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Original Article

Primary nursing intervention can improve the prognosis and postoperative quality of life of patients with hypertensive intracerebral hemorrhage undergoing minimally invasive surgery

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Abstract: Objective: This study aimed to explore the role of primary nursing in patients with hypertensive intracerebral hemorrhage (HICH) undergoing minimally invasive surgery. Methods: We randomly assigned 106 patients with HICH treated in our hospital to receive routine nursing (54 cases, group A) or primary nursing in addition to routine nursing (52 cases, group B). The scores of negative emotions, incidence of complications, quality of life, and prognosis of all patients were recorded. Results: The score of negative emotions and the incidence of complications were lower in group B than in group A ($P < 0.05$). The scores of quality of life and prognosis were higher in group B than in group A ($P < 0.05$). Conclusion: Primary nursing intervention can improve the prognosis and postoperative quality of life of patients with HICH undergoing minimally invasive surgery.

Keywords: Primary nursing, minimally invasive surgery, hypertensive intracerebral hemorrhage, prognosis, quality of life

Introduction

Hypertension is triggered by reduced blood vessel diameter caused by vascular contraction and arterial remodeling [1], which induces cardiovascular and cerebrovascular diseases [2], as well as dementia and disability [3]. Hypertensive intracerebral hemorrhage (HICH), a common late complication of hypertension, and is caused by the mechanical pressure on brain tissue from hematomas [4]. Patients surviving from HICH are troubled by serious sequelae [5]. Minimally invasive surgery is safe and effective in treating HICH, but its efficacy in the recovery of nerve function is limited. With more public attention to medical care, routine nursing is becoming less effective for most people, so hospitals are turning to new interventions that are tailored to each patient with consideration of the individual situation and personalized clinical care [6]. Primary nursing is one of those new interventions. Here we explored the effect of primary nursing on patients with HICH undergoing minimally invasive surgery.

Materials and methods

General information

We randomly assigned 106 patients with HICH treated in Tangshan Gongren Hospital to receive routine nursing (54 cases, group A) or primary nursing in addition to routine nursing (52 cases, group B).

Exclusion and inclusion criteria

Inclusion criteria: Patients diagnosed with HICH [7]. This study was approved by the ethics committee of our hospital. All patients and their families signed the written informed consent.

Table 1. General information of patients [n (%)] ($\bar{x} \pm sd$)

Factors	Group A (n=54)	Group B (n=52)	t/χ^2	P
Sex			0.593	0.441
Male	30 (55.56)	25 (48.08)		
Female	24 (44.44)	27 (51.92)		
Age (year)	62.57 ± 7.38	63.14 ± 6.67	0.416	0.677
Weight (kg)	67.24 ± 5.31	66.79 ± 5.53	0.427	0.670
Height (cm)	170.44 ± 6.28	169.26 ± 5.79	1.005	0.317
Ethnicity			0.266	0.606
Han nationality	37 (68.52)	38 (73.08)		
Minority nationality	17 (31.48)	14 (26.92)		
Place of residence			0.577	0.447
Urban area	32 (59.26)	27 (51.92)		
Rural area	22 (40.74)	25 (48.08)		
Educational background			0.593	0.441
≥ high school	30 (55.56)	25 (48.08)		
< high school	24 (44.44)	27 (51.92)		
Financial situation			0.437	0.803
Poor	14 (25.93)	11 (21.15)		
Moderate	22 (40.74)	24 (46.15)		
Rich	18 (33.33)	17 (32.69)		
Diabetes			0.616	0.432
Yes	28 (51.85)	23 (44.23)		
No	26 (48.15)	29 (55.77)		
Smoking			0.568	0.451
Yes	37 (68.52)	32 (61.54)		
No	17 (31.48)	20 (38.46)		
Drinking			0.566	0.451
Yes	35 (64.81)	30 (57.69)		
No	19 (35.19)	22 (42.31)		
Staying up			0.197	0.657
Yes	32 (59.26)	33 (63.46)		
No	22 (40.74)	19 (36.54)		
Exercise			0.910	0.340
Yes	21 (38.89)	25 (48.08)		
No	33 (61.11)	27 (51.92)		

Exclusion criteria: Patients with liver and kidney dysfunction, major hematological diseases, or comorbid tumors; patients with communication barriers; patients withholding related information from the medical staff.

Nursing methods

Both groups of patients underwent minimally invasive surgery in strict accordance with the operating procedures. We monitored the vital signs of patients.

Patients in group A received routine nursing: Doctors performed routine rounds and gave medical advice, and the nursing staff monitored the disease condition and taught patients health knowledge about the disease.

Patients in group B received personalized primary nursing centered on the needs of each patient in addition to routine nursing.

(1) Shift arrangement: Under hierarchical nursing management, we arranged an 8-hour flexible schedule. The responsibilities of each position were clarified to ensure the work of each shift was well accomplished.

(2) Psychological care: The nursing staff kept frequent in communication with patients to understand their demands and relieved their negative emotions by diverting their attention from the disease or popularizing knowledge about the healing from the disease to enhance the treatment confidence of patients.

(3) Knowledge education: In an easy-to-understand way, the nursing staff introduced the disease knowledge to patients via pictures or stories and told them about successful cases to enhance treatment compliance. The nursing staff was required to remain patient in answering the patient's questions on throughout the process.

(4) Nutritional intervention: Nutritional support was essential since patients generally experienced severe stress and decreased disease

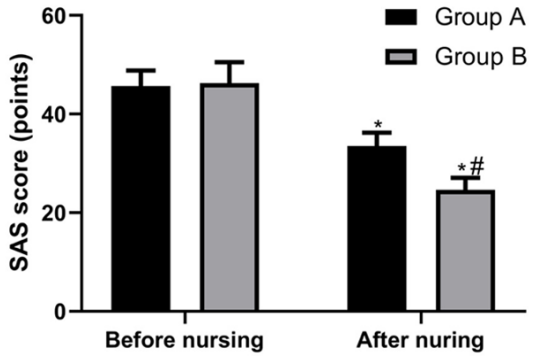

Figure 1. Comparison of the SAS score. The two groups were not notably different in the SAS score before nursing ($P > 0.05$). After nursing, the SAS score markedly decreased in both groups ($P < 0.05$), with a sharper decrease in group B ($P < 0.05$). Note: * indicates $P < 0.05$ when compared with data before nursing in the same group; # indicates $P < 0.05$ when compared with group A.

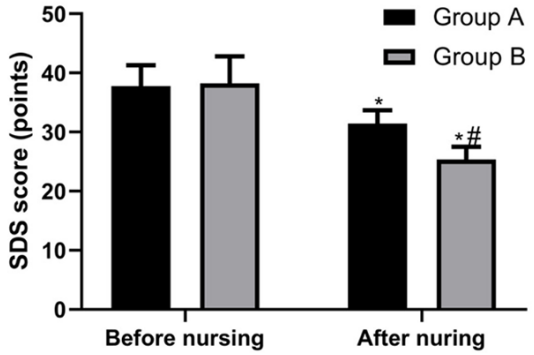

Figure 2. Comparison of the SDS score. The two groups were not notably different in the SDS score before nursing ($P > 0.05$). After nursing, the SDS score markedly decreased in both groups ($P < 0.05$), with a sharper decrease in group B ($P < 0.05$). Note: * indicates $P < 0.05$ when compared with data before nursing in the same group; # indicates $P < 0.05$ when compared with group A.

resistance and immunity. Enteral nutritional support was given if borborygmus occurred in patients: Water first and then nutrients, at a low primary dose and then a suitable increase in the dose according to the patient's condition.

(5) Catheter care: The drainage tube for the minimally invasive surgery was marked. The nursing staff kept the drainage smooth to avoid any pressure on the tube or tube blockage and distortion. The color and volume of drainage fluid were closely monitored.

(6) Complications care: The nursing staff monitored the vital signs and intracranial pressure of patients throughout the day and managed to control the blood pressure at an ideal level. For patients with high intracranial pressure, medication or surgeries were required to lower the blood pressure. The sputum of patients was cleared in time to avoid sputum accumulation which may cause breathing difficulties. Patients with severe sputum accumulation were treated with drugs.

(7) Recovery nursing: Within 3 days after the surgery, the recovery nursing was started when the vital signs of patients were stable. Patients were ordered to lie in a suitable position for joint training. The training intensity was in a stepwise increase according to the patient's situation. Frequent massages were necessary to prevent muscle atrophy. We also encouraged patients to often communicate with their families.

Outcome measures

(1) The Self-rating Anxiety Scale (SAS) [8] and the Self-rating Depression Scale (SDS) [9] were employed to assess the anxiety and depression of patients before nursing and 1 month after nursing. The scores of the two scales are proportional to the severity of anxiety and depression.

(2) The 100-point Barthel scale [10] was employed to assess the activities of daily living of patients 1 month after nursing. The score of the scale is proportional to the performance in activities of daily living.

(3) The 100-point Short Form-36 (SF-36) [11] health survey was employed to assess the physical function, self-care ability, psychological function, and quality of life of patients 1 month after nursing. A higher score suggests a higher quality of life.

(4) The National Institutes of Health Stroke Scale (NIHSS) [12] and the Glasgow Prognostic Score (GPS) [13] were used to assess the prognosis 15 days after the surgery. The NIHSS is a 42-point scale, in which the score is proportional to the severity of neurological impairment and inversely proportional to the performance of prognosis. A NIHH score of $\geq$ 16

Table 2. Comparison of complications after nursing [n (%)]

Complications	Group A (n=54)	Group B (n=52)	χ^2	P
Pulmonary infection	2 (3.70)	1 (1.92)	-	-
Constipation	4 (7.41)	2 (3.85)	-	-
Pressure ulcer	3 (5.56)	0 (0.00)	-	-
Urinary tract infection	3 (5.56)	1 (1.92)	-	-
Peptic ulcer	2 (3.70)	0 (0.00)	-	-
Fever	3 (5.56)	1 (1.92)	-	-
Total incidence	17 (31.48)	5 (9.62)	7.701	0.005

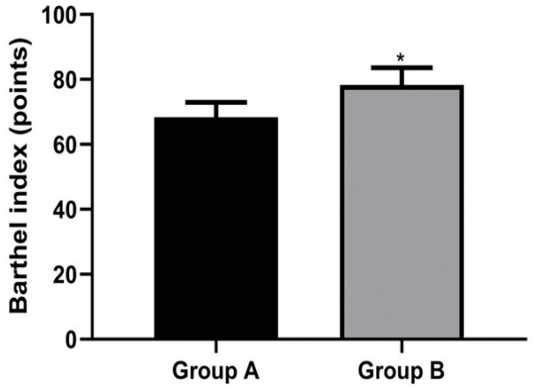

Figure 3. Comparison of activities of daily living after nursing. The Barthel score after nursing was markedly lower in group A than in group B (P < 0.05). Note: * indicates P < 0.05 when compared with group A.

points indicates a poor prognosis. The score of GPS ranges from 0 to 5 points, proportional to the performance of prognosis.

Statistical analysis

The statistical analysis was performed with SPSS 20.0 (SPSS, Inc., Chicago, IL, USA). The measurement data were expressed by the mean ± standard deviation ($\bar{x}$ ± sd) and analyzed by the t-test. The count data were expressed by the (%) and analyzed by the chi-square test. P < 0.05 indicates a statistical difference.

Results

General information

As shown in **Table 1**, the comparison between the two groups showed no differences in general information such as sex, age, and living habits (P > 0.05).

Comparison of the SAS score

As shown in **Figure 1**, the SAS score was (45.69 ± 3.14) points before nursing and (33.51 ± 2.73) points after nursing in group A, and (46.25 ± 3.32) points before nursing and (24.64 ± 2.45) points after nursing in group B. The SAS score after nursing was lower in group B than in group A (P < 0.05).

Comparison of the SDS score

As shown in **Figure 2**, the SDS score was (37.75 ± 3.58) points before nursing and (31.44 ± 2.25) points after nursing in group A, and (38.24 ± 3.31) points before nursing and (25.35 ± 2.16) points after nursing in group B. The SDS score after nursing was lower in group B than in group A (P < 0.05).

Comparison of complications after nursing

As shown in **Table 2**, the incidence of complications including pulmonary infection, constipation, and urinary tract infection was markedly lower in group B than in group A (P < 0.05).

Comparison of activities of daily living after nursing

As shown in **Figure 3** which illustrates the activities of daily living of patients, the Barthel score after nursing was lower in group A than in group B (68.35 ± 4.64 vs. 78.29 ± 5.31, P < 0.05).

Comparison of the nursing satisfaction rate after nursing

Patient satisfaction with nursing was evaluated. As shown in **Table 3**, the total nursing satisfaction rate was higher in group B than in group A (P < 0.05).

Comparison of the quality of life after nursing

The score of self-care ability was (54.67 ± 3.69) points in group A and (74.24 ± 5.24) points in group B. The score of psychological function was (63.29 ± 4.28) points in group A and (77.52 ± 4.67) points in group B. The score of physical function was (75.13 ± 5.21) points in group A and (84.43 ± 5.43) points in group B. The score of quality of life was (76.80 ± 5.35) points in group A and (91.45 ± 4.78)

Table 3. Comparison of the nursing satisfaction rate after nursing [n (%)]

Satisfaction level	Group A (n=54)	Group B (n=52)	χ^2	P
Great	12 (22.22)	24 (46.15)	-	-
Good	11 (20.37)	15 (28.85)	-	-
Fair	8 (14.81)	7 (13.46)	-	-
Poor	23 (42.59)	6 (11.54)	-	-
Total satisfaction rate	31 (57.41)	46 (88.46)	12.851	0.000

Table 4. Comparison of the quality of life after nursing ($\bar{x}$ ± sd)

Group	n	Self-care ability	Psychological function	Physical function	Quality of life
Group A	54	54.67 ± 3.69	63.29 ± 4.28	75.13 ± 5.21	76.80 ± 5.35
Group B	52	74.24 ± 5.24	77.52 ± 4.67	84.43 ± 5.43	91.45 ± 4.78
t		22.300	16.360	8.999	14.850
P		< 0.0001	< 0.0001	< 0.0001	< 0.0001

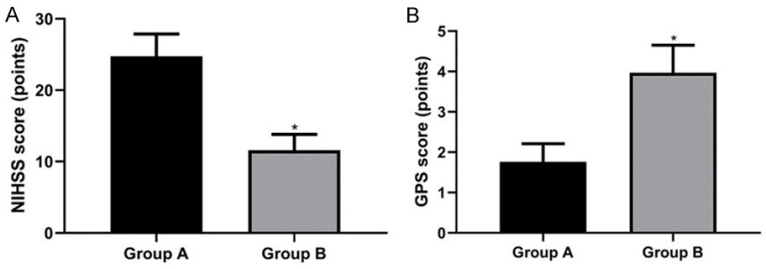

Figure 4. Comparison of activities of daily living after nursing. A. The comparison of the NIHSS score after nursing revealed a markedly lower NIHSS score in group B than in group A (P < 0.05). Note: * indicates P < 0.05 when compared with group A. B. The comparison of the GPS score after nursing revealed a markedly higher GPS score in group B than in group A (P < 0.05). Note: * indicates P < 0.05 when compared with group A.

points in group B. As shown in **Table 4**, the total score of quality of life was higher in group B than in group A (P < 0.05).

Comparison of the prognostic score after nursing

The NIHSS score after nursing was (24.74 ± 3.13) points in group A and (11.58 ± 2.24) points in group B. The GPS score was (1.76 ± 0.45) points in group A and (3.97 ± 0.68) points in group B. As shown in **Figure 4**, group B had lower NIHSS score and higher GPS score than group A after nursing (P < 0.05).

Discussion

Patient-centered care planning, a formal process by which clinicians and patients collaborate to develop longitudinal treatment plans, is often applied to improve the quality of primary care for individuals with complex and high medical needs [14]. Usually, this model of care will be affected by a variety of factors, including individual needs and preferences, disease progression, and response and tolerance to the treatment [15]. Some of the main principles of patient-centered care include all-round care for the patient in a personalized way and understanding the mental status, social interactions, and cultural complexity of patients [16]. Emotions play a vital role in physical health [17]. It has been found that negative emotions can impact the pathophysiology of cardiovascular diseases [18]. Negative emotions can affect self-perception [19] and reduce the efficacy of subsequent treatment [20]. Therefore, emotional counseling for patients is an essential part of primary nursing. Here we found that patients receiving primary nursing had lower scores of negative emotions. Such results suggest that emotional intervention in primary nursing can significantly relieve negative emotions and distress. The improvement in negative emotions was a result of frequent communications between the nursing staff and patients and education about the disease knowledge and defensive measures, which helped patients know more information about the disease, improved the trust between doctors and patients, and enhanced the patients' confidence in the treatment. Positive emotions may play a protective role in the progression of diseases [21]. Boosting positive emotions is quite beneficial to those who are not good at regulating negative emotions [22]. So it can be concluded that boosting positive emotions of patients is particularly critical during nursing. In routine nursing, the negative

emotions of patients are ignored, which may be one of the reasons for the poor efficacy of routine nursing.

In primary nursing, the nursing staff detect and predict the patient's various vital signs to prevent complications. So the incidence of complications was lower in patients undergoing a primary nursing intervention in this study. The systolic blood pressure and low-density lipoprotein of diabetics are under better control when they receive primary nursing [23]. Primary nursing plays an important role in improving disease management, strengthening the self-management strategies, and reducing the massive use of resources [24]. All of these findings indicate that primary nursing can promote disease control and the prevention of complications. This study revealed that primary nursing can enhance the satisfaction level and the quality of life of patients. The patient-centered primary nursing enables patients to actively participate in the nursing, develops patients' health management and self-nursing capabilities, and encourages patients to express their concerns and preferences for the treatment [25]. So primary nursing can increase the satisfaction level and quality of life of patients. In this study, the results of the prognostic score was better in patients receiving primary nursing over patients receiving routine nursing. Such results suggest that the patient-centered primary nursing can improve the prognosis of patients [26]. The improvement in the prognosis may be due to the all-round management by primary nursing to control the complexity of the disease.

This study is subject to some limitations. For example, we did not test the concentrations of inflammatory factors before and after treatment, nor did we measure the nursing compliance of patients. We will address those problems in the following research.

In summary, primary nursing intervention can improve the prognosis and postoperative quality of life of patients with HICH undergoing minimally invasive surgery.

Disclosure of conflict of interest

None.

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