

Original Article

The effect of comprehensive nursing on the recovery speed and prognosis of elderly colon cancer patients

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Abstract: To explore the effect of comprehensive nursing on the recovery speed and prognosis of elderly colon cancer patients. A total of 110 elderly patients undergoing colon cancer surgery in our hospital from January 2018 to January 2020 were selected and divided into a control group (n=55, routine care) and an observation group (n=55, comprehensive nursing) according to the random number table method. The post-care stress state index score, surgical tolerance, postoperative recovery, postoperative complications, satisfaction, gastrointestinal quality of life index and other conditions were compared. The Numerical Rating Scale (NRS), Hamilton Depression Scale (HAMD) and Hamilton Anxiety Scale (HAMA) and other indicators scores in observation group were lower than those in the control group; the observation group had shorter postoperative hospital stay, bed time, first defecating time, first anal exhaust time; the postoperative complication rate of the observation group was 9.09%, which was lower than 25.45% of the control group; the satisfaction rate of the observation group was 94.55%, which was higher than 78.18% of the control group. All the above differences were statistically significant ($P<0.05$). The Gastrointestinal Quality of Life Index (GIQLI) score of the observation group was higher than that of the control group, and the difference was statistically significant (inter-group effect: $F=172.100$, $P<0.001$). The GIQLI score of both groups increased with time (time effect: $F=69.270$, $P<0.001$), and the grouping and time had an interactive effect (interactive effect: $F=7.186$, $P<0.001$). The application of comprehensive nursing in elderly patients with colon cancer has a remarkable effect. It can promote the rehabilitation of patients and improve the prognosis, which is worthy of promotion in clinic.

Keywords: Comprehensive nursing, elderly, colon cancer, recovery speed, prognosis

Introduction

As a malignant tumor, colon cancer is located on the mucosa of the colon and occurs at the junction of the sigmoid colon and rectum [1]. Colon cancer usually demonstrates no marked symptoms in the early stage. However, indigestion, abdominal distension, and even severe symptoms such as abdominal pain, mucus or bloody stool, etc. present in the middle and late stages, which adversely affect the patient's work and life. The prevalence of colon cancer is high and ranks third in gastrointestinal tumors. With the improvement of the living standards, the incidence of colon cancer is increasing year by year, seriously undermining public health [2, 3]. Surgery is commonly used for clinical treatment of colon cancer. But it is very traumatic,

and likely to lay burden on patient's psychology and physiology. For elderly patients in particular, due to the decline of their organ functions, it undoubtedly increases the burden and risk of surgery [4]. Therefore, it is of great significance for the nursing staffs to implement certain nursing interventions for the rehabilitation and prognosis during the perioperative period of elderly colon cancer patients. Comprehensive nursing is a nursing model providing comprehensive and systematic nursing before, during and after surgery [5]. It has been applied in many fields and obtained satisfactory results. However, what role it plays in recovery rate and prognosis of colon cancer is rarely reported. Therefore, it is urgent to explore the effect of comprehensive nursing on the recovery rate and prognosis of elderly colon cancer patients.

Materials and methods

General information

The elderly patients with colon cancer surgery admitted to our hospital (October 2017 to October 2019) were enrolled. Inclusion criteria: ① patients who received resection of colon cancer [6, 7]; ② patients aged ≥ 60 years; ③ patients with no language communication barrier; ④ patients whose family members signed informed consent forms. Exclusion criteria: ① patients with mental illness; ② patients with organic diseases such as heart, liver, lung and kidney. A total of 110 patients were included and divided into a control group with 55 cases and an observation group with 55 cases using the random number table method. This study was in accordance with Helsinki Declaration and was approved by the Committee of Zhangqiu District People's Hospital.

Methods

Control group: Routine care was implemented for patients. During the perioperative period, medical staffs paid attention to the patient's psychological state, conducted counseling on the patient's anxiety, depression and other emotions, and instructed the patient to reasonably arrange rest and sleep time.

Observation group: On the basis of the control group, comprehensive nursing was adopted during the perioperative period [8]. (1) Pre-operative nursing: 1) Based on the report of the patient's examination results, the nursing staffs understood the patient's physical state, medical history and surgical history. For patients with high blood sugar and high blood pressure before surgery, the corresponding hypoglycemic and hypotensive treatment was provided to avoid the factors affecting the effect of the surgery. 2) Medical staffs conducted systematic health education and psychological counseling, popularized the basic medical knowledge about colon cancer surgical treatment for patients and their family members, and explained and solved their questions patiently; paid attention to the psychological status of patients, identified patients with negative emotions such as tension, anxiety, and depression in time, analyzed the factors that cause psychological burden according to the actual situation, and helped them eliminate

negative emotions in possible and targeted manner so as not to affect the quality of the operation. 3) Medical staffs gave patients oral gut antibiotics 3 days before the start of the operation, encouraged patients to choose foods that are easy to digest and high in calories, vitamins, proteins, etc., required patients to fast 1 day before surgery, and instructed them to properly take compound polyethylene glycol electrolyte powder. (2) Intraoperative nursing: During the surgery, aseptic operation was strictly implemented according to the specific requirements of the operating room; nursing staff paid attention to the changes in the patient's vital signs, and reported to the physicians in case of emergencies such as breathing difficulties and accelerated heart rate, etc.; nursing staff was required to closely cooperate with physicians in performing surgery-related nursing during the surgery, such as assisting physicians to deliver surgical-related equipment in a timely manner and remove related obstacles that affected the surgical procedures. (3) Postoperative nursing: The nursing staff adjusted the patient into a comfortable position after surgery, encouraged the patient to take appropriate exercise according to the recovery situation, and regularly massaged the limbs to prevent venous thrombosis of the lower extremities; rigorous care was performed for the postoperative indwelling tube; paid attention to the vital signs of the patient in real time, and avoided the risk factors that cause the infection of the incision as much as possible; eating was prohibited before the patient's intestinal peristalsis function recovered, and liquid food was preferred; multiple small meals were encouraged after returning to normal.

Outcome measures

(1) Stress state indicators including Numerical Rating Scale (NRS), Hamilton Depression Scale (HAMD) and Hamilton Anxiety Scale (HAMA) were applied. The NRS was employed to evaluate the pain level, scaling from 0 to 10 points; the higher the score, the severe the pain. HAMD and HAMA scores were used to evaluate the degree of depression and anxiety of the patient. The degree was in direct proportion to the score [9-11]. (2) Surgical tolerance was systematically analyzed based on the patient's postoperative complaint and related organ examinations. Poor: complain of serious adverse reactions that require special treatment; the

Table 1. Comparison of general information between the two groups

Groups	sex		age	colon cancer type			
	female	male		sigmoid colon cancer	transverse colon cancer	left colon cancer	colon cancer
Control group (n=55)	24	31	70.55±6.69	18	8	16	13
Observation group (n=55)	27	28	68.28±6.54	15	11	14	15
t/X ²	0.329		1.799	0.036			
P	0.566		0.075	0.849			

Table 2. Comparison of stress state indicators between the two groups (point, $\bar{x} \pm sd$)

Groups	NRS	HAMD	HAMA
Control group (n=55)	6.25±1.07	26.14±4.98	25.41±3.34
Observation group (n=55)	2.53±0.31	13.76±4.32	14.08±2.52
t	24.770	13.930	20.080
P	<0.001	<0.001	<0.001

follow-up treatment and nursing cannot be well coordinated, or organs such as the heart, liver, lungs, and kidneys show abnormal function. Good: complain of adverse reactions, but are tolerable, and examination of organs such as heart, liver, lung, kidney, etc. shows no abnormality, and can cooperate with follow-up treatment and nursing. Excellent: complain of no abnormal reaction, can actively cooperate with follow-up treatment and nursing, and examination of organs such as heart, liver, lung, kidney, etc. is normal. Surgical tolerance rate = (good + excellent) number of cases/total number of cases $\times 100\%$ [12]. (3) Postoperative recovery was evaluated by observing the hospitalization stay, time to get out of bed, first defecating time, first passage gas anus time, etc. (4) Complications were observed with respect to postoperative intestinal adhesions, incision infections, and lung infections. Total complication rate = (postoperative intestinal adhesions + incision infections + lung infections) cases/total cases number $\times 100\%$ [13]. (5) Satisfaction was assessed on the day of discharge, using a 10-point grading system, with a full score of 10 points. 1-4 points represents unsatisfactory, 5-6 points represents moderate, 7-8 points represents satisfied, 9-10 points represents very satisfied. Satisfaction = (moderate + satisfied + very satisfied) number of cases/total number of cases $\times 100\%$. (6) Gastrointestinal Quality of Life Index (GIQLI) was used to assess the patient's quality of life before and 7, 14, 21, 28 days after surgery, with a full score

of 144 points. The score was proportional to the quality of life [14].

Statistical methods

The qualitative data were represented by n (%), and tested by chi-square test. When $1 \leq$ theoretical frequency < 5 , the chi-square value needed to be corrected. When the

theoretical frequency < 1 , the exact probability method was applied to calculate. The quantitative data were expressed as $\bar{x} \pm sd$, and the inter-group comparison was performed by t test, and the comparison of data at different time points between the groups was conducted by repeated measures analysis of variance. $P < 0.05$ was considered statistically significant.

Results

Comparison of general information between the two groups

Control group: 31 males and 24 females, aged 63 to 79 years with an average of 70.55 ± 6.69 years; type of colon cancer: 18 cases of sigmoid colon cancer, 8 cases of transverse colon cancer, 16 cases of left colon cancer, and 13 cases of colon cancer. Observation group: 28 males and 27 females, aged 62-81 years with an average of 68.28 ± 6.54 years; type of colon cancer: 15 cases of sigmoid colon cancer, 11 cases of transverse colon cancer, 14 cases of left colon cancer, and 15 cases of colon cancer. The difference was not significant between the two groups in terms of gender, age, colon cancer type and other data ($P > 0.05$, **Table 1**).

Lower NRS, HAMD, HAMA scores in the observation group

The NRS, HAMD, HAMA scores in the observation group were lower than those in the control group ($P < 0.05$, **Table 2**).

Effect of comprehensive nursing care on rehabilitation speed

Table 3. Comparison of surgical tolerance between the two groups [n (%)]

Groups	Poor	Good	Excellent	Excellent and good rate
Control group (n=55)	5 (9.09)	19 (34.55)	31 (56.36)	50 (90.91)
Observation group (n=55)	0 (0)	12 (21.82)	43 (78.18)	55 (100.0)
χ^2				7.170
<i>P</i>				0.007

Table 4. Comparison of postoperative recovery between the two groups (d, $\bar{x} \pm sd$)

Groups	Hospital stay	Time to get out of bed	First defecating time	First passage gas anus time
Control group (n=55)	15.23±3.11	4.15±1.24	5.66±1.18	5.16±1.06
Observation group (n=55)	14.01±2.48	2.79±0.35	4.07±1.35	3.69±1.04
<i>t</i>	2.275	7.828	6.576	7.341
<i>P</i>	0.025	<0.001	<0.001	<0.001

Table 5. Comparison of postoperative complications between the two groups [n (%)]

Groups	Intestinal adhesions	Incision infections	Lung infections	Total incidence
Control group (n=55)	3 (5.45)	6 (10.91)	5 (9.09)	14 (25.45)
Observation group (n=55)	1 (1.82)	2 (3.64)	2 (3.64)	5 (9.09)
χ^2				0.023
<i>P</i>				5.153

Table 6. Comparison of satisfaction between the two groups [n (%)]

Groups	Unsatisfied	Moderate	Satisfied	Very satisfied	Satisfaction rate
Control group (n=55)	12 (21.82)	7 (12.73)	21 (38.18)	15 (27.27)	43 (78.18)
Observation group (n=55)	3 (5.45)	11 (20.0)	17 (30.91)	24 (43.64)	52 (94.55)
χ^2					4.940
<i>P</i>					0.026

Higher surgical tolerance in the observation group

The excellent rate of surgical tolerance in the observation group was 100.0%, which was higher than 90.91% in the control group ($P < 0.05$, **Table 3**).

Better postoperative recovery in the observation group

The postoperative hospitalization stay, time to get out of bed, first defecating time, first passage gas anus time in the observation group were shorter than those in the control group ($P < 0.05$, **Table 4**).

Fewer postoperative complications in the observation group

The incidence of postoperative complications in the observation group was 9.09%, which

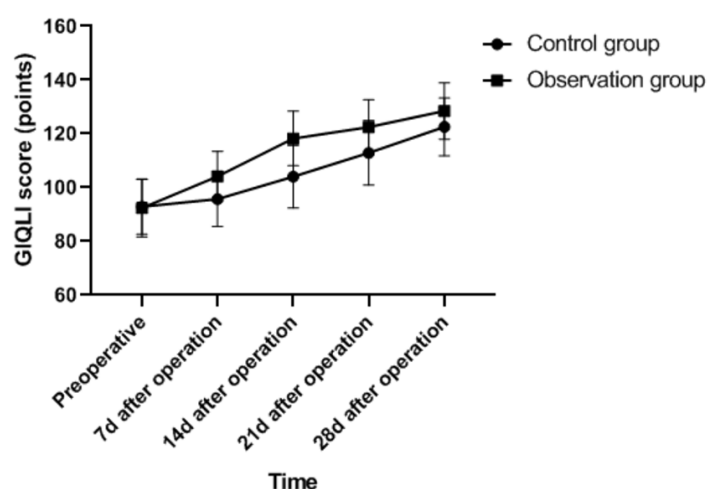
was lower than 25.45% in the control group, and the difference was statistically significant ($P < 0.05$, **Table 5**).

Higher satisfaction in the observation group

The satisfaction rate of the observation group was 94.55%, which was higher than 78.18% of the control group ($P < 0.05$, **Table 6**).

Comparison of GIQLI score levels of the two groups

The GIQLI score level of the observation group was higher than that of the control group (inter-group effect: $F = 172.100$, $P < 0.001$). The GIQLI score of both groups increased with time (time effect: $F = 69.270$, $P < 0.001$), and the grouping and time had an interactive effect (interactive effect: $F = 7.186$, $P < 0.001$) (**Figure 1**).

Comparison of GIQLI scores between the two groups**Figure 1.** Comparison of GIQLI scores between the two groups.

Discussion

Colon cancer is a digestive system cancer with high prevalence and fatality rate, and the deaths caused by colon cancer exceed 600,000 every year [15]. At present, the pathogenesis of colon cancer remains unclear, but its close relation to individual genetics, individual diet, and changes in the external environment has been confirmed. Surgery is currently the conventional treatment method for colon cancer. Nursing and clinical science disciplines are inseparable, and the combination of both is used in the treatment of diseases, which often obtains favorable outcome. Therefore, comprehensive nursing intervention has a positive impact on the recovery and prognosis of patients after colon cancer surgery.

The results of this study are as follows. (1) The scores of NRS, HAMD, HAMA and other indicators in the observation group were significantly lower than those in the control group, indicating that compared with conventional nursing, comprehensive nursing can remarkably reduce the level of stress state indicators in elderly patients with colon cancer, relieve pain, and effectively reduce patients' depression, anxiety and other negative psychological emotions; the observation group had shorter postoperative hospitalization stay, time to get out of bed, first bowel movement time, first anal exhaustion time, etc., revealing that comprehensive nursing can shorten hospital stay, promote patients

to get out of bed early, early defecation and anal exhaustion after surgery. Due to the fact that colon cancer is a chronic disease and that the symptom is atypical, patients are usually diagnosed and confirmed without any warning, and they easily suffer serious shocks, which can lead to anxiety, depression and other negative emotions, and is not conducive to the treatment. The comprehensive nursing has some strength as follows. On the one hand, in the course of comprehensive nursing, the nursing staff actively communicated with the patient, explained the surgery-related

knowledge, helped the patient eliminate unnecessary panic and doubts; postoperative management of the patient's diet was conducive to the rehabilitation of the disease. On the other hand, the nursing staffs closely observed the patient's vital signs during surgery and provided active cooperation etc., to ensure the smooth operation of surgery. Corresponding measures were provided to lower blood sugar and blood pressure before surgery, to avoid the risk factors that affect the effectiveness of surgical treatment to the greatest extent [16]. (2) The incidence of postoperative complications in the observation group was significantly lower than that in the control group, and the satisfaction rate was significantly higher than that in the control group, indicating that comprehensive nursing can significantly reduce postoperative intestinal adhesions, incision infections, and lung infections in elderly colon cancer patients. Nursing staffs gave intestinal antibiotics to patients before surgery, which inhibited the growth of intestinal bacteria and effectively prevented postoperative infections [17]; the implementation of strict aseptic operation during surgery effectively prevented or reduced the risk of postoperative infections. At the same time, nursing staffs paid attention to the psychological changes of patients, timely detected and corrected the negative mood that affected the therapeutic effect. The comprehensive management of diseases and eating diet enhanced the patient's recognition

toward nursing service and patient's satisfaction [18]. (3) The GIQLI score of the observation group was significantly higher than that of the control group, indicating that comprehensive nursing greatly improved the gastrointestinal quality of elderly colon cancer patients. Nursing staffs strictly managed the diet of the patient. Specifically, feeding was prohibited until the intestinal peristalsis function returns to normal, with the liquid food as the priority. It was encouraged to have multiple small meals when the patient's diet returns to normal, which was conducive to the recovery of gastrointestinal function [19, 20]. However, there is still room for improvement in this study due to the small sample size, which needs to be further explored by increasing sample sizes in the future.

To sum up, the application of comprehensive nursing in elderly patients with colon cancer has a remarkable effect, which can promote the recovery of patients and improve the prognosis, and it is worthy of clinical promotion.

Disclosure of conflict of interest

None.

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References

- [1] Gharib E, Nasrabadi PN and Zali MR. miR-497-5p mediates starvation-induced death in colon cancer cells by targeting acyl-CoA synthetase-5 and modulation of lipid metabolism. *J Cell Physiol* 2020; 235: 5570-5589.
- [2] Lucchetti D, Perelli L, Colella F, Ricciardi-Tenore C, Scoarughi GL, Barbato G, Boninsegna A, De Maria R and Sgambato R. Low-intensity pulsed ultrasound affects growth, differentiation, migration, and epithelial-to-mesenchymal transition of colorectal cancer cells. *J Cell Physiol* 2020; 235: 5363-5377.
- [3] Jahanafrooz Z, Mosafer J, Akbari M, Hashemzaei M, Mokhtarzadeh A and Baradaran B. Colon cancer therapy by focusing on colon cancer stem cells and their tumor microenvironment. *J Cell Physiol* 2020; 235: 4153-4166.
- [4] Sun YH, Li M and Liu GJ. The function of Piezo1 in colon cancer metastasis and its potential regulatory mechanism. *J Cancer Res Clin* 2020; 146: 1139-1152.
- [5] Fitch M, Coronado AC, Schippke JC, Chadder J and Green E. Exploring the perspectives of patients about their care experience: identifying what patients perceive are important qualities in cancer care. *Support Care Cancer* 2019; 28: 2299-2309.
- [6] Lai HW, Wei CC and Hung HC. Tumor sidedness influences prognostic impact of lymph node metastasis in colon cancer patients undergoing curative surgery. *Sci Rep* 2019; 9: 19892.
- [7] Moretto R, Falcone A and Cremolini C. Duration of oxaliplatin-based adjuvant chemotherapy in patients with stage III or high-risk stage II resected colon cancer. *Int J Cancer* 2020; 146: 2652-2654.
- [8] O'Keeffe DT, Johnson K and Maraka S. Provision of bidirectional remote patient care with an unmanned aerial vehicle. *Mayo Clin Proc* 2020; 95: 830.
- [9] Beukenhorst AL, Schultz DM, McBeth J, Sergeant JC and Dixon WG. Are weather conditions associated with chronic musculoskeletal pain? Review of results and methodologies. *Pain* 2020; 161: 668-683.
- [10] Antoun Reyad A, Girgis E and Mishriky R. Efficacy and safety of brexpiprazole in acute management of psychiatric disorders: a meta-analysis of randomized controlled trials. *Int Clin Psychopharmacol* 2020; 35: 119-128.
- [11] Green SM, Donegan E and McCabe RE. Cognitive behavioral therapy for perinatal anxiety: a randomized controlled trial. *Aust N Z J Psychiatry* 2020; 54: 423-432.
- [12] Territo A, Bevilacqua G and Meneghetti L. En bloc resection of bladder tumors: indications, techniques, and future directions. *Curr Opin Urol* 2020; 30: 421-427.
- [13] Gao Z, Wang C, Cui Y, Shen Z, Jiang K, Shen D, Wang Y, Zhan S, Guo P, Yang X, Liu F, Shen K, Liang B, Yin M, Xie Q, Wang Y, Wang S and Ye Y. Efficacy and safety of complete mesocolic excision in patients with colon cancer: three-year results from a prospective, nonrandomized, double-blind, controlled trial. *Ann Surg* 2020; 271: 519-526.
- [14] Hannon E, Eaton S, Curry JI, MKiely E, Spitz L and De Coppi P. Outcomes in adulthood of gastric transposition for complex and long gap esophageal atresia. *J Pediatr Surg* 2020; 55: 639-645.
- [15] Arabsorkhi Z, Gharib E, Yaghmoorian Khojini J, Farhadieh ME, Nazemalhosseini-Mojarad E and Zali MR. miR-298 plays a pivotal role in colon cancer invasiveness by targeting PTEN. *J Cell Physiol* 2020; 235: 4335-4350.
- [16] Polat F, Willems LH, Dogan K and Rosman C. The oncological and surgical safety of robot-

- assisted surgery in colorectal cancer: outcomes of a longitudinal prospective cohort study. *Surg Endosc* 2019; 33: 3644-3655.
- [17] Niemeläinen S, Huhtala H, Ehrlich A, Kössi J, Jämsen E and Hyöty M. Risk factors of short-term survival in the aged in elective colon cancer surgery: a population-based study. *Int J Colorectal Dis* 2020; 35: 307-315.
- [18] Brock RL, Franz MR, O'Bleness JJ and Lawrence E. The dynamic interplay between satisfaction with intimate relationship functioning and daily mood in low-income outpatients. *Fam Process* 2019; 58: 891-907.
- [19] Felsenreich DM, Langer FB, Bichler C, Eilenberg M, Jedamzik J, Jedamzik I, Vock N, Gensthaler L, Rabl C, Todoroff A and Prager G. Roux-en-Y gastric bypass as a treatment for barrett's esophagus after sleeve gastrectomy. *Obes Surg* 2020; 30: 1273-1279.
- [20] Roman H, Tuech JJ, Huet E, Bridoux V, Khalil H, Hennetier C, Bubenheim M and Branduse LA. Excision versus colorectal resection in deep endometriosis infiltrating the rectum: 5-year follow-up of patients enrolled in a randomized controlled trial. *Hum Reprod* 2019; 34: 2362-2371.