

A COMPARATIVE STUDY ON THE EFFECTIVENESS OF ERAS (ENHANCED RECOVERY AFTER SURGERY) PATHWAY WITH CONVENTIONAL PROTOCOL IN GASTROINTESTINAL SURGERIES

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Abstract

Introduction: Enhanced recovery after surgery (ERAS) protocol is a novel method of enhancing patient recovery in post gastrointestinal surgery patients. Enhanced recovery after surgery (ERAS) is a multidisciplinary approach, comprehensively designed to improve postoperative outcome. In 1997, a Dutch professor Henrik Kehlet gave the concept of “multimodal approach to control postoperative pathophysiology and rehabilitation”. Colorectal surgery was the first surgical subspecialty where the ERAS pathway was implemented in the year 1999. The term ERAS was given in 2001 by a team of surgeons who met in London to develop guidelines for perioperative care, grounded on evidence.

Materials and Methods: The study was conducted in Meenakshi Medical College from April 2022 to June 2022. The source of the study was patients in the general surgery department admitted for gastrointestinal surgery. Inclusion and exclusion criteria were established and patients satisfying said criteria were included in the study. The patients and attenders were informed about the study, the workup, nature and complications that could happen. Patients who consented alone were included. Patients from my unit were made into the test group and other as control group. The average length of hospital stay for test group patients was 7 days. The average length of hospital stay for control group patients was 14 days. There is a statistical difference between the study and the control group regarding length of hospital stay. The length of hospital stay for study group patients was very low compared to the control group.

Results: The average age of patients undergoing gastrointestinal surgeries was 49 in the test group and 44 in the control group. The female patients in this study were 35% in the study group and 40% in the control group, the average female patients were 37.5%. The male patients were 65% in the test group and 62.5% in the control group. The average male patients were 62.5% in this study. There is no statistical significance in gender distribution.

Conclusion: From this study, ERAS is found beneficial in reducing the length of hospital stay, cost-effective with fewer complications, and better surgical outcomes when compared to conventional management of patients undergoing gastrointestinal surgeries.

Key Words: Enhanced recovery after surgery, gastrointestinal surgeries, hospital stay.

INTRODUCTION

Enhanced recovery after surgery (ERAS) protocol is a novel method of enhancing patient recovery in post-gastrointestinal surgery patients.¹

Enhanced recovery after surgery (ERAS) is a multidisciplinary approach, comprehensively designed to improve postoperative outcome. In 1997, Dutch professor Henrik Kehlet gave the concept of “multimodal approach to control postoperative pathophysiology and rehabilitation”. Colorectal surgery was the first surgical subspecialty where the ERAS pathway was implemented in the year 1999. The term ERAS was given in 2001 by a team of surgeons who met in London to develop guidelines for perioperative care, grounded on evidence. ERAS program is also referred to as “rapid recovery program,” “multimodal perioperative management,” or “fast-track program.” It involves the cooperation of surgeons, anesthetists, and staff caring for patients.² Stress is the key pathogenic factor resulting in postoperative morbidity and organ dysfunction. This knowledge has encouraged the development of techniques to ease undesirable responses. Patient counseling about surgery and the postoperative recovery period, reducing the duration of preoperative fasting, a technique for pain alleviation for early ambulation, control of nausea, vomiting, and ileus, realizing the benefits of early enteral nutrition, and antithrombotic and antimicrobial prophylaxis are the techniques directed to early recovery. On the other hand, traditional practices encourage the use of drains, nasogastric tubes, catheters, restriction of oral intake, and ambulation. Gradually, these are losing popularity as there is no scientific proof to support such a practice.³

It refers to patient-oriented, evidence-based, and interdisciplinary team-developed pathways for surgical outcomes and also facilitates a culture that reduces patients’ surgical stress response, optimizes their physiologic function and facilitates recovery.⁴

ERAS protocol involves pre-, intra, and post-operative elements and their fundamental aspects focus on preoperative counselling, no fasting, optimal fluid management, decreased use of tubes, opioid-sparing analgesia, and early mobilization.

The goal of ERAS protocol is to mitigate surgery-related morbidities, reduce postoperative pain and analgesic use, complications, and readmission rates, improve patient satisfaction, and reduce hospital stay. On account of its successful implementation in colorectal surgery and other specialties, there has been a demand for investigating ERAS in gynecological surgeries. There is limited data on the effectiveness of ERAS program in gynecological procedures, especially benign surgeries.⁵

AIM

This study aimed to learn the effectiveness of implementing the ERAS protocol in post gastrointestinal surgical patients as compared to the conventional way of managing patients undergoing the same.

MATERIALS AND METHODS

STUDY PLACE: The study was conducted in Meenakshi Medical College, Hospital and Research Institute.

STUDY DESIGN: A prospective cohort.

STUDY POPULATION: Patients admitted in General Surgery ward for gastrointestinal surgery.

STUDY PERIOD: April 2022 to June 2022.

SAMPLE SIZE: 10 in test, 10 in control, a total of 20 cases.

INCLUSION CRITERIA:

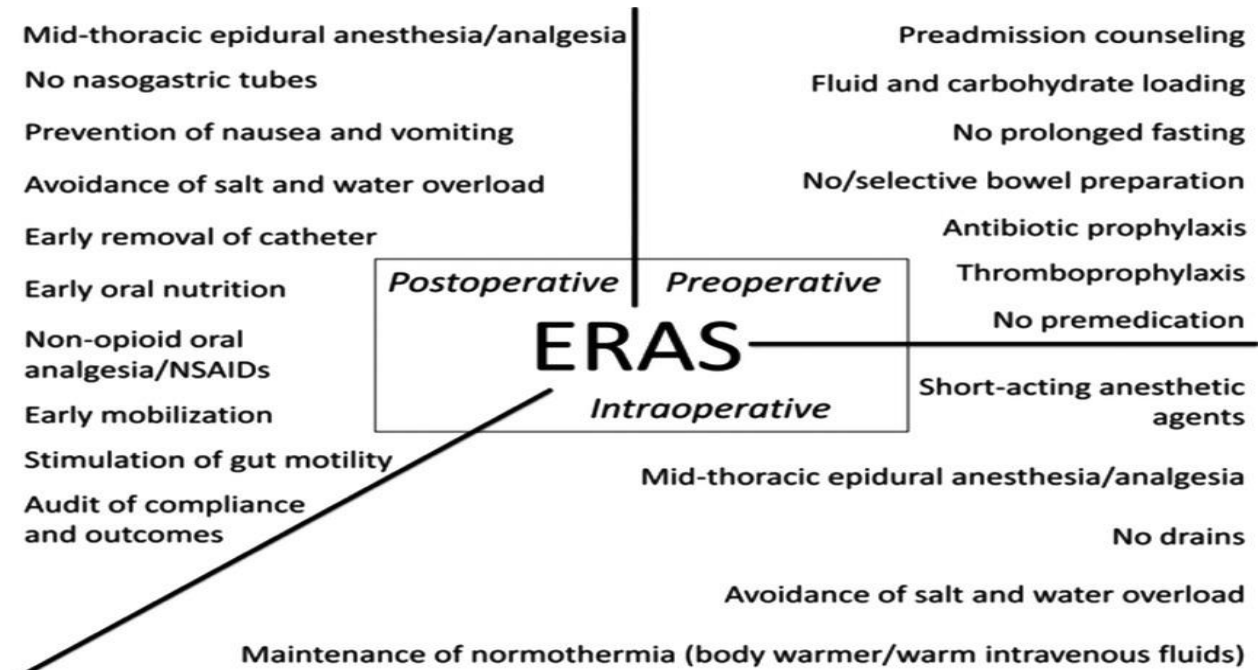
- Patients undergoing gastrointestinal surgeries
- Age > 12 years

EXCLUSION CRITERIA

- Immunocompromised
- Emergency surgeries
- Relaporotomies
- Laparoscopic gastrointestinal surgeries

This study was conducted in Meenakshi Medical College, the source of the study being patients in the general surgery department admitted for gastrointestinal surgery. Inclusion and exclusion criteria were established and patients satisfying both were included in the study.

The patients and attenders were informed about the study, the workup, nature and complications that could happen, patients who consented alone were included. Patients from my unit were made into the testgroup and others as control group.



Period	Enhanced Recovery Protocol (ERP)	Conventional care Protocol (CCP) (key differences only)
Pre-operative	<ul style="list-style-type: none"> • Provide complete information about the protocol and take an informed consent • Advice given regarding exercise, smoking and alcohol cessation • Optimize any pre-existing co-morbidity • Minimal starvation (6 hrs for solids and 2 hrs for liquids) • 100g oral carbohydrate drink • Avoid mechanical bowel preparation • Pre-operative antibiotic 	<ul style="list-style-type: none"> • Overnight starvation • No carbohydrate drink • Mechanical bowel preparation • Parenteral hydration (to compensate for bowel preparation)
Operative	<ul style="list-style-type: none"> • Epidural anaesthesia (0.125% bupivacaine, continuous infusion) along with spinal or general anaesthesia • Arterial/Central lines inserted only if unavoidable • Goal directed fluid therapy • Maintain optimal oxygenation • Avoid hypothermia • Minimal tissue handling • Elective use of nasogastric tubes, abdominal drains and urinary catheters 	<ul style="list-style-type: none"> • Done under spinal or general anaesthesia • Routine use of Nasogastric tubes, abdominal drain and urinary catheter • Liberal hydration
Post-operative	<ul style="list-style-type: none"> • Maintain supplemental oxygen • Strict post-operative nausea and vomiting prophylaxis • Early enforced mobilization • Early enteral nutrition • Removal of epidural catheter by day 2 • Ensuring adequate analgesia after epidural catheter removal • Early removal of all tubes, drains and catheters 	<ul style="list-style-type: none"> • No emphasis on PONV prophylaxis • No enforced mobilization • Removal of nasogastric tube and abdominal drain delayed till markers of bowel motility are observed • Oral or Enteral nutrition given once bowel motility is restored
Post-discharge	<ul style="list-style-type: none"> • Ensure 30-day follow-up including: <ul style="list-style-type: none"> ◦ Phone call at 48 hours ◦ 7th day Clinic visit ◦ Any Emergency visit 	<ul style="list-style-type: none"> • Patient follows up on day 7 in the clinic or else as and when required

PRE OPERATIVE MEASURES

1) Counselling :

- In the study group, patients and attenders were both educated sufficiently regarding the disease, surgical procedure and the core benefits of the surgery.
- Instructions after surgery regarding early mobilization, early feeding and breathing exercises were also meted out
- Patients who may have stoma were also explained in detail regarding stoma care along with appropriately training the patients and their attenders for the same.
- This pre-operative education has shown to improve patient satisfaction and allay anxiety.

Optimization of comorbidities

- Adequate breathing exercises, cessation of smoking, improving nutritional status and other comorbidities that patients had were corrected and made fit for surgery. This has enhanced post-operative recovery.

Minimal starvation and carbohydrate loading

- Patients were kept nil by mouth for 6 hrs before surgery and 2 hrs prior were administered 100 ml of 25% dextrose and 500 ml of 0.9% NaCl

Avoidance of mechanical bowel preparation

- No oral mechanical bowel preparation, for patients with surgeries involving left sided anastomosis of colon, single phosphate enema was given on the day of the surgery

Deep vein thrombosis prophylaxis

- All patients in the study were given prophylaxis – enoxaparin (20mcg, s.c), the night before the surgery and continued throughout hospital stay as o.d dose. patients with high risk to develop DVT, prophylaxis was continued for up to 1 month.

Antibiotic prophylaxis

- Inj. Ceftriaxone 1g i.v stat was given, prior to skin incision. For prolonged procedures > 4 hrs, second dose was administered.

INTRA OPERATIVE MEASURES

Epidural analgesia

- All patients received epidural analgesia and continued for 48 hours post operatively.

Surgical approach and incision:

- Only open surgeries were included in this study and length of incision was kept to the minimum, a lower transverse incision made whenever possible.

Avoidance of drains, ng tubes and catheters:

- Routine NG tube, drain tube were avoided and if placed, were removed after the purpose of keeping it was fulfilled.

POST OPERATIVE MEASURES

Avoidance of opiates

- Post op patients were on epidural analgesia for 48 hours , after it was removed , I.V Paracetamol infusion and diclofenac /brufen were used for breakthrough pain.

Early post operative diet

- Patients were started on oral fluids on POD 1. Patients with a colostomy were started on oral diet within 24 hours post op. Semisolids were started on POD 2.

Early postoperative mobilization

- Patients were mobilized and made ambulant on 1st post operative day itself.

The study patients were managed in the post op ward, examined daily with vitals monitoring, i/o charting and basic blood investigations like CBC, RFT, serum electrolytes were done serially

Regular wound dressings were done aseptically.

Patients with Surgical Site infections were treated appropriately with wound dressings, antibiotics according to culture and sensitivity.

Other complications like anastomotic leak, enterocutaneous fistula were managed conservatively as per protocol with special concern to hydration, diet, antibiotic and strict monitoring of vitals.

All patients were followed up for a month after discharge with regular weekly review and complications if any arising were also noted.

DATA EXTRACTION AND STATISTICAL ANALYSIS

The collected data were analyzed with IBM.SPSS statistics software 23.0 Version. To describe the data descriptive statistics frequency analysis, and percentage analysis were used for categorical variables and the mean & S.D were used for continuous variables.

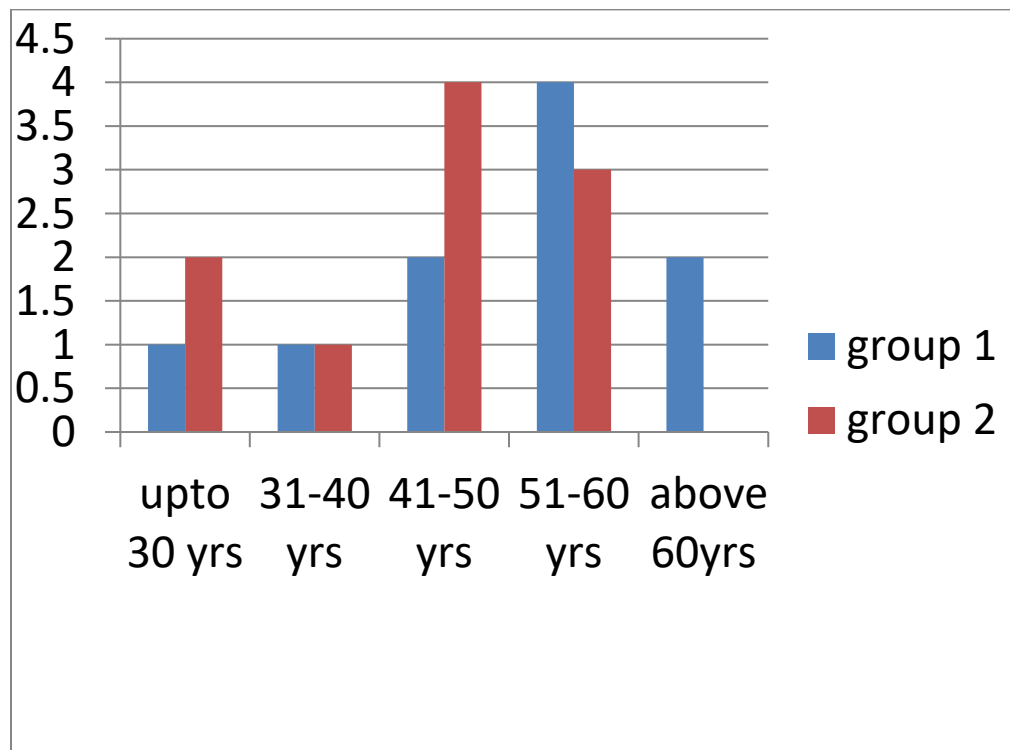
To find the significant difference between the bivariate samples Independent groups the Unpaired sample t-test was used.

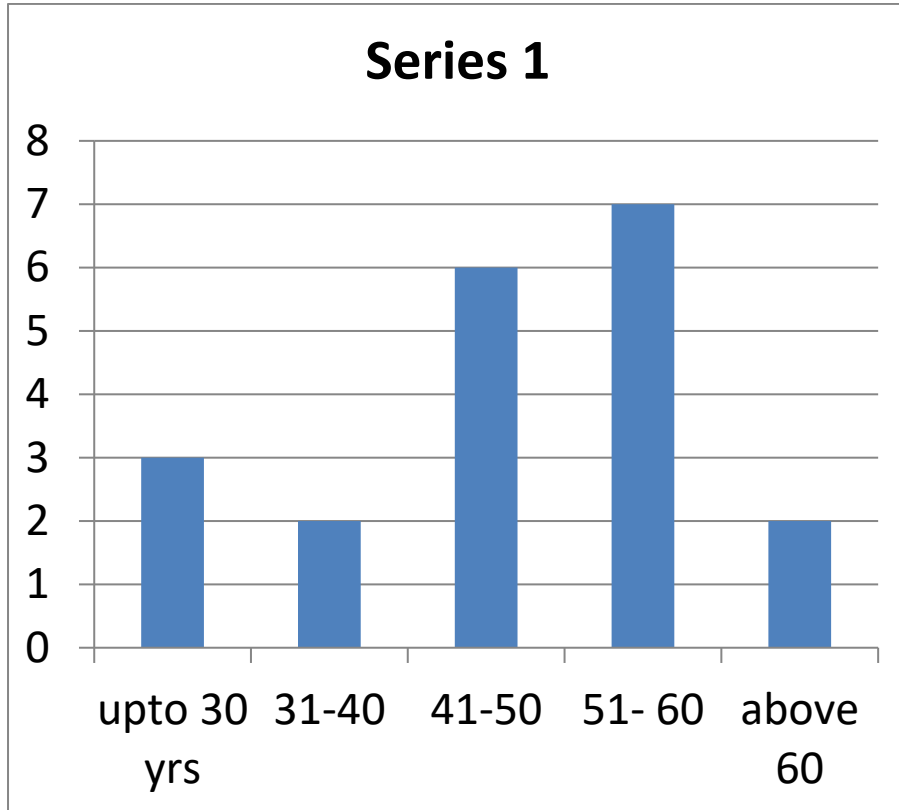
To find the significance in categorical data Chi-Square test was used. In both the above statistical tools the probability value i.e $p > 0.05$ is considered as significant level.

RESULTS

AGE DISTRIBUTION:

The average age of patients undergoing gastrointestinal surgeries was 49 in the test group and 44 in the control group.





			Group 1	Group 2	Total
Age	Up to 30 yrs	Count	1	2	3
		% within groups	15%	20%	17.5%
	31-40 yrs	Count	1	1	2
		% within groups	10%	15%	12.5%
	41-50 yrs	Count	2	4	6
		% within groups	20%	35%	27.5%
	51-60 yrs	Count	4	3	7
		% within groups	40%	30%	34.5%
	Above 60 yrs	Count	2	0	1
			15%	0	10%

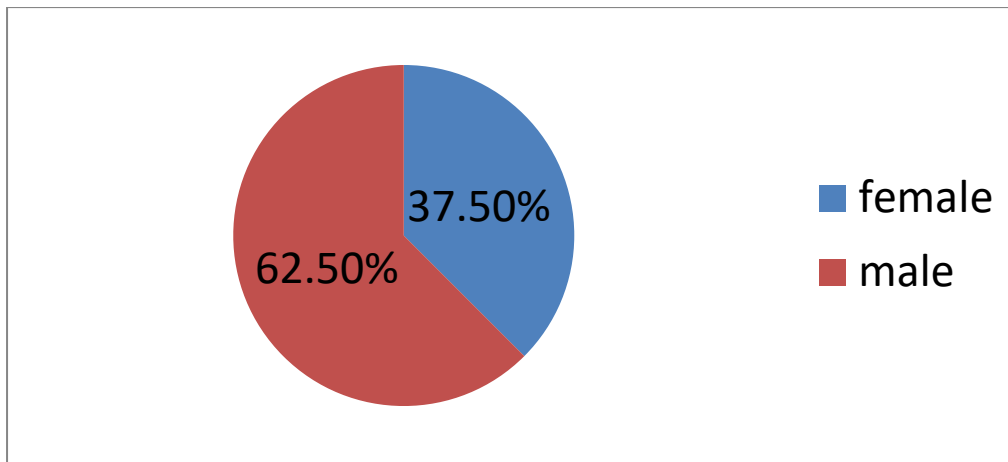
Total		Count	10	10	20
		% within groups	100	100	100

Patients above 60 years were 15% in the test group and 1% in the control group, together accounting for around 10%.

There is statistical significance between the test and control group regarding age distribution.

GENDER DISTRIBUTION:

The female patients were 35% in the test group and 40% in the control group, the average female patients were 37.5%. The male patients were 65% in the test group and 62.5% in the control group. The average male patients were 62.5% in this study. There is no statistical significance in gender distribution.

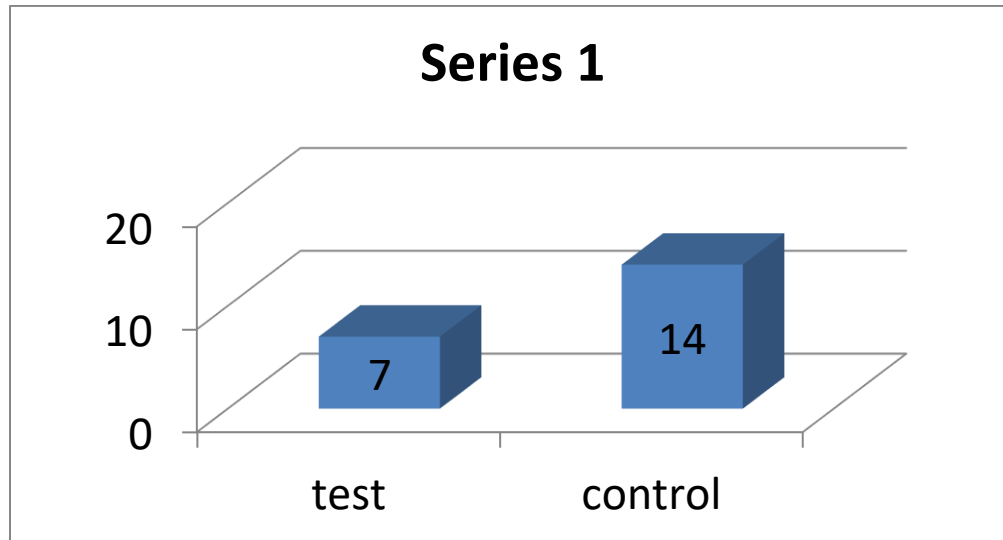


LENGTH OF HOSPITAL STAY

The average length of hospital stay for test group patients was 7 days.

The average length of hospital stay for control group patients was 14 days.

There is a statistical difference between the test and the control group regarding length of hospital stay. The length of hospital stay for test group patients was very low compared to the control group.



COMPARISON OF COMPLICATIONS:

In this study, patients with nil complications were 30, accounting for 75 % of total patients of which 16 patients were in test and 14 patients in control group.

SURGICAL SITE INFECTIONS:

Patients with nil complications accounts for about 80% and 70% in control group, 3 patients in test group accounting for 6% of total patients and 2 patients in control group accounting for 15% of total patients developed surgical site infections.

The test group with SSI form about 15% of population and 15% in control group. There is no difference in significance in test and control population.

ANASTOMOTIC LEAK:

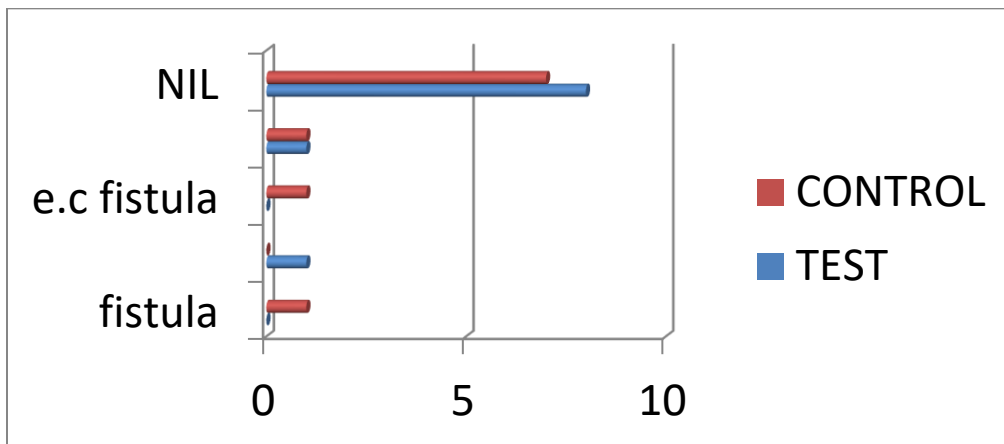
Number of patients in test group who developed anastomatic leak were 0 and 1 patient accounting for 2.5% of total patients had anastomatic leak.

The test group population formed 0% of an anastomatic leak, control group patient formed around 1% of anastomatic leak.

ENTEROCUTANEOUS FISTULA:

Number of patient in test group who had enterocutaneous fistula was 0 and 2 patient in control group accounting for about 5% of total patients.

			Test	Control	Total
Complications	Fistula	Count	0	1	1
		% within group	0%	5%	2.5%
	Anas leak	Count	1	0	1
		% within group	5%	0%	2.5%
	E.C fistula	Count	0	1	1
		% within the group	0%	10%	5%
	Nil	Count	8	7	15
		% within the group	80%	70%	75%
	SSIs	Count	1	1	2
		% within the group	15%	15%	15%
		Total	100%	100%	100%



Test group has overall fewer complications than the control group.

DISCUSSION

The conventional approach to postoperative management has been in use for many years, just as a practice of habit without a sound scientific basis. ERAS protocol claimed to be better in comparison to the conventional approach as reported from other specialty surgeries. The authors intended to find the basis of this result with respect to benign gynecological surgeries. A benefit in terms of most of the intended outcomes was found with the ERAS protocol in the present study.⁶ The discussion is based on the similarity of such a finding in studies done with different varieties of samples. Thus, it was concluded that ERAS which has found a better outcome than the irrational conventional approach is recommended. This was also an opportunity to introduce this advancement into the routine protocol of perioperative management and educate the personnel involved in perioperative care.⁷ The benefit of lesser hospital stay found in the present study was consistent with studies conducted by Wijk et al., Mukhopadhyay and Khalil, and Modesitt et al., where patients receiving ERAS protocol were discharged earlier.⁸

The average age of patients undergoing gastrointestinal surgeries was 49 in the test group and 44 in the control group.

As it is seen, the two pairs of groups were almost identical. The age distribution was also similar among the two groups. The maximum age of a patient undergoing GIT surgery in this study and minimum age was:

Patients under age of 30 years 15% in the test group, 20% in control group. They account for around 17.5%. Patients from age group of 31-40 years were 10 % in the test group, 15% in the control group, totally they form 5% of the total. Patients coming under the age group of 41-50 years were 20% in test group, 35 % in control group and they make up 27.5% of population. Patients from 51-60 years were 40% in the test group and 25% in the control group, forming 32.5% of the total study group.⁹

GENDER DISTRIBUTION:

Female patients in this study were 35% in the test group and 40% in the control group, the average female patients were 37.5 %. The male patients were 65% in the test group and 62.5 % in the control group. The average male patients were 62.5 % in this study. There is no statistical significance among gender distribution.¹⁰

CONCLUSION

From this study, ERAS is found beneficial in reducing the length of hospital stay, cost effective with fewer complications and better surgical outcomes when compared to conventional management of patients undergoing gastrointestinal surgeries.

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