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Effects Of Different Nutrition Nursing Plans On Nutritional And Neurological Rehabilitation Of Patients With Severe Cerebral Hemorrhage After Craniotomy

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ABSTRACT

Objective: To compare the effects of different nutrition nursing plans on the nutritional and neurological rehabilitation of patients with severe cerebral hemorrhage after craniotomy.

Methods: A total of 80 severe cerebral hemorrhage patients undergoing craniotomy in our hospital from January 2017 to December 2019 were enrolled and evenly assigned into two groups (control group and observation group) using a random number table. The patients in control group were given delayed enteral nutrition intervention, while those in observation group underwent early enteral nutrition intervention. The indices of nutritional status, serum inflammatory factors, immune function indices, incidence rate of complications, duration of mechanical ventilation, length of hospital stay, neurologic impairment score and activities of daily living (ADL) score were compared between the two groups.

Results: After intervention, the levels of prealbumin, transferrin, albumin and hemoglobin were higher in observation group than those in control group ($P<0.05$). Besides, the serum interleukin-6 IL-6, C-reactive protein CRP and procalcitonin PCT levels were lower in observation group than those in control group ($P<0.05$). In addition, the cluster of differentiation 3 $(CD3)^+$ and CD4/CD8 were higher in observation group than those in control group ($P<0.05$). The incidence rate of complications was 2.50% in observation group, which was lower than that (15.00%) in control group ($P<0.05$). Compared with those in control group, the duration of mechanical ventilation and length of hospital stay were shortened in observation group ($P<0.05$). Observation group displayed a lower National Institute of Health score and a higher ADL score in contrast with control group ($P<0.05$).

Conclusion: Early enteral nutrition intervention is more effective in improving nutritional status and immune function of patients with severe cerebral hemorrhage after craniotomy and promoting neurological rehabilitation compared with delayed enteral nutrition intervention.

KEYWORDS: craniotomy; cerebral hemorrhage; nutrition nursing; rehabilitation

INTRODUCTION

Brain hemorrhage is a serious acute essential neurochirurgical disease. The patients suffering from this illness are in serious and rapidly worsening circumstances , especially extreme cerebral hemorrhage, with high risk of injury and death[2-3].

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Cerebral hemorrhage is treated predominantly by the application of hematoma craniotomy. Cryotomy hematoma evacuation is successful in the removal of intracranial hematoma and intracranial hemorrhage prevention. However, patients with extreme brain hemorrhage are sometimes in coma after undergoing such an procedure and can not feed individually. Furthermore, they absorb quick resources internally. They are also vulnerable to malnutrition, which does not help their pronouncement[4]. Health nursing care is required

to maintain the safety of individuals with serious cerebral hemorrhage. Enteral feeding is one of the most important methods for feeding nursing, but its pacing is universally utilized in clinical practice. In this study a random-based group-controlled studies of 80 serious cerebral hemorrhage patients undergoing craniotomy in the hospital were performed separately, from January 2017 to December 2019, to compare the effect of various nutritional plans for severe brain hemorrhage post-craniotomy patients.

MATERIALS AND METHODS

General information

A total of eighty patients with severe brain haemorrhage treated with craniotomy have been entered and divided into two groups (control groups and monitoring groups) with the random number table from January 2017 to December 2019. The control group included 21 men and 19 women aged 45-74 years with an average of (62,13 ± 10,34) years. In the group, 22 men and 18 women aged 44-73 were in observation, with a mean age of (61.68 ± 10.29). There were no statistically important differences between age and sex between the two groups (P>0.05) that were similar. The study was approved by the Committee for Medical Ethics and the patients and family signed an informed consent.

Criteria for the inclusion: (1) Severe brain hemorrhage patients based on the results of comprehensive clinical exams (head CT, head RMRI, observation of symptoms, etc.) (2) patients with indications of craniotomic and craniotomic hematomy evacuation, (3) patients with a CSG of 8 points and a coma, and (4) patients aged 12 years old. Criteria for inclusion:Criteria of exclusion: (2) those with other neurological diseases, (3) those which are complicated by severe infections, or (4) patients with chronic underlying diseases, like hypertension or diabetes. Exclusion criteria: Exclusion criteria

Methods

Delayed enteral feeding intervention was performed in a control group after 7 days of patient admission, while early enteral feeding intervention was performed by a 2nd-d monitoring team after patient admission. The procedures of operation were the following: A jejunal tube was attached to the patient's nasal cavity, which injected Peptisorb enteral nutritional fluid at an infusion rate of 20-30 mL / h. The infusion intensity was modified in compliance with the patient's specific condition and regulated by a maximum rate of 120 ml / h. During the enteral nutrition intervention the remainder of the patients' stomach was carefully monitored to change their infusion rate in time. Furthermore the nasogastric tube was closely monitored to ensure a smooth and unfoldment of the nasogastric tube. The nutrient solution should be correctly heated before infusion, to verify its temperature at around 37 ° C. Furthermore the patient's oral cavity was regularly cleaned at least three times per day. Specifically, the oral mucosa was carefully washed with cotton swabs falling into normal saline, then iodine glycerin was added to the oral cavity, then normal saline and warm water was used to protect patients.

Observation indices

The nutritional status index (pré-albumin, transferrin, albumine and hemoglobin), serum inflammatory factors [interleukin-6 (IL-6), procalcitonin (PCT), C-reactive protein (CRP)], immune function indices [CD3+ and CD4/CD8 differentiation clusters], complication incidence, mechanical ventilation duration, hospital stay time of day, neurological distress and activity of a hospital, etc.In the National Institute for Health Crime (NIHSS) range of 0-45 points, neurological impairment[5] score was assessed. [5]. The result was related positively to neurological disorder.An ADL score [6] of 0 to 100 point range was evaluated with the modified Barthel index. The score has been positively linked to everyday activities.

Analysis statistics

Software for SPSS 22.0 has been used. Tests of μ2 and t were performed in numerical data (n) and quantitative data (including ± s) respectivamente. A statistically significant difference was indicated by P<0.05.

RESULTS

Nutritional status indices

Prealbumin, transferrin, albumin and haemoglobin were elevated, comparison with previous intervention, in all groups and in the observed community higher than those in the control group following intervention (P<0.05) (Table 1).

Serum inflammatory factors

In comparison to the amounts before the treatment in both classes, the serum IL-6, CRP and PCT amounts were lowered in investigation classes than those in the post-intervention control community (P<0.05) (Table 2).

Immune function indices

In both the intervention groups the CD3 + and the CD4 / CD8 improved compared with the pre-intervention groups, which were higher in the evaluation groups than in the after intervention control community (P<0.05) (Table 3).

Incidence rates of complications

The incidence rate of complications was 2.50% in observation group, which was lower than that (15.00%) in control group (P<0.05) (Table 4).

Duration of mechanical ventilation and length of hospital stay

Compared with those in control group, the duration of mechanical ventilation and length of hospital stay were shortened in observation group (P<0.05) (Table 5).

NIHSS and ADL scores

The NIHSS and ADL scores were improved in both groups after intervention compared with those before intervention. Observation group displayed a lower NIHSS score and a higher ADL score in contrast with control group (P<0.05) (Table 6).

Table 6. **NIHSS and ADL scores ($\bar{\chi} \pm s$, point)**

Group	Time	NIHSS score	ADL score
Control group (n=40)	Before intervention	26.97±4.23	61.48±6.52
	After intervention	22.14±3.05#	70.59±8.43#
Observation group (n=40)	Before intervention	26.83±4.29	61.62±6.40
	After intervention	19.02±2.86#*	81.65±10.27#*

#*P*<0.05 *vs.* before intervention, **P*<0.05 *vs.* control group.

DISCUSSION

Cerebral haemorrhage is an ageing brain condition particularly widespread. If the ageing process accelerates and nutritional composition shifts, more and more people are suffering brain haemorrhage [7-9]. Cerebral haemorrhage applies specifically to intracranial bleeding induced by the breaking down and accelerated deterioration of brain arteries owing to multiple services. In fact, serious brain haemorrhage cases have more extreme symptoms. For life-saving reasons, surgery in patients with serious cerebral haemorrhage is clinically suggested, and craniotomy evacuation of the hematoma is a primary surgical technique which can effectively eradicate intracranial hematoma to decrease intracranial pressure and monitor development of the disease [10]. Nevertheless, cerebral extreme haemorrhage victims are sometimes in a coma, and can not feed spontaneously following craniotomy, resulting in a decreased nutritional absorption. Moreover, these patients have relatively fast metabolic problems and internal energy intake and growing energy needs. As a consequence, the equilibrium between ingestion and absorption of nutrients falls, thus increasing a possibility of starvation and quickly aggravating patients' condition[11]. Regarding the possibility of malnutrition following craniotomy of patients with serious brain haemorrhage, dietary measures of clinic patients are suggested. As one of the latest methods of helping clinical nutrition, enteral nutrition help implies mostly to infude nutrient solution through the nasal feeder tube through the patient's gastrointestinal tract, to facilitate the complete absorption through the gastrointestinal tract of the nutrient solution through patients and to provide essential nutrients to their patients[12]. However, there is no scientifically appropriate inference as to whether enteral diet can be introduced for patients with serious cerebral haemorrhage, so further review is required. In this research, patients with acute brain haemorrhage were subjected to early and delayed enteral feeding procedures. The findings revealed that (1) the amounts in observer community during the procedure (P<0.05), pre-albumin, transferrin, albumin and haemoglobin) were higher than those in control group , suggesting a greater improvement of the nutritional state of patients suffering from serious brain haemorrhage. This is primarily because early enteral feeding is fast and can maintain the gastrointestinal mucosa's structural integrity, enhances gastrointestinal efficiency, enhances patients' ability to digest nutritional elements and re-establishes the equilibrium between dietary intake and absorption[13]. (2) A lower serum levels IL-6, CRP and PCT reported a lower complication occurrence rate (2,50 percent versus 15,00 percent) when contrasted with the control group and an elevated CD3 + and CD4 / CD8 incidences (P<0,05). It indicates that an early enteral feeding regimen will also decrease patients' inflammation, boost immune function and minimise complications. The key explanation is that early enteral nutrition will add nutrients as quickly as possible, decrease patients' fast metabolism, boost body climate, inhibit release, control immune function and prevent complications as opposed to

delayed enteral nutrition.. (3) The artificial breathing period and patient patient stay in the testing community is shorter than the control group. (3) In the comparison category and those in the control community the NIHSS score decreased while the ADL score improved after intervention (P < 0,05). That is primarily because early enteral feeding improves the immune system of patients, decreases the likelihood of starvation in patients and allows patients to rehabilitate at an early level, which tends to improve the neuro-rehabilitative impact of patients.

In conclusion, the earlier enteral nutritional treatment enhances the nutritional condition and immune function of patients who have a serious brain haemorrhage following craniotomy and increases cognitive healing outcomes more effectively relative to slower enteral nutrition operation.

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Table 1. **Nutritional status indices ($\bar{\chi} \pm s$)**

Group	Time	Prealbumin (g/L)	Transferrin (g/L)	Albumin (g/L)	Hemoglobin (g/L)
Control group (n=40)	Before intervention	0.20±0.08	31.04±1.35	35.66±1.80	104.15±1.72
	After intervention	0.30±0.09#	32.49±1.46#	38.09±2.31#	106.52±2.39#
Observation group (n=40)	Before intervention	0.21±0.10	31.17±1.41	35.83±1.85	104.31±1.76
	After intervention	0.42±0.12#*	33.98±1.37#*	40.95±2.74#*	109.94±2.87#*

#*P*<0.05 *vs.* before intervention, ***P*<0.05 *vs.* control group.

Table 2. **Serum inflammatory factors ($\bar{\chi} \pm s$)**

Group	Time	IL-6 (ng/L)	CRP (mg/L)	PCT (ng/mL)
Control group (n=40)	Before intervention	26.61±3.49	9.83±1.61	6.35±1.80
	After intervention	22.50±2.87#	8.20±1.47#	4.46±1.31#
Observation group (n=40)	Before intervention	26.48±3.52	9.72±1.64	6.14±1.87
	After intervention	19.64±2.39#*	6.69±1.29#*	3.09±1.02#*

#*P*<0.05 *vs.* before intervention, ***P*<0.05 *vs.* control group.

Table 3. **Immune function indices ($\bar{\chi} \pm s$)**

Group	Time	$CD3^+$ (%)	CD4/CD8
Control group (n=40)	Before intervention	35.43±2.91	1.30±0.15
	After intervention	39.12±3.57#	1.49±0.19#
Observation group (n=40)	Before intervention	35.61±2.86	1.34±0.16
	After intervention	43.84±4.65#*	1.70±0.22#*

#*P*<0.05 *vs.* before intervention, ***P*<0.05 *vs.* control group.

Table 4. **Incidence rates of complications [n (%)]**

Group	n	Ventilator-associated pneumonia	Diarrhea	Refeeding syndrome	Total incidence rate
Control group	40	1 (2.50%)	3 (7.50%)	2 (5.00%)	6 (15.00%)
Observation group	40	0 (0%)	1 (2.50%)	0 (0%)	1 (2.50%) *

***P*<0.05 *vs.* control group.

Table 5. **Duration of mechanical ventilation and length of hospital stay ($\bar{\chi} \pm s$, d)**

Group	Duration of mechanical ventilation	Length of hospital stay
Control group (n=40)	8.23±2.08	13.91±2.57
Observation group (n=40)	6.14±1.85*	10.38±2.20*

***P*<0.05 *vs.* control group.