points. The effective rate of treatment includes obvious effect and remission, obvious effect: the clinical symptoms of patients with acute cerebral infarction disappear, NIHSS and Barthel scores were within the normal range, with no adverse events. Remission: the clinical symptoms of cerebral infarction were basically disappeared, NIHSS and Barthel scores were mildly abnormal, and there were occasional adverse events. Inefficacy: clinical symptoms of cerebral infarction persisted or even worsened in the patients, and severe abnormalities in NIHSS and Barthel scores were associated with adverse events. Adverse events of acute cerebral infarction include arrhythmia, coagulation disorder, infection and constipation. The quality of life of the patients was assessed by follow-up questionnaires after discharge, including physiological field, psychological field, social relationship field, environmental field and total score. [4]

2.4. Statistical processing

SPSS 19.0 software was used for statistical analysis in this study. T-test was used for comparison of measurement data, and chi-square test was used for comparison of counting data. $P< 0.05$, Indicating a statistically significant difference.

3. Consequences

3.1. Neurological impairment and viability score

It were similar of NIHSS score and Barthel score of the two groups before treatment, and it was not statistically significant between two groups after t-test ($P> 0.05$) according to table 1. The above scores were increased in both groups after treatment, but the increase was significantly higher in the experimental group than in the control group, and the differences were statistically significant after T test ($P< 0.05$).

Table 1. Comparison of neurological impairment and life ability between the two groups before and after treatment

Groups		Experimental group (n=53)	Control group (n=53)	T	P
Nihss score	Prior treatment	33.59±2.33	33.56±2.32	0.035	>0.05
	Posttreatment	68.71±5.64	49.17±5.06	30.596	＜0.05
Barthel score	Prior treatment	26.73±2.62	26.72±2.61	0.032	＞0.05
	Posttreatment	61.55±7.35	48.67±6.95	14.713	＜0.05

3.2. Comparison of therapeutic effects and incidence of adverse reactions

It were shown the treatment effect and incidence of adverse reaction events in the two groups in table 2 and table 3, respectively. The treatment efficiency of the experimental group was 96.23% higher than that of the control group (73.58%), and the chi-square value was 10.601 after chi-square test (P< 0.05). The incidence of adverse reaction events in the experimental group was 9.43%, much lower than that in the control group, which was 22.64%. After chi-square test, chi-square value was 3.433, and the difference was also statistically significant (P< 0.05).

Table 2. Comparison of therapeutic effects and incidence of adverse reactions

Groups	Excellent	Excellent	Invalid	Total effective rate
Treatment group (n = 53)	30(56.61%)	21(39.62%)	2(3.77%)	51(96.23%)
Control group (n = 53)	20(37.73%)	19(35.85%)	14(26.42%)	39(73.58%)

Table 3. Comparison of adverse reaction events between the two groups after treatment

Groups	Clotting disorders	Arrhythmia	Infection	Constipation	Other	Total
Treatment group (n = 53)	1(1.89%)	1(1.89%)	1(1.89%)	0	1(1.89%)	5(9.43%)
Control group (n = 53)	4(7.55%)	3(5.66%)	2(3.77%)	1(1.89%)	2(3.77%)	12(22.64%)

3.3. Quality of life assessment

It were all higher which the body functions of patients quality of life scores for role function, emotional function, cognitive function and social function in the experimental group than those in the control group after treatment, and it was statistically significant between two groups after T test according to table 4

Table 4. Evaluation of life quality of patients in the two groups after treatment

Groups	Total quality of life	The body function	Role function	Emotion function	Cognitive function	Social function
Treatment group (n = 53)	83.27±5.21	89.85±6.02	88.66±10.15	88.47±7.32	87.21±9.16	89.15±7.32
Control group (n = 53)	67.15±6.24	62.21±3.07	69.34±8.21	68.12±9.77	65.13±7.26	66.31±6.82

4. Discussion

Acute cerebral infarction seriously threatens the health and safety of Chinese people, because the clinical morbidity increases year by year and shows a trend of younger age, resulting in severe neurological dysfunction, limb hemiplegia and even death and other serious adverse outcomes, With the continuous severe aging of China's population and the increase of obesity, hyperglycemia and hyperlipidemia in the elderly in recent years. At present, it is believed that the core measure of its treatment is early active and effective thrombolytic anticoagulation, dredging blocked cerebral vessels, so as to restore normal blood supply to brain tissue and maintain normal brain function, based on the pathophysiological study of the onset of acute cerebral infarction. At present, the core measures are to restore normal blood supply to brain tissue and maintain normal brain function through early active and effective thrombolytic anticoagulation, dredging blocked cerebral blood vessels, all based on the pathophysiology of acute cerebral infarction [5]. Therefore, it is of positive significance and value to explore safe and effective thrombolytic drugs for improving the therapeutic effect of acute cerebral infarction.

Fibrinolytic enzyme is a kind of proteolytic enzyme which can degrade fibrinolytic gel, as an important component of the fibrinolytic system according to the physiological definition [6]. It is interdependent and restrict each other in vivo fibrinolytic system and coagulation system under normal physiological conditions. During coagulation reaction, excessive thrombus can be dissolved through activation of fibrinolytic system, and then hyperfibrinolysis can be avoided through negative feedback, and fibrinogen level in the body can be reduced to adjust fibrinolytic state. The blood of the body in patients with acute cerebral infarction is mostly in a highly coagulable state due to a variety of pathological or physiological factors, therefore, it has a scientific and reasonable theoretical basis for the treatment with fibrinolytic enzyme. In this study, fibrinolytic enzyme can bind the proteins in thrombus fibers with high specificity, rapidly degrade fibrinolytic proteins and dissolve cerebral thrombosis, which was extracted from snake venom as a proteolytic enzyme, belonging to single-chain zinc metalloproteinase. [8] Fibrinolytic enzyme can inhibit thrombosis and prevent the recurrence of cerebral infarction by dissolving Fb fibrinogen, it can avoid the high-viscosity state and regulate blood viscosity. In this study, fibrinolytic enzyme can enhance thrombolytic effect by

promoting the activation of fibrinogen. In addition, the fibrinolytic enzyme can effectively prevent the occurrence of abnormal bleeding in other parts of the body due to its inconspicuous activation of the fibrinolytic system in the body, It has enough time to exert thrombolytic effect at the site of cerebral thrombosis because it has a long half-life in the body and has a long-lasting effect.

It is of positive and important significance for improving the prognosis of patients and improving the treatment effect that active treatment of promoting blood circulation and removing blood stasis in the brain tissue of cerebral infarction area although early thrombolysis is an effective measure for the treatment of acute cerebral infarction. The main components of ginkgo biloba extract include flavonoid glycosides and terpenes. [9] it mainly has avoided the occurrence and aggravation of thrombosis in patients with acute cerebral infarction via delaying blood coagulation, platelet aggregation and platelet generation and antagonistic platelet activation factor. [10] Moreover, ginkgo biloba extract has to protect brain cells from ischemia and hypoxia injury by reducing cytotoxicity and good nerve protective effect. Pharmacological studies have found that ginkgo biloba extract can promote the recovery of brain tissue and nerve function, prevent the occurrence of adverse reactions such as ischemia and hypoxia and cerebral edema, because it can improve microcirculation, promote the release of cerebral neurotransmitters, effectively remove oxygen free radicals, and reduce acute cerebral ischemia reperfusion injury. [11] In this study, it was selected for treatment that atomized inhalation of ginkgo biloba extract. Drug oxygen inhalation can improve the effective blood absorption of ginkgo biloba extract, which oxygen saturation in blood to 98% or more, maximize the role of oxygen therapy. It plays the role of cerebral infarction treatment and further promote the recovery of neurological function in stroke patients. [12]

It fully confirmed that the positive clinical value of fibrinolytic enzyme combined with ginkgo biloba extract in the treatment of acute cerebral infarction with oxygen inhalation, which is worthy of clinical application and promotion in this study. It were all higher than those in the control group that NIHSS score, Barthel score, effective rate and quality of life of patients in the experimental group, while the incidence of adverse reactions was lower than in the control group, all indicating that it was significantly better than in the control group which the clinical value of treatment in the experimental group.

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