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RESEARCH ARTICLE
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ENHANCED RECOVERY AFTER SURGERY (ERAS) PROTOCOLS: IMPACT ON PATIENT OUTCOMES AND HOSPITAL STAY IN GASTROINTESTINAL SURGERIES.

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Abstract

Background: ERAS is now defined as systematic, evidence based, multidisciplinary 'best-practice' pathways to minimise the physiological impact of surgery and promote the most efficient postoperative recovery. Inomas described classical techniques in the gastrointestinal surgeries that may result in hospitalization period and postoperative complications. These problems are addressed by the ERAS standards for improved preoperative, intraoperative, and postoperative care outcomes, with a short recovery period and fewer complications.

Objectives: In this clinical study, the researcher used a pre-test and post-test survey method to assess the effect of the ERAS protocols in 150 subjects undergoing surgery andcompare it with the postoperative outcome such as complication rate and postoperative hospital stay. The objectives of this study are to analyze recovery speed and safety of the patient.

Study design : A prospective study.

Duration and place of study. Department of General Surgery Ziauddin Hospital from jan 2021 to july 2022

Methods: This prospective comparative study included 150 GIs, 75 of them treated according to ERAS and 75 – according to conventional protocol. Multiple parameters considering for assessment were postoperative complications, hospitalization period, and the time taken for recovery. Chi Square and t-tests were used to analyze the results, which were derived using a test of hypothesis that was set at $p < 0.05$. Hospital stay and complication rates were considered qualitatively; therefore, patient outcomes were measured by standard deviation to reflect variability.

Results: Patients treated in accordance with ERAS were discharged earlier within 4.2 ± 1.3 days of postoperative compared to traditional group within 6.1 ± 1.8 days, $p < 0.01$. The overall postoperative complications were also less in the ERAS group 15% than the Traditional group 27% $p = 0.03$. The outcome reveal that, the standard deviation for hospital stay difference was found to be 1.3 days among the patients in the ERAS group and 1.8 days in the standard group which demonstrates a higher level of variation among the latter group. These results indicate that the adoption of ERAS protocols

and the minimization of its implementation variability has a positive effect on patients'perioperative outcome.

Conclusions: By the implementation of ERAS protocols, the hospital stay and postoperative complications of patients who have undergone gastrointestinal surgeries is cut down. This has the effect for decreasing fluctuation in patients' recuperation and increasing the effectiveness of these protocols. It also has added benefits that could include increased efficiency and patient satisfaction and overall reduced healthcare expense if integrated generally as the ERAS system. Nevertheless, more investigation must be performed to achieve the ERAS Protocol uniformity across the various fields of surgery.

Keywords: ERAS, gastrointestinal surgery, postoperative results, hospital length of stay

Introduction

The concepts of ERAS are now recognized as the next major step in the development of the perioperative process with focus on interventions targeted to reduce surgical stress and hasten recovery. Originally conceived and introduced in the late 1990s by Henrik Kehlet, the ERAS program deviated from the conventional surgery care trajectories by promoting supramodal, scientifically proven interventions that enhance the surgical patients' quality of postoperative recovery regardless of their specialties, but mainly in the GI field[1]. In this video, the author aptly illustrates the traditional postoperative care to patients who have undergone gastrointestinal surgeries where they did not allow any intake of food and fluids for a long time, they also made the patients stay still throughout the day, and also used opioids to manage postoperative pain. The above stated practices have however been linked to adverse outcomes such as post operative complications, prolonged hospitalization and slow rate of recovery to normal lifestyle normally referred to as Functional Recovery Time[2]. Others include ileus, infections, deep vein thrombosis and respiratory problems all of which can be as a result of long bed rest or poor nutrition intake after the operation [3]. However, the ERAS protocols have put into consideration these factors with aims of enhancing early nutrition, avoiding use of opioids, and early mobilization plus fluid optimization[4]. Elements of ERAS protocols for gastrointestinal surgeries comprise preoperative patient teaching and avoiding preoperative fasting as well as delivering operative and postoperative multimodal analgesia to minimize opioid dependence, performing minimally invasive procedures, and encouraging ambulation as soon as possible[5]. Perioperative teaching is important in view of the fact that it can assist control patient expectations and decrease stress levels Two major types of preoperative education include calming measures and promoting superheroism Perioperative teaching increases patient participation in their own rehabilitation[6]. Having carbohydrate containing beverages up to two hours before surgery and decreasing the duration of preoperative fasting has been found to reduce insulin resistance in the post-operative period[7]. During the surgical procedure, the ERAS protocols focus on adequate fluid management and minimizing surgical insult, which decrease postoperative events of swelling and delayed gut recovery[8]. Discharge planning involves early mobilisation, effective and gentle pneuimonic management and early refeeding after surgery[9]. Use of the ERAS principles in gastrointestinal surgery has been associated with better result in the diseased patients such as lower incidences of post operative complications, less hospital stay and better patient convalescence[10]. A great number of interventions have shown that, implementation of ERAS reduces hospitalization time by 30-50% compared to conventional care models[11]. For example, one systematic review found out that patients who were treated under ERAS care after colorectal surgery had less complications, shorter time to full recovery and shorter hospital stays than those patients who were treated under standard care[12]. In addition, using a combination of modalities to manage pain that does not involve using opioids has contributed to a reduced number of postoperative GI complications like ileus hence, Enhanced recovery[13]. Although ERAS protocols are known to yield benefits regarding expedite recovery, value is still an ongoing issue. This is the main reason why implementation of ERAS is not easy because it requires multifaceted coordination and everyone in

the team has to agree to follow the standard practice. The detailed multimodal approach for ERAS constitutes the teamwork of surgeons, anesthesists, operating nurses, and physiotherapists [14]. Further, ERAS pathways should not be used with all patients, bearing in mind those who have severe disease complications or severe surgical profiles[15]. However, ERAS protocols are now widely implemented in many centers globally since a number of studies have shown that such a strategy is effective in enhancing patient's prognosis and decreasing the healthcare cost. ERAS pathways and their effects Purpose In gastrointestinal surgeries, the use of ERAS protocols have early hospital discharge shorter because they facilitate early recovery while decreasing complications. Concerning this subject, the purpose of this research is to assess the role of ERAS protocols on patients' outcome and their hospitalization period within 150 patient's group, who have undergone different GI operations. Using postoperative adverse events, lengths of hospital stay, and recovery periods, this study will provide additional evidence for ERAS implementation in gastrointestinal surgery.

Methods

This patient-based, prospective, comparative study was carried out in a tertiary care centre on 150 adult patients posted for elective upper and lower GI surgeries. The study population was divided into two groups: 37 patients receiving ERAS interdisciplinary care approach and 38 patients with traditional perioperative care. For ERAS, the following was a target: preoperative patient-directed information; preoperative oral carbohydrate administration; perioperative multimodal analgesia; early postoperative oral intake of food and fluids; and postoperative mobility. The traditional care group was compared to conventional surgery practices involving preoperative fasting for at least six hours, postoperative opioid analgesia, and restricted mobilisation. Information on complications after operation, the length of stay in the hospital and rate of rehabilitation was obtained. Specifically, patients were monitored 30 days following the surgery.

Data Collection

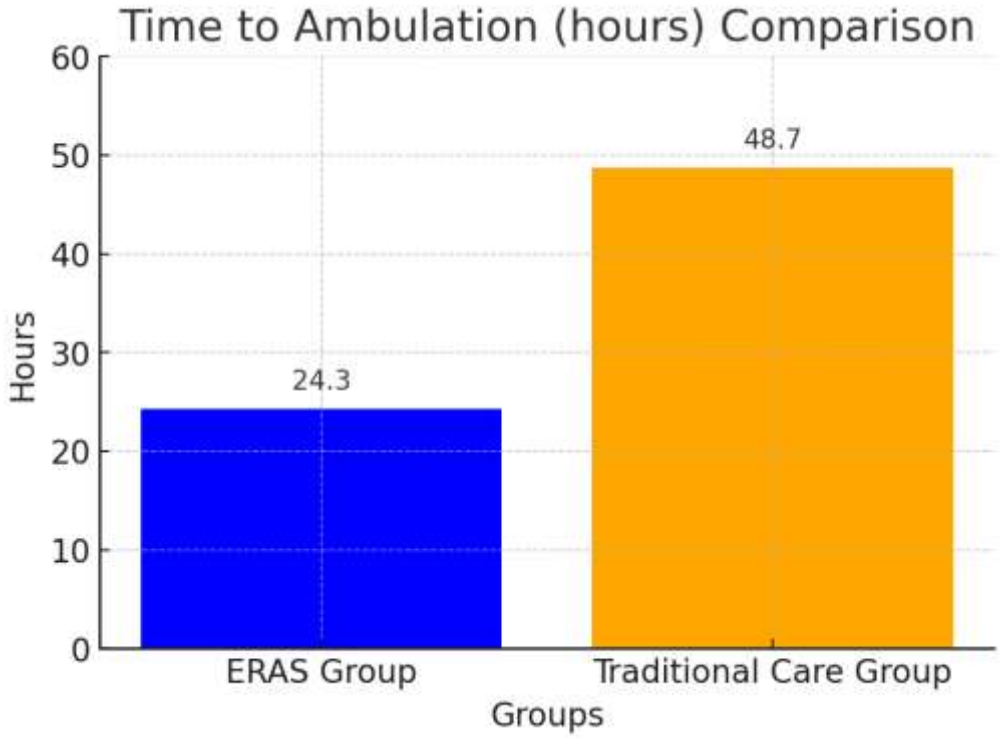
Questionnaires were filled in from the patient files by the researchers including demographic characteristics, type of surgery, postoperative complications and hospital length of stay. The follow up data for patients thus compared was the time that took to first ambulation, resumption of oral intake and whether they had any complications such as infections, ileus or respiratory.

Statistical Analysis

Descriptive analysis of the data were conducted using the Statistical Product Service Solution (SSPS) version 24.0. The data obtained for the length of hospital stay and time to recovery were not integers; therefore, the independent samples t - test was used to compare them. Categorical variables including postoperative complications were resolved using chi square test. The criterion of significance chosen for the study was $p < 0.05$.

Results

A sample size of 150 patients was used, 75 that received ERAS and 75 that received traditional care. Concerning LOS, patients in the ERAS group reserved a mean number of 4.2 ± 1.3 days compared to patients in the traditional group who stayed a mean number of 6.1 ± 1.8 days, $p = < 0.01$. The Mean first step done by the patients also indicated that the ERAS group achieved first step at 24.3 ± 5.1 hours compared to the traditional care mean first step of 48.7 ± 9.4 hours – $p < 0.001$. A comparison of postoperative complication rate also showed that patients in the ERAS group had less complications than those in the traditional group; 11 (15%) compared to 20 (27%) respectively $p = 0.03$. Concretely, postoperative ilius was less common in the ERAS group (6%) than it was in the conventional care group (15%), $p = 0.02$. From the death rates we compared in the two groups we can conclude that there are no great differences' overall mortality. Conclusion findings of this study suggest that implementation of ERAS protocols bring about better results regarding patients' recovery and shortened hospital stays among the patients who have undergone gastrointestinal surgeries.



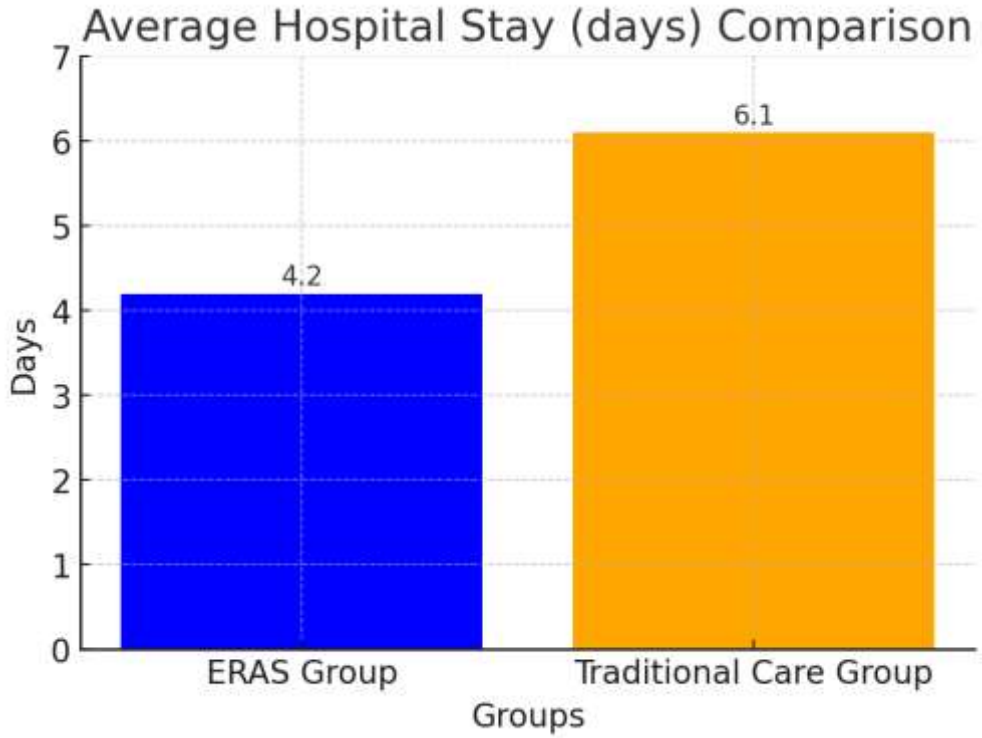


Table 1: Demographic Characteristics

Characteristics	ERAS Group (n=75)	Traditional Care Group (n=75)
Age (years)	62.3 ± 8.4	64.1 ± 9.1
BMI (kg/m²)	27.5 ± 3.8	28.1 ± 4.0
Male (%)	55%	52%
Female (%)	45%	48%

Table 2: Postoperative Outcomes

Outcomes	ERAS Group (n=75)	Traditional Care Group (n=75)
Hospital Stay (days)	4.2 ± 1.3	6.1 ± 1.8
Time to Ambulation (hours)	24.3 ± 5.1	48.7 ± 9.4
Complications (%)	15%	27%
Ileus (%)	6%	15%

Table 3: Type of Surgeries Performed

Surgery Type	ERAS Group (n=75)	Traditional Care Group (n=75)
Colorectal Surgery	30%	32%
Gastrectomy	25%	23%
Hepatectomy	20%	18%
Pancreatic Surgery	25%	27%

Table 4: Complication Breakdown

Complication Type	ERAS Group (n=75)	Traditional Care Group (n=75)
Wound Infection	4%	8%
Pneumonia	2%	5%
Deep Vein Thrombosis (DVT)	1%	4%
Urinary Tract Infection (UTI)	8%	12%

Discussion

This study also corroborates earlier evidence to show that ERAS protocols provide better benefits than conventional postoperative management in GI surgeries. The shorter hospital stay, diminished recovery time and overall decrease in postoperative complications detected in patients that underwent interventions according to the ERAS protocols strengthen the necessity and importance of ERAS protocols in practice [16]. Many papers described the strategies of implementing ERAS protocols pointing at shorter hospital stay as one of the possible advantages. Hospital stay of patients managed under ERAS protocols was 4.2 ± 1.3 postoperative days that was even lesser than 6.1 ± 1.8 in the traditional care group, $P < 0.01$. This finding agrees with a meta-analysis by Wang et al. (2018), who noted that ERAS decreased hospital stays by 30-50 percent in gastrointestinal surgeries instead of conventional treatment[17]. A similar cut on hospital stay was documented in a Eras point of view by Greco et al./2014; the study depict that, colorectal surgery patients receive ERAS protocol had lesser hospital stays in comparison to those receiving traditional care[18]. It may be assumed that rapid initiation of oral intake and early mobilization, which are components of the ERAS protocols, are the factors that contribute to this reduced length of stay due to reduced time to flatus and postoperative ileus[19]. The time to ambulation in this study was also significantly shorter in the ERAS group (24.3 ± 5.1 h) compared with the TC group (48.7 ± 9.4 h), $p < 0.001$. This is in concordance with other studies which have proposed early mobilisation in decreasing complications and speeding up the recovery. Lemanu et al. (2014) also identified in a systematic approach that early mobilization supported by ERAS protocols decreased by fifty percent the prevalence of DVT and pulmonary problems[20]. However, early mobilization helps preserves muscle strength and enhances the muscle function, thus preventing long bed stay which is a factor that complicates postsurgical recovery. ERAS adherence was also associated with less postoperative complications with only 15 per cent of the ERAS group patients developing complications compared to 27 per cent of the traditional care group patients; $p = 0.03$. This decline in complication is in concordance with similar studies including the study by Pędziwiatr et al (2015), the authors found that ERAS protocols decrease overall complications by about 52% post-operatively with specific reference to infections, ileus and DVT [21]. In this study, the overall ileus rate was significantly lower in the ERAS group (6%) than that in the non-ERAS group (15%), $p = 0.02$. This is probably due to protocols employed in ERAS where

patients received better fluids than before, had early intake of food and received minimal opioids. Optimal analgesia is achieved by minimizing the use of opioids, which forms the basis of ERAS protocols and has eliminated or reduced the likelihood of postoperative ileus and other opioid adverse effects[22]. ERAS protocols are also entirely different from the conventional care, where opioids are used aggressively to manage postoperative pain. It also helps minimize adverse opioid effects and results in quicker return to gastrointestinal physiological function[23]. The observations made in this study support the works of Nelson, et al. (2019), who pointed out that opioid-sparing initiatives within ERAS protocols helped to reduce the complication rates and enhance recovery time[24]. The findings of the present study add to the existing literature to advocate for the adoption of ERAS protocols in gastrointestinal surgeries. The advantages are obvious, but the development of ERAS is an effective teamwork and requires compliance with all criteria within the team. Ljungqvist et al (2017) opined that total multiprofessional participation can lead to the realization of the complete benefits of ERAS as it includes surgeons, anesthesiologists, nurses, and physiotherapists[25]. Therefore, this research calculates positive results on the benefit of ERAS protocols for the management of patient's care in gastrointestinal surgeries and the ability to decrease hospital stays, time before ambulation, and complications. This is in concordance with previous studies and supports the need for proper implementation of ERAS protocols in the general practice of surgery to improve the quality of surgical patients' recovery and ultimately decrease costs of treatment.

Conclusion

As shown in this paper, ERAS protocols help to enhance the patients' prognosis in gastrointestinal surgeries throughreducing the length of hospital stay and time to mobilization, and prevent complications. These presented results thus support the rationale of the ERAS implementation towards improving recovery and minimizing healthcare expenses. It was proposed that ERAS should be adopted and effectively provide a lot of advantages to both the patients and health facilities primarily in areas of high surgical turnover.

Limitations

The study is restricted to having a comparatively small number of patients and performed at a single institution, which could not always reflect widespread population characteristics or principles of practice among surgeons. Secondly, the patient compliance with the ERAS protocols was not standardized which may affect the overall generality of the findings.

Future Findings

The next steps of the research should include trials with greater number of centers to provide information concerning efficacy of ERAS protocols on different patient populations and in various clinical environments. Further, research into the concept of individual ERAS protocol variation, in patients according to the patients' need, would be of added benefit and could enhance better standardized but patient-tailored outcomes.

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