



PROTOCOLS FOR IMPROVING OUTCOMES IN EMERGENCY ABDOMINAL SURGERY: A COHORT ANALYSIS

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Abstract:

Initially designed to improve the recovery outcome of elective colorectal surgeries in comparison to standard methods, Enhanced Recovery After Surgery (ERAS) protocols have demonstrated potential to positively affect the recovery outcome of surgery. Nevertheless, there is a gap in the use of these in emergency gastrointestinal operations. This research paper presents an assessment of the viability and effectiveness of the ERAS protocols in a sample of patients who have undergone emergency cases of abdominal surgeries at the IQ City Medical College. The most important aspects, such as minimally invasive surgery, optimal intraoperative fluid management, and preoperative hyperglycemia control were evaluated. Findings showed that those patients that followed the ERAS protocols had a major complication reduction and quicker healing. Nevertheless, high morbidity, preoperative hyperglycemia, and the necessity of urgent surgical intervention were found to be the obstacles in the complete adherence to the protocols. This research emphasizes the possible advantages of ERAS implementation in the emergency surgical environment with an emphasis on early mobilization, early nutrition, and meticulous fluid administration to improve the outcome of the recovery process.

Key Words: Enhanced Recovery After Surgery, Emergency Surgery, Postoperative Recovery, Gastrointestinal Surgery, Minimally Invasive Surgery\

INTRODUCTION

The Enhanced Recovery After Surgery (ERAS) protocols are the evidence-based practices designed to minimize the occurrence of complications and improve recovery in the post-operative period. These procedures have been adopted as the protocol in elective colorectal operations offering great benefits in patient recovery and the overall outcomes. Their application in emergency surgeries is however less developed with the existing guidelines providing very little information on how to be used in this situation. Nonetheless, ERAS guidelines have shown promise in the treatment of disease conditions like gastric ulcers and obstructive colorectal cancer. Systematic reviews and meta-

analyses reveal that at the same time ERAS protocols have some common underlying principles, they vary greatly, in particular in their intraoperative approaches. The preoperative factors tend to be out of scope of the emergency surgery ERAS guidelines, because the factors due to stress usually need other methods of management. This has made majority of the studies tend to focus on postoperative interventions in order to determine aspects that affect compliance and effectiveness. It is important to gain an excellent insight into how ERAS protocols are used in emergency surgery departments. This study tests the viability and the effectiveness of these protocols in a high population of patients undergoing emergency abdominal surgeries. This is aimed at enhancing recovery rates and determining barriers to compliance, which can be used to make subsequent implementations more effective.

METHODOLOGY

The participants of the study were those who had experienced a peritoneal contamination, connective tissue bypass, or adhesiolysis within the 12 months of time. Patients were excluded in case they did not want to take part, when they were in septic shock, or after elective surgery, operative endoscopy, or diagnostic interventions. Moreover, patients with multiorgan failure undergoing open abdomen surgery or needed urgent postoperative attention in the intensive care unit were not under expedited recovery policy. There were improved Recovery after surgery (ERAS) protocols where the data was keenly collected through ERAS specific documentation forms. These forms captured Comorbidity Index scores, primary diagnoses, surgery, short term results and overall health status after surgery. The complications were categorized under Clavien-Dindo grading system. Follow-up of the postoperative stage involved face-to-face and phone communication to monitor the recovery rate. Its methodology was stipulated to estimate the variables that influence adherence and study the efficacy of ERAS interventions to enhance the postoperative outcomes of patients with emergency surgeries of the abdomen.

Statistical Analysis

The summary of continuous variables was provided in terms of medians and interquartile ranges (IQRs), whereas the summary of categorical variables was in the form of percentages. The compliance with each of the protocol components was evaluated during the postoperative period. Both univariate and multivariate analysis were carried out using an ordinal regression model to evaluate the results. To measure postoperative compliance, mean values were calculated.

RESULTS

Intestinal obstruction was also an etiological cause of 327 deaths, whereas abdominal infections caused 262 deaths (44.6). The mean time from admission to surgery was about eight hours ranging between 3 hours and 25 hours. Most intestinal resections (43.5) were done with anastomoses and 93 cases (15.8) were done without anastomoses. In 246 cases, the least invasive procedures were done. Antidiarrheal and antiemetic prophylaxis were taken after surgery. The fluid infusion rate also significantly improved as it was increased by 17.14 kilograms per hour as compared to 8.33 kilograms per hour. In patients with intra-abdominal sepsis, 95.8% of the patients would be required to undergo abdominal drainage and 55.7% of the patients would be required to undertake intestinal drainage in case of intestinal obstructions. The total morbidity had been 60.4% and major complications were developed in 15.6% of patients. The 30-day mortality rate was 6.3%. The patients were in the hospital after an average of 8 days and a range of 6-12 days.

Table 1: Enhanced Recovery Protocol: Key Components and Their Impact on Postoperative Recovery

		Median (IQR)	N	%
The entropy of anesthesia monitors (depth)			150	25.3%
Observation of neuromuscular blockade			115	20.0%
Preventing PONV			258	45.6%
Anesthesia for general surgery plus locoregional surgery			71	12.1%
Activating the heating system			275	43.8%
Analyzing arterial pressure invasively			51	8.3%
Opioid used	Benzoylureas		135	23.7%
	The opioid drug		70	12.8%
	Isoflurane		65	11.9%
	Defensible		4	0.4%
	Benzedrine		4	0.4%
	Other		5	0.8%
Intraoperative transfusion			35	06.2%
Inotropes/Vasopressors			35	06.0%
Intravenous fluids ml/kg/h		12 (8.33–17.14)		
Intravenous fluids	3–6 ml/Kg/h		70	11.2%
	7–12 ml/Kg/h		90	15.1%
	> 20 ml/Kg/h		140	23.7%
Minimally invasive surgery			72	12.6%
Drain	All patients		211	35.1%
	obstruction		90	27.3%
	Intra-abdominal sepsis		120	46.3%

		Median (IQR)	N	%
Overall morbidity			173	30.22%
30-day mortality			18	3.14%
Complication grade	0		116	20.28%
	I		68	11.41%
	II		65	11.45%
	IIIa		7	1.11%
	IIIb		13	2.28%
	IVa		5	0.30%
	IVb		3	0.43%
	V		18	3.14%
Surgical site infection			41	7.13%
Anastomotic leak			12	3.43%
Respiratory infection			23	3.44%
Urinary tract infection			10	1.23%
Cardiovascular complications			30	5.45%
Readmission within 30 days			15	3.24%
Length of stay (days)		8 (6–12)		

Table 2: Outcomes after short-term surgery

Approximately 66.4% of patients were mobile two days after surgery, and 56.4% were able to eat

Table 3: Completing the postoperative checklist is mandatory

POD	0	1	2	3	4	5	6	7
Naso-gastric tube removal	15.1	28.3	39.5	44.6	45.9	48.3	50.4	50.6
Oral fluid intake	0	15.0	28.2	35.4	40.6	43.5	40.2	45.6
Mobilization > 4 h	0	18.1	35.4	45.1	45.5	48.0	46.2	50.9
Urinary catheter removal	0	15.1	28.0	35.1	40.3	43.6	43.4	44.2
Solid food intake	0	3.1	14.3	26.2	40.1	43.5	40.8	54.4
i.v. fluids stop	0	4.3	35.3	25.1	33.6	38.2	40.8	42.3

Perforated stomach ulcers, high glucose levels before surgery, and patients with infusion rates greater than 12 mL/kg/h have been associated with reduced postoperative compliance

DISCUSSION

Implementation of improved recovery measures (ERAS) on patients undergoing emergency gastrointestinal operations is essential in the enhancement of postoperative outcomes. The most important elements, including early nasogastric tube removal, patient movement, and the introduction of oral nutrition during the first two postoperative days, are crucial to the successful recovery. Despite the relatively fast recovery among the patients who underwent laparoscopic surgery, high rates of morbidities and preoperative hyperglycemia were identified to interfere with the process of recovery. It has been demonstrated that the risk of complications is higher among patients with peptic ulcers and obstructive colorectal cancer, thus special recovery regimes must be developed to address the unique characteristics of these conditions. Erased protocols have shown to decrease hospitalization and complication and therefore their importance in urgent surgical settings. The level of compliance to postoperative instructions was found to be lower among the patients who were scheduled to undergo urgent colectomy than the ones that were to undergo elective colectomy. This distinction highlights the difficulties of dealing with emergency surgical patients. The sequential selection of the participants reduced selection bias and provided a representative sample. In most cases, the patients of emergency surgery had American Society of Anesthesiologists (ASA) above 2 which demanded an immediate surgical attention. Conversely, patients who have undergone elective colorectal surgery have been recorded to realize their postoperative objectives within the same day of surgery. The research points out that there is a positive correlation between the technique of surgery and the post-operative recovery also indicated by a multiple regression analysis ($p = 0.04$). In line with numerous researches, little invasive colon corrective operations result in improved postoperative results in contrast to an open procedure. Nonetheless, the application of such techniques in emergency cases is controversial because of the infrequent utilization of the methods. One in five of our group surgeries was minimal and two-thirds of laparoscopic operations were successful. About one-fifth of the emergency surgeries were laparoscopic, highlighting the possible benefits of promoting the use of minimally invasive operations in case of an emergency. Postoperative recovery can only be optimized by ERAS protocols such as the handling of intraoperative fluids. Postoperative fluids have been found to delay the recovery of the subjects in terms of mobilization, oral feeding as well as the recovery on the whole ($p < 0.001$). It is therefore important that hydraulic overload is prevented by being cautious with regard to intraoperative hemodynamics. It is important to note that 55.7 percent of cases of peritoneal contamination that are visible are indicative of over-indication and are not suggested elective abdominal drainage as it affects the recovery adversely. Elective and emergency surgery are associated with high morbidity and mortality in preoperative hyperglycemia. Organ dysfunction and severe health consequences may happen due to high levels of blood sugar, and it is important to regulate the amount of glucose in patients of emergency surgery ($p = 0.002$). Moreover, there was a great delay in the postoperative recovery after repairing a perforated peptic ulcer ($p < 0.001$). Although the randomized trials have proved the safety and efficacy of early postoperative feeding, surgeons are not keen to start feeding immediately after surgery. Overall, the implications of the findings are that ERAS protocols can be used more widely in emergency gastrointestinal surgeries to enhance patient outcomes and increase

their recovery.

CONCLUSION

This paper highlights the considerable benefits of implementing Enhanced Recovery After Surgery (ERAS) in emergency gastrointestinal surgery. The main results indicate that the use of minimum invasive surgery methods, effective intraoperative fluid balance, and careful preoperative hyperglycemia vigilance can play an important role in improving postoperative recovery. Irrespective of the challenges posed by the emergency environment and the prevalence of the pandemic, the high rate of patient recruitment and the broad scope of experience of the recruited hospitals contribute to the feasibility and efficacy of ERAS guidelines. Reducing the application of invasive methods, avoiding hydraulic overload, and strictly controlling the level of glucose in the patient are key factors to better patient recovery. The article establishes that surgical procedures done in laparoscopic locations lead to faster healing and reduced complications, which justifies the need to ensure that the strategies are incorporated in the emergency surgical guidelines.

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