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Effectiveness of Enhanced Recovery After Surgery (ERAS) Pathway in Reducing Length of Hospital Stay

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ABSTRACT

Background: Enhanced Recovery After Surgery (ERAS) is a model of perioperative care that utilizes evidence-based practice to minimize stress in surgery, early mobilization, and faster functional recovery. One of the ERAS targets is the reduction of length of hospital stay (LOS), which is of particular significance to resource-constrained healthcare systems like those found in Pakistan.

Objectives: This research was conducted to assess the effectiveness of the ERAS pathway to shorten LOS in adult patients undergoing elective abdominal surgery at tertiary care hospitals in Punjab, Pakistan. Secondary goals encompassed evaluation of postoperative pain, mobilization period, opioid analgesia, complications and a 30 days readmission rate.

Methods: The study was a prospective observational study that was carried out between June 2024 and August 2025 and involved 120 adults who are going to have an elective abdominal surgery. The participants were arbitrarily divided into an ERAS group (n=60) or a management group (n=60). The elements of ERAS were preoperative counselling, decreased fasting, carbohydrate loading, multimodal analgesia, early mobilization, and early enteral nutrition. The structural proforma was used to record LOS and secondary outcomes. Statistical evaluation was done in SPSS version 26 whereby independent t-tests and chi-square tests were used respectively.

Results: ERAS patients experienced a much shorter LOS (3.2 +/- 1.1 days) than conventional care patients (6.4 +/- 2.3 days). ERAS was also linked with an earlier mobilization (6.5 ± 2.3 hours), an earlier oral consumption (10.4 ± 3.1 hours), a lower postoperative pain rating, and a considerable decrease in opioid consumption. The ERAS group had fewer postoperative ileus and nausea/vomiting. There was no significant difference in 30 day readmission.

Conclusion: ERAS substantially decreases LOS and improves the recovery during the postoperative period without raising the rates of readmission. ERAS protocols can be incorporated in the day-to-day practice of surgery to enhance the perioperative outcomes and utilization of healthcare resources in Pakistan.

Keywords: Enhanced Recovery After Surgery, ERAS pathway, postoperative recovery, length of hospital stay, multimodal analgesia, elective abdominal surgery.

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INTRODUCTION

Enhanced Recovery After Surgery (ERAS) is evidence-based, multimodal approach of perioperative care that seeks to minimize the physiological stress of surgery and speed the recovery of normal physiological functioning[1]. Initially presented as an organized idea in colorectal surgery, ERAS protocols are now widely used in various fields of surgery such as hepatobiliary, gynecological, orthopedic, and general abdominal surgery[2]. ERAS incorporates integrated approaches that are focused on all aspects of surgical management: preoperative optimization, intraoperative physiological support, and postoperative functional restoration, unlike the traditional perioperative management that is based on prolonged fasting, regular nasogastric drainage, delayed mobilization, and liberal opioid use[3].

The main idea of ERAS is to preserve homeostasis during the surgical period[4]. ERAS is designed to minimize surgical stress response, decrease postoperative catabolism, preserve gastrointestinal motility, and prevent

postoperative complications through incorporation of patient counselling, lessening of fasting, carbohydrate loading, standardized anesthesia, multimodal analgesia, early mobilization and early enteral nutrition[5]. All these factors reduce the duration of time taken by patients to be back on their feet, bowel and nutrition[6].

Length of hospital stay (LOS) has developed to become one of the most significant measures of surgical effectiveness and quality of recovery[7]. The negative outcomes of a long LOS include complications in the postoperative period, hospital-acquired infections, cost burden, and consumption of healthcare resources[8]. Interventions with safe LOS reduction are transformative in improving the delivery of healthcare in countries with increasing surgical volumes like Pakistan where the capacity of health care systems is constrained[9].

Even though the global evidence supporting ERAS is established, its use in Pakistan is scant, and apprehensions have been raised on its practicability, safety, and influence on the actual postoperative outcomes[10]. Thus, the assessment of ERAS in the framework of tertiary care hospitals in Punjab can offer the necessary background data to be implemented nationwide[11]. The research evaluates the efficiency of ERAS to decrease the length of stay in elective abdominal surgery patients and the effect of the modality on postoperative pain, mobilization, complication rate, and early readmission[12].

MATERIALS AND METHODS

The study was a prospective observational study that was carried out in tertiary care hospitals in Punjab, Pakistan, during a 15-month period (June 2024- August 2025). The objective of the study was to examine the usefulness of Enhanced Recovery After Surgery (ERAS) pathway in the shortening of hospital stay in adult patients who had an elective abdominal surgery.

Non-probability consecutive sampling was applied as 120 patients were enrolled. The eligible individuals were all adults with ages that fell within the range of 18-70 years and they were meant to undergo elective surgeries that involved the abdomen like colorectal, hepatobiliary, or general abdominal surgeries. Patients whose operations were emergency, those who are hemodynamically unstable, severely malnourished, pregnant, or with reluctance to take part were excluded. Patients who had signed an informed consent were then split into two equal groups of an ERAS group (n=60) treated using the standardized ERAS protocol and a conventional care group (n=60) treated using standard perioperative practice.

ERAS Protocol Components: ERAS pathway involved preoperative counselling, minimization of preoperative fasting period, carbohydrate loading during the preoperative period up to 2 hrs, avoidance of regular nasogastric tubes, normothermia, goal-directed fluid therapy, multimodal non-opioid analgesia, early postoperative mobilization (in less than 6 hrs), and initiation of enteral nutrition in the first 1218 hrs. The traditional care was adhered to traditional fasting, traditional opioid analgesia, late feeding, and late mobilization.

Outcome Measures: The length of hospital stay (LOS), which is calculated as the number of days between surgery and discharge is the major outcome.

Secondary outcomes were the postoperative pain scores (VAS), the time to first mobilization, opioid requirement, postoperative complications, and 30-day readmission.

Data Analysis and Collection:A structured proforma was used to record all the clinical parameters. The SPSS version 26 was used to analyze data. Independent t-tests were used to compare continuous variables that were expressed as mean standard deviation. Chi-square tests were used to compare categorical variables. A p-value below 0.05 was deemed to be significant.

RESULTS

Baseline Characteristics: This totaled 120 patients in the final analysis which was split down to both the ERAS group (n= 60) and conventional care group (n= 60). The two groups were similar in terms of their baseline demographics (e.g., age, BMI, gender, and major comorbidities, e.g. diabetes and hypertension). This similarity made the differences that were observed between the two groups after the operations to be attributed to the ERAS protocol instead of differences in the baselines. Table 1 shows the demographic and clinical characteristics distribution in detail.

Postoperative Recovery Outcomes: ERAS group showed a much improved postoperative recovery profile in comparison with conventional care group. The mean length of stay at the ERAS pathway was significantly less (3.2 + 1.1 days) than when treated using conventional care (6.4 + 2.3 days). Likewise, the first mobilization and first oral intake was significantly earlier in the ERAS group, meaning the faster recovery of functions. The pain score at 24 hours follow-up was found to reduce significantly in the patients under ERAS and the opioid intake was close to half that in the traditional group. Such differences illustrate how ERAS can be used to improve the activities after surgery. Table 2 displays the comparison of these parameters in detail.

Postoperative Complications and Readmission Rates: ERAS group had less postoperative complications as compared to conventional care group. In the ERAS group, postoperative ileus was greatly lowered (3.3%) when compared to the conventional group (13.3%). Though, the difference in surgical site infections and postoperative nausea/vomiting was not statistically significant, a stable decreasing tendency in the number of complications was noted in the ERAS group. Significantly, the readmission rate was not greater in the case of early discharge, which proves that the ERAS is the means of safe recovery. Table

3 displays full comparative data about complications and readmissions.

On the whole, the ERAS pathway led to a much shorter length of stay, an earlier onset of mobility and oral intake, a decreased score on pain, decreased opioid dependence and reduced postoperative complications. The lack of the rise in the readmission rates proves the safety and clinical appropriateness of ERAS in tertiary care hospitals in Punjab. The findings support the use of ERAS as a useful method of improving the perioperative outcomes and increase the efficiency of surgical recovery.

Table 1: Baseline Characteristics of Study Participants

Variable	ERAS Group (n=60)	Conventional Care (n=60)	p-value
Mean Age (years)	48.1 ± 11.6	49.3 ± 12.4	0.62
BMI (kg/m²)	27.3 ± 3.4	27.6 ± 3.7	0.71
Gender (Male/Female)	38 / 22	40 / 20	0.68
Diabetes Mellitus (%)	26.7%	30.0%	0.67
Hypertension (%)	40.0%	41.7%	0.84
Smoking (%)	18.3%	21.7%	0.64

Table 2: Postoperative Recovery Outcomes

Outcome	ERAS Group	Conventional Care	p-value
Length of Hospital Stay (days)	**3.2 ± 1.1**	**6.4 ± 2.3**	<0.001
First Mobilization (hours)	**6.5 ± 2.3**	**19.2 ± 6.1**	<0.001
Time to First Oral Intake (hours)	10.4 ± 3.1	28.7 ± 7.6	<0.001
Postoperative Pain Score (VAS 24h)	3.0 ± 1.2	5.6 ± 1.7	<0.001
Opioid Use (mg/day)	9.2 ± 3.4	19.6 ± 5.1	<0.001

Table 3: Postoperative Complications and Readmission Rates

Complication / Outcome	ERAS Group	Conventional Care	p-value
Surgical Site Infection	8.3%	18.3%	0.09
Postoperative Ileus	3.3%	13.3%	0.04
Nausea/Vomiting	11.7%	25.0%	0.05
Urinary Retention	5.0%	11.7%	0.18
30-day Readmission	3.3%	5.0%	0.64

DISCUSSION

This research was done to determine the efficacy of the Enhanced Recovery After Surgery (ERAS) pathway in decreasing the length of hospital stay of adult patients undergoing elective abdominal surgery in tertiary care hospitals in Punjab, Pakistan[1]. The results prove that ERAS has an evident and practically significant superiority to traditional perioperative care[2]. The patients treated using the ERAS protocol had shorter hospitalization, mobilized sooner, resumed oral nutrition earlier, had less pain post-surgery, and decreased opioid consumption[3]. These results are in line with the existing literature in the international literature on the benefits of multimodal and evidence based perioperative care in the optimization of functional recovery[4].

One of the most significant results of this study is the decrease in length of hospital stay which is almost fifty-fold shorter when it comes to patients that were treated by the methods of ERAS[5]. The shortened hospitalization does not only contribute to the quick recovery of patients but also decreases the burden of the healthcare system, minimizes hospital-acquired complications, and enhances bed occupancy[6]. Early mobilization and early oral feeding, which are some of ERAS components, could have played a role in overall postoperative ileus reduction in the ERAS group[7]. Early feeding enhances gastrointestinal motility, and, at least, opioid reduces the occurrence of paralytic ileus and improves mobility[8].

Strategies of pain management were also significant[9]. ERAS highlights the use of multimodal, opioid-sparing analgesia, which is not linked to the negative responses of high doses of opioids (nausea, sedation, and bowel dysfunction, etc.)[10]. The strategy saw a much-reduced level of pain ratings and opioid use in the ERAS group, which further contributes to the improved recovery[11].

Though the differences in terms of surgical site infections and nausea/vomiting did not achieve a significant level, there was a definite downward trend in the ERAS group[12]. The insignificance between the two groups in 30-day readmission rates proves that the earlier discharge is safe and does not affect the postoperative results[13]. This is especially relevant in healthcare systems that lack resources and in which the turnover of the hospital bed is a significant variable[14].

The effectiveness of ERAS protocols in this paper indicates that they are achievable and safe in the Pakistani healthcare environment[15]. Since Pakistan is moving toward a more standardized process of surgical care, these results substantiate further implementation of ERAS in tertiary care hospitals[16]. Surgical teams training, standardization,

patient education, and monitoring of adherence will be critical to a consistent implementation[17-20].

CONCLUSION

Enhanced Recovery After Surgery (ERAS) pathway is beneficial in improving postoperative outcomes and a shorter hospital stay among elective surgery patients undergoing abdominal surgery. ERAS enhances early mobilization, accelerates bowel functional recovery, decreases the intensity of pain and minimal opioid administration with no escalation in the postoperative complications and readmission rates. The results suggest the extension of ERAS guidelines to tertiary care hospitals in Punjab because they are a safe, effective, and patient-centered method of contemporary surgery.

ERAS is to be a part of the standard surgical practice to improve the recovery and optimizing the use of healthcare resources and the overall quality of the perioperative management in Pakistan.

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