Section: General Surgery

Original Research Article

TO COMPARE THE "ENHANCED RECOVERY AFTER SURGERY" (ERAS) PROTOCOL TO MANAGE THE PATIENTS WITH HOLLOW VISCUS PERFORATION PERITONITIS WITH THE CONVENTIONAL WAY OF MANAGEMENT OF THE SIMILAR PATIENTS

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Abstract

Background: Enhanced Recovery after Surgery" (ERAS) commonly known as "fast track" surgery or "enhanced recovery protocol" (ERP) refers to patient-centered, evidence-based and interdisciplinary team developed pathways for a surgical specialty and facility culture to reduce the patient's surgical stress response, optimize their physiologic function and facilitate recovery. The study aimed to compare the effectiveness of the "Enhanced Recovery After Surgery" (ERAS) protocol with conventional management in patients with hollow viscus perforation peritonitis. **Materials and Methods:** The study was conducted as a prospective cohort study at JLN Medical College, Ajmer on the patients undergoing emergency gastro-intestinal surgeries for hollow viscus perforation peritonitis and aged over 12 years. The study included two groups: the test group (ERAS group) consisting of 30 patients admitted to the general surgery ward and followed ERAS protocol, and the control group consisting of 30 patients admitted to other units. Parameters like preoperative (optimization of co-morbidities, minimal starvation and carbohydrate loading, deep vein thrombosis (DVT) prophylaxis, antibiotic prophylaxis), perioperative (epidural analgesia, local blocks, etc), and post-operative parameters (oral fluid administration, mobilisation, wound dressing), post-operative complications, and length of hospital stay were compared. **Results:** The results showed that patients in the ERAS group had shorter times to mobilization after surgery, removal of Ryle's tube, and initiation of a soft diet compared to the control group (p value=0.000). The ERAS group had a significantly shorter mean duration of hospital stay compared to the control group (p value=0.000). Complication rates were lower in the ERAS group, although the difference was not statistically significant (p value=0.228). **Conclusion:** The study demonstrated the benefits of implementing the ERAS protocol in patients with hollow viscus perforation peritonitis. The protocol resulted in shorter hospital stays, earlier recovery milestones, and potentially reduced post-operative complications compared to conventional management.

INTRODUCTION

Enhanced recovery protocols are a new way of improving the experience of patients who need major surgery which comprise a combination of various perioperative patient care methods using a multidisciplinary team approach that integrates evidence based interventions that reduce surgical stress, maintain postoperative physiological function and accelerate recovery in patients undergoing major surgery.1 ERAS protocols involve pre, intra and postoperative elements and their fundamental aspects focusing on the preoperative counselling, no or minimal fasting, optimal fluid management, decreased use of tubes, opioid-sparing analgesia and early mobilization.2

More than 234 million major surgical procedures are performed globally each year and despite advances in surgical and anaesthetic care, morbidity after abdominal surgery is still high. The Fast-track or enhanced recovery after surgery (ERAS) clinical pathways have been proposed to improve the quality of perioperative care with the aim of attenuating the

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loss of functional capacity and accelerating the recovery process. The ERAS pathways reduce the delay until full recovery after major abdominal surgery by attenuating surgical stress and maintaining postoperative physiological functions.3
The implementation of the ERAS pathways has been shown to impact positively in reducing postoperative morbidity and as a consequence length of stay in hospital (LOSH) and its related costs are reduced.4
Use of the ERAS pathway has been shown to reduce care time by more than 30 percent and to reduce postoperative complications by up to 50 percent. ERAS pathways have been implemented successfully in specialties like pancreatic, gynecologic, cardiovascular, thoracic, pediatric, orthopedic, colorectal surgery and urologic surgery.7To this end, this study aimed to evaluate the efficacy and safety of ERAS protocols for patients with hollow viscus perforation peritonitis.

MATERIALS AND METHODS

A hospital based prospective cohort study done on 60 patients admitted for gastrointestinal surgeries for hollow viscus perforation peritonitis in the department of General Surgery, J.L.N. Medical College & attached group of hospitals, Ajmer. A total of 60 patients were included in this study. Patients were divided into two groups randomly. One group was the Test Group with 30 patients & the other was the Control Group with 30 patients. The operating surgeon was same in all the cases.

Selection Criteria

Inclusion Criteria

Patients with age more than 12 years undergoing emergency gastrointestinal surgeries for hollow viscus perforation peritonitis were included in the study.

Exclusion Criteria

Immuno-compromised patients, patients with re-laparotomy surgeries or laparoscopic GI surgeries were not included in the study.

Methodology of the Study

Patients admitted in our unit for gastrointestinal surgeries formed the test group while patients admitted in other units formed the control group. The sample size of this study was Test Group - 30 patients & Control Group - 30 patients. Patient admitted in general surgery ward, who fulfilled both inclusion and exclusion criteria were selected. The patients and the attenders were informed about the nature of study, the work up, the components of study and the complications that may happen and those patients who gave consent alone were included in this study.

Pre-OP Counselling

In the test group of 30 patients, each patient and their attenders were counselled adequately. Clear instructions were given regarding. Patients who might have stoma were be explained in detail about the stoma and the patients and attenders were appropriately trained for stoma care and counselled regarding quality of life with stoma even before surgery.

Optimisation of CO-Morbidities: Patients were given adequate breathing exercises. Alcoholics and smokers were made to abstain from it. Other medical co-morbidities were corrected and made fit for surgery. This was done to enhance post-operative recovery.

Minimal Starvation and Carbohydrate Loading: Patients posted for surgery were kept in nil per oral for maximum of 6 hours before surgery. Four hours before surgery, they were administered 100 ml of 25% dextrose and 500ml of 0.9%NaCl.

Deep Vein Thrombosis Prophylaxis: All patients in the study were started on Deep vein thrombosis prophylaxis. They were given Injection Enoxaparin (low molecular weight heparin 20 micrograms subcutaneously, night before surgery and continued for entire length of hospital stay as OD. Those patients at high risk of DVT, the prophylaxis was continued for up to one month after surgery.

In this study, only open surgeries were included and the length of the incision was kept as minimum as possible.

Post-Operative Components: Patients were started on oral fluids on 2nd post-operative day. For patients with colostomy, oral diet was started within 24 hours postoperatively. Semisolid diet was started on 3rd POD. Complaints by patients were attended to immediately. Regular wound dressings were done. Patients with surgical site infections were managed with wound dressings and antibiotics according to culture and sensitivity.

RESULTS

A total of 60 patients undergoing emergency surgery for hollow viscus peritonitis were included in the study, 30 each divided into two groups. One group following ERAS protocol (case group) and other one following the conventional management (control group). The mean age of the patients in case group was 38.53±14.06 years and in control group, was 36.23±7.97 years. The maximum patients in our study belonged to 31-40 years age-group and were males as compared to females in both the Case and Control group. (Graph 1 and 2)

In the study, the Counselling and Carbohydrate loading as a part of the pre-operative procedures in ERAS protocol were performed in all the Cases whereas Bowel Preparation as done in conventional management was done in all the Control group patients. And thus, the difference between the two groups came out to be statistically significant (p value=0.00) (Table 1)

There are several peri-operative procedures that have to be performed in both the groups. The antibiotic prophylaxis was given to both the groups. However, DVT prophylaxis and Epidural analgesia as a part of ERAS protocol was given exclusively to Cases group

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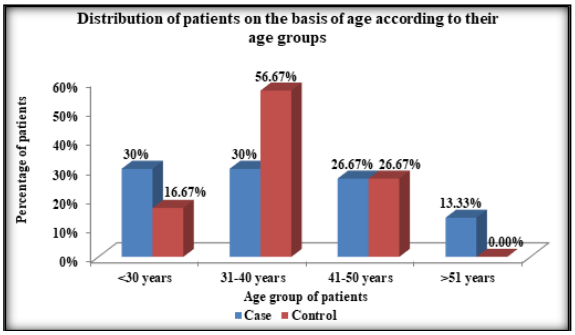
and not to the Control group. The difference was statistically significant. (p value=0.00) (Table 2)

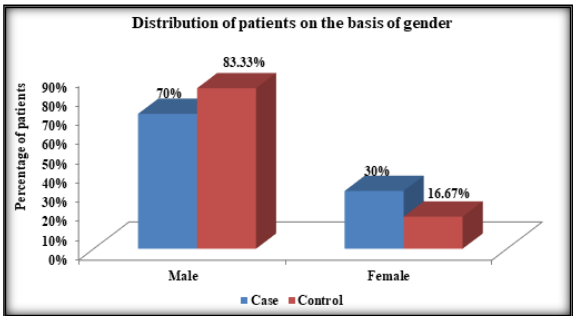
As a result of all these protocol changes, a lot of post-operative observations were made. It was observed that the mean of time taken in Mobilisation after operation, removal of Ryle's tube and initiation of soft diet post-operatively was much lesser in the Cases group where ERAS protocol was followed as compared to the Control group. And the difference between the two groups in all the three parameters was statistically significant. (Table 3) (p value<0.05)

After the surgeries were performed, the comparison of Post-operative Complications between Cases and Control groups was done. It was observed that only 2 (6.67%) patients in the Cases group developed a complication like surgical site infection whereas 5 (16.67%) patients in control groups developed various complications like surgical site infection, enterocutaneous fistula and anastomotic leak. However, the difference between the two groups was not statistically significant. (Table 4) (p value>0.05)

A major finding that the current study revealed was that the mean duration to discharge the patients who followed ERAS protocol was much lesser (6.4 days) than the patients where ERAS protocol was not followed (controls) (10.37 days) with the difference between the two being highly statistically significant. (p value<0.05) (Graph 3).



Graph 1: Distribution of patients on the basis of age according to their age groups



Graph 2: Distribution of patients on the basis of gender.

Table 1: Pre-operative Procedures in Cases and Control Groups

Pre-operative Procedure	Case group		Control Group		p value
	Number	%	Number	%	
Counselling	30	100%	0	0%	0.000
Bowel preparation	0	0%	30	100%	0.000
Carbohydrate loading	30	100%	0	0%	0.000

Table 2: Peri-operative Procedures in Cases and Control Groups

Peri-operative Procedure	Case group		Control Group		p value
	Number	%	Number	%	
Antibiotic prophylaxis	30	100%	30	100%	-
DVT prophylaxis	30	100%	0	0%	0.000
Epidural analgesia	30	100%	0	0%	0.000

Table 3: Post-operative Observations in Cases and Control Groups

Post-operative	Case group		Control Group		p value
	Mean	Standard Deviation	Mean	Standard Deviation	
Mobilisation (in days after operation)	0.53	±0.57	1.97	±0.41	0.000
Ryles tube (in days after operation)	1.3	±0.53	3.6	±0.67	0.000
Soft diet (in days after operation)	3.5	±0.90	5.83	±0.79	0.000

Table 4: Comparison of Post-Operative Complications between Cases and Control groups.

Complications	Case group		Control Group		p value
	Number	%	Number	%	
Surgical site infection	2	6.67%	3	10.00%	0.641
Enterocutaneous fistula	0	0%	1	3.33%	0.313
Anastomotic leak	0	0%	1	3.33%	0.313
Total	2	6.67%	5	16.67%	0.228

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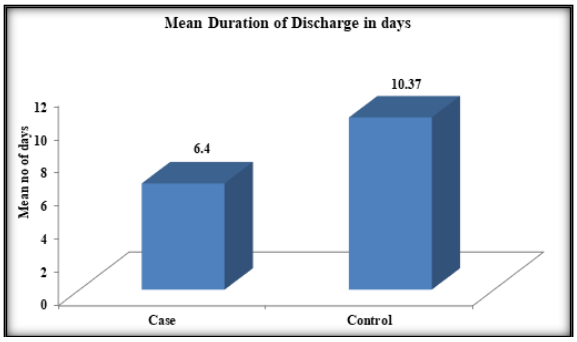

Graph 3: Mean Duration in days to discharge the patient after the surgery.

DISCUSSION

In our study, antibiotic prophylaxis was given to all the patients of both the groups, i.e., ERAS group (cases) and control group. However, DVT prophylaxis and Epidural analgesia was given exclusively to Cases group and none of the patients in Control group, thus proving ERAS to be more efficacious. On the contrary, Purushottam V et al.[5] in his study stated that the usage of epidural analgesia, non-steroidal anti-inflammatory drugs and DVT prophylaxis was higher in the ERAS group with significant statistical difference. Moreover, the meantime taken in mobilisation after operation, removal of Ryle's tube and initiation of soft diet post-operatively was much lesser in the Cases group where ERAS protocol was followed as compared to the Control group, proving ERAS protocol to be significantly better than conventional modality with statistically significant difference. Similar were the results stated by, Purushottam V et al.[5], Pranavi AV et al.[6], Saurabh K et al.[7], Ni X et al.[8], Mohsina S et al.[9], Yilmaz G et al.[10] and Ni TG et al.[11] while Sartori A et al.[12] reported non-significant difference between the two groups.

Further, only 2 patients in the Cases group developed a complication like surgical site infection in contrast to 5 patients in control groups developing complications like surgical site infection, enterocutaneous fistula and anastomotic leak. However, the difference between the two groups was not statistically significant, (p value>0.05). Therefore, we need a bigger sample size in order to reach a definitive conclusion to state the efficacy ERAS in reducing complications. These results were comparable to studies conducted by, Lode L et al's.[13], Saurabh K et al between the case and control groups, while Nygren J et al.[14] reported in their study that, after colonic resection, postoperative complications decreased in enhanced recovery. Moreover, the mean duration to discharge the patients who followed ERAS protocol was much lesser than the patients where ERAS protocol was not followed and the difference between the two was highly statistically significant (p value<0.05). This observation was comparable to resulted reported by Pranavi AV et al's.[6], Purushottam V et al.[5], Sartori A et al.[12], Lode L et al.[13], Saurabh K et al.[7], Ni X et al.[8], Mohsina S et al.[9], Ni TG et al.[11] and Ye Z et al.[15] Thus, our study could depict the efficacy of applying the ERAS protocol on patients undergoing abdominal surgeries following hollow viscus perforation. However, more such studies should be conducted and reviewed to solidify the statement.

CONCLUSION

In our study, mean time taken in Mobilisation after operation, removal of Ryle's tube and initiation of soft diet post-operatively was much lesser in the Cases group where ERAS protocol was followed as compared to the Control group proving ERAS to be better than current modalities in practice. ERAS protocol resulted in slightly less post-operative complications (p value>0.05), mean duration to discharge the patients who followed ERAS protocol was much lesser than the patients where ERAS protocol was not followed with difference being statistically significant. Therefore, it can be safely concluded that, ERAS protocol is a better modality in managing and to assess the patients undergoing abdominal surgeries for hollow viscus perforation.

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