

## EFFECT OF NURSING INTERVENTION ON THE PERIOPERATIVE STRESS RESPONSE IN GLIOMA PATIENTS

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### ABSTRACT

**Objective:** To study the effect of nursing intervention on perioperative period stress response of glioma patients.

**Methods:** The clinical data of glioma patients undergoing surgery in our hospital were retrospectively analyzed and divided into two groups according to different nursing methods. The control group was given routine nursing. The observation group was given standardized nursing intervention on the basis of the control group. The clinical indicators, psychological status and pain scores were compared between the two groups.

**Results:** The heart rate and systolic blood pressure in the observation group before and after the surgery were lower than those in the control group, and the differences were statistically significant.

**Conclusion:** Nursing intervention has a positive effect on the perioperative stress response of glioma patients. It can maintain the stability of vital signs, improve the patient's psychological state and effectively reduce the pain, which is worthy of clinical promotion.

**Keywords:** Glioma, Perioperative Period, Nursing Intervention, Stress Response.

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### Introduction

Glioma is the most common primary brain tumor resulting from the cancerous changes of the brain and spinal glial cells (see Figure 1). The annual incidence is about 3-8 people per 100,000 population<sup>(1)</sup>. Like other tumors (diseases), gliomas are also caused by an interaction between innate genetic risk factors and environmental carcinogenic factors. Some known genetic diseases, such as neurofibromatosis (type I) and tuberous sclerosis, are genetic susceptibility factors for gliomas<sup>(2)</sup>. From the perspective of pathology, gliomas are caused by carcinogenic mutations (or combination of mutations) on the level of cell genetic material (DNA) and epigenetic material under the interaction of internal genetic susceptibility factors and external environmental factors; these mutation drive cells enter the cell cycle for mitosis, evading apoptosis, evading contact inhibition of cell growth, evading immune suppression, etc., and enabling cells to obtain energy

metabolism abnormalities that are compatible with sustained growth, inducing tumor neovascularization, hypoxia, necrosis and other changes<sup>(3)</sup>.

The molecular changes corresponding to the clinical and cytopathological features of different grades of gliomas are also different. For example, low-grade gliomas are mainly characterized by low-speed cell division hyperplasia, while high-grade gliomas are characterized by high-speed cell division hyperplasia, accompanied by neovascularization and hypoxia and necrosis of tumors.

Correspondingly, low-grade gliomas often have no activation of molecular pathways such as HIF-1 and VEGF and high expression at the molecular level<sup>(4)</sup>. It is worth noting that although the brain is considered to be an organ, in which, under normal physiological conditions, the cells almost do not divide and proliferate, but at certain times and conditions, there will be some cell division in the brain central organ. For example, in childhood, there is division of neurons.



**Figure 1:** DMedical imaging results of a patient with brain glioma.

Therefore, in childhood, neuron-derived tumors, such as medulloblastoma, have a higher incidence than those of adults. However, this does not mean that the occurrence of cell division has the possibility of canceration. Because, in most cases, the mutations that occur in the process of cell proliferation can be corrected by the “stabilization” function of the cell molecule; if it cannot be corrected, the cells will initiate the apoptotic pathway, causing the mutated cells to spontaneously die. It can be seen that the occurrence of gliomas is an accidental event of a small probability<sup>(5)</sup>. Low-grade gliomas may “accumulate” new mutations during cell proliferation, leading to a shift to high-grade gliomas (malignancy).

In order to systematically understand the molecular etiology of gliomas, the United States launched a molecular genetic mapping project for gliomas in 2008. By sequencing the DNA of gliomas, it was found that for every average glioblastoma, it has 5 molecular mutations, among which, NF gene is the most common tumor suppressor gene; EGFR is the most common proto-oncogene<sup>(6)</sup>. These molecular mutations drive the expression of various signaling pathways and constitute the molecular basis for the development and progression of gliomas<sup>(7)</sup>.

Surgery is one of the effective methods for treating gliomas<sup>(8)</sup>. However, the pain or trauma caused by surgery and the emotions that the patients are faced with during surgery can easily lead to physiological or psychological stress responses, ultimately affecting the surgical results, therefore, it is especially important to give patients active nursing interventions<sup>(9)</sup>. In this study, 46 patients with gliomas who underwent perioperative nursing

intervention were compared with 46 patients undergoing routine nursing in order to provide reference for future clinical care plans<sup>(10)</sup>. The results are reported as follows.

## Experiment

### General information

The data of 92 patients with gliomas undergoing surgical treatment from January 2014 to January 2015 were retrospectively analyzed and divided into observation group and control group according to different nursing methods, 46 cases each. The observation group male to female ratio is 24:22, ages are 24-65 years, average age is  $(44.52 \pm 0.31)$  years old, body masses are 48-62 kg, average mass is  $(55.10 \pm 0.42)$  kg; control group male to female ratio is 25:21, ages are 25-67 years old, average age is  $(45.03 \pm 0.89)$  years old, body masses are 47-63 kg, average mass is  $(54.92 \pm 0.51)$  kg. There was no significant difference in baseline data between the two groups ( $P > 0.05$ ).

### Methods

Control group: nursing staff provided routine gliomas nursing for patients before and after the surgery to strengthen their physical function exercise and improve self-care abilities<sup>(11)</sup>.

*On this basis, the observation group:*

- Before the surgery, nursing staff introduces the basic knowledge of the disease and the basic surgical procedures to the patient in an easy-to-understand language, and enumerates cases of post-operative rehabilitation patients to relieve their anxiety and fear.

- Nursing staff actively cooperates with the doctors during the surgery and asks the patients whether they have discomfort and teaches them how to relax.

- After the surgery, nursing staff strengthens inspections, pays attention to changes in the patient's emotions and conducts corresponding psychological counseling, instructs the patients' functional recovery training and observes and records the conditions, satisfies their reasonable requirements as much as possible.

Observing indicators and judgment criteria: record heart rate and systolic blood pressure changes of the two groups at the time of admission, 1d before surgery, inserting inhaling tube, by the end of the surgery and 1d after surgery; according to the self-rating anxiety scale and self-rating de-

pression scale (SAS & SDS) to evaluate the mental status of the patients, with 50 as the critical value, the score is inversely proportional to the degree of emotion. According to the visual analogue pain scores (VAS) to give scores: 0-3 for mild pain, 4-6 for moderate, and 7-10 for severe.

Statistical processing: the data was processed by SPSS 20.0 statistical software. Measured data was expressed as the mean standard deviation ( $\bar{x}\pm s$ ). Within and between groups, the t-test was used for comparison, and the count was expressed as a percentage (%). The  $X^2$  test was used.  $P<0.05$  indicates statistically significant difference.

**Results and discussion**

The results of the questionnaire showed that, the awareness rate of glioma nursing knowledge of the patients and their families in the two groups are shown in Table 1. The awareness rate of glioma nursing knowledge of the patients and their families in the observation group is significantly higher than that of the control group, there was a significant difference between the two groups ( $P<0.05$ ), and it's of statistical significance<sup>(12)</sup>.

Groups	n	Known	Unknown	Awareness rate
Control group	46	26	20	62.0%
Observation group	46	29	15	87.9%

**Table 1:** Comparison of awareness rate of nursing knowledge in two groups.

Comparison of the psychological status of the two groups: the SAS and SDS scores of the observation group were significantly lower than that of the control group, and the differences were statistically significant ( $P<0.05$ ), as shown in Table 2.

Groups	SASA	SDS
Observation group	32.10±10.75	31.26±11.14
Control group	43.27±8.39	39.12±10.58

**Table 2:** Comparison of the psychological status of the two groups (n=46,  $\bar{x}\pm s$ , points).

Comparison of the clinical indicators of the two groups: for the two groups of patients, their heart rate and systolic blood pressure at the time of

1d before surgery, inserting inhaling tube, and by the end of surgery were all higher than that at the time of admission, but the indicator values of the observation group are all lower than that of the control group, and the difference is statistically significant ( $P<0.05$ ), see Table 3.

Groups	Project	On admission	1h before surgery	Suction tube	End of surgery	1h after operation
Observation group	Heart rate	59.91±10.48	77.90±11.86	79.02±10.78	86.29±12.91	68.37±10.92
	Systolic pressure	97.32±14.87	124.31±15.19	126.53±17.94	118.31±13.92	116.58±17.79
Control group	Heart rate	60.15±9.84	91.85±14.76	91.30±11.99	86.30±12.87	77.12±13.68
	Systolic pressure	98.10±13.95	136.67±17.28	140.21±15.36	130.25±16.79	129.45±15.32

**Table 3:** Comparison of two groups of clinical indicators ( $\bar{x}\pm s$ , n = 46).

The pain scores of the two groups were compared: postoperative VAS score of the observation group is (2.75±0.46), which is lower than the control group (4.13±1.02), and the difference is statistically significant ( $P<0.05$ ).

Groups	Very satisfied	Satisfied	Displasure	Satisfaction rate
Observation group	22	14	10	36%
Control group	15	16	15	24%

**Table 4:** Comparison of two sets of nursing satisfaction.

Groups	Excellent	Good	Poor	Excellent rate
Observation group	25	19	2	95.65%
Control group	22	18	6	86.96%

**Table 5:** Comparison of nursing rate of nurses in two groups.

According to the questionnaires released before, there was a significant difference in the satisfaction of patients and their families in nursing interventions ( $P<0.05$ ), which has statistical significance, as shown in Table 4. At the same time, there is a certain gap between the two groups of nursing intervention personnel's attitude rate, as shown in Table 5.

## Conclusion and prospect

Glioma is a common primary brain tumor caused by canceration of the brain and spinal cord glial cells, accounting for up to 40%-50% of malignant tumors in the brain. Surgery is one of the main factors for the patient's stress response. This study mainly analyzed the clinical indicators, psychological status and pain scores in order to explore the effect of nursing intervention on perioperative period stress response in patients with brain gliomas. Surgical stress is a special kind of stress phenomenon. Most patients think that surgery is a type of negative event. Although patients usually have some psychological preparation before admission, there is still a strong stress response before surgery, and the intraoperative stress response can last until after the surgery. Therefore, it will not only affect the patient's life, but also may directly affect the patient's health.

The data from this study showed that after nursing, the SAS and SDS scores of the observation group were lower than those of the control group, suggesting that the standardized and systematic nursing intervention is superior to conventional nursing in reducing the psychological stress of glioma patients undergoing surgical treatment.

Considering that the above generated results are closely related to the perioperative nursing performed by the nursing staff for the observation group from many aspects, such as psychological and language; preoperatively, the nursing staff should actively communicate with the patients and care about the patient's in-patient life helps to reduce the patients' unfamiliarity with the environment. Using an easy-to-understand language to educate patients about health can raise their awareness of disease; introducing surgical procedures and informing patients of intraoperative attention can enhance patient compliance; enumerating cases of postoperative recovery is conducive for patients to build confidence of treatment, ease fears, anxiety and other negative emotions; after the surgery, paying attention to the emotional changes in patients and giving corresponding instruction is conducive to rehabilitation training.

At the same time, the results showed that, for the two groups of patients, their heart rate and systolic blood pressure at the time of 1d before surgery, inserting inhaling tube, and by the end of the surgery were all higher than that at the time of admission, which means that the surgery will cause physiological stress response to the patients, however, the

increase of the indicator values in the observation group was significantly less than that in the control group, therefore, it can be seen that perioperative application of standardized and systematic nursing interventions in glioma patients is conducive to maintaining the stability of their vital signs. This is similar to the literature research results obtained by previous researchers, which can further confirm the feasibility and effectiveness of nursing intervention in reducing perioperative physiological stress response in glioma patients. The reason for this is that the nursing staff's psychological care of the patients helps them to adjust their mentality, and teaching the patient how to relax during the operation is beneficial to relieve their body stress. In addition, the results of this study showed that the VAS score in the observation group was  $(2.75 \pm 0.46)$  points, which was less than the  $(4.13 \pm 1.02)$  points in the control group, indicating that the glioma patients receiving scientific and standardized nursing intervention during the perioperative period is helpful for relieving the pain, we presume that it's because the patients received good nursing before, during and after the surgery, which make their body relax, the physiological stress decrease, and the functional recovery training is normal. The long-term clinical practice found that: after nursing, the scores of qualities of life in the observation group were better than those in the control group, indicating that perioperative nursing intervention for glioma can effectively improve the quality of life of patients, and scientific and reasonable nursing intervention can effectively improve the treatment effect. Due to limitation of factors such as the environment, time, and sample size, the results of this study and the degree of patient satisfaction with the nursing service in this hospital need to be further verified or explored.

In summary, perioperative nursing intervention for glioma patients can reduce physical and psychological stress responses, maintain stable vital signs and relieve pain, which is of practical value.

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