

Effect of Rapid Rehabilitation Concepts on Quality of Life and Pain in Patients Undergoing Radical Breast Cancer Surgery in Perioperative Period

Xin Li

Hai-yan An

Yi Zhao

Mingli Ji

Jing An

Yan Tao

Xin Li Severe Medicine, The Second Affiliated Hospital of Xingtai Medical College, Xingtai, China, Hai-yan An Operating Room, Chengde Central Hospital, Chengde, China, Yi Zhao Operating Room, Hebei Eye Hospital, Xingtai, 054001, Hebei, China, Mingli Ji Medical examination center, Second Affiliated Hospital of Xingtai Medical College, Xingtai, China, Jing An Clinical Laboratory, Second Affiliated Hospital of Xingtai Medical College, Xingtai, China, Yan Tao Department of Nursing, Xingtai Medical College, Xingtai, China, #Co-Author: These authors contribute same to this work. *Corresponding Author: Department of Nursing, Xingtai Medical College, Xingtai, China (Email: 47411429@qq.com)

Objective: To study the effect of rapid rehabilitation nursing on patients' quality of life and pain level during the perioperative period of radical breast cancer surgery. **Methods:** 126 patients who were hospitalized in our hospital from January 2018 to February 2020 and underwent radical breast cancer surgery were divided into control group and rapid rehabilitation group according to the perioperative period intervention method. Routine nursing intervention and rapid rehabilitation nursing intervention were used respectively. The general conditions of the two groups were recorded, and the differences of T cell subsets before operation and 3 days after operation were detected. Visual analogue pain (VAS) score was used to evaluate the changes of pain degree at 1 day, 3 days and 5 days after operation and on the day of discharge. Postoperative complications and satisfaction were compared between the two groups. Quality of life (QOL) was assessed at 1 month and 3 months after operation using the CARES-SF score. **Results:** Anesthesia waking time (26.12 ± 5.77) min, off-bed activity time (14.25 ± 2.87) h and hospital stay (7.82 ± 2.15) d in the rapid rehabilitation group were shorter than those in the control group ($P < 0.05$). The operation time (92.02 ± 14.78) min and intraoperative blood loss (57.96 ± 13.96) mL in the rapid rehabilitation group were not significantly different from those in the control group ($P > 0.05$). In the control group, 3d after operation, T lymphocyte subsets were decreased gradually than that before operation ($P < 0.05$), CD3+ was decreased 3d after operation than that before operation in the rapid rehabilitation group ($P < 0.05$), but CD4+, CD8+, CD4+ / CD8+ 3d after operation had no significant difference than that before operation ($P > 0.05$). In rapid rehabilitation group, T lymphocyte subsets at 3d after operation were higher than those in the control group ($P < 0.05$). The postoperative complication rate of the rapid rehabilitation group was lower than that of the control group, and the satisfaction degree was higher than that of the control group, with significant difference ($P < 0.05$). After follow-up, it was found that the scores of qualities of life, such as physiology, psychosocial, marriage, sexual life and relationship with medical staff in the rapid rehabilitation group were lower than those in the control group at 1 month and 3 months after operation ($P < 0.05$). **Conclusion:** The concept of rapid rehabilitation nursing can stabilize the immune function of patients after radical breast cancer surgery, promote the postoperative rehabilitation and improve the quality of life after operation

Keywords: Radical breast cancer surgery; Rapid rehabilitation concept; Quality of life; Pain level; Complications

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Breast cancer is a malignant tumor with a high incidence. The early diagnosis rate of breast cancer is closely related to the enhancement of self-care

consciousness of women and the development of modern imaging techniques. Early radical surgery helps to prolong the survival of patients, and the

5-year survival rate of breast cancer is increasing¹. However, radical mastectomy for breast cancer is associated with more trauma, severe postoperative pain and more complications. It is also easy to increase the psychological burden of the patients and cause greater physical and mental distress to the patients. High-quality nursing intervention in perioperative period can help relieve pain, ensure surgical effect and promote postoperative rehabilitation, which is beneficial to improve patient's prognosis².

Rapid rehabilitation surgery is the concept put forward by the Danish scholar Kehlet in the 1990s. Through multi-mode and multi-disciplinary cooperation, a series of optimized treatment measures confirmed by evidence-based medicine were adopted in the perioperative period to relieve the stress on both body and mind of the patients, successfully go through the perioperative period and promote the early return to normal function³. The concept of rapid rehabilitation plays an active role in many fields such as surgery, gynecology, and orthopedics.⁴ This study observed the influence of the concept of rapid rehabilitation nursing on the quality of life and pain level of patients who underwent radical breast cancer surgery in perioperative period, which is reported as follows.

DATA AND METHODS

General data

From January 2018 to February 2020, 126 breast cancer patients, aged from 31 to 75 years, were divided into two groups according to the intervention method, 63 cases in each group. There was no significant difference in general data between the two groups ($P > 0.05$). See Table 1

Group	Age <i>n</i> (years-old)	Years of education (years)	Marital status		
			Married	Unmarried	Divorce / widowed
Control group	658.96±1.78	12.25±3.36	46	8	9
Rapid rehabilitation group	659.07±1.24	12.09±3.75	42	7	14

Inclusion and exclusion criteria

Inclusion criteria: (1) Primary breast cancer diagnosed by pathology⁵, all patients received radical breast cancer surgery; (2) Age ≥ 18 years, ≤ 75 years old, all female; (3) Patients with primary disease without metastasis; (4) Patients without radiotherapy, chemotherapy or other anti-tumor therapy before operation; (5) Complete clinical data.

Exclusion criteria: (1) Hearing, visual disturbance or patients with dementia, severe or depression and other psychiatric disorders; (2) Expected survival < 6 months; (3) Patients with tumors at other sites.

Group	<i>n</i>	Tumor staging		Payment mode		
		T2N0 M0 stage	T2N1M 0 stage	Medical insurance	Rural cooperative medical service	Self-pay
Control group	63	28	35	31	22	10
Rapid rehabilitation group	63	30	33	28	26	9

METHODS

In the control group, routine nursing intervention was performed in perioperative period, and preoperative visit was performed on the day before operation. The surgical procedure and precautions were introduced to the patient, and the patient was instructed to abstain from fasting and drinking for at least 12h before operation, and urinary catheter was routinely placed. Fluid input was not tightly controlled during intraoperative fluid replacement. The patient was given opioid analgesia after the operation, and began to eat after anus evacuation. After the operation, the patient was instructed to perform upper limb functional exercise on the operative side as long as the physical condition permits, and the drainage tube was removed 5-7 days after the operation.

In the rapid rehabilitation group, rapid rehabilitation concept nursing regimen intervention was performed in perioperative period. During preoperative visit, in addition to introducing surgical procedure by medical staff, the patient's participation was paid attention to, and the patient

was encouraged to ask questions, so as to eliminate the patient's doubt. Patients were instructed to shorten fasting time, fast for 6h before surgery, abstain from drinking for 4h, and supplement a small amount of glucose before surgery to prevent hypoglycemia. The catheter was not routinely indwelling before the operation, and the patient was told to discharge the urine once before entering the room. During the operation, the infusion volume shall be strictly controlled according to the blood loss, so as to avoid excessive liquid infusion in a short time. During the operation, pay attention to heat preservation, adjust the ambient temperature, cover the blanket on the non-surgical site, heat the flushing fluid and infuse the liquid, so that the central body temperature of the patient during the operation is not less than 36 °C. Minimize opioid use during postoperative analgesia. After postoperative 6h, a small amount of drinking water was started, and the food was gradually resumed. The patient was encouraged to move early after surgery, move the lower extremities in bed on the day of surgery, and begin ambulation the day after surgery. Instruct the patient to prevent postoperative pulmonary complications by abdominal breathing, effective cough, and remove the drainage tube 3-5 days after the surgery.

Observational indexes

The general situation of operation was recorded in the two groups, and the occurrence of postoperative complications was statistically analyzed in the two groups.

VAS score: At 1d, 3d and 5d after operation and on the day of discharge, 0 point represents no pain, 10 points represents intolerable pain, and the higher the score, the higher the pain degree⁶.

CARES-SF score: The patients were followed up for 3 months, and evaluated at postoperative 1 month and 3 months, respectively, including 5 dimensions of physiology, psychosocial, marriage, sexual function and relationship with medical staff. Each dimension was assigned a score according to Likert grade 5 score, i.e., none (0 point), mild (1 point), moderate (2 points), severe (3 points), severe (4 points). The higher the score, the worse the quality of life⁷.

Satisfaction degree: The self-made score of our hospital is used for evaluation. The self-made scale scores range from 0 to 10 points, of which 9 points and above are very satisfied, 7 points to 8 points are satisfied, and 6 points and below are unsatisfied.

Test method

The peripheral venous blood samples were collected at two time points before operation and 3 days after operation. The peripheral blood CD3+, CD4+, CD8+T lymphocyte ratio was measured by FACScan flow cytometer of BD company UAS, and the CD4+ / CD8+ ratio was calculated.

Statistical method

SPSS19.0 was used to process the data, and the measurement indexes were described by ($\bar{x} \pm s$). 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 general conditions of operation between the two groups

Anesthesia waking time (26.12 ± 5.77) min, off-bed activity time (14.25 ± 2.87) h and hospital stay (7.82 ± 2.15) d in the rapid rehabilitation group were shorter than those in the control group ($P < 0.05$). The operation time (92.02 ± 14.78) min and intraoperative blood loss (57.96 ± 13.96) mL in the rapid rehabilitation group were not significantly different from those in the control group ($P > 0.05$). See Table 2.

Comparison of VAS scores at different time points after operation in the two groups

The VAS scores on postoperative 1d, 3d, 5d and the day of discharge in the rapid rehabilitation group were shorter than those in the control group, and the differences were significant ($P < 0.05$). See Table 3

Table 2.
Comparison of General Surgical Conditions of Patients in the Two Groups ($\bar{x} \pm s$)

Group	n	Operation time (min)	Intraoperative blood loss (mL)	Anesthesia waking time (min)	Time to ambulation (h)	Hospital stay (d)
Control group	63	89.63±15.22	58.52±12.11	35.88±8.14	18.44±3.26	10.45±2.11
Rapid rehabilitation group	63	92.02±14.78	57.96±13.96	26.12±5.77 [#]	14.25±2.87 [#]	7.82±2.15 [#]

Compared with the control group, [#]P < 0.05

Comparison of T lymphocyte subsets in the two groups

3d after operation, in the control group, T lymphocyte subsets were decreased gradually than that before operation (P < 0.05), CD3⁺ was decreased in the rapid rehabilitation group (P <

0.05), but CD4⁺, CD8⁺, CD4⁺ / CD8⁺ had no significant difference (P > 0.05). In rapid rehabilitation group, T lymphocyte subsets at 3d after operation were higher than those in the control group (P < 0.05). See Table 4

Table 3.
Comparison of VAS Scores of Patients in the Two Groups at Different Time Points after Operation ($\bar{x} \pm s$)

Group	n	VAS score			
		1d after operation	3d after operation	5d after operation	Day of discharge
Control group	63	4.89±1.22	3.11±1.12	1.97±0.53	1.45±0.37
Rapid rehabilitation group	63	4.25±1.03	2.70±0.95 [#]	1.50±0.41 [#]	1.24±0.33 [#]

Compared with the control group, [#]P < 0.05

Table 4.
Comparison of T Lymphocyte Subsets Levels in the Two Groups ($\bar{x} \pm s$)

Group	Number of cases	CD3 ⁺ (%)		CD4 ⁺ (%)	
		Before operation	3d after operation	Before operation	3d after operation
Control group	63	54.22±4.52	43.55±3.12 [*]	28.56±3.65	24.02±4.11 [*]
Rapid rehabilitation group	63	53.97±5.03	47.21±4.52 ^{*#}	29.01±3.75	28.45±3.98

Table 4
Continue

Group	Number of cases	CD8 ⁺ (%)		CD4 ⁺ /CD8 ⁺	
		Before operation	3d after operation	Before operation	3d after operation
Control group	63	28.12±5.33	25.91±3.88 [*]	1.25±0.45	1.09±0.42 [*]
Rapid rehabilitation group	63	27.98±5.47	27.04±4.36 [#]	1.28±0.44	1.24±0.51 [#]

Compared with those before intervention of the group, ^{*}P < 0.05; compared with those before intervention of the control group, [#]P < 0.05

Comparison of postoperative complications between the two groups

The postoperative complication rate of the rapid rehabilitation group (4.76%) was lower than that of the control group (15.87%), and the difference was significant (P < 0.05). See Table 5

rapid rehabilitation group were lower than those in the control group (P < 0.05). See Table 6

Comparison of quality-of-life scores at follow-up in the two groups

At 1 and 3 months after operation, the physiology, psychosocial, marriage, sexual life, relationship with medical staff and total score in the

Table 5.
Comparison of Postoperative Complications between the Two Groups (n)

Group	n	Wound infection	Subcutaneous fluid collection	Urinary retention	Total
Control group	63	4 (6.35)	3 (4.76)	3 ()	10 (15.87)
Rapid rehabilitation group	63	2 (3.17)	1 (1.59)	0 (0.00)	3 (4.76) #

Compared with the control group, #P < 0.05

Table 6.
Comparison of Quality-of-Life Scores at Follow-up between the Two Groups ($\bar{x} \pm s$, points)

Group	Number of cases	Physiology		Psychosocial		Marriage	
		1 month after operation	3 months after operation	1 month after operation	3 months after operation	1 month after operation	3 months after operation
Control group	63	13.53±3.63	12.57±2.26	14.23±3.24	13.26±2.22	8.45±1.69	7.44±1.54
Rapid rehabilitation group	63	12.11±3.07#	11.37±2.16#	13.08±2.56#	12.27±2.42#	7.21±1.18#	6.64±1.27#

Comparison of patient satisfaction in the two groups (80.95%), and the difference was significant (P < 0.05). See Table 7

The satisfaction rate of the rapid rehabilitation group (93.65%) was higher than that of the control

Table 6.
Continue

Group	Number of cases	Sexual life		Relationship to medical staff		Total score	
		1 month after operation	3 months after operation	1 month after operation	3 months after operation	1 month after operation	3 months after operation
Control group	63	10.42±2.42	9.51±1.71	8.21±2.13	7.45±1.99	54.89±4.63	50.33±5.02
Rapid rehabilitation group	63	9.19±1.89#	8.57±1.78#	6.12±2.01#	5.90±2.04#	45.87±4.16#	42.52±4.55#

Compared with the control group, #P < 0.05

Table 7.
Comparison of Patient Satisfaction in the Two Groups (n)

Group	n	Very satisfied	Satisfied	Dissatisfied	Satisfaction rate (%)
Control group	63	26 (41.27)	25 (39.68)	12 (19.05)	51 (80.95)
Rapid rehabilitation group	63	34 (53.97)	25 (39.68)	4 (6.78)	59 (93.65) #

Compared with the control group, #P < 0.05

DISCUSSION

The incidence of breast cancer is related to genetic, psychological, environmental and immunological factors. In recent years, the incidence of breast cancer has been increasing year by year⁸. For the breast cancer patients in the perioperative period, the disease itself, the fear mood, the postoperative pain, the limitation of activities, and the loss of breasts, etc. have caused great psychological and physical stress to the patients, which not only caused great physical and mental distress to the patients, but also affected the immune function of the body through the neuroendocrine system. The serious patients may cause tumor escape and thus lead to postoperative recurrence or metastasis⁹. Therefore, the body and mind pain should be reduced as much as possible in the perioperative period of radical mastectomy for breast cancer.

At present, the conventional nursing mode is fasting and drinking for a long time before operation. The patient often causes hypoglycemic reaction due to hunger and thirst, and causes discomfort by placing urinary catheter before operation. The control of liquid input is not paid attention to during the surgery, and the liquid is not heated before infusion, resulting in a large amount of cold liquid entering within a short period of time, leading to central body temperature drop and easily leading to chills. Excessive postoperative opioid use may cause hyperalgesia and increase the risk of complications such as urinary retention and bowel paralysis. Postoperative feeding, ambulation and removal of drainage tube for a long time can lead to delayed recovery of intestinal function and deep venous thrombosis of lower limbs. In this care mode it is not conducive to the patient's postoperative recovery^{10, 11}.

Rapid rehabilitation surgical care is a new concept of surgical care, which has been shown to reduce surgical stress, accelerate postoperative recovery, and shorten hospital stay¹². The study found that compared with the patients who had the routine nursing intervention, those who had nursing intervention with rapid rehabilitation concept had shorter anesthesia waking time, off-bed activity time and hospital stay, lower VAS score at postoperative 1d, 3d and 5d and on discharge day, and lower postoperative complication rate. The operation time and intraoperative blood loss were comparable in the two groups. The above results suggest that the adoption of rapid rehabilitation concept nursing regimen in the perioperative period of radical breast cancer surgery can promote the patients' postoperative sobriety, reduce the pain, reduce the risk of complications, accelerate the postoperative recovery and shorten the hospital stay. This is due to the risk of urinary tract infections that may be reduced by appropriate pre-operative glucose supplementation and increased patient strength in the rapid rehabilitation surgical care mode; avoidance of indwelling catheterization; and early removal of the drain. Intraoperative use of anesthetic drugs may cause vasodilation, the thermoregulatory center is inhibited, and intraoperative large volume of disinfectant, flushing fluid and infusion fluid cause cold dilution of blood. Rapid rehabilitation surgical nursing mode can reduce the risk of intraoperative hypothermia, accelerate the metabolism of anesthetic drugs and shorten the waking time of anesthesia by strictly controlling the infusion volume and paying attention to intraoperative heat preservation. Postoperative analgesia reduces the use of traditional opioids, thereby reducing the risk of opioid-induced hyperalgesia, urinary retention, and bowel paralysis. Epidural analgesia can relieve pain and accelerate patient recovery^{13, 14}.

Surgical trauma and psychological stress can not only inhibit the immune function of patients, cause disproportion of T lymphocyte subsets, but also cause inflammatory response, and further aggravate immune abnormalities¹⁵. The study showed that the levels of CD3+, CD4+, CD8+, and CD4+ /

CD8+ were higher in the rapid rehabilitation group than those in the routine nursing intervention group. This is due to measures such as shortening fasting and drinking time before operation, avoiding indwelling urinary catheter, paying attention to heat preservation during operation, eating early after operation and starting ambulation in the mode of rapid rehabilitation surgery nursing, so as to control the patient's stress reaction degree and reduce its inhibition on the patient's postoperative immune function¹⁶.

The results of follow-up showed that compared with the routine nursing intervention, the physiology, psychosocial, marriage, sexual life, relationship with medical staff and total score of the nursing intervention with the concept of rapid rehabilitation were lower at 1 and 3 months after operation, and the satisfaction scores were higher, which indicated that the idea of rapid rehabilitation nursing in the perioperative period of radical breast cancer surgery was helpful to improve the quality of life and satisfaction. This is because the rapid rehabilitation surgical nursing mode describes the operation process to the patient in detail at the preoperative visit, so as to alleviate the patient's fear caused by lack of relevant knowledge, and reduce the patient's physical and mental pain, shorten the rehabilitation process, improve the patient's quality of life and satisfaction after operation through such measures as reducing the time of eating and drinking, eating early after operation, starting ambulation and not inserting urinary catheter before operation.

In conclusion, the adoption of rapid rehabilitation concept nursing regimen in perioperative period of radical breast cancer surgery can promote patients' awake time under anesthesia, shorten the course of disease, reduce the incidence rate of postoperative complications, and improve their quality of life and patients' satisfaction.

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