Application Effect of NRS2002 Scale in Perioperative Nutritional Intervention of Patients Undergoing Radical Cystectomy

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Abstract. *Background and aim:* This study aimed to explore the effect of nutritional intervention based on the NRS2002 scale in perioperative nutritional intervention in radical cystectomy for bladder cancer. *Methods:* A total of 65 patients with bladder cancer who were treated in our hospital from January 2019 to January 2020 and who met the inclusion and exclusion criteria were enrolled as the subjects. These patients were randomly divided into a control group and an experimental group. The patients in the control group received routine perioperative nutritional intervention, and the patients in the experimental group were given nutrition intervention based on NRS2002. The quality of life, nursing satisfaction rate, nutritional indexes (serum albumin, transferrin, and prealbumin), and body mass index (BMI) before and after intervention were compared between the two groups. *Results:* The differences in nursing satisfaction rate, sleep, appetite, interpersonal communication, daily activities, and mental state scores between the two groups were statistically significant (P < 0.05). The levels of prealbumin, transferrin, albumin, and BMI in the experimental group were higher than those in the control group, and the differences were statistically significant (P < 0.05). *Conclusion:* The perioperative nutritional intervention based on NRS2002 for patients undergoing total cystectomy can not only significantly improve the perioperative nutritional level and BMI but also improve the quality of life and nursing satisfaction. This is worthy of clinical popularization.

Key words: NRS2002 scale, nutrition intervention, bladder cancer, radical cystectomy, nutritional index

Introduction

Radical cystectomy is an effective method for the treatment of invasive bladder cancer. However, it is highly traumatic and causes many complications, especially in the perioperative period. Patients often suffer from malnutrition, which slows recovery and increases the cost of hospitalization (1). Routine nutritional care cannot find nutritional risks in time and has no systematic and scientific nursing guidance, so it has a poor effect in maintaining the nutritional level of patients. Nutritional risk screening 2002 (NRS2002) is used to evaluate the nutritional level of patients periodically or intermittently. It can not only identify patient malnutrition and provide targeted intervention measures but also eliminate the risk factors of malnutrition, enhance the immune ability of patients, and effectively promote their postoperative recovery (2-3). In the present study, we explore the clinical effect of nutritional intervention based on the NRS2002 scale in perioperative nutritional intervention in radical cystectomy for bladder cancer. It is reported as follows.

Information and methods

General information

In this study, 65 patients who were diagnosed with bladder cancer and underwent radical cystectomy from

January 2019 to January 2020 were enrolled as the study subjects. Inclusion criteria: patients who were confirmed to have myometrial invasive bladder cancer by cystoscopy and computed tomography (CT); patients with indications of total cystectomy; and patients whose hemoglobin (Hb) and serum albumin (ALB) were in the normal range. Exclusion criteria: patients with active hepatitis, renal failure, gastric cancer, and ventricular remodeling; patients with distant metastasis of cancer cells; patients with dysphagia or laryngeal carcinoma; and patients with a history of digestive tract surgery. All patients provided signed informed consent. These patients were randomly divided into the control group and experimental group. There were 25 males and nine females in the control group. These patients were aged 63.57 ± 6.87 years (51–76 years). There were 13 cases at grade T2a, 12 cases at grade T2b, and nine cases at grade T3. There were 23 males and eight females in the experimental group. These patients were aged 63.74 ± 6.85 years (52–75 years). There were 14 cases at grade T2a, 11 cases at grade T2b, and six cases at grade T3. The general data of the two groups were comparable (P > 0.05).

Methods

Patients in the control group received routine nutritional intervention. After admission, the patients were told to quit smoking and drinking and eat light food. They then fasted for eight hours before the operation and were not allowed to drink for two hours before the operation. The patients were given parenteral nutrition according to the doctor's advice. After the patients recovered their gastrointestinal peristalsis function, they were given a semi-liquid diet according to the doctor's advice and gradually shifted to a normal diet. During the period, nurses actively communicated with patients to understand their eating habits and inform them of the harm of bad diets. Food was divided into six portions each day so that the patients could develop the habit of eating a small amount each meal and of eating multiple meals a day. Patients were instructed to choose foods high in protein and carbohydrates, such as dairy products, fish, meat, legume products, and fresh fruits and vegetables, to ensure adequate nutrition before and after the operation.

The patients in the experimental group were assessed with NRS2002 before intervention. In addition to the same perioperative nutritional intervention measures as the control group, the specific measures included the following: (1) nutritional risk assessment and screening. Before the operation and within 24 hours after the operation, nurses used NRS2002 to assess the nutritional risk of patients. The scale includes three aspects: disease severity score (0–3 score), nutritional status impairment score (0–3 score), and age >70 years (1 score). The nutritional risk of patients was assessed according to the total score. If the score is ≥3, it means that there is nutritional risk or malnutrition. Nutritional support should be given, and an examination should be performed once a day. If the score is <3, it means that there is no nutritional risk, and nutritional assessment should be performed 1–2 times a week. If the re-examination score is ≥3, nutritional intervention should be given immediately. (2) The implementation of nutrition intervention: For the patient with a score of ≥3, the screening nurse contacted the nutritionist, and the nutritionist worked with the doctor in charge to formulate the individualized perioperative nutritional intervention plan according to the patient's specific situation. This included daily total caloric requirement, methods of nutritional support, the proportion of energy supplied by different methods, the time and frequency of response and measures, and re-evaluation of adverse reactions in the process of nutritional support. In the early postoperative period, the doctor in charge was informed about patients with a risky NRS score according to the results of laboratory examination. The parenteral nutrition solution composition was adjusted in time. At least two nutrients such as amino acids, fat emulsion, and glucose, were selected to ensure a daily non-protein calorie intake of 42 kJ/kg or above. After the recovery of intestinal function, enteral nutrition was preferred. The tolerance of patients was evaluated and adjusted in time. (3) According to the questions and issues raised by patients and their families during the implementation of nutrition intervention, good health education was given to enhance their compliance, improve the degree of cooperation, and ensure the effectiveness of the intervention.

Observation indexes

(1) The levels of serum albumin (ALB), transferrin (TRF), and serum prealbumin (PAB) were detected and compared before intervention and one week after intervention. The normal ranges are as follows: PAB, 240–350 mg/L; ALB, 35–50 g/L; TRF, 2.2–4 g/L. (2) The body mass index (BMI) of the two groups before and two weeks after the intervention were detected and compared. (3) The quality of life of the two groups was evaluated using the quality of life questionnaire for Chinese patients with cancer who received chemo-biotherapy (QLQ-CCC). This includes interpersonal communication, appetite, sleep, daily activities, and mental state. Each aspect is scored 1–5 points. The higher the score of each life aspect, the higher the quality of life. (4) The satisfaction rate of nursing after intervention was compared between the two groups, where a nursing satisfaction questionnaire was used to analyze the nursing satisfaction of patients, including nutrition risk screening and nutrition diet guidance. A score of 0–59 indicates unsatisfied, a score of 60–88 indicates relatively satisfied, and a score of 89–100 indicates very satisfied. The total satisfaction rate = (the number of satisfied cases + the number of relatively satisfied cases) /the number of total cases × 100%.

Statistical analysis

The data were analyzed using SPSS20.0 statistical software. Count data (%) and measurement data $(X \pm SD)$ were evaluated using X^2 tests and t-tests, respectively. If $P < 0.05$, it was considered that the difference between the two groups was statistically significant.

Results

Comparison of nutritional indexes between the two groups before and after intervention

Before intervention, the levels of PAB, TRF, and ALB of the two groups were comparable $(P > 0.05)$. After intervention, the levels of PAB, TRF, and ALB were higher in the experimental group than in the control group $(P < 0.05$, Tab. 1).

Comparison of BMI between the two groups before and after intervention

Before intervention, the BMI of the two groups was comparable $(P > 0.05)$. After intervention, the BMI of the two groups was significantly improved, and the BMI was higher in the experimental group than in the control group $(P < 0.05$, Tab. 2).

Comparison of quality of life between two groups after intervention

The scores of sleeps, appetite, interpersonal communication, daily activities, and mental state were higher in the experimental group than in the control group $(P < 0.05$, Tab. 3).

Comparison of nursing satisfaction rate between the two groups after intervention

The nursing satisfaction rate was higher in the experimental group than in the control group $(P < 0.05$, Tab 4).

Table 1. Comparison of nutritional indexes between the two groups before and after intervention

Group	n	ALB (mg/L)		TRF (g/L)		PAB (g/L)	
		Before intervention	**After intervention**	**Before intervention**	**After intervention**	**Before intervention**	**After intervention**
Control group	34	186.37±15.87	239.68±10.25	2.09±0.10	2.76±0.05	25.36±2.47	31.38±1.25
Experimental group	31	185.93±16.25	286.34±10.27	2.07±0.11	3.64±0.03	25.47±2.34	39.67±1.76
t		0.05	7.56	0.03	16.58	0.10	6.41
P		>0.05	<0.05	>0.05	<0.05	>0.05	<0.05

Table 2. Comparison of BMI between the two groups before and after intervention

Group	n	Before intervention	After intervention	t	P
Control group	34	20.41±1.26	23.49±0.32	4.17	<0.05
Experimental group	31	20.50±1.30	25.42±0.50	13.95	<0.05
t		0.12	6.50		
P		>0.05	<0.05		

Table 3. Comparison of quality of life between two groups after intervention

Group	n	Sleep	Appetite	Interpersonal communication	Daily activities	Mental state
Control group	34	2.16±0.08	3.02±0.03	2.96±0.11	3.10±0.05	2.83±0.12
Experimental group	31	3.57±0.05	3.94±0.04	3.72±0.27	4.10±0.08	3.97±0.06
t		29.79	49.82	10.11	31.82	16.03
P		<0.05	<0.05	<0.05	<0.05	<0.05

Table 4. Comparison of nursing satisfaction rate between the two groups after intervention

Group	n	Great satisfaction	Fairly satisfaction	Dissatisfaction	Total satisfaction rate
Control group	34	12 (35.29)	13 (38.24)	9 (26.47)	25 (73.53)
Experimental group	31	15 (48.39)	15 (48.39)	1 (3.23)	30 (96.77)
x^2					6.73
P					<0.05

Discussion

The NRS2002 scale is a commonly used nutritional risk screening tool. It is mainly used to evaluate malnutrition of patients and provide a reference for nutritional support in patients with bladder cancer to promote recovery after an operation (4-5). Nutritional intervention based on the NRS2002 scale can comprehensively or continuously evaluate the nutritional status of patients. It can not only screen the risk of malnutrition in time but also develop an individualized nutritional support plan for patients, improve the nutritional indicators of patients, and maintain the normal nutritional level of patients (6-7).

The nutritional intervention mode based on NRS2002 can effectively improve the perioperative nutritional status of patients

Malnutrition is an independent prognostic factor for the poor prognosis of patients with cancer. During the operation, physical output and postoperative repair also need great nutritional support. Malnutrition leads to a decline in the ability of cells and tissues to repair. This leads to the decrease of immune function, damage to the function of tissues and organs, a decrease in the patient's resistance to the disease, an increase in the incidence of complications, a prolonging of hospitalization stay, and affecting the prognosis of patients (8-9). Nutritional support provides patients with the nutrition they need, participates in the regulation of physiological functions of the body, and improves the body's immunity (10).

In past nutrition interventions, doctors, nurses, and nutritionists worked independently. Doctors roughly prescribed nutritional support drugs according to their experience. Nursing staff did not actively make an evaluation and would often give a passive implementation. Although health education on nutrition is also carried out, most focus on the types of diet and ways of eating. There is a lack of individualized guidance for patients' nutritional needs. There is inconsistency in

nutrition assessment between nutritionists and clinical doctors and nurses; thus, patients are often in the embarrassing situation of receiving unreasonable nutrition supplementation. This is where insufficient or unreasonable supplementation is given when supplementation is needed, and excessive supplementation is given when there is no additional demand.

In this study, the NRS2002 scale was used for nutritional screening in perioperative patients undergoing radical cystectomy. Nurses actively evaluated these patients. After finding out the nutritional risk, the team of nutritionists and doctors formulated a reasonable nutritional intervention plan jointly. The nurses provided effective health education and re-evaluation, and the levels of PAB, TRF, and ALB in the experimental group were significantly higher than those in the control group. It is concluded that this nutritional intervention mode can effectively improve the perioperative nutritional status of patients. This result indicates that the early participation of nutritionists may be conducive to the early implementation of scientific and reasonable nutrition intervention. The nutritionist comprehensively evaluated the total caloric requirements of patients according to the serum albumin, intraoperative conditions, and postoperative activities and took the intestinal function and the type of eating into account to formulate the nutritional intervention plan. These are often difficult for clinicians to treat or easy to ignore.

NRS2002 enhances nurses' awareness of active assessment

The NRS2002 scale is an assessment tool commonly used in nutritional risk screening, which requires nurses to take the initiative to evaluate patients to obtain accurate results. This process not only improves nurses' awareness of active assessment of patients but also virtually enhances nurses' concept of active nursing and then incorporates the evaluation and education of patients into their work. In this study, the nursing satisfaction rate was significantly higher in the experimental group than in the control group. This may be due to the use of assessment tools. Nurses emphasized the awareness of active assessment and provided perioperative patients more education and communication to meet the health education needs

of patients better. In this process, patients received nutrition-related knowledge and enhanced nurse-patient communication, which met the patients' needs for nutrition knowledge and relieved the anxiety caused by the disease. Individualized dietary nutrition counseling or education according to the nutritional demands of patients with cancer can effectively prevent the decline of body weight caused by tumor treatment and ensure the smooth progress of treatment with or without supplements (11).

Effective nutritional intervention can enhance the immune function of patients and reduce the incidence of infectious complications. It can also enhance the early out-of-bed activity for patients and reduce the incidence of postoperative complications. Targeted nursing intervention plans can effectively help patients to reduce negative emotions, improve treatment self-confidence, increase patient satisfaction rate, improve the overall treatment effect (12-13), and shorten the length of hospital stays. The NRS2002 scale screens not only high-risk patients but also promotes multidisciplinary collaboration, improves the participation of nutritionists and nurses' awareness of active assessment, and helps them take scientific and reasonable nutrition intervention in time. These will effectively improve the perioperative nutritional status of patients and improve the quality of life and nursing satisfaction rate. It is worthy of clinical reference and popularization.

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