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Research Article

Study on the Effectiveness of Enhanced Recovery After Surgery (ERAS) Protocols in Gastrointestinal Surgery

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Abstract

Background:

Enhanced Recovery After Surgery (ERAS) protocols are organized, team-based care plans that aim to lower surgical stress, improve body function, and help patients recover more quickly. Using these protocols in gastrointestinal (GI) surgery has shown better postoperative results compared to traditional care.

Objective:

The goal of this study is to assess how effective ERAS protocols are in gastrointestinal surgeries compared to conventional perioperative management. It will focus on recovery after surgery, complication rates, and the length of hospital stays.

Methods:

A prospective study took place over one year at a tertiary care hospital in India, involving 100 adult patients who had elective gastrointestinal surgery. Patients were randomly assigned to two groups: Group A (ERAS protocol, n=50) and Group B (Conventional care, n=50). We measured outcomes such as time to first bowel movement, time until patients could take oral intake, postoperative pain (using the Visual Analog Scale, VAS), complication rates, and the length of hospital stay. We analyzed the data using SPSS version 25.0, considering $p < 0.05$ as significant.

Results:

The average hospital stay was significantly shorter in the ERAS group (4.8 ± 1.2 days) compared to the conventional group (7.1 ± 1.8 days, $p < 0.001$). The time to bowel movement and oral intake occurred sooner in the ERAS group (29.4 ± 6.2 hours and 30.5 ± 5.8 hours) than in the conventional group (49.6 ± 8.3 hours and 52.4 ± 7.9 hours, respectively, $p < 0.001$). Postoperative pain scores at 24 hours were lower in the ERAS group (VAS 3.4 ± 0.9 vs 5.1 ± 1.1, $p < 0.001$). The complication rates were lower in the ERAS group (10%) compared to conventional care (22%).

Conclusion:

Using ERAS protocols in gastrointestinal surgery leads to less postoperative pain, quicker recovery, and shorter hospital stays without raising the risk of complications. ERAS should become the standard perioperative care in GI surgery.

Keywords: Enhanced Recovery After Surgery, ERAS, gastrointestinal surgery, postoperative recovery, hospital stay, perioperative care.

Introduction

Enhanced Recovery After Surgery (ERAS) protocols, first introduced by Kehlet in the late 1990s, mark a significant change in perioperative care. They integrate evidence-based methods aimed at reducing surgical stress, maintaining organ function, and speeding up recovery (1,2). Traditionally, patients undergoing gastrointestinal surgery have been treated with conservative perioperative care models. These models focused on long fasting periods, delayed mobilization, and generous use of intravenous fluids. However, these practices have been shown to extend recovery times and hospital stays (3).

ERAS is a multi-faceted approach that combines improved anesthesia, fluid management, pain relief, early enteral nutrition, and patient movement (4). Implementing ERAS requires teamwork among surgeons, anesthesiologists, nurses, and dietitians to achieve better outcomes. In gastrointestinal surgeries, especially colorectal, gastric, and hepatobiliary procedures, ERAS pathways have linked to less morbidity, quicker bowel function recovery, and shorter hospital stays (5,6).

Despite increasing global evidence, the adoption of ERAS in India has been slow. This is partly due to limited awareness, infrastructural issues, and resistance to change (7). Local studies are therefore necessary to show feasibility and benefits in the Indian healthcare system.

The present study aims to evaluate the effectiveness of ERAS protocols in gastrointestinal surgeries by comparing clinical outcomes between patients managed with ERAS and those receiving traditional perioperative care in a tertiary care hospital in India.

Materials and Methods

Study Design and Setting

This was a **prospective, randomized, comparative clinical study** conducted in the Department of General Surgery at a tertiary care teaching hospital in India over 12 months (January 2024 – December 2024). Ethical approval was obtained from the Institutional Ethics Committee, and written informed consent was obtained from all participants.

Sample Size and Randomization

A total of **100 adult patients** (aged 18–65 years) undergoing elective gastrointestinal surgery were included. Patients were randomly assigned into two equal groups:

- **Group A (ERAS protocol):** 50 patients
- **Group B (Conventional care):** 50 patients

Inclusion Criteria

- Adults (≥ 18 years) undergoing elective GI surgery (colorectal, gastric, small bowel, hepatobiliary)
- ASA physical status I–III

- Ability to provide informed consent

Exclusion Criteria

- Emergency surgeries
- Severe cardiac, renal, or hepatic comorbidities
- Inability to comply with postoperative protocols
- Conversion to open surgery in laparoscopic cases

Perioperative Protocols

Group A (ERAS):

- Preoperative counseling and carbohydrate-rich drink 2 h before surgery
- Avoidance of routine bowel preparation
- Short-acting anesthetics with multimodal analgesia (paracetamol, NSAIDs, limited opioids)
- Early removal of drains and nasogastric tubes
- Early oral fluids (within 6–12 h post-op)
- Early ambulation (within 12 h)

Group B (Conventional):

- Nil per oral after midnight
- Routine bowel preparation
- Opioid-based analgesia
- Delayed oral intake (> 48 h)
- Late ambulation (> 24–36 h)

Outcome Measures

Primary outcomes:

- **Length of postoperative hospital stay (days)**
- **Time to first bowel movement (hours)**

Secondary outcomes:

- **Time to oral intake (hours)**
- **Postoperative pain score (VAS scale 0–10)**
- **Postoperative complications (SSI, ileus, pneumonia, urinary infection)**

- **Readmission within 30 days**

Data Collection and Statistical Analysis

Data were recorded in a predesigned proforma and analyzed using **SPSS v25.0**. Continuous variables were expressed as mean ± SD and compared using **Student's t-test**. Categorical variables were compared using **Chi-square test**. A p-value < 0.05 was considered statistically significant.

Results

Demographic Characteristics

Both groups were comparable in baseline demographic characteristics (Table 1).

Table 1: Baseline Characteristics of Study Population

Parameter	ERAS (n=50)	Conventional (n=50)	p-value
Age (years, mean ± SD)	46.2 ± 11.3	47.4 ± 10.8	0.62
Male : Female	28 : 22	30 : 20	0.68
BMI (kg/m²)	24.1 ± 3.4	24.8 ± 3.6	0.45
ASA I/II/III	20/22/8	18/24/8	0.91

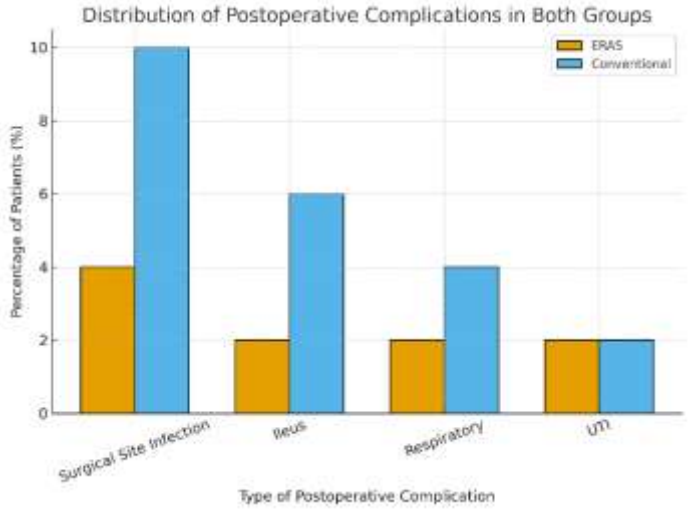
Primary and Secondary Outcomes

Table 2: Comparison of Postoperative Recovery Parameters

Parameter	ERAS (mean ± SD)	Conventional (mean ± SD)	p-value
Length of hospital stay (days)	4.8 ± 1.2	7.1 ± 1.8	<0.001
Time to bowel movement (hours)	29.4 ± 6.2	49.6 ± 8.3	<0.001
Time to oral intake (hours)	30.5 ± 5.8	52.4 ± 7.9	<0.001
Pain score (VAS 24 h)	3.4 ± 0.9	5.1 ± 1.1	<0.001
Postoperative complications (%)	10%	22%	0.04
Readmission within 30 days (%)	2%	6%	0.28

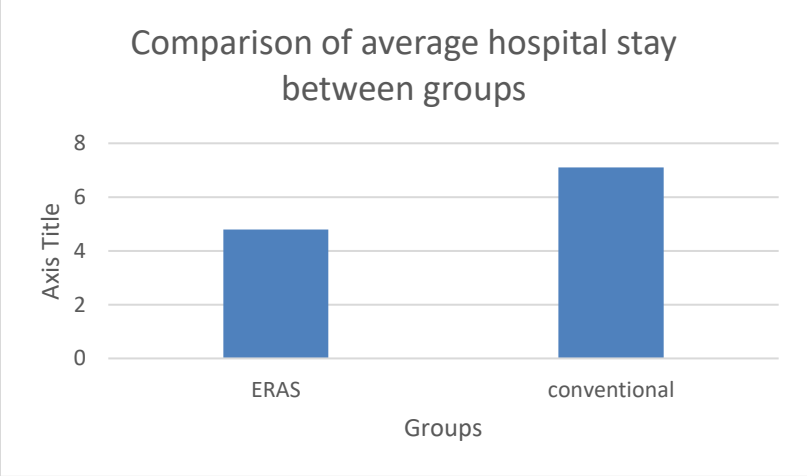
Complication Distribution

Figure 1. Distribution of postoperative complications in both groups



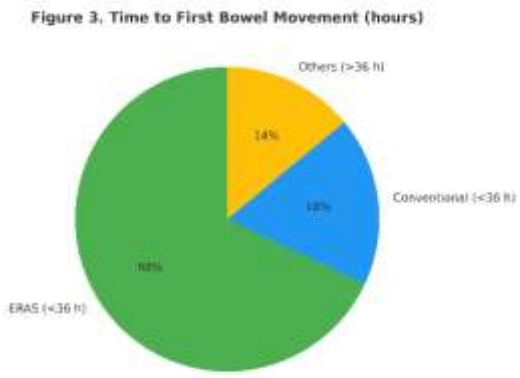
Length of Hospital Stay

Figure 2. Comparison of average hospital stay between groups



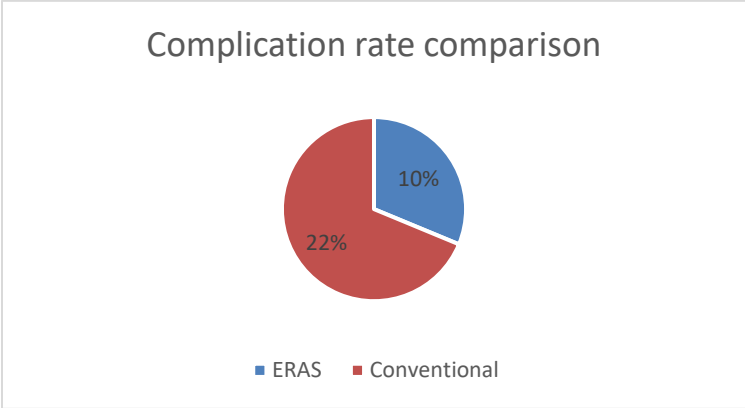
Return of Bowel Function

Figure 3. Time to first bowel movement (hours)



Overall Complication Rate

Figure 4. Complication rate comparison



Discussion

This study showed that using ERAS protocols in gastrointestinal surgery greatly improves recovery after surgery compared to traditional care. Key findings included a quicker return of bowel function, less postoperative pain, shorter hospital stays, and fewer complications.

Length of Hospital Stay

Patients who followed ERAS protocols had an average hospital stay of 4.8 days, which is significantly shorter than the 7.1 days for those in the conventional group. Similar findings have been reported by Gustafsson et al.[8] and Greco et al.[9], who attributed these results to early mobilization, less opioid use, and early feeding.

Gastrointestinal Recovery

The early return of bowel activity (29 hours compared to 50 hours) matches findings from Zhuang et al.[10], where ERAS reduced ileus and sped up gastrointestinal motility by minimizing bowel manipulation and avoiding too many IV fluids.

Pain Management

Lower pain scores after surgery in the ERAS group (VAS 3.4 vs 5.1) support the benefits of using multiple pain relief methods[11]. Reducing opioids helps lessen sedation, nausea, and ileus, which leads to quicker mobilization.

Complications

Overall complication rates were nearly cut in half with ERAS (10% vs 22%). Similar reductions were noted by Miller et al.[12] and Varadhan et al.[13], suggesting that ERAS improves the immune response and lowers the risk of infections through better blood sugar control and normal body temperature.

Readmission

Readmission rates were low and did not differ significantly, showing that ERAS is safe when done correctly. This finding is consistent with international studies on ERAS. [14,15]

Barriers to Implementation

In India, challenges include a lack of coordination among different teams, limited patient education, and resource limitations.[16] However, the success of this study shows that ERAS can work in settings with few resources.

Limitations

The study's limitations include being conducted at a single center and having a moderate sample size. Long-term results such as quality of life and cost analyses were not examined. Future trials involving multiple centers could provide stronger evidence.

Conclusion

ERAS protocols significantly improve recovery after gastrointestinal surgery by shortening hospital stays, reducing pain, and speeding up bowel function without increasing complication rates. Implementing ERAS in regular surgical practice in India is both practical and beneficial, leading to better patient outcomes and less strain on healthcare resources.

Recommendations

• Include ERAS protocols in all planned GI surgeries.

• Offer training workshops for surgical and nursing staff.

• Create standardized national ERAS guidelines.

• Future studies should look at cost-effectiveness and long-term functional outcomes.

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