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Original Article

Clinical efficacy of comprehensive nursing in patients with cerebral hemorrhagic hemiplegia

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Abstract: Objective: To explore the clinical efficacy of comprehensive rehabilitation nursing (CRN) intervention in patients with cerebral hemorrhagic hemiplegia (CHH). Methods: A total of 102 patients with CHH admitted to our hospital were selected for the prospective study. The patients were randomly divided into the control group (n=51) and the observation group (n=51) according to the random number table method. Routine nursing was performed in the control group, while CRN was conducted in the observation group. Fugl-Meyer motor function assessment scale, activity of daily living scale (Barthel index), self-rating anxiety scale (SAS), complications and muscle strength improvement (Brunnstrom assessment) were compared between the two groups. Results: Compared with those before nursing, Fugl-Meyer score, Barthel index and SAS score in the two groups after nursing were significantly improved (P<0.01). Fugl-Meyer score and Barthel index of the observation group were significantly higher than those of the control group after nursing, while SAS score showed the opposite change (P<0.001). The incidence of complications in the control group was 49.02%, and that in the observation group was 29.41% (P<0.05). The rate of muscle strength improvement in the observation group was 80.39% after nursing, which was significantly higher than that in the control group (60.78%; P<0.05). Conclusion: CRN intervention has a positive clinical efficacy in patients with CHH. It can enhance motor ability, improve the ability of daily life, amend psychological mood and reduce the incidence of complications.

Keywords: Comprehensive rehabilitation nursing, cerebral hemorrhage, hemiplegia, clinical efficacy

Introduction

Cerebral hemorrhage is a relatively common and serious brain disease in middle-aged and elderly patients admitted to the neurosurgery department. The annual number of cerebral hemorrhage in China is about 0.6-0.8 million, and the main pathogeneses of this disease are hypertension, atherosclerosis, etc. [1, 2]. Cerebral hemorrhage induced by substantial blood vessel rupture manifests as dizziness, headache, and disturbance of consciousness [3, 4]. Moreover, it has an acute condition and the fatality rate ranks first among all kinds of acute cerebrovascular diseases, seriously threatening the life and health of the patients [5]. Patients often relapse after treatment with a high disability rate, which lays heavy burden on the patients' family and the society.

In recent years, with the improvement of medical technology, the mortality of cerebral hemorrhage showed a declining trend. However, most patients still have sequelae such as limb dysfunction and hemiplegia, which seriously affects the physiological and psychological states of patients and reduces their quality of life [6]. It has been reported that effective nursing intervention has significant clinical significance for patients with CHH, which can improve the quality of life, enhance motor function, and reduce the incidence of complications [7, 8]. Comprehensive nursing (CN) intervention is a new mode of comprehensive nursing care. In addition to patients' own condition, nurses pay attention to the influencing factors of rehabilitation, such as environment, psychological state, physical factors, etc. It is mainly people-oriented, guided by the modern nursing concept, and based on the nursing procedure. The goal of CN is to provide the most optimal nursing care for patients according to their physiological, psychological, social, cultural, spiritual and other needs.

At present, CN has been widely used in gynecology, gastroenterology and urology departments, with good clinical effectiveness [9-11]. Meanwhile, it has also been actively promoted in cardiovascular and cerebrovascular departments, such as for the clinical application in cerebral infarction patients. But there are few reports about the nursing effect on the sequelae in cerebral infarction patients. A total of 102 patients with CHH admitted to Huashan Hospital, Fudan University from April 2019 to August 2020 were selected in this study. We specifically analyzed and explored the clinical efficacy of CN intervention in patients with CHH, in order to provide more research data for the application of this nursing intervention in these patients.

Materials and methods

General information

A total of 102 patients with CHH admitted to Huashan Hospital, Fudan University from April 2019 to August 2020 were selected for the prospective study. The patients were randomly divided into the control group (n=51) and the observation group (n=51) according to the random number table method. The control group was provided with routine nursing, while the observation group was given comprehensive rehabilitation nursing (CRN). The patients and their families received sufficient communication before the clinical study. All patients signed the informed consent, and this study was approved by the Clinical Ethics Committee of Huashan Hospital, Fudan University.

Inclusion criteria: 1) Patients were diagnosed with cerebral hemorrhage after cranial CT/MRI examination and had hemiplegic sequelae [12]; 2) Patients developed cerebral hemorrhage for the first time; 3) Patients were conscious 48 hours after admission, which was a stable period after acute phase; 4) Patients had no serious liver and kidney diseases, no mental disorders, and could communicate normally; 5) Patients volunteered to participate in this study.

Exclusion criteria: 1) Patients had previous history of stroke; 2) Patients had malignant tumors or other serious systemic diseases.

Methods

The control group received routine neurosurgical care, including disease interpretation, admission guidance, environmental care, medication guidance and discharge training.

Patients in the observation group were given CRN intervention and a nursing group was established. The nursing details are as follows. 1) Psychological nursing was mainly to actively communicate with patients, understand their psychological and physical state, establish a good and friendly doctor-patient relationship, and provide patients with a warm treatment environment. The patients' family members were told to spend more time with the patients, and to relieve patients' psychological pressure and negative emotions. The nursing process focused on encouragement and comfort. The patients were actively given language communication, and successful cases of treatment and rehabilitation were enumerated, in order to guide patients to correctly face the truth of the disease and establish confidence in the treatment. 2) Dietary nursing was to guide the patients to take low-fat, low-salt, high-protein, high-calorie and easily digestible food. Patients were required to eat more fruits and vegetables. For patients with dysphagia, intermittent oral-gastric tube feeding was adopted to provide necessary nutritional support. 3) Health education was to explain disease-related knowledge actively and comprehensively to the patients and their families. The treatment experience sharing was arranged to promote mutual support among patients and establish a positive relationship with patients. Timely explanation and guidance were provided for patients' inner doubts to ensure the correct treatment direction [13]. 4) Prevention of complications was to open the window for ventilation twice a day, so as to keep the air in the ward fresh. For patients with pulmonary infection, effective cough was instructed, aerosol inhalation drug treatment was carried out, and turn-over and percussion on back were assisted. For patients with urinary system infection, it was encouraged to drink more water. Indwelling catheter was not recommended, and intermittent clamping of the drainage tube was adopted to restore bladder function. Meanwhile, anti-reflux urine bag was used to prevent retrograde infection caused by urine reflux. Generally, paralytic patients were assisted to change their positions every two hours to reduce the occurrence of pressure sores; meanwhile, anti-pressure sore dressings or air cushion beds were adopted for the prevention [14]. 5) Movement nursing intervention was to guide the patients to do

Table 1. Comparison of general information between the two groups (n)

Item	Control group (n=51)	Observation group (n=51)	χ^2/t	P
Male/female	24/27	22/29	0.158	0.691
Age (years)	61.2±7.3	63.4±8.6	1.393	0.167
Weight (kg)	70.41±9.22	72.06±7.85	0.973	0.333
Hemiplegia side				
Left	31	28	0.362	0.547
Right	20	23		
Bleeding site				
Basal ganglia	16	14	0.189	0.664
Ventricle	20	19	0.042	0.839
Lobe	15	18	0.403	0.525
Muscle tension grading				
0-I	21	19	0.165	0.685
II-III	23	26	0.353	0.552
IV-V	7	6	0.088	0.767

more active movement and reduce braking time. For example, hanging foot pedaling movement on the bed and upper arm lifting movement were required for 3-5 min, 4 times/day. Patients were massaged and functionally exercised step by step (initially 10 minutes each time, 3 times a day; gradually extending the time) to promote circulatory and metabolic activities and prepare for getting out of bed as soon as possible [15]. Patients were asked to maintain emotional stability and prevent overexertion to avoid further bleeding. Meanwhile, blood pressure was controlled in the range of 130-150/90-100 mmHg to maintain blood supply to the brain.

Outcome measures

Primary outcome measures: 1) Fugl-Meyer motor function assessment scale: The highest score is 100 points, and higher score represents better function. Scores <50: Severe motor dysfunction; 50-84 scores: obvious motor dysfunction; 85-95 scores: moderate motor dysfunction; 96-99 scores: mild motor dysfunction. 2) Barthel index: Scores ≤40: patients are heavily dependent and need to be taken care of; 41-60 scores: patients are moderately dependent and need to be taken care of most of time; 61-99 scores: patients are slightly dependent and need to be taken care of some time; 100 scores: patients are independent and do not need to be taken care of. 3) Self-rating anxiety scale (SAS) score: Higher SAS score conveys more serious anxiety symptoms. Scores ≤50: normal; 50-60 scores: mild anxiety; 61-70 scores: moderate anxiety; ≥70 scores: severe anxiety.

Secondary outcome measures: 1) Brunnstrom score: The Brunnstrom assessment was used to evaluate patients' muscle strength, which has six grades. Significantly effective: Compared with that before treatment, the patient's muscle strength was improved by two or more grades. Effective: Compared with that before treatment, the patient's muscle strength was improved by one grade. Ineffective: Compared with that before treatment, the patient's muscle strength did not significantly improve or even deteriorate. 2) Complications: The main complications are re-bleeding, pulmonary infection, pressure ulcers, urinary tract infection and deformity. The incidence of complications (%) = Number of cases of complications/total number of cases ×100%.

Statistical analysis

All data were analyzed and processed by statistical software SPSS 15.0. Count data were represented by n (%) and analyzed by chi-square test. Measurement data were in line with normal distribution and expressed as mean ± standard deviation ($\bar{x}$ ± sd). Inter-group comparisons were analyzed by independent sample t-test, and intra-group comparisons before and after nursing were performed by paired t-test. P<0.05 is considered statistically significant.

Results

Comparison of general information

There was no significant difference between the two groups in the general information, including gender, age, weight, bleeding site, hemiplegia side and muscle strength state (all P>0.05). See **Table 1**.

Comparisons of Fugl-Meyer score and Barthel index

Before nursing, there was no significant difference between the two groups in the Fugl-Meyer score (P>0.05). After nursing, the Fugl-Meyer

Table 2. Comparison of the Fugl-Meyer scores between the two groups (score)

Group	Before nursing	After nursing	Difference between before and after nursing
Control group (n=51)	34.51±6.25	55.25±4.63**	20.74±1.62
Observation group (n=51)	33.28±5.73	69.89±5.71**	36.61±0.02
t	1.036	14.220	69.950
P	0.303	<0.001	<0.001

Note: Compared with before nursing, **P<0.01.

Table 3. Comparison of the Barthel index scores between the two groups

Group	Before nursing	After nursing	Difference between before and after nursing
Control group (n=51)	24.66±4.31	45.32±4.68**	20.66±0.57
Observation group (n=51)	25.21±5.64	63.84±5.70**	38.63±0.06
t	0.553	17.930	223.900
P	0.581	<0.001	<0.001

Note: Compared with before nursing, **P<0.01.

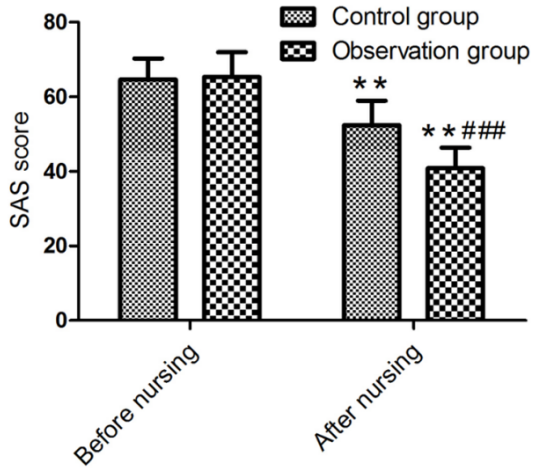

Figure 1. Comparison of SAS score between the two groups. Compared with intra-group before nursing, **P<0.01; compared with the control group after nursing, ###P<0.001. SAS: Self-rating anxiety scale.

scores in both groups were improved (P<0.01). The difference of the two groups in the Fugl-Meyer score between before and after nursing was statistically significant (P<0.001), and the Fugl-Meyer score of the observation group after nursing was significantly better than that of the control group (P<0.001). There was a similar trend in the Barthel index between the two groups. See **Tables 2**, **3**.

Comparison of SAS score

There was no significant difference in SAS score between the two groups before nursing (P>0.05). The SAS scores of the two groups after nursing decreased significantly (P<0.01), and the score of the observation group was significantly higher than that of the control group (40.86±5.53 vs. 52.36±6.63; P<0.001). See **Figure 1**.

Comparison of Brunnstrom score

After nursing, the improvement of muscle strength in the observation group was significantly effective in 17 cases and effective in 24 cases. The effective rate of muscle strength improvement in the observation group was 80.39%, which was significantly higher than that in the control group (60.78%; P<0.05). See **Table 4**.

Comparison of complications

The main complications are re-bleeding, pulmonary infection, pressure ulcers, urinary tract infection and deformity. The incidence of complications in the control group was higher than that in the observation group (49.02% vs. 29.41%, P<0.05). It indicated that CRN could effectively reduce the occurrence of complications of cerebral hemorrhagic hemiplegia. See **Table 5**.

Discussion

Patients with cerebral hemorrhage often suffer from varying degrees of neurological impairments, leading to language, consciousness, and limb activity impairments. It seriously affects the prognosis and quality of life of

Table 4. Comparison of muscle strength improvements between the two groups (n)

Group	Significantly effective	Effective	Ineffective	Effective rate
Control group (n=51)	13	18	20	60.78%
Observation group (n=51)	17	24	10	80.39%
χ^2	0.756	1.457		4.722
P	0.385	0.227		0.030

Table 5. Comparison of the complications between the two groups (n, %)

Group	Control group (n=51)	Observation group (n=51)	χ^2	P
Rebleeding	4 (7.84)	3 (5.88)	0.000	1.000
Pulmonary infection	5 (9.80)	4 (7.84)	0.000	1.000
Pressure ulcers	8 (15.69)	3 (5.88)	2.547	0.110
Urinary tract infection	4 (7.84)	2 (3.92)	0.177	0.674
Deformity	4 (7.84)	3 (5.88)	0.000	1.000
Incidence	49.02%	29.41%	4.113	0.043

patients and brings a great burden to the family and society. A study has revealed that effective rehabilitation nursing intervention is conducive to the recovery of damaged central nervous system and the promotion of cerebral functional repair [16]. Therefore, targeted selection and adoption of scientific and reasonable rehabilitation nursing mode has always been the focus of medical staff.

The fundamental purpose of nursing is to take the patients as the center. It should not only effectively meet the treatment need of patients, but also meet and adjust the psychological needs of patients. Due to the lack of relevant knowledge, it is had for patients with cerebral hemorrhage hemiplegia to take care of themselves at the early stage and they worry about becoming a burden to their families. Most patients are anxious about the treatment cycle and treatment cost. Moreover, they are afraid of hemiplegia and aphasia. Thus, patients tend to have negative emotions such as anxiety and self-abasement, which affect their normal treatment and compliance. Park et al. reported that positive psychological nursing intervention could effectively improve patients' adverse psychological state and treatment compliance [17]. In this study, psychological nursing and health education were conducted to adjust the psychological status of patients, active communication with the patients and their families were performed, and correct prognostic approaches were guided to the patients and their families. The above measures helped patients to establish confidence in the treatment. After nursing, SAS score of the observation group was significantly lower than that of the control group, indicating that CRN can effectively improve patients' anxiety.

Patients with hemiplegia after cerebral hemorrhage are physically inconvenient and need to stay in bed. Thus, it is more necessary for patients to conduct reasonable exercise nursing intervention. Kumble et al. found that reducing braking time, increasing active exercise, regular massage and functional exercise could effectively promote the circulatory metabolism and the repair of brain function, and facilitate the rehabilitation process of patients [18]. Letombe et al. also believed that rehabilitation training should be carried out at an early stage, and constantly moderate active and passive limb activities were conducive to the recovery of body functions [19]. In this study, with exercise nursing intervention and diet nursing, the scientific intake of nutrition was ensured, the exercise ability and self-care ability were effectively improved, and muscle strength was significantly enhanced.

Complications are thorny to tackle in the rehabilitation process of patients with cerebral hemorrhage. Effective control of complications is one of the prerequisites for improving the prognosis and quality of life of patients. Moulin et al. held the point that re-bleeding, pressure ulcers and multiple infections were the major complications, which should be paid much attention to in patients with cerebral hemorrhage [20]. In this study, the ward environment was controlled, and the patients were guided and assisted in cough and sputum excretion, in order to reduce the occurrence of pulmonary infection caused by cough, oral secretions that block the respiratory tract, etc. The avoidance of the risk of pressure sore caused by the patients' limb movement disorder was strengthened in this study, including regular turn-over,

using anti-pressure sore dressings in the prone pressure sore site, etc. It has been reported that 80% of urinary system infections are related to urethral catheterization, and most of them are retrograde infection [21]. Therefore, anti-reflux urine bag was used in this study instead of indwelling catheter to reduce the risk of retrograde infection caused by urine reflux. The results also showed that CRN intervention mode adopted in this study effectively reduced the incidence of the above complications, and the effect was obvious.

However, there are also some caveats in this study. First, this is a single-center study with small sample size, which only represents our hospital and the region. Moreover, this study lacks universality. Thus, in-depth study with multi-center and large sample size should be carried out in the future.

To sum up, CRN intervention has a positive clinical efficacy in patients with hemiplegia after cerebral hemorrhage. It can relieve adverse psychological mood, enhance motor ability, improve self-care ability, and significantly enhance muscle strength and reduce the incidence of complications, with great clinical significance.

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Disclosure of conflict of interest

None.

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