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Perioperative nursing of patients with brain metastases and individualized nursing effect observation

Li Yao, Li Mengye

Affiliated Hospital of Hebei University, Baoding, Hebei, China, 071000

Abstract: *In order to explore the perioperative nursing characteristics and personalized nursing effects of patients with brain metastases, 92 patients with brain metastases admitted from April 2022 to April 2024 were selected for analysis and random grouping. 46 patients in the control group received routine nursing, and 46 patients in the experimental group received personalized nursing after understanding the characteristics of perioperative nursing. By comparing nursing satisfaction, quality of life, postoperative complications, psychological state, medication compliance and other indicators, the conclusion is that the perioperative characteristics and personalized nursing observation of patients with brain metastases can significantly improve the quality of life of patients, help patients reduce the occurrence of complications, alleviate patients' negative emotions, and improve patients' medication compliance and nursing satisfaction. This is of great significance to the postoperative recovery of the disease.*

Keywords: *Brain metastases ;Perioperative nursing characteristics; Personalized care*

1. Introduction

Brain metastatic tumor refers to the metastasis of tumor cells from other locations of the human body into the brain tissue. The incidence of intracranial tumors is about 10%, and the most common primary cancer is lung cancer [1]. According to statistics, patients with brain metastases are accompanied by neurological impairment. During the progression of the disease, the treatment is difficult, the development is rapid, and the need for nursing is high [2]. Under normal circumstances, clinical need to provide patients with symptomatic surgical treatment, during the treatment can help patients to remove single tumors, timely collection of pathological tissue, reduce the patient's occupying effect, control the rise of intracranial pressure in patients. Due to the particularity of surgical location, perioperative nursing of patients is extremely important, and personalized intervention should be carried out according to the nursing needs of patients during maintenance. Traditional nursing cannot meet the nursing needs of patients, and only provides patients with simple cognitive education and environmental guidance, resulting in unsatisfactory nursing effect [3]. Personalized nursing is a relatively novel nursing model at the present stage. During the implementation of nursing, it is based on the nursing characteristics and needs of patients, including the prevention of postoperative complications, reducing the occurrence of venous thrombosis and pressure ulcers, giving patients dietary guidance and ensuring the nutritional status of patients. In addition, by improving the perioperative nursing mode of patients, guiding patients to maintain a good diagnostic mentality, ensuring patients' clinical compliance, and further improving nursing satisfaction have an important role in improving patients' quality of life and sleep quality. In this study, 92 patients with brain metastases were selected for analysis to explore the nursing effects under different nursing measures. The report is as follows.

2. Data and methods

2.1. Clinical data

A total of 92 patients with brain metastases from April 2022 to April 2024 were selected and randomly divided into 46 control groups, including 21 males and 25 females, aged 21-79 years, with an average age of (50.32±1.98) years. The experimental group was 22-78 years old, with an average age of (50.28±1.77) years old. Among the 46 patients in the experimental group, there were 20 males and 26 females. All the enrolled patients were given enhanced cerebral MRI before operation and confirmed by

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pathology after operation. There was no significant difference in age and gender ($P > 0.05$), indicating comparability.

Disease types: In the control group, there were 1 germ cell tumor, 1 osteosarcoma, 1 epithelial carcinoma, 1 nasopharyngeal carcinoma, 1 myoma, 1 neuroendocrine tumor and 2 liver cancer. There were 1 melanoma, 1 fibrosarcoma, 2 thyroid cancer, 2 ovarian cancer, 1 kidney cancer, 6 gastrointestinal tumors, 8 breast cancer, and 17 lung cancer. In the experimental group, there were 1 germ cell tumor, 1 osteosarcoma, 1 epithelial carcinoma, 2 nasopharyngeal carcinoma, 1 muscular tumor, 1 neuroendocrine tumor and 3 liver cancer. There were 1 melanoma, 1 fibrosarcoma, 4 thyroid cancer, 2 ovarian cancer, 3 kidney cancer, 4 gastrointestinal tumors, 5 breast cancer, and 16 lung cancer.

Treatment methods: In the control group, 10 cases were treated with primary disease surgery, 12 cases were treated with chemotherapy + surgery, 13 cases were treated with radiotherapy + surgery, 10 cases were treated with radiotherapy + chemoradiotherapy, and 1 case was treated with radiotherapy or chemotherapy alone. In the experimental group, 8 cases of primary disease were treated with surgery, 11 cases with chemotherapy + surgery, 12 cases with radiotherapy + surgery, 13 cases with surgery + chemoradiotherapy, and 2 cases with radiotherapy or chemotherapy alone.

Inclusion criteria: (1) meet clinical diagnostic criteria; (2) Family members and patients sign informed consent; (3) can communicate normally; (4) No abnormal coagulation function.

Exclusion criteria: (1) mental disorder; (2) Abnormal coagulation function; (3) Withdrawal from the study; (4) There are contraindications of chemoradiotherapy.

2.2. Method

(1) Control group - routine nursing: patients in this group were given simple cognitive education, clinical symptoms were monitored, and routine psychological counseling was given.

(2) Experimental group - personalized nursing under the characteristics of perioperative nursing: ① Perioperative nursing characteristics: a. Psychological state: patients have heavy psychological burden before surgery, especially some patients have less understanding of the operation, so that they have fear and worry about the treatment of the disease, which affects the treatment compliance of patients; In addition, postoperative patients are prone to complications, unable to autonomously activity in the short term, poor long-term efficacy, and patients are prone to negative emotions, depression and even suicidal tendencies after surgery. Therefore, it is extremely important to implement perioperative psychological counseling for patients. b. Preoperative preparation: Due to the fact that most patients with brain metastases are older patients and their body status is not as good as that of young people, blood vessels are prone to shrimp and wilted during radiotherapy and chemotherapy, which is easy to induce multiple puncture and unsuccessful puncture, resulting in unsatisfactory chemotherapy effect. c. Living conditions: most patients have insufficient sleep, resulting in excessive tension to ensure a good state; In addition to the lack of understanding of diet, patients will also have a high-fat and high-salt diet during daily eating, which is easy to affect their digestive function and cause constipation.. d. Intracranial pressure rise: patients with brain metastases have no obvious changes in the pupils during the rise in intracranial pressure, and most of them will have some neurological symptoms, such as convulsions, limb weakness, lethargy, unsteady gait, urinary incontinence, vomiting, severe pain, etc. Coupled with the influence of the patient's body, the patient cannot express discomfort in time, resulting in delay of the condition and increasing the difficulty of treatment. e. Postoperative complications: Patients with brain metastases are prone to complications such as lung infection, pressure sores, venous thrombosis, etc., especially if the patient stays in bed for a long time, it will lead to poor blood circulation and increase the risk of venous thrombosis and pressure sores. Patients do not have the ability to take care of themselves, resulting in improper health management of patients, easy to appear lung infection. ② Personalized nursing measures: a. Psychological nursing: preoperative visits are required to understand the emotional changes and cognition of patients, give patients treatment procedures and treatment safety education, eliminate patients' fear and strangeness, lead patients to understand the hospital environment, and enhance patients' trust; After the operation, it is necessary to explain the therapeutic effect and process, give the patient verbal encouragement and spiritual encouragement, and improve the patient's rehabilitation self-confidence; Instruct family members to give emotional support to patients, and eliminate patients' anxiety and depression. b. Preoperative vascular intervention: The vascular status of patients should be observed before venipuncture, and warm compress should be applied to the location of vascular puncture in advance to effectively reduce the pain and discomfort of patients and ensure the success rate of puncture. c. Life guidance: Guide patients to maintain good sleep habits before surgery, and soak their feet and

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drink warm milk before going to bed to create a quality sleep environment for patients and keep the environment quiet; Diet should guide patients to eat high-fibrosis food, low salt, low fat, low sugar diet, eat more sweet potatoes, kelp, radish, celery, leek and other foods, to prevent constipation in patients. d. Intracranial pressure control: It is necessary to observe the increase of the intracranial pressure of the patient, raise the head of the bed 30°, reduce the amount of return blood in the jugular vein, so as to achieve the purpose of reducing the intracranial pressure; Excessive ventilation of the ventilator can reduce the partial pressure of carbon dioxide, and the reduction of the partial pressure of carbon dioxide can make the cardiovascular and cerebrovascular contraction, and the cerebral blood flow will be reduced, so as to achieve the purpose of reducing the intracranial pressure. Direct lumbar puncture releases cerebrospinal fluid to reduce intracranial pressure. The main drugs to reduce intracranial pressure are to increase osmotic pressure, so that sodium and water are discharged from the urine. The common osmotic diuretics are mannitol and furosemide (Furosemide). e. Prevention of postoperative complications: Pay attention to the basic care and life care of patients after surgery, assist patients with postoperative passive and active activities, guide patients to wear anti-thrombotic elastic socks, and prevent patients from developing lower limb vein thrombosis; Observe the patient's oral status, guide the patient to gargle regularly, pay attention to oral hygiene, learn how to effectively expel sputum, help the patient turn over and buckle the back, thus preventing the emergence of lung infection. At the same time, soft pads should be placed at the location of the patient's bone prominences and the status of the patient's skin tissue should be checked regularly to avoid pressure sores in the patient. F. Nutritional support and nursing: Strengthen nutritional support for patients with anemia and hypoproteinemia, formulate diet plans according to patients' conditions, guide patients to eat a high-protein diet, and provide nasal feeding or intravenous nutritional support when necessary. For patients with hyponatremia and hypokalemia, electrolyte should be supplemented in time according to the doctor's advice, blood samples should be taken regularly, the results of blood sodium and blood potassium should be continuously monitored, and the changes of patients' condition should be closely observed. For intracranial infection, cooperate with doctors to indent lumbar cisternectomy drainage tube, timely send cerebrospinal fluid culture, use antibiotics rationally according to drug sensitivity test, pay attention to window ventilation, strengthen hand hygiene, and prevent cross infection.

2.3. Observation index

(1) Nursing satisfaction: The incidence of patients being very satisfied, relatively satisfied, generally satisfied and dissatisfied was recorded.

(2) Quality of life: The quality of life of patients was observed.

(3) Postoperative complications: The incidence of pressure ulcers, venous thrombosis and pulmonary infection were calculated.

(4) Psychological state: SAS and SDS of patients were explored.

(5) Medication compliance: Check the patient's clinical compliance, including very compliance, general compliance, non-compliance.

2.4. Statistical significance

The analysis data were analyzed using SPSS 23.0 software, with a percentage (%) to describe the counting data, and the comparison between groups was conducted by x2. The measurement data were described by (±s), and the independent sample t test or paired t test was used for comparison between groups. $P<0.05$ was considered statistically significant.

3. Results

3.1. Nursing satisfaction

The satisfaction data of the experimental group was higher than that of the control group, $P < 0.05$.(As shown in table 1)

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Table 1: Comparison of nursing satisfaction between the two groups.

Group	Number of casea	Very satisfied	Quite satisfied	Somewhat satisfied	Dissatisfied	Degree of satisfaction
Control group	46	16	10	10	10	78.3%
Experimental group	46	25	15	5	1	97.8%
X^2		-	-	-	-	8.3636
P		-		-	-	<0.05

3.2. Quality of life

The quality of life in control group was worse, $P < 0.05$.(As shown in table 2)

3.3. Postoperative complication

The number of complications in the control group was higher than that in the experimental group, $P < 0.05$. (As shown in table 3)

Table 3:Complications of the two groups (%)

Group	Number of casea	Pulmonary infection	Pressure sore	Venous thrombosis	Complication rate
Contrl group	46	2	2	2	13.0%
Experimental group	46	0	0	1	2.2%
X^2		-	-	-	3.8655
P		-	-	-	<0.05

3.4. Mental state

There was no difference before intervention, $P > 0.05$; After intervention, the psychological status of the experimental group was better than that of the control group, $P < 0.05$.(As shown in table 4)

Table 4:Evaluation scores of anxiety and depression before and after intervention of patients in the two groups.

Group	Number of casea	Before inclusion		After joining the group	
		SAS	SDS	SAS	SDS
Contrl group	46	43.22±1.45	45.27±2.87	41.22±1.66	42.66±1.02
Experimental group	46	43.15±1.32	45.19±2.54	32.78±0.52	31.74±0.58
t		0.2421	0.1415	32.9068	63.1198
P		＞0.05	＞0.05	<0.05	<0.05

3.5. Medication compliance

The data of medication compliance in the experimental group was higher than that in the control group, $P < 0.05$.(As shown in table 5)

Table 5:Comparison of medication compliance between the two groups.

Group	Number of casea	Very dependent	General compliance	Noncompliance	Compliance
Contrl group	46	26	10	10	78.3%
Experimental group	46	40	5	1	97.8%
X^2		-	-	-	8.3636
P		-	-	-	<0.05

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4. Discuss

At least 30% of cancer patients have brain metastases, once the occurrence of brain metastases will increase the risk of death of patients, and two-thirds of patients have multiple metastases. Other studies have suggested that there are about 150,000 patients with brain metastases in the world every year, and the incidence of brain metastases has shown an upward trend in recent years. Metastatic brain tumor refers to a tumor formed when malignant tumor cells originating in other parts of the body metastasize to the brain through the blood or lymphatic system [4]. This type of brain tumor can cause a variety of symptoms, which can vary depending on the location, size, and growth rate of the tumor. Patients may suffer from headache, visual impairment, epilepsy, neurological dysfunction, mental disorders, motor dysfunction, etc., and more symptomatic interventions such as surgery and chemoradiotherapy are taken clinically. The quality of life of patients will be affected during the treatment period, and the demand for perioperative nursing is greater.

Under normal circumstances, routine nursing intervention is usually adopted in clinical practice, but patients have strong discomfort and pain during treatment. In addition, patients have less understanding of treatment procedures and safety, and often have poor compliance and mood, which cannot guarantee the rehabilitation effect of patients [5]. Conventional nursing model is widely used in clinical practice, but it does not meet the nursing needs of patients. The implementation of personalized nursing is based on the characteristics of patients' perioperative nursing, takes patients as the core of nursing, pays attention to the comprehensiveness and effectiveness of nursing, and actively improves the implementation effect of nursing. Perioperative nursing of patients with brain metastatic tumor is characterized by psychological state, preoperative preparation, living conditions, complications, intracranial pressure changes, nutritional status, etc. Patients are often accompanied by poor cognition and poor mood before surgery, leading to poor compliance and affecting the quality of rehabilitation of patients. Personalized nursing is adopted to provide patients with preoperative psychological counseling and postoperative psychological intervention, actively eliminate patients' bad emotions, and guide patients to maintain good rehabilitation self-confidence. At the same time, the eating habits and sleeping habits of patients with brain metastatic tumor are poor, and it is necessary to guide them to maintain adequate sleep and good diet during personalized care, eat more high-fibrosis foods, avoid eating high-fat and high-salt foods, and prevent constipation and mental tension in patients. In addition, older patients have poor blood vessel status, so preoperative vascular observation and warm compress should be done in advance to ensure puncture effect and success rate. During the period of paying attention to the nutritional status of patients, corresponding interventions should be taken according to the time situation of patients to restore the physical function of patients. The risk of postoperative complications is higher in patients with brain metastases, and hygiene guidance and oral hygiene management should be done to prevent pulmonary infection after surgery. The lower extremity status of patients was observed regularly to avoid the occurrence of lower extremity venous thrombosis. The prevention of pressure ulcers can provide soft or air mattress for patients with brain metastatic tumor who are bedridden for a long time, and regularly observe the skin tissue status of patients, improve the rehabilitation quality of patients, and reduce the risk of pressure ulcers. According to the results of this experiment, the satisfaction data of the experimental group was higher than that of the control group, and postoperative complications, medication compliance, quality of life and negative emotion scores of the experimental group were better than those of the control group, $P < 0.05$. It can be seen that after the implementation of personalized nursing, patients' quality of life and nursing satisfaction are significantly increased, which can help patients reduce complications and improve surgical safety. At the same time, before the implementation of personalized nursing, based on the nursing needs of patients, the cognition of patients is actively improved, the negative emotions of patients are alleviated, and the rehabilitation self-confidence of patients is enhanced, thus ensuring the nursing satisfaction and clinical compliance of patients, and enhancing the trust in medical staff [6].

In summary, the implementation of perioperative nursing characteristics and personalized nursing for patients with brain metastases can improve the quality of life of patients, ensure the efficiency of disease rehabilitation, reduce the occurrence of complications, promote the patient's nursing satisfaction and clinical compliance, improve the patient's understanding of the disease, reduce the patient's anxiety and depression, and guide the patient to maintain a positive attitude.

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Table 2:Quality of life scores of the two groups.

Group	Number of casea	Mental health	Somatic role	Somatic function	Social function	Emotional role	General state of health	Invigoration	Somatic pain
Contrl group	46	46.53±2.67	40.34±2.05	49.67±3.82	41.22±4.31	42.65±3.15	49.65±4.38	51.25±1.98	56.76±3.11
Experimental group	46	58.94±3.82	61.45±4.98	63.73±5.79	55.67±6.59	67.77±3.23	70.22±1.35	67.84±2.54	70.49±4.33
t		18.0595	26.5855	13.7472	12.4461	35.7173	30.4391	34.9376	17.4674
P		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05