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Comparison of ERAS interventions with routine protocols in gynecologic surgery

Jinekolojik Cerrahide ERAS uygulamalarının rutin protokollerle karşılaştırılması

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ABSTRACT

Aim: ERAS (Enhanced recovery after surgery) protocols are a set of rules that aim to improve the patient's well-being from admission to discharge, shorten the duration of hospitalization, and at the same time reduce costs. In this study, we aimed to evaluate whether ERAS protocols are superior to patient follow-up our hospital's protocol for gynecologic surgery patients.

Materials and Methods: The study included 50 patients who will undergo total abdominal hysterectomy and bilateral oophorectomy under general anesthesia. After the patients were divided into two groups, One group received the ERAS protocol while the other group received the routine protocol of our hospital. For both groups, patient's satisfactions and length of hospital stay were recorded.

Results: Patient's satisfaction during the entire hospitalization process (p=0.000), was significantly higher in the ERAS Group. The duration of hospitalization (p=0.02) were significantly shorter in ERAS Group.

Conclusions: In gynecological cases where the ERAS protocol was used, patient satisfaction and length of hospital stay were more favorable compared to the routine protocol of the hospital.

Keywords: ERAS, enhanced recovery after surgery, gynecologic surgery, patient's satisfaction

ÖZ

Amaç: ERAS (Cerrahi sonrası gelişmiş iyileşme) protokolleri, hastaneye yatıştan taburculuğa kadar hastanın refahını iyileştirmeyi, hastanede kalış süresini kısaltmayı ve aynı zamanda maliyetleri düşürmeyi amaçlayan bir dizi kuraldır.Bu çalışmada ERAS protokollerinin hastanemizin jinekolojik cerrahi hastaları için uyguladığı hasta takip protokolüne göre daha üstün olupolmadığını değerlendirmeyi amaçladık.

Gereç ve Yöntemler: Çalışmaya genel anestezi altında total abdominal histerektomi ve bilateral ooferektomi yapılacak 50 hasta dahil edildi. Hastalar iki gruba ayrıldıktan sonra bir gruba ERAS protokolü, diğer gruba ise hastanemizin rutin protokolü uygulandı. Her iki grup için de hasta memnuniyetleri ve hastanede kalış süreleri kaydedildi.

Bulgular: Tüm hastanede yatış süreci boyunca hasta memnuniyeti (p=0.000), ERAS Grubu'nda anlamlı olarak daha yüksekti. Hastanede kalış süresi (p=0.02) ERAS Grubu'nda anlamlı olarak daha kısaydı.

Sonuç: ERAS protokolünün kullanıldığı jinekolojik olgularda hasta memnuniyeti ve hastanede kalış süresi hastanenin rutin protokolüne göre daha olumluydu.

Anahtar Kelimeler: ERAS, cerrahi sonrası gelişmiş iyileşme, Jinekolojik cerrahi, hasta memnuniyeti

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INTRODUCTION

The enhanced recovery after surgery (ERAS) protocols standardize hospitalization through discharge. They are aimed to decrease metabolic stress and complications, facilitate a rapid return to everyday life, and decreasing the length of stay and costs (1,2).

A multidisciplinary team, including surgeons, anesthesiologists, nurses, physical therapists, and dietitians, is required for effective implementation of ERAS. Implementing a comprehensive approach to perioperative care helps prevent members of a large team from becoming separated and failing to implement the full protocol (3). Because even in hospitals where the ERAS protocol has been in place for some time, there is incomplete compliance with some of its elements (4,5).

Despite high compliance in the beginning, it declines over time, which consequently affects the treatment outcomes. That's why even with proper functioning, it is important to regularly monitor treatment outcomes and the quality of protocol implementation (6). Successful implementation of the ERAS protocol is possible only through the collaboration of a team of surgeons, anesthesiologists and nurses (7).

Follow-up and monitoring of discharged patients is recommended for the detection and evaluation of clinical outcomes and continuity of care (8). Safe patient discharge is essential, including the availability of rapid access to care. To promote healthcare integrity, one study provided discharged patients with a rapid access phone number (9).

Despite the strong evidence supporting ERAS, implementation in daily practice tends to be slow, requiring a step-by-step transition to acclimate the environment to the procedure. The support of the persons in charge and the adoption of a comprehensive set of guidelines by the scientific societies are also very important (10).

ERAS protocols were first introduced in the field of colorectal surgery, and then a variety of protocols have been developed for different types of surgery (10,11). The ERAS Gynecologic/Oncology guidelines were first published in 2016 by Nelson et al. and updated in 2019 (12,13, 14).

ERAS Protocols

Nurses' acceptance of the use of this protocol and the cooperation of anesthesiologists and physicians are essential for the success of ERAS(15).(In overcoming barriers to ERAS implementation and ensuring protocol adherence, nurses play a key role (16).

Firstly, staff should be trained to discuss any issues that may arise during the introduction phase (9).

Patients should be informed both verbally and in writing when they are admitted. This education will help the patient to control postoperative pain and prevent nausea and anxiety. It is recommended that the patient receives counselling throughout the process (12,17,18).

It has been stated that by eliminating the lack of knowledge of the patients, tolerance to pain increases and perioperative narcotic and non-narcotic analgesics requirement decreases (19,20).

Preoperative administration of oral carbohydrates is associated with maintaining preoperative health and reducing postoperative insulin resistance (21). Patients can consume a light snack up until 6 hours and clear fluids up until 2 hours before the anesthesia (9,22).

It has been reported that taking 400 ml of oral carbohydrates up to 2-3 hours before anesthesia and 800 ml of carbohydrates the night before surgery provides a decrease in postoperative insulin resistance, preservation of muscle strength and body weight, increase in cardiac activity, decrease in myocardial damage, decrease in hyperglycemia and decrease in the dose of insulin administration (23).This application is one of the most important things to be done to reduce metabolic stress in the surgical process.

Similarly, early onset of oral intake is an important goal of the protocol. Early feeding plays an important role in earlier recovery of intestinal function, shorter hospital length of stay and increased patient outcome. Nausea and vomiting assessment will facilitate early feeding by ensuring the patient's postoperative comfort(24,25).

Short-acting anesthetics and postoperative non-opoidal analgesic aid optimal pain control and functional recovery and to minimize nausea, sedation, fatigue, and risk of opioid addiction (26).

Postoperative nausea and vomiting should be prevented as it may limit a patient's ability to begin oral feeding in the early recovery phase (9).

It is important to recognize the importance of early nutrition in the first 24 hours after surgery (27,28).

In postoperative pain management, the combined use of non-opioid drugs is preferred to reduce the side effects of opioid use (13).

Minimally invasive surgery is an important consideration for rapid postoperative recovery as it is effective in avoiding prolonged NG catheter use, maintaining normothermia and normovolemia, preventing postoperative ileus and early mobilization (12). The ERAS protocol requires removal of the urinary catheter within 24 hours (13). In addition, ambulation is recommended as much as the patient can tolerate between 8-24 hours postoperatively(29).

In this study, we planned to evaluate the effectiveness of our hospital's routine practices and ERAS protocols in terms of patient satisfaction and length of stay in patients undergoing total abdominal hysterectomy and/or bilateral oophorectomy under general anesthesia in our clinic.

METHODS

The study protocol was approved by Ankara Bilkent City Hospital Ethical Committee (E2-23-3124) in 04/01/23.

Before the patients were included in the study, the leaders of the relevant disciplines came together in a multidisciplinary meeting. An ERAS protocol was prepared that we could apply in our clinic.

The study included 50 ASA (American Society of Anesthesiologists)1 and ASA2 female patients between the ages of 18-65 years who will undergo total abdominal hysterectomy and bilateral oophorectomy under general anesthesia. Written and verbal consent is obtained from the patients.

The 50 subjects included in the study were randomly divided into two groups by drawing lots from envelopes containing 25 envelopes labeled "Group ERAS(E)" and 25 envelopes labeled "Group Routine(R)" when they were admitted to the hospital.

Patient refusal, the necessity to perform an intervention that is not in accordance with ERAS protocols, and the change of routine practices on a patient basis due to the occurrence of complications in the surgical process were the criteria for withdrawal. Also patients with type 1 or type 2 diabetes mellitus were not included in the study.

In the patient group in which the routine protocol was applied (Group R), the usual follow-up of the ward was performed.(Table 1) In both groups, the psychological status of the patient's were evaluated. Although patients are not normally questioned about anxiety, it was asked in both groups, not only Group E, in order to obtain study data.

In the patient group in which ERAS protocol was applied (Group E), exercise, pain, mobilization training was given by nurses after hospitalisation and their consent was obtained. Patients showered with chlorhexidine-based antimicrobial soap the night before surgery. They were allowed to drink water until 3 hours before surgery. Preoperative nutritional support was provided 3 hours before surgery (400ml carbohydrate-rich liquid food). Bowel preparation was not done for also two groups.

Upon entering the operating room, the patient's information was double-checked and the patient was asked to verbally confirm the location of surgery.

Risk factors for postoperative nausea and vomiting (non-smoking-postoperative nausea/ vomiting history- opioid administration) were evaluated and if the risk was 3 or higher, 4 mg. dexamethasone was administered at induction and 8 mg. Ondansetron was administered. Patient warming device was used during the case. No nasogastric catheter and drain was inserted. No opioids were used for postoperative analgesia (Paracetamol and nonsteroidal anti-inflammatory drugs were used). Attempts were made to switch to a normal diet within 24 hours postoperatively and the patient was strongly advised to consume caffeine and chew gum.

Out-of-bed mobilization for 2 hours on operation day and out-of-bed mobilization for 6 hours on post-operative 1^{2} day were targeted

Patient education was given before discharge.They were instructed to call or come to the hospital quickly in case of any problems

For both groups; Time of urinary catheter removal, the time for passage of gas by intestines, postoperative 2nd hour visual analogue scale (VAS), length of hospitalization, patient's satisfaction with the whole process, patient's satisfaction with the operating room process, patient's satisfaction with the ward process (all satisfaction ratings will be rated on a scale of 1-10) were recorded.

SPSS (Statistical Package for Social Science) 21 package program was used for data analysis. Descriptive statistics were expressed as mean ± standard deviation for continuous variables and number of observations and (%) for nominal variables. After determining normal distrubution using Kolmogorov-Smirnov test for quantitative data, analysis were performed using Student's t-test or Mann–Whitney U-test. $\chi 2$ test was used for qualitative data. $P<0.05$ was considered significant.

RESULTS

Fifty patients were included in our study. Demographic data and anxiety levels of the patients are given in Table 2. The average age was 56 ± 8.3 in group E and 58 ± 6.8 in group R. (p=0.822)

Table 1. Group E and Group R protocols

Group E protocol	Group R protocol
Evaluation of the psychological status of the patient	Evaluation of the psychological status of the patient
Preoperative exercise, pain, mobilization training	
Consent	Consent
Shower with chlorhexidine-based antimicrobial soap the night before surgery	Shower with chlorhexidine-based antimicrobial soap the night before surgery
Snack consumption until 12 a.m. at night	
No bowel preperation	No bowel preperation
Antithrombotic prophylaxis at 7 p.m. (at the night before surgery)	Antithrombotic prophylaxis at 7 p.m. (at the night before surgery)
Preoperative 400 cc. carbohydrate supplementation (at 3 hours before surgery)	
Drinking water up to 3 hours before surgery	
Antibiotik prophylaxis within 1 hour of incision	Antibiotik prophylaxis within 1 hour of incision
Double-checking patient information in the operating room	Double-checking patient information in the operating room
Verbal confirmation of the patient's surgical site	Verbal confirmation of the patient's surgical site
Nausea and vomiting evaluation and treatment	Only ondansetron
Patient warming	
Avoiding Liquid Overloading	Avoiding Liquid Overloading
No nasogastric catheter and drain	
No opioids were used for postoperativeanalgesia	
Early mobilization(3rd hour)	Mobilization at 6th hour
Early feeding (3rd hour)	Feeding at 6th hour
Frequent reminders about caffeine consumption and chewing gum	
Urinary catheter removal earlier (3rd hour)	Urinary catheter removal at 6th hour
Patient education given before discharge	Advices given before discharge

Group E : Group ERASGroup R : Group Routine

Table 2. Demographic data and anxiety the patient groups

	Group E	Group R	p
ASA1(%)	11 (44%)	8 (32%)	0.561
ASA2(%)	14 (56%)	17 (68%)	0.561
Anxiety	22 (88%)	23 (92%)	0.036

Group E : Group ERASGroup R : Group Routine

The groups were comparable with respect to age, ASA, operative time and intraoperative fluid (Table 2 and 3). Although group R was significantly higher in anxiety (P=0.036), there was only one patient difference between the two groups.

The ERAS protocol was successfully implemented in all Group E patients. None of the patients in the Group E experienced any complications or problems that required protocol disruption

Table 3. Patient follow-up values

	Group E Mean ±SD	Group R Ortalama ±SD	p
Duration of surgery, min	85±15	97±26	0.247
Intraoperative fluid, ml	900±124	1000±149	0.165
Time of urinary catheter removal,hr	4.2±0.6	6±0	0.00
Postoperative VAS	7.3±0.6	4.7±1.4	0.00
Time for passage of gas by intestines (hour)	13.6±4.2	20.9±4.5	0.002
Length of hospitalization(day)	1.2±0.4	1.8±0.4	0.02

Group E : Group ERASGroup R : Group Routine

Table 4. Patient's satisfaction scores with operating-room, ward process and the whole process

	Group E Mean ±SD	Group R Ortalama ±SD	p
Patient's satisfaction score during the entire hospitalization process	9.8±0.3	9,2±0,7	0.000
Patient's satisfaction score during the operating- room process	9.8±0.3	9.2±0.6	0.001
Patient's satisfaction score during the ward process	9.7±0.4	9.2±0.7	0.012

Group E : Group ERASGroup R : Group Routine

In the Group R, the removal time of the urinary catheter was 6 hours postoperatively, while in the group E, it was aimed to be removed at 4 hours postoperatively. Urinary catheter removal time was significantly shorter in Group E (p=0.00). Postoperative VAS scores were significantly higher in Group E (p=0.00).

The time for gas to pass through the intestines (p=0.002) and the duration of hospitalization (p=0.02) (Table 3) were significantly shorter in Group E.

Patient's satisfaction during the entire hospitalization process (p=0.000), patient's satisfaction during the operating- room process (p=0.001) and patient's satisfaction during the ward process (p=0.012) were significantly higher in the Group E (Table 4).

DISCUSSION

In our study, we compared whether the ERAS protocol is superior to the routine patient follow-up protocol in terms of patient outcome and patient satisfaction.

Although the days of hospitalization were statistically shorter in the ERAS group, when considered clinically, they had very similar values. We believe that this is related to our clinic's policy of discharging patients as quickly and safely as possible.

Scores of Group Ewere higher than scores of Group Rin terms of patient satisfaction with the ward, operation room and the whole process. Since our hospital is a reference hospital and has some accreditations, it has its own criteria, similar to ERAS rules, which are meticulously applied. Therefore, although Group R patients also had high satisfaction, the successful implementation of the ERAS protocol led to higher results.

Since our routine fluid therapy protocols were similar to ERAS protocols, the intraoperative infused fluid was similar between the groups. Euvolemia was aimed by avoiding fluid overload or hypovolemia (24).

In Group E patients, the urinary catheter removal time was aimed to be changed from the sixth hour to the fourth hour postoperatively and was successfully performed. Shorter catheterization time resulted in decreased infection rates in many studies (30). Relatively early removal of the urinary catheter in the Group E did not cause any problems or recatheterization.

However, since the lack of opioid use in postoperative analgesia causes an increase in pain, it may be appropriate to add gabapentin to the initial treatment.

The time for gas to pass through the intestines was faster in Group E than in Group R. This was thought to be related to early feeding and early mobilization after the surgery.In one study, patients were permitted to consume clear liquids within 30 minutes and solid food within 1 hour of surgery. As a result, a shorter hospital stay was observed (31).

We believe that the main challenge in implementing ERAS criteria is not the rules, but the healthcare workers who may resist the implementation of these rules. ERAS practices may face resistance from healthcare personnel due to their perceived safety and familiarity with older treatment methods that management has approved for years. Consequently, ERAS protocols may take time to become widely adopted (32,9).

The limited team of ERAS-trained nurses and doctors on the ward and in the operating room limits the possibility of widespread implementation and adds extra workload. For the staff, who often work in insufficient numbers and with a heavy workload, additional applications may create unhappiness.

However, it is seemed to be certain that ERAS protocols, when implemented correctly, have positive aspects for both the patient and the healthcare system. The way to achieve widespread adoption is for hospital administrators, team leaders, and unit managers to receive multidisciplinary ERAS training and establish a system where only ERAS rules apply (33).

In this way, when the ERAS protocol becomes a routine practice, rather than a method partially applied to some patients, all staff will

be familiar with the protocol and practitioners will not feel anxious and uncomfortable.

We believe that starting with the ERAS protocols that are most easily adapted to the system, rather than implementing them quickly and with all their rules, will both increase staff compliance and remove hesitation when positive results are achieved. Increased compliance will bring other benefits, both in terms of patient outcomes and financially (34,35,36).

It was thought that evaluating and analyzing patient results after regular applications would increase success (14,33).

CONCLUSIONS

We found that in gynecology cases in which we applied the ERAS protocol, patients' satisfaction and length of hospital stay were more favorable compared to the routine protocol of our hospital. The rapid spread of ERAS practices requires a positive view of the ERAS protocol by those in managerial positions, multidisciplinary training of all relevant personnel, and follow-up to see positive results.

Authors' contributions

Nihan Aydın Güzey participated in writing the article and designing the project. Esra Uyar Türkyılmazparticipated in article revision and project design. Nihan Aydın Güzey, Namık Özcan and Elif Kurtparticipated in the data collection. Şefik Mustafa Aksoy and Ayşe Filiz Yavuz participated design of the Project and in article revision.

All authors read and approved the final manuscript.

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Competing interests

The authors declare that there is no conflict of interest.

Availability of data and materials

The datasets used or analysed during the current study are available from the corresponding author on reasonable request.

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