

## Case Control Study

**Effects of nursing care in fast-track surgery on postoperative pain, psychological state, and patient satisfaction with nursing for glioma**

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**Abstract****BACKGROUND**

The brain is the most complex organ in the human body. Treatment for a glioma always involves a multi-disciplinary team. Nursing care in fast-track surgery or enhanced recovery after surgery is such kind of work implemented by an interdisciplinary team to provide services to patients to improve their outcomes.

**AIM**

To explore the effects of nursing care in fast-track surgery on postoperative pain, psychological state, and patient satisfaction with nursing for glioma.

**METHODS**

From June 2018 to June 2020, 138 patients who underwent operation for glioma at Cancer Hospital Affiliated to Chongqing University were selected. They were categorized into groups according to different nursing care that they received. Of them, 69 patients receiving nursing care in fast-track surgery were included in an experimental group, and 69 patients receiving conventional postoperative nursing were included in a control group. Visual analogue scale was used to evaluate postoperative pain in the two groups immediately after the operation and at 3 d after the operation. Self-rating anxiety scale (SAS) and self-rating depression scale (SDS) were used to evaluate the psychological status of patients immediately after operation and on the 3<sup>rd</sup> postoperative day. A self-made satisfaction scale for patient satisfaction with nursing was used to evaluate and compare patient satisfaction with nursing between the two groups.

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## RESULTS

Time to excretion, time to out-of-bed activities, and length of hospital stay were significantly shorter in the observation group than in the control group ( $P < 0.05$ ). There was no significant difference in duration of operative time or intraoperative bleeding between the two groups ( $P > 0.05$ ). There was no significant difference in postoperative pain score between the two groups ( $P > 0.05$ ). The pain score was significantly lower in the observation group than in the control group at 3 d after the operation ( $P < 0.05$ ). There was no significant difference in postoperative SAS or SDS score between the two groups ( $P > 0.05$ ). SAS and SDS scores were significantly lower in the observation group than in the control group at 3 d after operation ( $P < 0.05$ ). The rate of patient satisfaction with nursing was 94.2% in the observation group, which was significantly higher than that (81.2%) of the control group ( $P < 0.05$ ).

## CONCLUSION

Nursing care in fast-track surgery can relieve postoperative pain, anxiety, and depression, and improve patient satisfaction with nursing in patients with glioma, which is worthy of clinical application.

**Key Words:** Nursing care in fast-track surgery; Glioma; Visual analogue scale; Self-rating anxiety scale; Self-rating depression scale

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**Core Tip:** Surgery is the most common initial treatment for gliomas. How to reduce patients' surgical stress response, optimize organ function, and facilitate their recovery is an important question. Nursing care in fast-track surgery may help to solve the problem. The present study reported the benefits of nursing care in fast-track surgery in patients with glioma. It was found that this kind of service shortened the time to excretion, time to out-of-bed activities, and length of hospital stay, relieved pain, lessened unhealthy emotions, and improved patient satisfaction.

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## INTRODUCTION

Glioma is a common central nervous system disorder and represents nearly 50% of all central nervous system diseases[1-3]. The complex condition of gliomas raises high demand on operation and its rapid postoperative progression places high demand on nursing strategies[4-7]. Nursing care in fast-track surgery also known as enhanced recovery after surgery is an ideal choice for nursing due to its characteristics of phased and early rehabilitation intervention, recovery of function, correcting disturbance to homeostasis, and maintaining function for organs to improve the efficacy of surgical treatment, increase the success rate of treatment, and reduce the clinical mortality[8,9]. Nursing care in fast-track surgery applied after the surgery can effectively promote postoperative rehabilitation, lessen postoperative trauma and stress disorder, relieve the effect of anesthesia-induced injury on psychological and emotional health, and accelerate early rehabilitation[10-13]. The present study investigated nursing care in fast-track surgery in patients with glioma and discuss its effects on postoperative pain, psychological state, and patient satisfaction.

## MATERIALS AND METHODS

### General information

One hundred and thirty-eight patients who underwent surgery for glioma at Cancer Hospital Affiliated to Chongqing University were selected between June 2018 and June 2020. They were categorized into groups based on nursing care that they received. Of them, 69 patients receiving nursing care in fast-track surgery were included in an experimental group and 69 patients receiving conventional nursing after the surgery were included in a control group. All the patients were diagnosed with glioma by imaging examination and laboratory test. Patients in fair condition without communication or perception disorders or other major illnesses were eligible for this study. All the participants provided written informed consent. The exclusion criteria included patients with complications of severe cardiopulmonary or kidney disorders, patients who cannot tolerate surgery, patients with severe psychological disorders or poor compliance, and patients with other malignant tumors. In the experimental group, 39 patients were male with an average age of  $39.22 \pm 10.21$  (range, 20 to 56) years. In terms of tumor sites, 33 patients had glioma of the right frontal lobe, 20 had glioma of the right temporal pole, 9 had glioma of the right polar occipital lobe, and 7 had glioma of the left frontal lobe. The tumor had an average size of  $4.78 \pm 0.11$  (range, 2 to 6) cm in diameter. The average course of disease was  $157.41 \pm 37.55$  (range, 11 to 272) d. In the control group, 37 patients were male and the average age was  $39.73 \pm 11.09$  (range, 21 to 57) years. For the tumor sites, 34 patients had glioma of the right frontal lobe, 19 had glioma of the right temporal pole, 7 had glioma of the right polar occipital lobe, and 9 had glioma of the left frontal lobe. The average tumor size was  $5.11 \pm 0.35$  (range, 2 to 6) cm. The average course of disease was  $163.17 \pm 38.04$  (range, 12 to 285) d. There was no statistically significant difference in variables such as gender, age, tumor sites, and course of disease between the two groups ( $P > 0.05$ ).

### Nursing care delivery strategies

In both groups, patients underwent surgery for glioma. Based on this, the experimental group received nursing care in fast-track surgery and the control group received conventional nursing. Nursing care in fast-track surgery included: (1) Preoperative health education. Before the operation, an effective communication was carried out between clinicians and nurses and patients and their family members, informing the latter information on their diseases such as causes of diseases, potential operational risks, necessity of surgery, potential complications, and corresponding interventions. By communication, the patients' psychological state was known well, their personality traits were analyzed, and their knowledge about their disease was assessed pertinently to let them keep an optimistic attitude toward the treatment outcomes; (2) Intraoperative cooperation. During the operation, the patients should cooperate with clinicians and nurses' treatment and clinicians and nurses should closely monitor the changes in vital signs, protect patient privacy, and maintain appropriate body temperature for the patients; and (3) Postoperative nursing care. First, urinary catheter was removed as early as possible based on the recovery of patients. Generally, extubation was feasible at 6 h after the surgery. Second, patient consciousness, heart rate, blood pressure, and breathing, as well as the color, nature, and volume of drainage, were primarily observed to discover the occurrence of possible complications promptly. Third, prophylactic patient controlled analgesia pump combined with nonsteroidal anti-inflammatory drugs was administered to patients for postoperative analgesia before the anesthetic effect disappeared completely. Moreover, pain was assessed regularly. In patients whose pain score was above 3 to 4, analgesia strategies should be adjusted timely. Fourth, patients received a volume-controlled infusion with daily intake not exceeding 1500 mL. Fifth, patients should recover oral feeding as early as possible based on the rehabilitation efficacy. Nursing care in the control group included wound care, urinary catheter care, and gastric tube care, and meanwhile postoperative complication monitoring, such as postoperative bleeding and pulmonary infection. Intensive monitoring was provided by the nurses who should report any abnormality without delay and help the clinicians with the management[14,15].

### Measures

First, postoperative rehabilitation outcomes and pain score were compared between the two groups. Visual analogue scale was used to assess pain score at 3 d after the surgery on a 0 to 10 scale to assume 0 represents no pain and 10 represents unbearable pain. Second, postoperative psychological state was compared between the two

groups. Self-rating anxiety scale (SAS) and self-rating depression scale (SDS) were used to evaluate psychological state immediately and at 3 d after the surgery. The higher the SAS and SDS scores, the more severe the symptoms. Third, patient satisfaction with nursing was compared between the two groups. For patient satisfaction survey, the patients rated the nursing that they received based on their feeling involving the attitude of the nurses, their operating skills, knowledge mastery, comfort, satisfaction with the environment, *etc.* The survey included 25 questions and every question had four options, namely, dissatisfied, partly satisfied, satisfied, and highly satisfied on a 1 to 4 scale. The maximum score on this survey was 100 points. Scores of  $\leq 59$ ,  $> 59$  but  $\leq 79$ , and  $> 79$  represented dissatisfaction, satisfaction, and high satisfaction, respectively. Satisfaction rate was calculated as (number of satisfied patients + number of highly satisfied patients)/total number of patients  $\times$  100%.

### Statistical analysis

SPSS22.0 was used to analyze the data in the study. Quantitative data are reported as the mean  $\pm$  SD and Student's *t* test was used to compare the difference between the two groups. Dichotomous data are reported as percentages and  $\chi^2$  test was used to compare the difference between the two groups.  $P < 0.05$  represented that there was a significant difference.

## RESULTS

In terms of postoperative rehabilitation outcome, time to excretion, time to out-of-bed activities, and length of hospital stay were significantly shorter in the observation group than in the control group ( $P < 0.05$ ; Table 1). However, there was no significant difference in intraoperative bleeding between the two groups ( $P > 0.05$ ).

For pain score immediately after the operation, there was no significant difference between the two groups ( $P > 0.05$ ). At 3 d after the operation, pain score was significantly lower in the observation group than in the control group ( $P < 0.05$ ; Table 2).

No significant difference was observed in SAS and SDS scores between the two groups immediately after the operation ( $P > 0.05$ ). However, SAS and SDS scores were significantly lower in the observation group than in the control group ( $P < 0.05$ ; Table 3).

With regard to patient satisfaction, the satisfaction rate was 94.2% in the observation group, which was significantly higher than that (81.0%) of the control group ( $P < 0.05$ ; Table 4).

## DISCUSSION

The effects of glioma may be devastating due to its complicated condition and fast progression[16,17]. Currently, the primary clinical therapy for glioma was surgical treatment. However, patients are prone to negative emotions including anxiety and depression because of postoperative injuries and this may lead to poor treatment and rehabilitation efficacy and outcomes. Nursing care in fast-track surgery can provide preoperative, intraoperative, and postoperative nursing by using effective comprehensive interventions perioperatively to promote postoperative rehabilitation[18,19]. Moreover, patients' subjective perception of disease was improved by preoperative health education so that patient fear of disease and operation was relieved and patient negative emotions were reduced. At last, patient compliance with treatment was increased[20].

The present study applied nursing care in fast-track surgery in patients undergoing surgery for glioma. The results showed that time to excretion, time to out-of-bed activities, and length of hospital stay were significantly shorter in the observation group than in the control group. Furthermore, pain score and SAS and SDS scores were significantly lower in the observation group than in the control group immediately after the surgery and at 3 d after the surgery. These data imply that nursing care in fast-track surgery can promote postoperative rehabilitation, shorten length of hospital stay, relieve pain and negative emotions, and improve patient satisfaction in patients with glioma. Nursing care in fast-track surgery is a new method in nursing. Based on conventional nursing, it raises correct perception of disease in patients and their family members in different aspects, relieve patient fear of disease, improve quality of nursing, and help patient adapt and recover as soon as possible. In addition, nursing

**Table 1 Comparison of postoperative rehabilitation outcomes**

Group	<i>n</i>	Duration of operative time (min)	Intraoperative bleeding (mL)	Time to excretion (d)	Time to out-of-bed activities (d)	Length of hospital stay (d)
Control	69	73.25 ± 12.35	79.21 ± 17.33	4.82 ± 2.19	5.44 ± 1.02	14.76 ± 4.52
Experimental	69	71.67 ± 11.09	76.45 ± 21.05	3.36 ± 1.06	1.97 ± 0.67	9.53 ± 3.22
<i>t</i>		0.733	0.549	7.655	8.054	12.093
<i>P</i> value		0.454	0.378	0.021	0.017	0.001

**Table 2 Pain score immediately after the operation and at 3 d after the operation**

Group	<i>n</i>	Immediately after operation	3 d after operation
Control	69	4.65 ± 1.52	3.21 ± 0.73
Experimental	69	4.37 ± 1.63	1.25 ± 0.54
<i>t</i>		0.635	5.673
<i>P</i> value		0.364	0.037

**Table 3 Differences in psychological status immediately after the operation and at 3 d after the operation**

Group	<i>n</i>	SAS		SDS	
		Immediately after operation	3 d after operation	Immediately after operation	3 d after operation
Control	69	44.32 ± 11.63	33.04 ± 10.64	41.25 ± 9.53	26.43 ± 6.75
Experimental	69	41.21 ± 13.98	21.67 ± 9.45	38.95 ± 9.16	15.73 ± 5.33
<i>t</i>		0.635	11.635	0.544	12.112
<i>P</i> value		0.364	0.001	0.441	0.001

**Table 4 Comparison of patient satisfaction with nursing between the two groups, *n* (%)**

Group	<i>n</i>	Dissatisfied	Partly satisfied	Satisfied	Highly satisfied	Satisfaction rate (%)
Control	69	5 (7.2)	8 (11.6)	29 (42.0)	27 (39.1)	81.2
Experimental	69	1 (1.4)	3 (4.3)	30 (43.5)	35 (50.7)	94.2
$\chi^2$						6.793
<i>P</i> value						0.031

care in fast-track surgery promote patient recovery in many ways including comprehensively assessing patient condition and emotion, monitoring changes in progression, extubating, encouraging patient to get out of bed and recover patient oral feeding as early as possible, and reducing infusion volume to shorten the length of stay in the hospital[21,22].

To sum up, nursing care in fast-track surgery can relieve postoperative pain and negative emotions of anxiety and depression and raise patient satisfaction with nursing in patients undergoing surgery for glioma. It deserves clinical promotion.

## CONCLUSION

The present study explored the effects of nursing care in fast-track surgery on patients with glioma. These interventions implemented in the preoperative, intraoperative, and postoperative periods show benefits ranging from relieving pain and bad emotions to shortening time to recovery in patients with glioma undergoing surgery.

## ARTICLE HIGHLIGHTS

### Research background

Considerable evidence exists demonstrating that nursing care in fast-track surgery can bring a serial of benefits in patients undergoing surgery. Surgery is an initial treatment for glioma. Nursing care is essential for the postoperative recovery of patients with glioma. To what extent the patients with glioma can benefit from fast-track recovery technique deserves to be discussed.

### Research motivation

To find evidence on the role of nursing care implemented in fast-track surgery in reducing length of hospital stay, time to function recovery, pain, bad emotions, and surgery associated complications in patients with glioma.

### Research objectives

To report the efficacy of nursing care in fast-track surgery in patients with glioma.

### Research methods

The study enrolled 138 patients who underwent surgery for glioma. They were categorized into an experimental group and a control group with 69 patients in each group. The experimental group was given nursing care in fast-track surgery including preoperative patient education, intraoperative patient-clinician-nurse cooperation, and postoperative nursing care and the control group was given conventional nursing after the surgery. Patient outcomes were compared between the two groups.

### Research results

Nursing care in fast-track surgery shortened the time to excretion, time to out-of-bed activities, and length of hospital stay and relieved pain and psychological state at 3 d after the surgery. Moreover, it improved patient satisfaction.

### Research conclusions

Benefits of the enhanced recovery programs were showed and it further improves quality of life in long term post-surgical periods in patients with glioma.

### Research perspectives

In the future, studies should focus on the long-term functional recovery of patients undergoing surgery for glioma under fast-track recovery technique settings.

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