Clinical Efficacy of Neurointerventional Catheter Thrombolysis for Cerebral Infarction

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Abstract: *Objective.* To analyze the clinical efficacy of neurointerventional catheter thrombolysis for cerebral infarction. *Methods.* A total of 56 patients with cerebral infarction admitted to our hospital from April 2018 to June 2019 were enrolled for the experimental study. Two different treatments were applied to patients, and patients were divided into observation groups and controls according to different treatment methods. After grouped into two groups the control group was treated with intravenous thrombolysis. The observation group was treated with neurointerventional arterial catheter thrombolysis. The treatment effect, NIHSS score and BI index, neurological deficit score before and after treatment, and coagulation index were compared between the two groups. *Results.* The therapeutic effect of the observation group (92.86%) was significantly different from that of the control group (67.86%), and the observation group was higher than the control group. The data of the observation group in the NIHSS score and the BI index were 5.42±1.77 and 95.64±2.15, respectively, which were better than the control group. The neurological deficit scores of the observation group before and after treatment were 19.88±6.24 and 9.14±5.81, respectively. After treatment, the difference was significant compared with the control group, *P*<0.05. The coagulation indexes of the observation group in FIB, PT, TT, etc. were respectively 3.68±1.04, 11.46±1.62, 15.37±2.46, all were better than the control group (2.13±0.47, 13.72±2.72, 19.85±2.62), *P*<0.05. *Conclusion.* the clinical efficacy of neurointerventional arterial catheter thrombolysis for cerebral infarction is significant, it can effectively promote the recovery of various functional conditions of patients with cerebral infarction, which is worthy of further application and promotion.

1 Introduction

The main cause of cerebral infarction is necrosis and softening of some brain tissue caused by hypoxic-ischemic brain, which belongs to a brain circulatory disorder[1]. In general, those tissue around the cerebral infarction has the characteristics of reversiblity. We must take effective treatment in order to improve the recovery of brain function and to reduce the impact of brain damage in healthy patients[2]. According to relevant surveys the incidence and mortality of cerebral infarction are relatively high. The main clinical treatment is neurointerventional arterial catheter thrombolytic therapy, which can effectively improve the clinical treatment effect in patients[3]. This study also analyzed the clinical efficacy of neurointerventional catheter thrombolysis for cerebral infarction. The details are as follows.

2 Information and methods

2.1 Clinical basic data

The study was conducted among 56 patients with cerebral infarction admitted to our hospital. The case selection time was from April 2018 to June 2019. The patients were divided into observation group and control group according to different treatment methods. The number of male patients in the observation group

was 15 and the number of females was 13 and the age ranged from 38 to 73. The median age was (55.17±1.34). Among the patients, 6 patients had a right middle cerebral artery, 7 patients had a left anterior cerebral artery, 11 patients had a right posterior cerebral artery, and 4 patients had a left middle cerebral artery. . In the control group, the number of male patients were 14 and the number of females were 14 and their age ranged from 35 to 75 years. The median age was (55.23±1.36) years old, 5 of them had a right middle cerebral artery. Six patients had a left anterior cerebral artery, 12 patients had a right posterior cerebral artery, and 5 patients had a left middle cerebral artery. In the above situation, the two groups of patients found $P>0.05$ was not statistically significant.

2.2 Methods

In control group, the main treatment method was intravenous thrombolysis. First, 1 million U of urokinase and 100 ml of normal saline were combined together. The combined solution have to be unifromly dispersed then the patient can be treated with intravenous drip. The observation group were mainly subjected to neuro-invasive arterial catheter thrombolytic therapy. The patient were intramuscularly injected with 0.2 g of phenobarbital sodium, and local anesthesia was performed with lidocaine. The femoral artery was intubated to enter the vascular occlusion position. 20-400,000 U urokinase and 50 ml saline were injected at the rate of 10,000 U per minute, and 5000 IU of heparin was injected for the first time. After completion, 2500 IU of heparin was injected every hour. The patients were then subjected to angiography to ensure systemic heparinization.

2.3 Observation indicators

The therapeutic effects, NIHSS score and BI index, neurological deficit score before and after treatment, coagulation indexes such as FIB, PT and TT were observed and analyzed.

2.4 Statistical analysis

The relevant data were tested by SPSS 17.0, and the X2 value test was performed on the treatment effect. The T values of other indexes and scores were also calculated, and $P<0.05$ was statistically significant.

3 Results

3.1 Comparison of treatment effects

The therapeutic effects among the two groups of patients were compared, and the therapeutic effect of the observation group was found to be higher than that of the control group. See Table 1 for details.

Table 1. Comparison of treatment effects between the two groups

Group	Significant effect	Effective effect	Invalid effect	Total efficiency
Observation group (n=28)	16（57.14%）	10（35.71%）	2（7.14%）	26（92.86%）
Control group (n=28)	10（35.71%）	9（32.14%）	9（32.14%）	19（67.86%）
X^2				5.5354
P				0.0185

3.2 Comparison of NIHSS score and BI index

The observation group had better NIHSS score and BI index than the control group. See Table 2 for details.

Table 2. Comparison of NIHSS scores and BI indices between the two groups

Group	NIHSS score	BI index
Observation group (n=28)	5.42±1.77	95.64±2.15
Control group (n=28)	8.88±2.32	75.42±2.68
T	6.2741	31.1407
P	$P<0.05$	$P<0.05$

3.3 Comparison of neurological deficit scores before and after treatment

The results of neurological deficit scores before and after treatment in the observation group and the control group are as follows. See Table 3 for details.

Table 3. Comparison of neurological deficit scores before and after treatment in both groups

Group	Before treatment	After treatment
Observation group (n=28)	19.88±6.24	9.14±5.81
Control group (n=28)	20.44±6.53	16.86±5.18
T	0.3280	5.2480
P	P>0.05	P<0.05

3.4 Comparison of coagulation indicators

The observation group had better coagulation indexes such as FIB, PT and TT than the control group. See Table 4 for details.

Table 4. Comparison of two groups of coagulation indicators

Group	FIB	PT	TT
Observation group (n=28)	3.68±1.04	11.46±1.62	15.37±2.46
Control group (n=28)	2.13±0.47	13.72±2.72	19.85±2.62
T	7.1865	3.7773	6.5961
P	P<0.05	P<0.05	P<0.05

4 Discussion

According to the survey, the mortality rate of acute cerebral infarction is 5%, accounting for 50% of the incidence of acute cerebrovascular disease. In general, most of the patients with cerebral infarction are middle-aged and elderly patients, it is a critical disease which requires timely treatment intervention and could seriously threatens patient's life safety and quality of life. The related influencing factors are also complex which includes hemodynamic changes, vascular wall lesions, blood components, etc., need to take effective treatment measures to improve clinical outcomes[4]. Clinical studies have shown that a large number of patients with cerebral infarction may have spontaneous recanalization in the vascular occlusion. Although it has a significant mitigation effect on the current symptoms and conditions, reducing the current risk of patients, but there is no obvious effect in the later treatment and development for the disease. If the corresponding treatment and intervention were not taken, it might lead to the loss of physiological activity of the collateral vessels, thus threatening the patient's life safety. In response to this situation, patients can be stabilized by effective thrombolytic therapy and the ischemic penumbra can be effectively treated to ensure that the occluded blood vessels can be recanalized[5]. At present, clinical treatment of acute cerebral infarction usually uses mechanical thrombosis, selective arterial thrombolysis, intravascular ultrasound treatment, etc. Our studies have mainly used nerve interventional arterial catheter thrombolytic therapy, which can effectively expand the treatment scope and can help patients to restore their daily living ability, can also effectively reduce the symptoms of neurological deficits in patients. It can also strengthen the blood flow rate in the occlusion area, further reducing ischemia and time of hypoxia[6]. Through the interventional treatment of arterial catheter thromboembolism, treatment can be combined with mechanical thrombosis, which can improve the speed of blood flow in the penumbra which ensure the occlusion area can be recanalized, and further promote the patency of blood vessels[7]. Secondly, due to the influence of embolism, the blood flow velocity inside the blood vessel is slowed down. Therefore, the patient is given an arterial thrombolytic drug treatment, and the intravenous injection of the drug is relatively long, which can improve the retention time of the drug in the human body, thereby improving the drug effect. Finally, it can also be combined with microcatheter treatment, so that the infarct site can be treated in a targeted manner to ensure that the drug at the infarction site is always in higher concentration state, thereby improving the clinical treatment effect[8].

In this study, the treatment effect of the observation group (92.86%) was significantly different from that of the control group (67.86%), and the observation group was higher than the control group. The data of the observation group in the NIHSS score and the BI index were 5.42±1.77 and 95.64±2.15, respectively. The data of the control group in the NIHSS score and the BI index were 8.88±2.32 and 75.42±2.68, respectively, which are better than the control group. The neurological deficit scores of the observation group before and after treatment were 19.88±6.24 and 9.14±5.81 respectively. After treatment, the difference was significant compared with the control group (20.44±6.53, 16.86±5.18), $P<0.05$. The coagulation indexes of the observation group in FIB, PT, TT, etc. were 3.68±1.04, 11.46±1.62, 15.37±2.46 respectively which were better than the control group (2.13±0.47, 13.72±2.72, 19.85±2.62) and the difference was significant.

In conclusion, the clinical efficacy of neurointerventional arterial catheter thrombolysis for cerebral infarction is significant, and it can effectively clear the occluded blood vessels in the brain of patients, greatly reducing the risk of patients and is easy to operate, less trauma to the patient. It is worthy enough for further application in clinical promotion.

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