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Original Article

Effect of care intervention based on susceptible pointers of care quality in patients with hepatic cerebropathy

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Abstract: Objective: To investigate the effect of care intervention based on susceptible pointers of care quality in patients with hepatic cerebropathy. Methods: The clinical data of 106 patients with hepatic cerebropathy from January 2020 to June 2021 were retrospectively analyzed, and they were assigned to a study group (n=53) or a control group (n=53) in line with diverse care means. The control group received conventional care, and the study group received additional care intervention based on susceptible pointers of care quality. The liver function, blood ammonia, neural function, capacity of daily life, and quality of life were observed and contrasted in the two groups before and after the intervention. The implementation or occurrence of key indicators of care quality, the occurrence of adverse care events, and patient care satisfaction rate were documented in the two groups after intervention. Results: After the intervention, the liver function, neural function, capacity of everyday activities, quality of life and the implementation or occurrence of key pointers of care quality in the study group were superior to those in the control group ($P<0.05$). The blood ammonia and the incidence of adverse events in the study group were lower than those of the control group ($P<0.05$), and the care satisfaction rate of patients in the study group was higher than that of the control group ($P<0.05$). Conclusion: Care intervention based on susceptible pointers of care quality can help patients with hepatic cerebropathy to enhance liver and neural function, decrease blood ammonia and have fewer adverse care events, and enhances quality of life, care quality, and care satisfaction of patients.

Keywords: Susceptible pointers of care quality, care intervention, hepatic cerebropathy, care effect, care satisfaction rate, impact

Introduction

Hepatic cerebropathy is a syndrome of central nervous system dysfunction caused by severe liver disease and based on metabolic disorders. Its main clinical manifestations are disturbance of consciousness, behavioral disorders, and coma. Caused by drug-induced hepatitis, fatty liver, liver cirrhosis, liver cancer and other liver disease, the onset is either acute or slow, and most patients are in coma after the appearance of jaundice, and some are misdiagnosed with mental illness due to disturbance of consciousness before the appearance of jaundice. If the disease is not treated in a timely and effective manner, it will affect the patient's intelligence, and as the disease progresses, it may even cause death [1-4]. With this serious and complex disease, patients need to stay in bed for a long time and need more care. Therefore, improving the quality of clinical care is of great significance to the recovery of the patient. Care quality indicators are an important means for evaluating care quality, and guide implementation of care [5, 6]. Studies have shown that the current routine nursing care for hepatic encephalopathy cannot guarantee the quality of nursing, and the nursing effect is uneven, which may have an unstable impact on the patient's condition. Sensitive indicators of nursing quality play an important role in improving quality. Nursing practice applied to various clinical diseases can improve outcome. However, there are few reports on the use of sensitive indicators of nursing quality in hepatic encephalopathy, so this study is expected to improve nursing quality for that condition [7, 8]. Following the context of the above

research, this study explored the effect of care intervention based on susceptible pointers of care quality on patients with hepatic cerebropathy, in order to try to improve care.

Materials and methods

General data

A total of 106 patients with hepatic encephalopathy from January 2020 to June 2021 were selected as study samples, and their clinical data were collected and retrospectively analyzed. In line with the diverse care means, they were assigned into a control group and a study group, with 53 cases in each group. This study was performed under the approval of the Ethics Committee of The Second Affiliated Hospital of Wenzhou Medical University (LCKY2020-314), and informed consent was obtained from all patients.

Inclusion criteria: Patients were confirmed to have hepatic cerebropathy by clinical symptoms, signs and imaging examinations [9].

Exclusion criteria: (1) Patients with other brain diseases; (2) Patients with a history of brain trauma or brain surgery; (3) Patients with severe mental illness; (4) Patients with severe basic metabolic diseases; (5) Patients with incomplete clinical data.

Care methods

In the control group, conventional intervention measures were implemented for patients, including correction of water and electrolytes, acid-base disorders, and enhanced digestive tract care and guidance: Nurses advised patients to have a light diet, strictly limiting protein intake, thereby reducing blood ammonia and preventing coma. Patients were asked to record intake and output, and apply diuretics as prescribed. Besides, their conditions were observed, and close attention was paid to the occurrence of alkalosis once the blood pH value rose. The patients were asked to report hypoxia, hypokalemia, nausea and vomiting, or arrhythmia to the doctor in time, and timely intervention was taken.

The research group received additional intervention measures based on susceptible indices of care quality: (1) A management group of susceptible pointers of care quality of hepatic cerebropathy was established. The head nurse led the responsible nurses to learn the knowledge related to the susceptible indices of care quality, learn the susceptible indices of care quality related to hepatic cerebropathy, study the evaluation scales related to care quality, and incorporate them for the guidance of clinicians. Then, outstanding nurses were selected to form a management group for indicators of critical stroke care quality. (2) The sensitive indicators of nursing quality were filtered and determined. Under the guidance of management team, preliminary screening was conducted for the treatment of hepatic encephalopathy. The sensitive indicators were selected to determine the structure index, process index and result index. Eventually, we selected patient identification accuracy, qualification rate of nursing skills, qualified rate of risk assessment, complications, and early rehabilitation training as five sensitive indices of nursing quality. (3) The nurses were trained regarding to the susceptible indices of care quality. In line with the relevant requirements of the susceptible pointers of care quality, all the nurses who participated in the study were trained for relevant care skills. During the implementation of each susceptible index, we rectified the susceptible index with poor execution or high incidence, and put forward suggestions for changes in actual clinical care for consolidation and reappraisal, and formulated a final care plan that was scientific and targeted. (4) Care measures related to hepatic cerebropathy following the requirements of susceptible pointers of care quality were implemented. Nurses regularly reviewed the patient's cognitive function, behavior and personality. Any abnormality was timely reported to and treated by the doctor. In addition, nurses educated the patients' family members about disease knowledge, so as to enhance the family members' awareness of the disease and help the patient's auxiliary care. There are many causes of hepatic coma in patients, most of which are related to upper gastrointestinal bleeding or heavy use of hypnotics. At the same time, the patients were ensured to have unblocked intestines, and were observed for every-day defecation. For patients with constipation, oral lactulose and other interventions can be taken as needed, and a small amount of vegetable protein can be given to promote recovery after the patient's awakening. For patients with consciousness disorder or physical movement disorder, timely assessment of neural function and limb motor

function was carried out. When the patient met the requirements of early rehabilitation training, necessary guidance was carried out to help the patient restore limb movement as much as possible. This enhanced the patient's self-care capacity.

Observation indicators

(1) The liver function [alanine aminotransferase (ALT), serum albumin (ALB), total bilirubin (TBIL)] and blood ammonia (NH_3) level were detected before and after intervention in the two groups using an automatic biochemical analyzer (IDEXX, Catalyst One). The operations were strictly referred to the instrument manual.

(2) Before and after the intervention, the neural function of the two groups was appraised by the Neural Defect Rating Scale [10]. The evaluation contents included delayed wake-up and questioning, gazing at the visual field, facial recognition, coordinated movement of up and down, left and right, and speech response, with an overall score of 42 points. The higher the score, the worse the neural function. The Barthel index [11] was employed to appraise and compare the daily life capacity of the two groups, with an overall score of 100 points.

① Those with a score of 100 points were able to take care of themselves in everyday life, but they may not be able to live independently. For example, they may not able to cook or have a normal social life; ② Those with 60 points or more could manage basic selfcare, with only mild function impairment, and were able to complete part of everyday activities independently; ③ Those with 60-41 points needed help in everyday life; ④ Those 40-20 points needed significant help in everyday life; ⑤ Those with score below 20 points could not take care of themselves at all in everyday life.

(3) Before and after the intervention, the quality of life of the two groups was appraised by the Comprehensive Assessment Questionnaire for Quality of Live-74 (GQOL-74) [12], including four aspects: physical, mental, emotional and social, with a score of 100 points for each aspect. The higher the score, the better quality of life.

(4) The implementation or occurrence of key pointers of care quality after intervention were documented, including the accuracy ratio of patient identification, the qualified ratio of care skills, the qualified ratio of risk assessment, the incidence of complications, and the implementation ratio of early rehabilitation training. Recognition accuracy: Patients were asked to identify images such as trees, flowers and people, and the proportion of patients who could correctly identify an images was recorded. Nursing skills pass rate: Nurses were regularly assessed for nursing skills, and the pass rate of nursing skills was recorded. Risk assessment pass rate: Risk assessment of the probability of serious complications in patients was carried out on a regular basis, and no risk factors was considered qualified. Complication rate: The number of cases with complications such as cerebral edema, kidney injury, and gastrointestinal bleeding was recorded. Implementation rate of early rehabilitation training: Assessment of the patient's condition was performed, and the number of patients eligible for early rehabilitation training was recorded.

(5) The occurrence of adverse care events after intervention was documented. The events included nurses' medication error, jaundice, ascites and infection.

(6) After the intervention, a questionnaire [13] was employed to investigate the care satisfaction rate, which included satisfaction, basic satisfaction and dissatisfaction. Overall satisfaction rate = satisfaction + basic satisfaction.

Statistical analysis

Statistical software SPSS 22.0 was employed for statistical analysis, and GraphPad Prism 6 was employed to analyze the data and plot graphs. Comparisons between and within groups were performed using bar charts. The measured data were expressed as (mean ± SD), and t test was employed for comparison. Counteddata were expressed as n or %, and the χ^2 test was employed . Differences were considered significant at $P<0.05$.

Results

Contrast of baseline data between the two groups

There were no significant differences in sex, age, duration of disease and pathogenic causes between the two groups ($P>0.05$). See **Table 1**.

Table 1. Contrast of baseline data between the two groups [n, mean ± SD]

Item	Control group (n=53)	Study group (n=53)	χ^2/t	P
Male/Female	42/11	40/13	0.215	0.643
Average age (years)	55.85±7.11	57.40±6.02	1.211	0.229
Disease duration (years)	11.23±3.50	10.04±4.60	1.499	0.137
Cause (case)				
Alcoholic cirrhosis	2	3	0.300	0.860
Portosystemic shunt	26	27		
Cirrhosis after hepatitis B	25	23		

Table 2. Contrast of liver function and blood ammonia degrees between the two groups before and after intervention (mean ± SD)

Group	Time	ALT (U/L)	ALB (g/L)	TBIL (mmol/L)	NH3 (μmol/L)
Study group (n=53)	Before intervention	164.45±43.53	30.42±3.43	203.52±58.32	184.34±25.27
	After intervention	40.92±16.47*,#	37.16±2.82*,#	69.45±25.23*,#	53.56±8.21*,#
Control group (n=53)	Before intervention	161.42±46.81	30.38±3.19	198.72±60.34	179.53±23.81
	After intervention	62.32±21.21*	34.48±3.20*	84.81±21.36*	66.23±12.08*

Annotation: *Contrasted with before intervention within the group, P<0.05; #contrasted with the control group after intervention, P<0.05.

Table 3. Contrast of neural function and daily life capacity between the two groups before and after the intervention (score, $\bar{x}$±s)

Group	Time	Neural function	Daily life capacity
Study group(n=53)	Before intervention	14.49±4.16	50.15±20.08
	After intervention	6.65±3.95*,#	75.97±19.76*,#
Control group (n=53)	Before intervention	14.30±4.21	51.18±22.00
	After intervention	10.15±3.87*	64.81±20.69*

Annotation: *Contrasted with before intervention within the group, P<0.05; #contrasted with the control group after intervention, P<0.05.

Contrast of liver function and blood ammonia degrees between the two groups before and after intervention

After the intervention, the liver function and blood ammonia degree of the two groups were better than those before intervention (P<0.05), and the liver function and blood ammonia in the study group were superior to thecontrol group (P<0.05). See **Table 2**.

Contrast of neural function and daily life capacity between the two groups before and after the intervention

After intervention, the neural function scores of the two groups were obviously lower than those before the intervention (P<0.05), and the daily life capacity scores were higher than those before the intervention (P<0.05). The neural function scores of the study group were lower than those of the control group. The scores of daily life activities in the study group were higher than those of the control group (P<0.05). See **Table 3**; **Figures 1** and **2**.

Contrast of quality of life scores between the two groups before and after the intervention

After intervention, the quality of life scores in the two groups were obviously higher than those before the intervention (P<0.05), and the quality of life scores in the study group were higher than thoseof the control group (P<0.05). See **Table 4**.

Differences in indices of quality of care between the two groups after the intervention

After intervention, the identification accuracy ratio, care skill qualified ratio, risk assessment qualified ratio, and early rehabilitation training

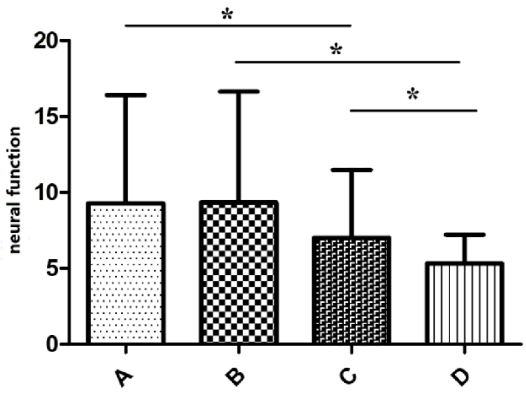

Figure 1. Contrast of neural function before and after intervention in the two groups. Note: A: Control group before treatment; B: Study group before treatment; C: Control group after treatment; D: Study group after treatment. *P<0.05.

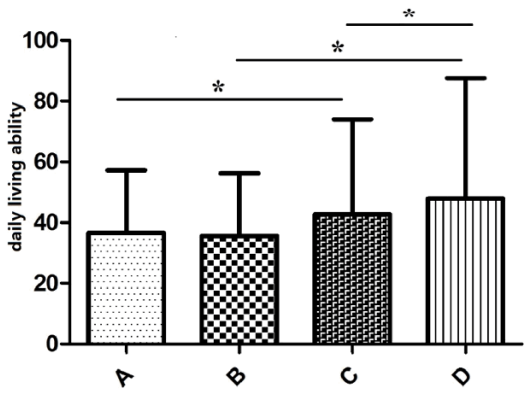

Figure 2. Contrast of daily life capacity between the two groups before and after the intervention. Note: A: Control group before treatment; B: Study group before treatment; C: Control group after treatment; D: Study group after treatment. *P<0.05.

implementation ratio in the study group were higher than those of the control group (P<0.05). Incidence of complications was lower in the study group than in the control group (P<0.05). See **Table 5**.

Incidence of adverse care events in the two groups

The incidence of adverse care events in the study group was lower than that ofthe control group (P<0.05). See **Table 6**.

Care satisfaction rate in the two groups

The care satisfaction rate of the patients in the study group was higher than in the control group (P<0.05). See **Table 7**.

Discussion

Hepatic cerebropathy is a neural/psychiatric abnormal syndrome caused by acute and chronic liver diseases with metabolic disorders. It is a special type of cerebropathy. Studies have confirmed that in patients with liver cirrhosis, the incidence of mild hepatic cerebropathy is 30% to 85%. If patients cannot receive timely treatment and care, their intelligence will decline with the progression of the disease, and the condition may eventually develop into severe hepatic cerebropathy, which impacts on patients' physical activity, stress response capacity, and quality of life, and may even endanger the patient's life. Timely and effective care intervention is expected to improve patients' condition and prognosis [14]. Care quality-susceptible pointers are widely employed in clinical care for various diseases, and the effect is remarkable. This study attempts to explore the effect of care intervention based on care quality-susceptible pointers in patients with hepatic cerebropathy.

The outcome of this study manifested that after intervention, the implementation or occurrence of key pointers of liver function, neural function, everyday activity, quality of life and care quality in the study group were better than the control group, and the blood ammonia and the incidence of adverse care events were lower in the study group. The satisfaction rate of patients was higher in the study group than the control group, suggesting that care intervention based on susceptible indices of care quality could help patients with hepatic cerebropathy to improve liver and neural function, decrease blood ammonia,and have fewer adverse events, and increase patients' daily life capacity, quality of life care satisfaction rate.. Studies have manifested that the main cause of hepatic cerebropathy is the increase of ammonia in the body, which cannot be cleared by the liver in time, thereby increasing the concentration of blood ammonia and inhibiting brain activity [15]. Therefore, the treatment plan is mostly oriented to decrease ammonia production and scavenge ammonia. Care intervention based on susceptible pointers of care quality is given in line with the pathogenic cause of hepatic cerebropathy to reduce intestinal ammonia inhalation and strictly proscribe hypnotics during treatment. Constipation can increase the

Table 4. Contrast of quality of life scores between the two groups before and after the intervention (points, $\bar{x}\pm s$)

Group	Time	Physiological score	Mental score	Sentiment score	Social score
Study group (n=53)	Before intervention	56.42±3.53	57.75±5.48	55.67±4.92	56.93±6.61
	After intervention	69.14±4.21*,#	82.13±6.12*,#	71.25±5.28*,#	82.95±7.22*,#
Control group (n=53)	Before intervention	56.71±3.47	57.78±5.44	55.72±4.88	56.82±6.56
	After intervention	60.41±3.26*	69.57±4.26*	61.13±3.21*	64.07±5.14*

Annotation: *Contrasted with before intervention within the group, P<0.05; #contrasted with the control group after intervention, P<0.05.

Table 5. Contrast of the implementation or occurrence of key pointers of care quality between the two groups after intervention [n (%)]

Group	Patient identification accuracy	Care Skills Pass Ratio	Risk assessment pass ratio	Complication ratio	Early rehabilitation training implementation ratio
Study group (*n*=53)	50 (94.34)	51(96.23)	51(96.23)	4 (7.55)	46 (86.79)
Control group (*n*=53)	39 (73.58)	40(75.47)	41(77.36)	15 (28.30)	31 (58.49)
χ^2	8.477	9.396	8.230	7.759	10.681
P	0.004	0.002	0.004	0.005	0.001

Table 6. Contrast of the incidence of adverse care events between the two groups [n (%)]

Group	Medication error	Jaundice	Ascites	Infect	Overall incidence
Study group (n=53)	1 (73.58)	0 (75.47)	1 (77.36)	1 (28.30)	3 (58.49)
Control group (n=53)	3 (94.34)	3 (96.23)	2 (96.23)	2 (7.55)	10 (86.79)
χ^2					4.296
P					0.0 38

Table 7. Contrast of care satisfaction rate between two groups of patients [n (%)]

Group	Satisfaction	Basic satisfaction	Dissatisfaction	Overall satisfaction rate
Study group (n=53)	20 (37.74)	31 (58.49)	2 (3.77)	51 (96.23)
Control group (n=53)	14 (26.42)	16 (30.19)	23 (43.40)	30 (56.60)
χ^2				23.084
P				0.000

absorption of ammonia in the intestinal tract. To ensure the intestinal tract of patients was unblocked, their daily stool condition was observed. If constipation was found, oral lactulose and other interventions were used as needed to improve liver function and reduce blood ammonia. This is consistent with the findings of Li et al. [16]. In addition, the patient compliance is also dependent on the quality of care, and the relevant care records can affect the follow-up treatment in patients with hepatic cerebropathy. High-quality care can enable patients to receive early and effective treatment, promote the recovery of patients' neural function and everyday activities, and enhance their quality of life. These results are consistent with the research of Yap et al. [17]. After the introduction of sensitive indicators of nursing quality, the evaluation criteria of nursing quality were established. Through regular assessment of skilled operation in nurses, their professional skills were further strengthened. In this case, each nursing measure was implemented with the optimized standard, so nursing satisfaction of patients was improved [18]. Therefore, after applying the susceptible indices of care quality, the entire process was strengthened, and the quality of care was obviously enhanced, thereby reducing adverse events, ensuring patients' compliance and promoting the recovery from the disease. In addition, the selection of susceptible indices of care quality in this study fully

considered patient outcomes, and emphasized pointers closely related to patient outcomes, especially risk assessment and early rehabilitation training. By encouraging and guiding patients to carry out early rehabilitation training, strengthening patients' limb motor function and life capacity, the recovery of the patient is greatly benefited [19, 20].

This study is a retrospective study, which has certain limitations and may have retrospective bias. In addition, the sample size of this study is small from a single center. More objective and accurate conclusions need to be found by further prospective multi-center and large-sample studies.

Conclusions

Care intervention based on susceptible pointers of care quality can help patients with hepatic cerebropathy to enhance liver and neural function, decrease blood ammonia and tadversecare events, and enhance patients' capacity for daily life, quality of life, and satisfaction.

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Disclosure of conflict of interest

None.

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