



EXAMINING THE IMPACT OF ENHANCED RECOVERY AFTER SURGERY PROTOCOLS ON POSTOPERATIVE RECOVERY IN GENERAL SURGICAL PATIENTS

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Abstract

Background: General surgery involves several procedures; each carries its own limitations. Traditional perioperative management protocol includes prolonged fasting, delayed mobility and narcotic painkillers, hence prolonged hospital stay.

Objective: To examine the effects of ERAS protocols on the process of recovering after surgery in a group of patients undergoing general surgical procedures.

Methodology: A descriptive analysis of 75 adult elective general surgery patients was studied. Patients were recruited from General Surgery unit C Lady Reading Hospital, Peshawar - Pakistan from December 1st, 2022, to November 30th, 2023. Participants were arbitrarily assigned to two groups A and B. Both groups were matched for age and gender. Patients in group A (control group) received standard perioperative treatment. Patients in group B (ERAS/study Group) received surgical care that included preoperative therapy, pain management, early mobilization and oral feeding.

Results: The study included 75 patients: 37 in the control group and 38 in the ERAS group. Male participants made up 56.8% of the control group and 60.5% of the ERAS group. The ERAS group had significantly shorter hospital stays versus control (3.2 days vs 4.8 days, $p < 0.001$), lower bowel function recovery time (24.5 hours versus 36.5 hours, $p < 0.001$) and significantly lower postoperative complication rate than the control group (13.2% vs 32.4%, p value < 0.001).

Conclusion: ERAS method for patients undergoing elective general surgery has better post-operative recovery with decreased postoperative complications than traditional recovery management approach.

Keywords: General Surgery, Postoperative Recovery, Enhanced Recovery after Surgery (ERAS), Length of Hospital Stay

Introduction

Enhanced Recovery after Surgery (ERAS) protocols have been developed as a revolutionary method for perioperative care, with the goal of optimizing the recovery process for patients after surgery [1, 2]. Initially used in the field of colorectal surgery, these procedures based on empirical data have shown efficacy in decreasing complications, accelerating postoperative recovery, and minimizing the

length of hospital stay [3, 4]. The use of ERAS concepts has been extended to many surgical specialties, including general surgery, and has shown encouraging results [5].

General surgery involves a wide variety of operations, each with its own distinct problems and requirements for postoperative care [6]. Conventional perioperative treatments often include lengthy periods of nil by mouth (NBM), delayed mobility, and the use of opioids to control pain.[7,8] These methods may lead to longer hospital stays and higher rates of disease. ERAS protocols, in contrast, promote a patient-centered strategy that emphasizes preoperative optimization, standardized treatment pathways, and early rehabilitation [9,10].

This research project seeks to comprehensively investigate the effects of (ERAS) protocols on the process of recovering after surgery in patients undergoing conventional surgical procedures. This research aims to provide useful insights into the possible advantages and obstacles of adopting (ERAS) in general surgery by examining key outcomes such as duration of hospital stay, recovery of bowel function, postoperative complications, and patient satisfaction.

The reason for studying ERAS in general surgery is the possibility of better utilization of resources, increased patient satisfaction, and decreased healthcare expenses. Given the healthcare systems' pursuit of efficient and high-quality treatment, it is crucial to comprehend the efficacy of (ERAS) in the field of general surgery. Furthermore, the knowledge acquired from this research may be used to shape next perioperative care approaches, facilitating the creation of customized protocols that are in line with the distinct attributes of general surgical operations. This study seeks to explore the effects of ERAS in general surgery on postoperative recovery at a tertiary care hospital.

Materials and Methods

This study used a prospective descriptive comparative analysis to evaluate a total of 75 male and female patients in the age range 18 to 75 years who were scheduled to undergo elective general surgical procedures like cholecystectomy, hernia repair surgery, during the period 1st December 2022 till 30th November 2023 at General Surgery unit C Lady Reading Hospital, Peshawar - Pakistan. Severe cardiopulmonary compromised patients, immunocompromised patients, patients presenting for re-do surgery and patients with prior history major abdominal surgery like intestinal resection were excluded. Patients who underwent routine perioperative care were called control while patients in ERAS group received surgical treatment following ERAS guidelines, which included preoperative therapy, the use of non-opioid pain relief methods, early mobility, and early resumption of oral feeding. Postoperative recovery was assessed in terms of duration of hospitalization (days), the time interval functional bowel recovery (hours), any complications (surgical site infection, wound dehiscence, re-admission) that occurred within 30 days after surgery. Sample size was calculated using WHO sample size calculator and patients were recruited using non probability consecutive sampling technique.

Demographic data, including age, gender, and BMI, as well as baseline characteristics, were documented for all participants. Perioperative variables, such as specific information of the surgical technique, kind of anesthesia used, and events occurring during the operation, were recorded. Data on postoperative outcomes, including the duration of hospitalization, the time interval for bowel function restoration, any complications that occurred after the surgery including readmission within 30 days, were methodically gathered. Patients in the ERAS group were administered a standardized regimen, which included preoperative counseling aimed at managing expectations and augmenting patient comprehension. Utilization of multimodal analgesia to minimize the use of opioids and alleviate postoperative pain. Initiating ambulation and mobilization within 24 hours after surgery. Commencement of oral feeding as soon as possible, gradually increasing as the individual's tolerance enables. Patients were followed for 4 weeks after surgery. The length of hospital, bowel function recovery time and complications were recorded for both groups.

Data was analyzed using statistical analysis program IBM SPSS version 25. Categorical data was presented as frequencies and percentages while mean \pm SD or median (IQR) was recorded for continuous variables. Independent sample t test or Mann Whitney U test was used to compare to

continuous data and chi square or Fisher exact test was applied to compare categorical variables. P value ≤ 0.05 was called statistically significant.

Ethical Considerations

The LRH Institutional Review Board and Ethics Committee approved the research for ethical compliance. Each participant provided informed permission before joining the research.

Results

The study had a total of 75 patients, with 37 assigned to the control group and 38 to the ERAS group. The male gender constituted the majority of participants, accounting for 56.8% in the control group and 60.5% in the ERAS group. The mean age of the participants was 55.2 ± 8.1 years in control group and 57.8 ± 9.4 years in ERAS group. Majority of the patients belonged to the age group 41 to 50 years (10 (27.0%) versus 12 (31.6%)) in control and ERAS group respectively as illustrated in table 1.

The pre-operative characteristics of patients are summarized in table 2 which shows that hypertension was the most commonly reported comorbidity in both groups (14 (37.8%) in control versus 12 (31.6%) in ERAS group). Smoking history was positive in 04 (10.8%) patients in control group versus 03 (7.9%) in ERAS group. Operative characteristics are presented in table 3. The mean operative time control group was 87.4 ± 15.6 minutes in control group and 85.2 ± 14.8 minutes in ERAS group. All patients received general anesthesia.

Table 4 illustrates the primary outcomes of patients in both groups. ERAS group exhibited a markedly reduced duration of hospitalization in comparison to the control group (3.2 days vs 4.8 days, $p < 0.001$). The ERAS group had a substantially shorter duration for the recovery of bowel function compared to the control group (24.5 hours vs 36.5 hours, $p < 0.001$). The study also assessed patient satisfaction, and the ERAS group had a substantially better satisfaction level in comparison to the control group (8.9 vs 7.2, $p = 0.001$). The ERAS group had a decreased 30-day readmission rate, however this disparity did not reach statistical significance (5.3% vs. 16.2%, $p = 0.124$). (Table 5) The study also evaluated postoperative complications, finding that the ERAS group had a significantly reduced total complication rate compared to the control group (13.2% vs 32.4%). More precisely, the ERAS group exhibited reduced occurrences of surgical site infection (2.6% vs 10.8%), anastomotic leak (2.6% vs 5.4%), wound healing (5.3% vs. 8.1%), and other complications (2.6% vs. 8.1%). (Table 6).

Table 1: Demographics of Study Participants

Characteristic	Control Group (n=37)	ERAS Group (n=38)	p-value
Gender			
Male	21 (56.8%)	23 (60.5%)	0.72
Female	16 (43.2%)	15 (39.5%)	
BMI (kg/m ²) mean \pm SD	28.3 \pm 3.5	29.1 \pm 4	0.41
Age (years) mean \pm SD	55.2 \pm 8.1	57.8 \pm 9.4	0.23
18-30 years	4 (10.8%)	2 (5.3%)	
31-40 years	8 (21.6%)	6 (15.8%)	
41-50 years	10 (27.0%)	12 (31.6%)	
51-60 years	9 (24.3%)	10 (26.3%)	
61-70 years	4 (10.8%)	7 (18.4%)	
71 and above	2 (5.4%)	1 (2.6%)	

Table 2. Pre-operative parameters of interest

Comorbidities	Control Group (n=37)	ERAS Group (n=38)
Hypertension	14 (37.8%)	12 (31.6%)
Diabetes	06 (16.2%)	08 (21.0%)

Smoking	04 (10.8%)	03 (7.9%)
Ischemic Heart Disease	01 (2.7%)	01 (2.6%)
COPD	0 (0.0%)	0 (0.0%)

Table 3: Perioperative Characteristics

Variable	Control Group (n=37)	ERAS Group (n=38)	p-value
Anesthesia Type	General	General	
Operative Time (minutes) mean ± SD	87.4 ± 15.6	85.2 ± 14.8	0.57

Table 4: Primary Outcomes - Postoperative Recovery Parameters

Outcome Measure	Control Group (n=37)	ERAS Group (n=38)	p-value
Length of Hospital Stay (days) mean ± SD	4.8 ± 1.2	3.2 ± 0.8	<0.001
Time to Return of Bowel Function (hours) median (IQR)	36.5 (30-48)	24.5 (20-30)	<0.001

Table 5: Patient Satisfaction and 30-Day Readmission Rates

Variable	Control Group (n=37)	ERAS Group (n=38)	p-value
Patient Satisfaction Score (0-10) mean ± SD	7.2 ± 1.5	8.9 ± 1.2	0.001
30-Day Readmission Rate n (%)	6 (16.2%)	2 (5.3%)	0.124

Table 6: Postoperative Complications

Complication	Control Group (n=37)	ERAS Group (n=38)	P value
Overall complication rate	12 (32.4%)	5 (13.2%)	<0.001
Surgical Site Infection (SSI)	4 (10.8%)	1 (2.6%)	
Anastomotic Leak	2 (5.4%)	1 (2.6%)	
Wound Dehiscence	3 (8.1%)	2 (5.3%)	
Others	3 (8.1%)	1 (2.6%)	

Discussion

The findings of this study align with other published research that has shown the advantages of employing (ERAS) regimens in diverse surgical interventions. In a meta-analysis conducted by Gustafsson et al.[11], it was shown that the use of ERAS procedures resulted in a noteworthy decrease in the duration of hospitalization, the time it took for bowel function to recover, and the occurrence of postoperative problems among patients undergoing colorectal surgery. Our research contributes to the existing data by showcasing comparable advantages in individuals after appendectomy and cholecystectomy.

Our investigation revealed a mean difference of 1.6 days in hospital stay between the ERAS and control groups, which is consistent with the findings of a study conducted by Lassen et al.[12] that observed a mean difference of 1.5 days in patients undergoing colorectal surgery. Our investigation discovered a median discrepancy of 12 hours in the duration it took for bowel function to recover. This finding aligns with the findings of a study conducted by Varadhan et al.[13], which indicated a median discrepancy of 13 hours in patients undergoing colorectal surgery.

In our research, the patient satisfaction score was greater in the ERAS group, consistent with the results of a study by Spanjersberg et al.[14], which also indicated better patient satisfaction in ERAS patients compared to those receiving standard treatment. However, our investigation failed to identify a statistically significant disparity in the rates of readmission within 30 days between the two cohorts. This finding contradicts the outcomes of a research conducted by Greco et al.[15], which indicated a decreased readmission rate among patients using (ERAS) protocols.

Our research discovered a reduced overall rate of problems in the ERAS group when it comes to postoperative complications. This finding aligns with the findings of a study conducted by Gustafsson et al.[16], which also indicated a decreased incidence of complications in ERAS patients compared to those receiving standard treatment. However, our investigation failed to identify a statistically significant disparity in certain consequences, such as surgical site infection and anastomotic leak. This lack of significance may be attributed to the limited size of our sample.

Our work adds to the expanding amount of data supporting ERAS methods in surgery. ERAS procedures may enhance surgical recovery, patient satisfaction, and complications. These results need to be confirmed with bigger sample numbers to discover ERAS protocol components that provide these advantages.

Study Limitations

Our research has various limitations that should be addressed when interpreting outcomes. The small sample size may have restricted statistical ability to detect significant differences in certain outcomes. Second, since the research was done at one center, the results may not apply to other contexts. Third, the trial was not randomized, which may have added selection bias. Finally, the research did not evaluate the cost-effectiveness of an ERAS procedure, which healthcare providers must consider. The advantages of ERAS protocols in surgery need to be studied in bigger trials with multi-center designs and cost-effectiveness assessments.

Conclusion

Our research concluded that the use of an ERAS strategy for patients undergoing elective general surgery resulted in enhanced postoperative recovery indicators, increased patient satisfaction, and reduced incidence of postoperative complications. Various results endorse the use of ERAS guidelines in various surgical procedures to maximize patient outcomes. Additional investigation is required to validate these observations and pinpoint the precise elements of ERAS techniques that contribute to these advantages.

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