Article

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Quality of Life and Anxiety Status of Patients with Ovarian Tumor Undergoing Enhanced Recovery after Surgery

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Abstract

Background: This study aimed to explore the quality of life and anxiety status of patients with ovarian tumor undergoing enhanced recovery after surgery (ERAS).

Methods: This article retrospectively analyzed the clinical data of 300 patients with ovarian tumor admitted in the First Affiliated Hospital of Hebei North University. The patients were divided into two groups according to the perioperative management methods. A total of 156 patients who received traditional perioperative management were included in the control group, and the ERAS group included 144 patients who received traditional perioperative management combined with ERAS management. Quality of life questionnaire-C30 (QLQ-C30) and self-rating anxiety scale (SAS) were used to compare the postoperative quality of life and anxiety status.

Results: The ERAS group showed significantly shorter first feeding time ($p < 0.001$), exhaust time ($p < 0.001$) and defecation time ($p = 0.002$), infusion time ($p = 0.026$), and hospitalization time ($p < 0.001$) than the control group. Inter-group comparison showed no significant difference in QLQ-C30 scores in terms of physical ($p = 0.345$), role ($p = 0.509$), emotional ($p = 0.235$), cognitive ($p = 0.462$), and social functions ($p = 0.645$) before surgery. The scores of physical, role, emotional, cognitive, and social functions in the ERAS group were significantly higher than the control group after surgery ($p < 0.001$). There was no significant difference in preoperative anxiety scores between the two groups ($p = 0.056$). The postoperative anxiety score of the ERAS group was significantly lower than that of the control group ($p = 0.002$).

Conclusions: ERAS could alleviate the postoperative negative emotions such as anxiety, promote the physical and mental health and improve the quality of life of patients with ovarian tumor.

Introduction

Ovarian tumor is a common gynecological disease with diverse pathological types [1]. It has the highest mortality among various gynecological tumors, and most patients may be diagnosed at an advanced stage [2]. Consequently, ovarian tumor poses a significant threat to women's health and warrants considerable societal attention [3]. Pedicle torsion of ovarian tumors can result in acute abdominal pain. Potentially severe complications such as tumor necrosis, infection, and rupture ensue if not promptly addressed, underscoring the urgency of surgical intervention. Clinical observations reveal that some patients undergoing ovarian tumor surgery experience anxiety, fear, and stress responses owing to the surgical trauma and associated uncertainties [4]. Surgical procedures may lead to varying degrees of blood loss and gastrointestinal dysfunction, prolonging recovery time and compromising patients' quality of life [5]. The incidence of anxiety in ovarian tumor patients can be as high as 92%, stemming from physical discomfort and also from uncertainties regarding economic, lifestyle, and fertility changes associated with the disease [6].

Following surgery, ovarian tumor patients still face challenges such as tumor recurrence and chemotherapy resistance, necessitating standardized perioperative care

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alongside treatment. Enhanced recovery after surgery (ERAS), initially proposed by Henrik Kehlet in 1997, aims to optimize perioperative nursing, minimize surgical stress responses, and expedite postoperative recovery based on medical evidence [7]. One study by Boitano *et al.* [8] has demonstrated that ERAS reduces the incidence of intestinal obstruction and shortens hospital stays following open surgery for gynecological tumors. Additionally, Bisch *et al.* [9] found that the median hospitalization duration for all gynecological surgeries decreases from 4 to 3 days after implementing ERAS protocols. The fundamental principle of ERAS is to mitigate surgical trauma and complications, shorten hospital stays, and accelerate rehabilitation through evidence-based practices in perioperative management [10]. To investigate the postoperative quality of life and anxiety levels among ovarian tumor patients under the ERAS framework, we conducted the present retrospective study to evaluate the application effectiveness of ERAS.

Methods

Clinical Data

This article retrospectively analyzed the clinical data of 300 patients with ovarian tumor admitted to the First Affiliated Hospital of Hebei North University from January 2020 to December 2021. The patients were divided into the two groups according to perioperative management methods. The control group included 156 patients who received traditional perioperative management, and the ERAS group contained 144 patients who received traditional perioperative management combined with ERAS management.

This study conforming to the Declaration of Helsinki [11] was approved by the Medical Ethics Committee of The First Affiliated Hospital of Hebei North University (approval no.: K2021117), and patients and their families signed the informed consent.

Inclusion and Exclusion Criteria

Inclusion criteria. Patients who had true and complete clinical data and those who were capable of communicating in Chinese, completing the questionnaires, and answering the doctor's questions correctly within 30 s were included.

Exclusion criteria. Patients who cannot express their feeling owing to mental disorders, and those with other types of tumors, acute infectious diseases, functional impairment in the heart, liver, kidney, or other organs, and recurrence of ovarian tumor or second operation were excluded.

Nursing Methods

The control group received traditional perioperative nursing measures for ovarian tumor, which primarily included daily care, vital sign monitoring, medication assistance, postoperative dietary assistance, and other routine rehabilitation measures. ERAS group received traditional perioperative management plus ERAS, and the traditional perioperative management was similar to the control group, with ERAS management summarized as follows.

Preoperative Management

Anemia was treated before surgery, mechanical bowel preparation was canceled, and the patients drank clear fluid 2 h before anesthesia induction. The nursing staff explained the disease's progression, precautions taken, and the benefits of laparoscopic minimally invasive surgery. Laparoscopic surgery is a recently developed minimally invasive method of removing ovarian tumors through micro-wound surgery under endoscopy. Preoperative education can reveal a patient's expectations of surgery, reduce a patient's fear of surgery, relieve fatigue, and eliminate a patient's nervous and anxious state of mind. The patients were informed that they can eat solid food 6 h before surgery and liquid food 2 h before surgery. Carbohydrates such as 10% glucose injection (specification: 500 mL:50 g; NMPA approval no.: H13022477; manufacturer: SJZ No. Pharmaceutical Co., Ltd.; Shijiazhuang, China), were provided 2 h before surgery. The intestines were prepared for stool clearing, and the patient's body temperature was kept at 36 °C.

Intraoperative Management

A heating blanket was laid on the operating bed to monitor changes in the patient's body temperature and ensure that the temperature of the intravenous fluid was about 37 °C. We helped place the patient's position, give the patient pneumatic compression pump (model: Kendall SCDTM Express; manufacturer: Covidien; location: Shanghai, China) to massage the leg throughout the entire operation, prevent the formation of deep vein thrombosis, and ensure the comfort and safety of patients during the operation.

Postoperative Management

(1) Health education. After surgery, the patients were taught about the knowledge related to postoperative rehabilitation of ovarian tumor via multimedia to enhance the

patients' cognition of the disease and improve their enthusiasm for postoperative rehabilitation. (2) Diet guidance. After anesthetic awareness, the patients were given a small amount of warm water at about 37 °C for many times to closely observe the cough while drinking water. When cough occurred, the patient's head was immediately tilted to one side to prevent aspiration. After 6 h of surgery, the patients were given a retention diet such as rice soup, followed by semi-liquid diet such as noodles after anal exhaust. The patient gradually returned to normal diet after defecation. (3) Analgesic guidance. Patients received corresponding relief measures according to their different pain degrees. If mild pain can be tolerated and did not affect sleep, the pain can be relieved by diverting attention. If the severe pain affected sleep and was unbearable, analgesic drugs would be given to relieve pain following the doctor's advice. (4) Exercise guidance. After surgery, the patient's bed head was raised to put patients in the supine position, gradually transitioning from the supine position into the semi-reclining position. Then, the patients tried to sit at the bedside, gradually reaching the state of getting out of bed and standing by the bedside. After the patients can gradually stand at the bedside, they were guided to walk slowly along the corridor with the handrail. (5) Respiratory function exercise. Patients were guided in performing respiratory function exercises after surgery to prevent pulmonary complications and venous thrombosis, thereby accelerating wound recovery. (6) Urine catheterization intervention. The conditions of the catheter during the indwelling catheter were observed, and the secretions on the catheter was removed promptly to keep patients' urethral orifice clean and thus avoid infection. The patients were further instructed to drink more water and replace the urine bag regularly. After surgery, the catheter was removed according to patient's specific conditions and doctor's advice. (7) Psychological guidance. Postoperative patients were encouraged to use catharsis methods such as confessing and recording and describing unpleasant events to reduce negative emotions. The psychological status of patients should be observed. Patients usually had anxiety, irritability, and other negative emotions owing to illness and surgery. After surgery, effective psychological rehabilitation plans should be formulated according to the specific conditions of patients. Family members should also be guided to pay attention to the psychological status of patients and accordingly adjust their psychological status and accelerate postoperative recovery.

Observation Index

The self-rating anxiety scale (SAS) scores of patients on the day of hospitalization and at discharge were collected. We also gathered the quality of life questionnaire-C30 (QLQ-C30) scores of patients on the day of hospitalization and at the time of reexamination 1 month after surgery.

Quality of Life Assessment

The QLQ-C30 was used to evaluate patients' quality of life [12]. It is universal scale and can reflect the similar characteristics of postoperative quality of life of patients with tumors. The QLQ-C30 has 30 items and five functional dimensions: physical, role, emotional, cognitive, and social functions. It also includes nine symptom dimensions, namely, tiredness, nausea and vomiting, pain, shortness of breath, insomnia, loss of appetite, constipation, diarrhea, and financial difficulties, and one overall quality of life dimension. All entries were scored on a scale of 1 to 4, and the total score ranges from 30 to 120. A high score indicated good quality of life. We evaluated the quality of life of postoperative patients with ovarian tumor primarily by using the functional dimensions of the QLQ-C30, and the scores of each functional dimension were converted into standard scores for evaluation. The QLQ-C30 scale had high reliability and internal consistency for patients with tumor, with a Cronbach's α coefficient of 0.897. It is often used in the selection of surgery or treatment plan and the investigation of intervention factors during treatment.

Anxiety-Status Assessment

The SAS was used to assess patients' anxiety status [13]. It uses a four-point scale to assess the frequency of symptoms: 1, no or very little occurrence; 2, sometimes; 3, most of the time; 4, most or all of the time. Among the 20 items, 15 were stated in negative words and graded in the order of 1–4. The remaining five items (nos. 5, 9, 13, 17, and 19) were stated in positive terms and scored in reverse order (4–1). The main statistical indicator of the SAS was the total score. The scores for each item were added, and. the total score (rough score) was multiplied by 1.25. Then, the standard score was obtained by determining the integral part. Results were interpreted according to the Chinese norm results, and the cutoff value of the SAS standard score was 50 points. A score of 50–59 was classified as mild anxiety, 60–69 was classified as moderate anxiety, and more than 70 was classified as severe anxiety. The SAS had high reliability and internal consistency for patients with tumor, with a Cronbach's α coefficient of 0.906.

Table 1. Comparison of demographic characteristics [M (P25, P75)/($\bar{x} \pm$ s)/n (%)].

	ERAS group (N = 144)	Control group (N = 156)	Z/t/χ^2	*p* value
Age (years)	47.00 (39.00, 53.00)	46.00 (39.00, 54.00)	−0.455	0.649
BMI (kg/m^2)	28.29 (27.54, 29.00)	28.43 (27.51, 29.54)	−1.185	0.236
Weight (kg)	48.01 ± 2.18	47.69 ± 2.86	1.093	0.275
Education level (n)			0.016	0.899
Junior high school and below	95 (65.97)	104 (66.67)		
Junior high school and above	49 (34.03)	52 (33.33)		
Place of residence (n)			1.278	0.258
Village	109 (75.69)	109 (69.87)		
City	35 (24.31)	47 (30.13)		

ERAS, enhanced recovery after surgery; BMI, body mass index.

Table 2. Comparative results of postoperative recovery time [M (P25, P75)/($\bar{x} \pm$ s)].

Projects	ERAS group (N = 144)	Control group (N = 156)	Z/t	*p*
First feeding time (h)	9.55 ± 1.79	12.15 ± 1.79	−12.589	<0.001
First exhaust time (d)	2.00 (2.00, 2.00)	3.00 (2.00, 3.00)	−8.383	<0.001
First defecation time (d)	3.00 (3.00, 4.00)	3.00 (3.00, 4.00)	−3.135	0.002
Infusion time (d)	5.00 (5.00, 6.00)	6.00 (5.00, 6.00)	−2.224	0.026
Hospitalization time (d)	6.00 (5.00, 6.00)	6.00 (5.00, 7.00)	−3.898	<0.001

Statistical Method

SPSS v26.0 (International Business Machines Corporation, Armonk, NY, USA) was used in this study. Shapiro–Wilk test was performed for continuous variables such as age, body mass index (BMI), weight, first postoperative feeding time, first postoperative exhaust time, first postoperative defecation time, postoperative infusion time, postoperative hospital stay, QLQ-C30 score, SAS score. Normal distribution was expressed by ($\bar{x} \pm$ s), and *t* test was used. The data meeting skewed distribution were tested by non-parametric test, expressed as M (P25, P75). Categorical variables such as education level and place of residence were presented as n (%) and were tested using the χ^2 test. A *p* value less than 0.05 was considered statistically significant.

Results

Comparison of Demographic Characteristics

No significant difference existed in age, BMI, weight, education level, and place of residence between the ERAS and control groups (*p* > 0.05), as shown in Table 1.

Comparison of Postoperative Recovery Time

Some differences in postoperative recovery existed between the two groups. The ERAS group showed significantly shorter first feeding time (*p* < 0.001), exhaust time (*p* < 0.001) and defecation time (*p* = 0.002), infusion time (*p* = 0.026), and hospitalization time (*p* < 0.001) than the control group. This finding indicated that patients in the ERAS group had shorter postoperative recovery time and faster postoperative recovery. The statistical results are shown in Table 2.

Comparison of Quality of Life

Inter-group comparison showed no significant difference in QLQ-C30 scores in terms of physical (*p* = 0.345), role (*p* = 0.509), emotional (*p* = 0.235), cognitive (*p* = 0.462), and social functions (*p* = 0.645) before surgery. These scores mentioned were significantly higher in the ERAS group than the control group after surgery (all *p* < 0.001), indicating that perioperative ERAS management can significantly improve the quality of life of patients. The statistical results are shown in Table 3.

Comparison of Anxiety-Status Scores

There was no significant difference in preoperative SAS scores between the two groups (*p* = 0.056). The SAS score of the ERAS group was significantly lower than that

Table 3. Comparison of quality of life [M (P25, P75)/($\bar{x} \pm$ s)].

		Physical function score	Role function score	Emotional function score	Cognitive function score	Social function score
ERAS group (N = 144)	Preoperation	82.00 (76.00, 90.50)	83.06 ± 7.99	67.00 (62.00, 73.00)	72.00 (69.00, 74.00)	71.00 (68.50, 74.00)
	Postoperation	87.05 ± 7.72	87.89 ± 7.60	85.00 (83.00, 88.00)	85.00 (84.00, 87.00)	85.00 (82.00, 87.00)
Control group (N = 156)	Preoperation	82.00 (78.00, 86.00)	83.67 ± 8.17	68.00 (64.00, 74.00)	71.00 (68.00, 74.00)	72.00 (69.00, 74.00)
	Postoperation	82.04 ± 8.14	84.92 ± 6.60	74.00 (69.00, 79.00)	75.00 (72.00, 77.00)	78.00 (75.00, 81.00)
Z/t Preoperative comparison between groups		−0.943	−0.661	−1.188	−0.736	−0.460
p Preoperative comparison between groups		0.345	0.509	0.235	0.462	0.645
Z/t Postoperative comparison between groups		5.540	3.616	−10.866	−14.463	−11.939
p Postoperative comparison between groups		<0.001	<0.001	<0.001	<0.001	<0.001

Table 4. Comparison of anxiety state scores [M (P25, P75)/($\bar{x} \pm$ s)].

	Preoperation	Postoperation
ERAS group (N = 144)	62.00 (60.00, 64.00)	45.22 ± 3.68
Control group (N = 156)	63.00 (61.00, 64.50)	46.54 ± 3.60
Z/t	−1.911	−3.147
p value	0.056	0.002

of the control group (p = 0.002). This finding indicated that after ERAS management, patients showed significantly improved anxiety status, as well as a good emotional state and reduced negative emotions. The statistical results are shown in Table 4.

Discussion

This study found that the use of ERAS management significantly improved the quality of life and reduced the anxiety levels of patients undergoing surgery for ovarian tumor. Patients in the ERAS group had significantly shorter postoperative recovery times, higher quality of life scores, and lower anxiety scores. Therefore, ERAS management successfully addressed the recovery issues of patients after ovarian tumor surgery, providing an effective approach to enhancing their quality of life and psychological well-being.

This study observed that various parameters including first feeding time, first defecation time, defecation frequency, infusion time, and hospitalization time after surgery were significantly shorter in the ERAS group than in the control group, indicating that ERAS effectively reduced the postoperative recovery period for patients with ovarian tumors [14]. The core of ERAS implementation involves preoperative education, which aims to enhance patients' understanding of their condition and the necessary rehabilitation measures through health education [15]. Additionally, improvements in feeding and activity management under traditional nursing protocols contribute to enhanced gastrointestinal peristalsis and reduced first defecation time post-surgery [16].

In terms of emotional well-being, we noted that the postoperative anxiety scores of patients in the ERAS group were notably lower than those in the control group, suggesting that ERAS interventions can mitigate anxiety and other negative emotions. Accordingly, better physical and mental health outcomes are fostered for patients after ovarian tumor surgery [17]. This improvement may be attributed to the emphasis placed on addressing patients' psychological needs within the ERAS framework, which includes providing psychological counseling, understanding patients' concerns, and implementing tailored intervention plans to alle-

viate anxiety and other negative emotions effectively [18]. ERAS further contributes to the acceleration of postoperative recovery, thereby reducing economic burdens and associated anxiety [19].

Moreover, this study found significant improvements in various aspects of quality of life, including physical function, role function, emotional function, cognitive function, and social function, in the ERAS group compared with the control group [20]. ERAS is a patient-centered nursing approach spanning across the entire perioperative period. It is aligned with current advancements in medical practice. Post-surgery, ERAS encourages early mobilization and dietary intake, thereby enhancing vital capacity and metabolic processes, as well as facilitating early recovery. Ultimately, patients' gastrointestinal motility is promoted, and their quality of life is improved [21]. Additionally, ERAS emphasizes temperature management, fluid balance, and minimal drainage, ensuring optimal surgical conditions and promoting postoperative recovery [22,23]. This comprehensive approach reduces the risk of complications such as urinary tract infections and facilitates the restoration of patients' bodily functions after surgery. The findings of this study are consistent with those of previous research in the field [24].

Conclusions

Accelerated rehabilitation guidance can alleviate anxiety in patients with ovarian tumor after surgery and other adverse emotions. It can also promote patients' physical and mental health and improve their quality of life.

Availability of Data and Materials

The original contributions presented in the study are included in the article. Further inquiries can be directed to the corresponding author.

Author Contributions

XR, XY and YaweiZ designed the research study. XR and YaweiZ performed the research. LS, YuanZ and YH conducted data analysis. XR and LZ analyzed the data. All authors contributed to the drafting or important editorial changes in the manuscript. All authors read and approved the final manuscript. All authors have participated sufficiently in the work and agreed to be accountable for all aspects of the work.

Ethics Approval and Consent to Participate

This study has been approved by the Medical Ethics Committee of The First Affiliated Hospital of Hebei North University, Approval No.: K2021117. The patients and their families signed the informed consent.

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Conflict of Interest

The authors declare no conflict of interest.

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