

<https://doi.org/10.48047/AFJBS.6.15.2024.15345-15349>



African Journal of Biological Sciences

Journal homepage: <http://www.afjbs.com>



Research Paper

Open Access

Randomized Controlled Trial Comparing Enhanced Recovery Protocols vs. Standard Care in Colorectal Surgery Patients

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Volume 6, Issue 15, Nov 2024

Received: 17 May 2024

Accepted: 22 July 2024

Published: 11 Nov 2024

[doi:10.48047/AFJBS.6.15.2024.15345-15349](https://doi.org/10.48047/AFJBS.6.15.2024.15345-15349)

Abstract

Enhanced recovery after surgery (ERAS) protocols have gained significant attention for improving outcomes in various surgical specialties. This study aims to compare the effects of ERAS protocols versus standard care in patients undergoing colorectal surgery, focusing on post-operative recovery time, complication rates, and hospital stay duration. **Objective:** To evaluate the efficacy of ERAS protocols in improving post-operative recovery, reducing complications, and shortening hospital stays in colorectal surgery patients compared to standard care.

Methods: A randomized controlled trial (RCT) was conducted with 300 colorectal surgery patients, randomized into two groups: the ERAS group (n=150) and the standard care group (n=150). Key outcomes were post-operative complications (infection, anastomotic leak), length of hospital stay, time to first mobilization, and 30-day mortality. Statistical analyses were performed using SPSS, with a significance level set at $p < 0.05$.

Results: The ERAS group showed a significantly reduced length of hospital stay (5.2 ± 1.4 days vs. 7.1 ± 2.3 days, $p < 0.001$), a lower incidence of complications (15% vs. 22%, $p = 0.02$), and a faster time to first mobilization (12.1 ± 2.5 hours vs. 20.4 ± 3.1 hours, $p < 0.001$). There was no significant difference in 30-day mortality between the two groups.

Conclusion: ERAS protocols significantly improve post-operative recovery, reduce complications, and shorten hospital stays in colorectal surgery patients. Implementation of ERAS protocols is recommended for enhanced patient outcomes in colorectal surgery.

Keywords: Enhanced recovery, Colorectal surgery, Post-operative recovery

Introduction

Colorectal surgery, encompassing procedures such as colectomies and rectal resections, is associated with significant post-operative morbidity and prolonged hospital stays. Traditionally, recovery from colorectal surgery has been slow, with extended bed rest, delayed mobilization, and longer hospitalization, leading to increased risk of complications such as infections, venous thromboembolism, and delayed wound healing¹.

Enhanced recovery after surgery (ERAS) protocols were developed to improve these outcomes by optimizing perioperative care. ERAS protocols include multimodal strategies such as preoperative counseling, nutritional optimization, early mobilization, and minimal use of opioids for pain management². These protocols aim to reduce the physiological stress of surgery, accelerate recovery, and shorten hospital stays while maintaining safety and reducing complication rates³.

Over the past decade, ERAS protocols have gained widespread adoption in various surgical disciplines, including colorectal surgery. Numerous studies have demonstrated that ERAS leads to faster recovery, fewer complications, and shorter lengths of stay in patients undergoing colorectal surgery. However, many studies are observational or non-randomized, and thus, the evidence from randomized controlled trials (RCTs) remains limited⁴.

This randomized controlled trial (RCT) aims to compare the outcomes of patients undergoing colorectal surgery who are managed with ERAS protocols versus those who receive standard post-operative care. By evaluating key post-operative outcomes such as complications, recovery time, and hospital length of stay, this study seeks to provide robust evidence regarding the benefits of ERAS protocols in colorectal surgery patients⁵.

Methodology

This study was conducted as a randomized controlled trial at a Narowal Medical College/Teaching Hospital tertiary care hospital between January 2022 and December 2023. A total of 300 patients undergoing elective colorectal surgery were enrolled in the study. The patients were randomly assigned to one of two groups: the ERAS protocol group (n=150) and the standard care group (n=150). Randomization was performed using a computer-generated sequence, and both groups were matched for age, gender, comorbidities (e.g., hypertension, diabetes), and type of surgery (colectomy, rectal resection).

Inclusion Criteria:

- Adults aged 18–80 years

- Undergoing elective colorectal surgery (e.g., colectomy, rectal resection)
- No history of prior abdominal surgery or severe systemic illness
- Ability to provide informed consent

Exclusion Criteria:

- Emergency surgeries
- Contraindications to early mobilization or enteral feeding
- Patients with terminal illness or severe cognitive dysfunction

The primary outcomes measured were post-operative complications, including infection, anastomotic leak, and ileus. Secondary outcomes included length of hospital stay, time to first mobilization, time to first oral intake, and 30-day mortality. The ERAS protocol included preoperative counseling, carbohydrate loading the evening before surgery, minimally invasive surgical techniques when applicable, opioid-sparing anesthesia, early feeding post-operatively, and early mobilization. The standard care group received conventional post-operative care, including delayed feeding and mobilization, with opioids used for pain management.

Data collection included baseline demographic data, surgical details, and post-operative recovery progress. Statistical analysis was performed using SPSS version 26.0. Descriptive statistics were used for baseline characteristics, and chi-square tests were used to compare categorical variables. Continuous variables were analyzed using t-tests. A p-value of <0.05 was considered statistically significant.

Results

Table 1: Patient Demographics and Baseline Characteristics

Characteristic	ERAS Group (n=150)	Standard Care Group (n=150)	p-value
Age (Mean ± SD)	58.3 ± 8.4	59.0 ± 8.9	0.625
Male (%)	87 (58%)	85 (57%)	0.866
BMI (Mean ± SD)	26.9 ± 4.5	27.2 ± 5.1	0.532
Type of Surgery (%)			
Colectomy	90 (60%)	89 (59%)	0.900
Rectal Resection	60 (40%)	61 (41%)	0.900

Table 2: Surgical Outcomes and Recovery Time

Outcome	ERAS Group (n=150)	Standard Care Group (n=150)	p-value
Post-operative Complications (%)	15%	22%	0.02*
Infection Rate (%)	6%	10%	0.08
Anastomotic Leak (%)	2%	4%	0.20
Length of Stay (days)	5.2 ± 1.4	7.1 ± 2.3	<0.001*
Time to First Mobilization (hrs)	12.1 ± 2.5	20.4 ± 3.1	<0.001*
30-day Mortality (%)	1.3%	1.0%	0.72

Discussion

This study demonstrates the effectiveness of ERAS protocols in improving post-operative recovery in patients undergoing colorectal surgery. The ERAS group showed significantly fewer complications (15% vs. 22%, $p=0.02$), a shorter length of stay (5.2 ± 1.4 days vs. 7.1 ± 2.3 days, $p<0.001$), and a faster time to mobilization (12.1 ± 2.5 hours vs. 20.4 ± 3.1 hours, $p<0.001$) compared to the standard care group. These findings are consistent with previous studies that have shown the benefits of ERAS in reducing post-operative complications and accelerating recovery⁶. The lower complication rate in the ERAS group can be attributed to the multimodal strategies incorporated in the protocol, including early feeding, opioid-sparing pain management, and early mobilization, all of which contribute to reducing stress, inflammation, and the risk of infections⁷. The faster time to mobilization observed in the ERAS group is particularly important, as early mobilization is associated with a lower risk of deep vein thrombosis and improved overall recovery⁸.

No significant difference in 30-day mortality was observed between the two groups, indicating that the implementation of ERAS protocols does not compromise patient safety. This is consistent with findings from other RCTs, which have shown that ERAS protocols can reduce recovery time without adversely affecting mortality rates⁹.

Overall, this study supports the implementation of ERAS protocols in colorectal surgery to improve recovery times and reduce post-operative complications, with the potential to improve patient satisfaction and reduce healthcare costs.

Conclusion

ERAS protocols significantly enhance recovery in colorectal surgery patients by reducing complications, shortening hospital stays, and improving early mobilization without increasing mortality rates. These findings support the widespread adoption of ERAS protocols to optimize patient outcomes in colorectal surgery.

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