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Original Article

Effects of early rehabilitation nursing on improvement of conditions and quality of life in patients after ischemic strokes

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Abstract: Objective: The aim of the current study was to observe the effects of early rehabilitation nursing on improvement of conditions and quality of life in patients after ischemic strokes. Methods: A total of 96 stroke patients were selected and randomly divided into the experimental group (treated with early rehabilitation nursing) and control group (treated with conventional nursing), with 48 patients in each group and an average age of (64.33±5.29) years. CNS (stroke neurological deficit scores) and FMA (Fugl-meyer) were used to evaluate neurological and limb motor function, before and after nursing. MMSE (mini-mental state examination) and CDR (clinical dementia rating) were used to evaluate cognitive function, before and after nursing. A quality of life evaluation form was used to evaluate the daily lives, physical function, social function, and psychological function of patients. Questionnaires were used to evaluate nursing satisfaction. Results: CNS scores of the two groups were significantly lower than those before intervention. FMA scores were significantly higher than those before intervention ($P<0.05$). After intervention, CNS scores of the experimental group were obviously lower than those of the control group and FMA scores were significantly higher than those of the control group ($P<0.05$). Both groups had better MMSE scores and CDR scores than before intervention, but MMSE scores and CDR scores of the experimental group were higher than those of the control group ($P<0.05$). Quality of life scores of the experimental group were significantly lower than those of the control group after 4 weeks of intervention ($P<0.05$). Satisfaction levels of patients in the experimental group were significantly higher than those of the control group ($P<0.05$). Conclusion: Early rehabilitation nursing can obviously improve conditions of patients after ischemic strokes. This method can promote the recovery of nerves, limb movement, and cognitive function, improving the quality of life and satisfaction of patients. Therefore, it is worthy of clinical promotion.

Keywords: Early rehabilitation nursing, ischemic stroke, quality of life

Introduction

Ischemic strokes occur mostly in middle-aged and elderly people. They are caused by a series of cerebrovascular diseases or systemic blood circulation disorders, affecting motor, nerve, and cognitive function [1]. In recent years, with changes in dietary habits, incidence of ischemic strokes has increased. A series of dysfunctions caused by ischemic strokes adversely affect patient recovery [2]. These dysfunctions seriously affect the quality of life of patients, posing a major threat to the health of the elderly. Moreover, this decline in the quality of life of patients not only has a serious impact on patient self-help abilities, but also adds pressure and a heavy burden to families and society. Therefore, it is of great clinical significance to find an effective treatment and nursing method for patients after ischemic strokes. In recent years, with the development of medical technology, clinical studies concerning the promotion of recovery of various functions after ischemic strokes have been carried out in depth.

Early rehabilitation nursing is a nursing rehabilitation model that has developed rapidly in recent years. It subverts the concept that early rehabilitation training should be performed in

Table 1. General information

Factor	Test group n=48	Control group n=48	t/X^2	P
Sex			0.043	0.835
Male	28 (51.85)	29 (54.76)		
Female	20 (48.15)	19 (45.24)		
Age			0.043	0.837
≥40	21 (53.70)	20 (61.90)		
<40	27 (46.30)	28 (38.10)		
BMI			0.042	0.838
≥22	24 (55.56)	23 (57.14)		
<22	24 (44.44)	25 (42.86)		
Lesion site			0.048	0.939
Basal ganglia	11 (22.22)	10 (19.05)		
Thalamus	13 (25.93)	11 (26.19)		
Cerebellum	12 (29.63)	14 (33.33)		
Other parts	12 (22.22)	13 (21.43)		
Time of onset (h)	9.85±1.46	10.01±1.38	0.552	0.582
Coagulation function				
APTT s	28.53±2.25	28.67±2.31	0.301	0.764
PT s	11.77±1.09	11.89±1.08	0.542	0.589
FIB g/l	3.18±0.17	3.14±0.14	1.258	0.211
TT s	14.35±1.23	14.26±1.56	0.316	0.754
Alochol			0.178	0.673
Yes	31 (57.41)	29 (57.14)		
No	17 (42.59)	19 (42.86)		
Liver function				
Serum total proteing/L	71.56±2.39	71.61±2.33	0.143	0.918
Glutamic pyruvic transaminase ìmol/L	26.15±4.32	26.24±4.31	0.102	0.919
Total bilirubin ìmol/L	11.41±2.17	11.36±2.12	0.113	0.909
Renal function index (ìmol/L)				
Creatinine	69.41±4.11	69.39±4.09	0.024	0.981
Urea	5.41±0.58	5.46±0.66	0.394	0.694
Uric acid	293.51±13.37	295.62±13.26	0.770	0.440
Risk factors			0.202	0.904
Hypertension	13 (27.08)	15 (31.25)		
Diabetes	17 (35.42)	16 (33.33)		
Heart disease	18 (37.50)	17 (35.42)		
Severity			0.311	0.856
Light	28 (58.33)	29 (60.42)		
Moderate	11 (22.92)	12 (25.00)		
Severe	9 (18.75)	7 (14.58)		

postoperative rehabilitation as soon as possible. Application of this method in many diseases, such as cerebral thrombosis and brain damage, has achieved good results. In the past, treatment of ischemic strokes focused on rescue and treatment. Early-rehabilitation nursing of patients was neglected, leading to a certain degree of dysfunction after treatment. Finding a suitable nursing model for patients with ischemic strokes has become a clinically active demand. Regarding nursing requirements of ischemic strokes, a large number of scholars believe that early nursing should be taken [3, 4]. The early rehabilitation nursing model is bet-

Table 2. CNS scores of the two groups before and after treatment

Time	Test group n=48	Control group n=48	t	P
Before treatment	22.56±3.72	22.13±3.54	0.580	0.563
After treatment	12.97±2.56	17.11±2.61	7.846	<0.001
t	9.462	7.908	-	-
P	<0.001	<0.001	-	-

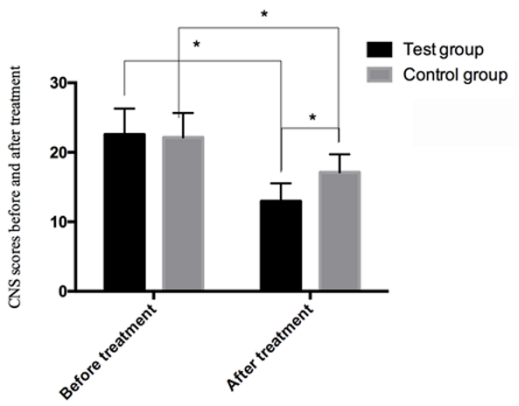

Figure 1. CNS scores before and after treatment between the two groups. There were no significant differences in CNS scores between the two groups before treatment (P>0.05). After treatment, the CNS score of the experimental group was significantly lower than that of the control group. The difference was statistically significant (P<0.05). Note: *indicated P<0.05.

ter in line with the nursing needs of patients with ischemic strokes. Some recent studies have explored its effects in depth.

Aiming to provide a better nursing model for patients with ischemic strokes and to promote recovery, the current study explored the effects of early rehabilitation nursing on improvement of patient conditions and quality of life.

Materials and methods

General information

A total of 96 stroke patients were selected and randomly divided into the experimental group (treated with early rehabilitation nursing) and control group (treated with conventional nursing), with 48 patients in each group. The average age was (64.33±5.29) years old. There were no significant differences in gender, age, and BMI between the two groups (P>0.05). Thus, they were comparable. See **Table 1** for details. Inclusion criteria: Patients meeting diagnostic criteria for ischemic strokes, with ages between 55 and 70 years old; Patients with no history of strokes [5]. Exclusion criteria: Patients with previous neurological or physical dysfunction; Patients with a history of psychosis; Patients with intracranial infections or intracranial space-occupying lesions; Patients with other severe organ diseases or tumors; Patients with communication impairment and cognitive dysfunction; Patients unwilling to cooperate with the experiment. All patients and their families agreed to participate in the experiment and provided informed consent. This trial was approved by the Ethics Committee.

Nursing methods in the control group and experimental group

After the patient was admitted to the hospital, intervention began. After the patient was discharged from the hospital, intervention ended. Both groups of patients were treated with the same medical treatment. Alteplase (rt-PA) venous thrombolytic therapy was employed. This is the administration of drugs called lytics or “clot busters” to dissolve blood clots that have acutely (suddenly) blocked major arteries or veins, posing potentially serious or life-threatening implications. The control group was treated with the conventional nursing model, including routine precautions, monitoring of vital signs, and rehabilitation exercise guidance. Patients in the experimental group were treated with the early rehabilitation nursing model. Specific measures were as follows: (1) According to specific conditions of the patients, the nurses prepared appropriate recipes for patients, helped patients and their families know more about limb rehabilitation training, and developed appropriate rehabilitation nursing programs within 12 hours after admission. Vital signs were closely monitored within 24 hours of admission. Family members were instructed to help the patients to place limbs in the correct position. For example, when the patient was lying on his back, the affected limbs were raised. The patient’s knuckles should be folded. A soft pillow should be placed under the buttocks of the affected side to avoid pressure sores. The affected leg should be kept in a slightly flexed state. If patient conditions

Table 3. FMA scores of the two groups before and after treatment

Time	Test group n=48	Control group n=48	t	P
Before treatment	26.42±4.26	26.39±4.22	0.034	0.972
After treatment	39.05±5.19	32.15±5.17	6.607	<0.001
t	8.461	5.862	-	-
P	<0.001	<0.001	-	-

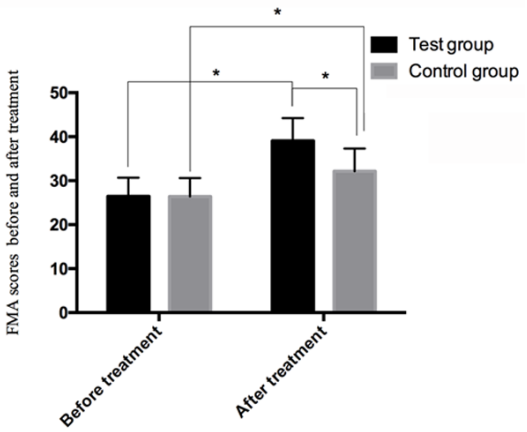

Figure 2. MA scores before and after treatment between the two groups. There were no significant differences in FMA scores between the two groups before treatment (P>0.05). After treatment, the FMA score of the experimental group was significantly higher than that of the control group. The difference was statistically significant (P<0.05). Note: *indicated P<0.05.

become stable 24 hours to 48 hours after admission, rehabilitation training can begin. The first step is psychological care. The nursing staff should actively communicate with patients and families, paying attention to patient psychological states. Timely psychological counseling can relieve psychological pressure and help patients gradually build confidence in overcoming the disease [6]. An increase of trust in the medical staff can help patients to better cooperate with treatment [7]. Nurses should help the patients with language function and swallowing function training. Nursing staffs should communicate with patients by means of expressions or gestures, encourage patients to speak more, and instruct patients to perform exercises, such as stretching tongues and cheek blowing. Patients should gradually return to their ordinary diet. In daily life, it is necessary to encourage and support patient daily life behavior, such as encouraging them do some exercise or brush their teeth as soon as possible. At the same time, it is more important to exercise limb function recovery. First, the patient should be assisted in performing passive movements of the limb joints, including various flexion, stretch, extortion, intorsion, and adduction of the shoulder joint, as well as various flexion activities of the lower extremities hip and knee joints. According to the patient's physical function recovery, training intensity should be adjusted, tracking progress. Passive movements should gradually develop into autonomous exercise, combined with rehabilitation equipment. Activity time should be increased, promoting recovery through the above various rehabilitation measures.

Outcome measures

CNS and FMA were used to evaluate neurological and limb motor function, before and after treatment. MMSE and CDR were used to evaluate cognitive function, before and after treatment. A quality of life evaluation form was used to evaluate the daily lives, physical function, social function, and psychological function of patients. Higher scores indicate a worse quality of life. Additionally, questionnaires were used to evaluate patient nursing satisfaction after intervention.

Statistical methods

SPSS19.0 software (Bo Yizhixun (Beijing) Information Technology Co., Ltd.) was used for statistical analysis of data obtained from the current experiment. Enumeration data was evaluated using Chi-squared tests. Measurement data are expressed by mean±standard deviation. Independent t-tests were used for comparisons between groups. Paired t-tests were performed before and after comparisons within groups. P<0.05 indicates statistical significance.

Results

Comparison of CNS scores before and after treatment between the two groups of patients

There were no significant differences in CNS scores between the two groups before treatment (P>0.05). CNS scores of the two groups were significantly improved after treatment.

Table 4. MMSE scores of the two groups before and after treatment

Time	Test group n=48	Control group n=48	t	P
Before treatment	19.67±3.21	20.13±3.19	0.704	0.483
After treatment	30.08±4.26	23.14±4.32	7.925	<0.001
t	7.169	3.883	-	-
P	<0.001	<0.001	-	-

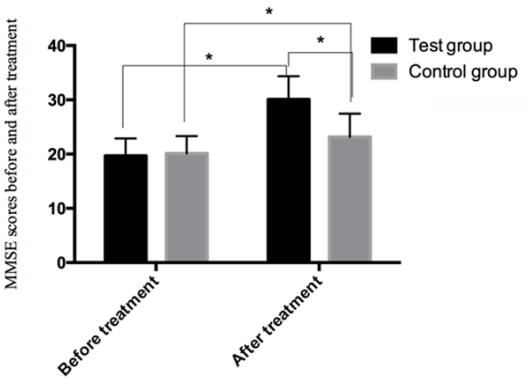

Figure 3. MMSE scores before and after treatment between the two groups. There were no significant differences in MMSE scores between the two groups before treatment (P>0.05). After treatment, the MMSE score of the experimental group was significantly lower than that of the control group. The difference was statistically significant (P<0.05). Note: *indicated P<0.05.

However, the CNS score (12.97±2.56) of the experimental group was significantly lower than that (17.11±2.61) of the control group. The difference was statistically significant (P<0.05) (**Table 2** and **Figure 1**).

Comparison of FMA scores before and after treatment between two groups of patients

There were no significant differences in FMA scores between the two groups before treatment (P>0.05). FMA scores of the two groups after treatment were higher than before treatment. However, the FMA score (39.05±5.19) of the experimental group after treatment was significantly higher than that (32.15±5.17) of the control group. The difference was statistically significant (P<0.05) (**Table 3** and **Figure 2**).

Comparison of MMSE scores before and after treatment between two groups of patients

There were no significant differences in MMSE scores between the two groups before treatment (P>0.05). MMSE scores of the two groups after treatment were higher than those before treatment. However, the MMSE score of the experimental group (30.08±4.26) after treatment were significantly higher than that (23.14±4.32) of the control group. The difference was statistically significant (P<0.05) (**Table 4** and **Figure 3**).

Comparison of CDR scores before and after treatment between two groups of patients

There were no significant differences in CDR scores between the two groups before treatment (P>0.05). CDR scores of the two groups after treatment were higher than those before treatment. However, the CDR score (1.42±0.18) of the experimental group after treatment was significantly lower than that (1.93±0.22) of the control group. The difference was statistically significant (P<0.05) (**Table 5** and **Figure 4**).

Comparison of quality of life scores after nursing intervention between two groups of patients

Daily life, material life, social function, and psychological function scores of experimental group patients after early rehabilitation nursing intervention were (28.21±5.39), (18.16±3.77), (16.18±3.75), and (17.62±3.36), respectively. For the control group, daily life, material life, social function, and psychological function scores after traditional nursing intervention were (33.45±5.85), (22.84±4.03), (20.92±4.35), and (22.57±3.45), respectively. Quality of life scores of the experimental group were significantly lower than those of the control group. Differences were statistically significant (P <0.05) (**Table 6**).

Comparison of nursing satisfaction between two groups of patients

For the experimental group, the number of patients that were very satisfied, satisfied, and dissatisfied with nursing service was 42, 10, and 2, respectively. Overall nursing satisfaction was 96.30%. For the control group, the number of patients was 21, 10, and 11, respectively. Overall nursing satisfaction was 73.81%. Nursing satisfaction of the experimental group was significantly higher than that of the control group, with statistically significant differences (P<0.05) (**Table 7**).

Table 5. CDR scores of the two groups before and after treatment

Time	Test group n=48	Control group n=48	t	P
Before treatment	2.19±0.33	2.21±0.31	0.306	0.760
After treatment	1.42±0.18	1.93±0.22	12.43	<0.001
t	8.443	5.103		
P	<0.001	<0.001		

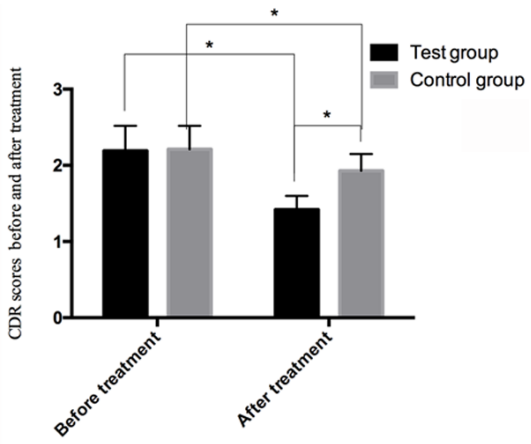

Figure 4. CDR scores before and after treatment between the two groups. There were no significant differences in MMSE scores between the two groups before treatment (P>0.05). After treatment, CDR scores of the experimental group was significantly lower than those of the control group. Differences were statistically significant (P<0.05). Note: *indicates P<0.05.

Discussion

Acute ischemic strokes can cause disabilities, even after treatment. In severe cases, ischemic strokes may even threaten lives. Current mechanisms of cognitive impairment in patients after acute ischemic strokes are not well understood. However, many studies have shown that this may be due to degeneration and necrosis of neurons in ischemic, hypoxic, and hippocampus regions in stroke patients [8, 9] It often brings about cholinergic nervous system pathway disorders [10]. The ability to release acetylcholine is decreased, leading to cognitive dysfunction. Various sequelae of patients with acute cerebral ischemia can seriously affect the quality of life of patients. Thus, special attention should be paid to the recovery of limb motor function and cognitive function. Due to a lack of attention in patients with acute cerebral ischemia in clinical nursing, many patients will suffer more serious sequelae, even after treatment [11, 12]. Therefore, a suitable nursing model for patients after acute ischemic strokes is very important. In recent years, there have been many reports concerning the application of early rehabilitation nursing. Application in surgical nursing, such as shoulder joint nursing or fracture nursing, has indicated that early rehabilitation nursing can promote rehabilitation in surgical patients.

The current study applied early rehabilitation nursing to patients after acute ischemic strokes. It was found that, although CNS scores, FMA scores, MMSE scores, and CDR scores of the two groups were improved after treatment, the scores of patients with rehabilitation nursing showed marked improvement in the intervention group. This suggests that application of early rehabilitation nursing can significantly improve neurological function and motor function of patients after acute ischemic strokes, compared with conventional nursing. Studies [13] have shown that early comprehensive rehabilitation nursing for patients after acute ischemic strokes can effectively promote the recovery of neurological function, partly consistent with present findings. Other studies have explored the effects of early rehabilitation nursing on the recovery of daily living ability in patients after acute ischemic strokes [14]. Results have indicated that application of early rehabilitation nursing can significantly improve daily living abilities within 24 to 48 hours after acute ischemic stroke progression has been halted. This is in accord with present conclusions. After discussing the effects of early rehabilitation nursing on patient conditions, the current study compared quality of life scores and nursing satisfaction scores of the two groups after nursing. Results showed that quality of life scores of the experimental group were significantly better than those of the control group. Patients in the experimental group were more satisfied with nursing services than those in the control group. Results indicate that early rehabilitation nursing can effectively improve the quality of life and satisfaction of patients. Other studies have indicated that application of early rehabilitation nursing in patients after acute ischemic strokes can effectively promote rehabilitation and improve patient satisfaction

Table 6. Comparison of quality of life scores between the two groups of patients after nursing intervention

Project	Test group n=48	Control group n=48	t	P
Daily life	28.21±5.39	33.45±5.85	4.564	<0.001
Material life	18.16±3.77	22.84±4.03	5.876	<0.001
Social function	16.18±3.75	20.92±4.35	5.718	<0.001
Psychological function	17.62±3.36	22.57±3.45	7.121	<0.001

Table 7. Comparison of nursing satisfaction of the two groups of patients

Nursing satisfaction	Adult group n=48	Control group n=48	X^2	P
Very satisfied	39 (81.25)	24 (50.00)	-	-
Satisfied	7 (14.58)	8 (16.67)	-	-
Dissatisfied	2 (4.17)	16 (33.33)	-	-
Nursing satisfaction	46 (95.83)	32 (66.67)	13.40	0.021

[15]. One study reported that application of early rehabilitation nursing in patients after acute ischemic strokes can improve patient treatment compliance, increase patient quality of life, and alleviate patient prognosis [16]. Results of the abovementioned studies are in accord with present conclusions. Other studies have stated that early rehabilitation nursing plays an effective role in the recovery of brain function and nerve and body motor function for traumatic brain injury patients [17]. It can also reduce the disability rate of patients and improve quality of life. More studies have indicated that early rehabilitation nursing can improve patient nerve function and negative emotions for elderly patients with cerebral infarction [18]. Therefore, it was hypothesized that application of early rehabilitation nursing in brain-damage diseases can promote the recovery of various functions.

In summary, application of early rehabilitation nursing in patients after acute ischemic strokes can improve patient conditions, quality of life, and nursing satisfaction. It is worthy of clinical promotion. However, the current study did not examine the nursing effects of stroke patients with different severities. Effects of different factors, such as stroke severity and negative nursing emotions, were not studied. Therefore, present results require verification. Hopefully, other researchers will carry out more targeted trials according to clinicopathological features and psychological factors with respect to post-stroke treatment, providing a more theoretical basis for clinical nursing of patients without strokes.

Disclosure of conflict of interest

None.

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