

Effect of rapid rehabilitation nursing on recovery rate of gastrointestinal function and quality of life in elderly patients undergoing radical resection of colorectal cancer

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Objective: To analyze the effect of rapid rehabilitation nursing on the recovery rate of gastrointestinal function and quality of life in elderly patients undergoing radical resection of colorectal cancer. **Methods:** 120 elderly patients with colorectal cancer admitted to our hospital from January 2018 to February 2020 were divided into two groups, the routine group (n = 60) was given routine nursing intervention, and the rapid group (n = 60) was given rapid rehabilitation nursing intervention. Postoperative general condition (including postoperative ambulation, exhausting, defecation, hospital stay and complications), pain degree score, abdominal distension score, gastrointestinal reaction score and changes of serum inflammatory factors were recorded in the two groups. Differences in quality of life were recorded at 1 and 6 months after surgery. **Results:** The general conditions, such as first ambulation, first exhausting, defecation and hospital stay were shorter in the rapid group than those in the routine group, and the incidence rate of postoperative complications was lower in the rapid group than that in the routine group ($P < 0.05$). At 6h after operation, abdominal distension score and gastrointestinal reaction score were similar in the two groups ($P > 0.05$); at 24h after operation, abdominal distension score in the rapid group was lower than that in the routine group ($P < 0.05$), and gastrointestinal reaction score was similar to that in the routine group ($P > 0.05$); at 48h after operation, abdominal distension score and gastrointestinal reaction score in the rapid group were lower than that in the routine group ($P < 0.05$); at 72h after operation, abdominal distension score in the rapid group was lower than that in the routine group ($P < 0.05$), and gastrointestinal reaction score was similar to that in the routine group ($P > 0.05$). At 24h, 48h and 72h after operation, the levels of IL-6 and IL-8 in the two groups were higher than those before operation ($P < 0.05$), and the levels of IL-6 and IL-8 in the rapid group were lower than those in the routine group ($P < 0.05$). At 2h after operation, the VAS scores of the two groups were similar ($P > 0.05$). At 6h, 12h and 24h after operation, the VAS scores of the rapid group were lower than those of the routine group ($P < 0.05$). At 1 month after operation, the scores of cognitive function, role function and emotional function in the rapid group were higher than those in the routine group ($P < 0.05$), and the scores of physical function, social function and general health status were relatively similar to those in the routine group ($P > 0.05$); at 6 months after operation, the scores of ORTCQLQ-c30 in the rapid group were higher than those in the routine group ($P < 0.05$). **Conclusion:** Rapid rehabilitation nursing can promote the postoperative recovery of gastrointestinal function, alleviate the degree of pain, reduce the incidence of complications and improve the quality of life in elderly patients undergoing radical resection of colorectal cancer.

Key words: Rapid rehabilitation nursing; Elderly; Radical resection of colorectal cancer; Gastrointestinal function; Quality of life
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Colorectal cancer is a common malignant tumor of digestive system, which mostly occurs in the elderly. Radical operation is the preferred treatment method ¹. Because the function of various organs and systems in the elderly has physiological decline, often accompanied with such basic diseases as hypertension, diabetes, coronary heart disease and chronic bronchitis in the elderly, the tolerance to radical surgical treatment is poor, and as a result, the risk during perioperative period is large, the postoperative recovery is delayed, and the adverse mood of the patient may be increased to some extent, and the patient often suffers from greater physical and mental distress, resulting in decreased quality of life of the patient ².

Rapid rehabilitation surgery is a popular concept of surgical rehabilitation in recent years. By optimizing perioperative treatment measures, the patient's stress response to surgical trauma shall be relieved, and the postoperative recovery of the patient shall be accelerated, so as to reduce the patient's medical burden ³. Rapid rehabilitation surgery has been applied in many fields, such as

surgery, orthopedics and gynecology. Most of its studies focus on accelerating postoperative recovery and improving quality of life ⁴. There are few reports on the effect of rapid recovery surgery on inflammation-related factors of body in patients with malignant tumor. This study analyzed the effects of rapid rehabilitation nursing on the recovery rate of gastrointestinal function, quality of life and serum inflammatory factors in elderly patients undergoing radical resection of colorectal cancer.

DATA AND METHODS

General data

120 patients (67 males and 53 females; age range from 60 to 78 years, mean (67.96±5.11) years) with elderly colorectal cancer admitted to our hospital from January 2018 to February 2020 were divided into 2 groups according to the intervention method, with 60 cases in each group. There was no significant difference in general data between the two groups ($P>0.05$). See Table 1

Table 1.
Comparison of General Data of Patients in the Two Groups

Group	n	Male / female	Age (years old)	Disease type		
				Sigmoid colon cancer	Rectal cancer	Ascending colon cancer
Routine group	60	32/29	68.23±5.21	21	34	5
Rapid group	60	35/25	67.85±6.02	20	33	7
Group	n	TNM staging			Complication	
		Stage I	Stage II	Stage III	Coronary heart disease	Diabetes / hypertension
Routine group	60	10	29	21	18	11
Rapid group	60	8	33	19	14	15

Inclusion and exclusion criteria

Inclusion criteria: (1) Confirmed by clinical symptoms, physical examination and imaging examination; (2) Age ≥ 60 years and ≤ 80 years; (3) Patients who have not received chemotherapy, radiotherapy or other immunotherapy before operation; (4) Expected survival time > 6 months; (5) Laparoscopic radical resection of colorectal cancer under general anesthesia; (6) Complete clinical data.

Exclusion criteria: (1) Tumor metastasis; (2) Patients with severe psychiatric diseases; (3) Patients with severe cerebrovascular and hemato

poietic diseases; (4) Patients with comprehension disorders; (5) Patients with unstable vital signs.

Methods

The routine group was given routine nursing intervention. During the preoperative visit, the patient was informed of the relevant situation of radical resection of colorectal cancer, and the patient was instructed to cooperate. Patients were instructed to prepare for operation to take magnesium sulfate and antibiotics orally daily for 3 days prior to surgery and to clean the enema one day prior to surgery. Patient were instructed to fast for at least 12h before surgery and abstain from

drinking for 6h. Gastric tube, urinary catheter and abdominal drainage tube were routinely placed during perioperative period. After operation, the gastric tube was removed after anal exhausting and the diet was started with a transition from a liquid and semi-liquid diet to a general diet. After operation, the patient shall determine the start time of activity according to his/her own situation, and perform analgesic treatment according to the patient's requirements. Around 5d after operation, the urinary catheter was removed, and the abdominal drainage tube was removed after the abdominal drainage fluid became clear.

Rapid rehabilitation nursing intervention was given to the rapid group. A rapid rehabilitation nursing group with head nurse as the group leader and responsible nurse as the group member was established in the ward. After training, the group members were on duty. After admission, the patient underwent rapid rehabilitation health education, which included operation-related knowledge, intervention measures of rapid rehabilitation surgery, preoperative coordination of nutritional screening and screening of respiratory diseases, guidance of proper feeding, drinking, effective cough and deep breathing methods in the early postoperative period, and the benefit of informing the patient of early postoperative ambulation. Gastric tube and mechanical enema were not routinely placed before operation, but the intestinal tract was cleaned by oral administration of laxatives such as polyethylene glycol electrolyte powder. A light diet was given 1d before the operation, and an enteral nutrition emulsion was orally administered on the evening before the operation, and 10% glucose water was orally administered 3h before the operation. A urinary catheter shall be placed before operation, and the abdominal drainage tube shall not be placed during operation as much as possible. If it is really necessary to be placed, it is necessary to make close observation. The patient was told to chew chewing gum until the anus was evacuated 6h after operation. After conscious anesthesia, the patient began to move the joints of lower limbs, turn over regularly

and tap back. After operation, the patient sat up on the first day, and began to move at the bedside on the second day. Intraoperatively, an epidural analgesia pump was installed for continuous analgesia until postoperative 48h. A urinary catheter was placed at regular intervals after operation to exercise bladder function. The urinary catheter was removed on postoperative 1d.

Observational indexes

Postoperative general condition (including postoperative ambulation, exhausting, defecation, hospital stay and complications), pain degree score, abdominal distension score, gastrointestinal reaction score and changes of serum inflammatory factors were recorded in the two groups. Patients were followed up for 6 months and their quality of life was recorded at 1 and 6 months postoperatively.

Test method

2ml of peripheral venous blood were drawn before operation and at 24h, 48h, 72h after operation, and were centrifuged at 1h after blood collection. Centrifugation parameters: 4°C, 3000 r/min, 8ml, 10min. Serum levels of IL-6 and IL-8 were measured by Hyperion MR III type enzyme-labeled analyzer. Enzyme-linked immunosorbent assay (ELISA) kits are all products of Nanjing Jiancheng Bioengineering Institute.

Scoring criteria

Pain intensity score

Visual analog (VAS) score was used for evaluation at 2h, 6h, 12h and 24h after operation, with 0 indicating no pain and 10 indicating intolerable pain, and the lower the score, the lighter the pain⁵.

Abdominal distension score

It was scored at 6h, 24h, 48h and 72h after operation. No abdominal distension was scored as 0. Intolerable abdominal distension was scored as 4. The higher the score, the more severe the abdominal distension⁶.

Gastrointestinal reaction score

Gastrointestinal reaction (GIR) was scored at 6h, 24h, 48h and 72h after operation, including grade 0 (no gastrointestinal reaction), grade 1 (nausea and vomiting), grade 2 (vomiting ≤ 2 times) and grade 3 (vomiting > 2 times), which were scored as 0, 1, 2 and 3 respectively ⁷.

Quality of life

The Chinese version of the Quality-of-Life Questionnaire (EORTC QLQ-C15) was used for evaluation at 1 and 6 months after surgery, including 5 domains of physical, cognitive, role, emotional and social function, with scores ranging from 0 to 100 in each domain. Higher scores were associated with better quality of life ⁸.

Statistical methods

SPSS19.0 was used to process the data, and the measurement indexes were described by (\pm s). Independent sample t test was used to compare among groups, paired t test was used to compare within groups, and χ^2 test was used to compare the counting data. $P < 0.05$ was considered statistically significant.

RESULTS

Comparison of postoperative ambulation, exhausting, defecation and hospital stay between the two groups

The time of first ambulation, time of first exhausting, time of first defecation and hospital stay in the rapid group were shorter than those in the routine group ($P < 0.05$). See Table 2

Table 2. Comparison of postoperative ambulation, exhausting, defecation and hospital stay between the two groups (\pm s)					
Group	Number of cases	Time to first ambulation (h)	Time of first exhausting (h)	Time of first defecation (h)	Hospital stay (d)
Routine group	60	32.23 \pm 5.77	36.56 \pm 5.98	40.38 \pm 5.14	7.85 \pm 2.69
Rapid group	60	21.12 \pm 3.98 [#]	24.01 \pm 5.23 [#]	27.22 \pm 5.03 [#]	5.91 \pm 2.01 [#]
Compared with routine group, [#] $P < 0.05$					

Comparison of abdominal distension score and gastrointestinal reaction score after operation in the two groups

At 6h after operation, compared between groups, abdominal distension score and gastrointestinal reaction score were similar in the two groups ($P > 0.05$); at 24h after operation, abdominal distension score in the rapid group was lower than that in the routine group ($P < 0.05$), and gastrointestinal reaction score was similar to that in the routine group ($P > 0.05$); at 48h after operation, abdominal distension score and gastrointestinal reaction score in the rapid group were lower than that in the routine group ($P < 0.05$); at 72h after operation, abdominal distension score in the rapid

group was lower than that in the routine group ($P < 0.05$), and gastrointestinal reaction score was similar to that in the routine group ($P > 0.05$). See Table 3

Comparison of serum inflammatory factor levels between the two groups

Preoperative comparison of serum inflammatory cytokines between the two groups showed similar results ($P > 0.05$). At 24h, 48h and 72h after operation, the levels of IL-6 and IL-8 in the two groups were higher than those before operation ($P < 0.05$). At the same time, the levels of IL-6 and IL-8 in the rapid group were lower than those in the routine group ($P < 0.05$). See Table 4

Table 3. Comparison of postoperative abdominal distension score and gastrointestinal reaction score in the two groups ($\bar{x} \pm s$)									
Group	Number of cases	Abdominal distension score (points)				Gastrointestinal reaction score (points)			
		6h	24h	48h	72h	6h	24h	48h	72h
Routine group	60	0.11 \pm 0.05	0.32 \pm 0.14	2.11 \pm 0.43	2.01 \pm 0.39	1.60 \pm 0.41	0.52 \pm 0.23	1.73 \pm 0.45	0.88 \pm 0.37
Rapid group	60	0.10 \pm 0.06	0.23 \pm 0.11 [#]	1.74 \pm 0.37 [#]	1.34 \pm 0.41 [#]	1.57 \pm 0.45	0.53 \pm 0.21	1.03 \pm 0.38 [#]	0.84 \pm 0.41

Compared with routine group, #P<0.05

Table 4.
Comparison of serum inflammatory factor levels in the two groups ($\bar{x} \pm s$)

Group	Number of cases	IL-6 (ng/L)				IL-8 (ng/L)			
		Before operation	24h after operation	48h after operation	72h after operation	Before operation	24h after operation	48h after operation	72h after operation
Routine group	60	5.68±1.74	223.36±58.66*	137.85±41.22*	45.11±10.25*	2.52±0.89	48.96±8.56*	53.63±7.14*	12.02±4.11*
Rapid group	60	5.71±1.59	185.36±46.99 [#]	95.66±23.14 [#]	27.56±5.14 [#]	2.48±0.85	35.36±6.12 [#]	42.15±5.23 [#]	8.25±2.14 [#]

Compared with those before operation of the group, *P<0.05; compared with the routine group, #P<0.05

Comparison of VAS scores between the two groups

At 2h after operation, the VAS scores of the two groups were similar (P>0.05). At 6h, 12h and 24h

after operation, the VAS scores of the rapid group were lower than those of the routine group (P<0.05). See Table 5

Table 5.
Comparison of VAS scores in the two groups ($\bar{x} \pm s$)

Group	Number of cases	VAS score (points)			
		2h after operation	6h after operation	12h after operation	24h after operation
Routine group	60	2.85±1.52	5.02±1.62	4.13±1.21	3.37±0.96
Rapid group	60	2.78±1.55	4.45±1.47 [#]	3.62±1.04 [#]	2.96±0.67 [#]

Compared with routine group, #P<0.05

Comparison of complications between the two groups

The incidence rate of complications in the rapid

group was 10.00%, which was lower than that in the routine group (18.33%), and the difference was significant (P<0.05). See Table 6

Table 6.
Comparison of complications in the two groups (n)

Group	Number of cases	Wound infection	Lung infection	Anastomotic fistula	Intestinal obstruction	Total (%)
Routine group	60	2 (3.33)	4 (6.67)	3 (10.00)	2 (3.33)	11 (18.33)
Rapid group	60	0 (0.00)	2 (3.33)	1 (1.67)	0 (0.00)	3 (10.00) [#]

Compared with routine group, #P<0.05

Comparison of ORTCQLQ-c30 scores in the two groups

At 1 month after operation, the scores of cognitive functions, role function and emotional function in the rapid group were higher than those in the routine group (P<0.05), and the scores of

physical function, social function and general health status were relatively similar to those in the routine group (P>0.05); at 6 months after operation, the scores of ORTCQLQ-c30 in the rapid group were higher than those in the routine group (P<0.05). See Table 7

Table 7.
Comparison of ORTCQLQ-c30 scores between the two groups ($\bar{x} \pm s$)

Group	Number of cases	Physical function		Cognitive function		Role function	
		1 month after operation	6 months after operation	1 month after operation	6 months after operation	1 month after operation	6 months after operation
Routine group	60	54.85±5.69	68.63±6.98	64.25±5.85	80.25±6.34	32.33±6.14	65.45±9.02
Rapid group	60	55.02±5.87	77.25±5.74 [#]	71.32±5.77 [#]	87.96±4.78 [#]	35.84±5.33 [#]	76.11±7.23 [#]

Group	Number of	Emotional function		Social function		General health status	
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	cases	1 month after operation	6 months after operation	1 month after operation	6 months after operation	1 month after operation	6 months after operation
Routine group	60	34.63±8.56	56.25±6.75	32.85±4.68	55.20±6.47	31.69±12.02	65.28±9.45
Rapid group	60	39.98±6.77 [#]	73.21±8.51 [#]	31.89±6.22	71.21±6.89 [#]	33.01±10.85	78.14±5.88 [#]
Compared with routine group, [#] P<0.05							

DISCUSSION

Radical surgery is currently the first-choice method for clinical treatment of colorectal cancer. With the rapid development of laparoscopic techniques in recent years, it has largely replaced traditional laparotomy in terms of reducing surgical trauma and postoperative pain, reducing complications and accelerating postoperative recovery⁹. However, laparoscopic radical resection of colorectal cancer shall be performed under general anesthesia, during which the diseased intestinal segment shall be removed and the digestive tract shall be reconstructed, and surgical trauma shall be inevitable¹⁰. In addition, the patient had negative emotions such as fear, anxiety and depression of surgery and tumor condition, which led to severe perioperative stress response¹¹. Therefore, it is important to optimize perioperative care in promoting rehabilitation.

The concept of rapid rehabilitation surgery was put forward by Danish doctor KEHLET in 2001. It has been proved in the surgical treatment of multiple diseases that it can reduce the stress response of surgery, relieve the physical and mental suffering of patients and accelerate the postoperative rehabilitation¹². Sun Yefei¹³ et al. applied rapid rehabilitation nursing to perioperative period of laparoscopic radical resection of colorectal cancer, and found that it could help alleviate negative psychology, reduce complications and accelerate recovery process. Song Hailiang¹⁴ found that the concept of rapid rehabilitation could improve the prognosis of patients who received laparoscopic radical resection of colorectal cancer.

In this study, we observed the perioperative related conditions such as the time of first ambulation, the time of first exhausting, the time of first defecation and the hospital stay as well as the incidence rate of complications in the two groups,

and found that the rapid rehabilitation nursing could promote the early ambulation of elderly patients after radical resection of colorectal cancer, accelerate the recovery of gastrointestinal function and reduce the complications. In this study, the abdominal distension, gastrointestinal reaction and pain scores at various time points after operation in the two groups were compared. It was found that rapid rehabilitation nursing could reduce postoperative abdominal distension, gastrointestinal reaction and pain sensation. This was due to the fact that the patients did not need mechanical enemas or gastric tube placement before the operation in the rapid rehabilitation nursing intervention, avoiding the stress response and gastrointestinal dysfunction caused by it, shortening the time of water deprivation and fasting before the operation, avoiding dehydration caused by long-term fasting and water deprivation, supplementing glucose 3h before operation, and avoiding hypoglycemia; the recovery of diet and ambulation in the early postoperative period could stimulate intestinal peristalsis, reduce intestinal obstruction, pulmonary infection and other complications. Pain management is performed and the indwelling analgesic pump is effective in reducing the patient's suffering.

Colorectal cancer disease itself and surgical trauma can cause the inflammatory state of the body. IL-6 and IL-8 are classical pro-inflammatory factors and play an important role in the inflammatory reaction¹⁵. The results showed that at 24h, 48h and 72h after operation, the levels of IL-6 and IL-8 in the two groups were higher than those before operation, and the levels of IL-6 and IL-8 in patients receiving rapid rehabilitation nursing intervention were lower than those receiving routine nursing intervention. This result suggests that radical resection of colorectal cancer

may induce inflammatory reaction in the body, and rapid rehabilitation nursing intervention may relieve inflammatory reaction. This is related to the preoperative non-mechanical enema, non-placement of gastric tube, shortened time of water deprivation and fasting, early ambulation after operation and the use of analgesic pump in the quick rehabilitation nursing mode, so as to reduce stress response, so that the patient's body has sufficient energy reserve, enhance the postoperative body's wound repair ability and reduce inflammatory reaction.

After postoperative follow-up for more than 6 months, it was found that the scores of cognitive function, role function and emotional function of patients receiving rapid rehabilitation nursing intervention were higher than those receiving routine nursing intervention at postoperative 1 month, and there was no significant difference in the scores of physical function, social function and general health status between the two groups; the scores of ORTCQLQ-c30 of patients receiving rapid rehabilitation nursing intervention were higher at postoperative 6 months. It is suggested that rapid rehabilitation nursing can alleviate the psychological stress and negative emotion of patients through preoperative education, and improve the quality of life of patients after operation. This is related to the rapid rehabilitation nursing, which can promote the postoperative recovery of gastrointestinal function, relieve the pain degree and negative emotion, and reduce the complications in the elderly patients who received radical resection of colorectal cancer.

Although laparoscopic surgery was used for radical resection of colorectal cancer, there was significant surgical trauma. Perioperative patients had severe stress response, more complications and poor postoperative quality of life. In this study, rapid rehabilitation nursing was performed in the perioperative period after radical resection of colorectal cancer in elderly patients. It was found that it had certain advantages in promoting postoperative gastrointestinal function recovery, alleviating pain degree, reducing complications and improvi

ng postoperative quality of life, which was basically consistent with the results of reported clinical studies. This study also demonstrated objectively by laboratory changes in serum inflammatory factor levels, and rapid rehabilitation nursing can alleviate the inflammatory reaction induced by radical resection of colorectal cancer.

In conclusion, the implementation of rapid rehabilitation nursing in perioperative period after radical resection of elderly colorectal cancer can promote postoperative gastrointestinal function recovery, reduce pain, reduce the risk of complications and improve postoperative quality of life.

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