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RESEARCH ARTICLE
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COMPARISON OF OUTCOMES OF ILEOSTOMY REVERSAL WITH AND WITHOUT ENHANCED RECOVERY AFTER SURGERY (ERAS) PROTOCOL

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ABSTRACT

Introduction: Enhanced Recovery After Surgery (ERAS) is a program of perioperative pathways that reduce the post-operative complications and recovery time. Implementation of ERAS protocols in colorectal surgery is practiced worldwide.(1) Many research publications has proved that length of hospital stay and postoperative complications are reduced with application of ERAS in colorectal surgery (1). Limited data is available about use of ERAS protocols in small bowel anastomosis and after ileostomy reversal. This study was conducted to assess the outcomes of ileostomy reversal with or without ERAS protocol.

Objectives: To compare frequency of prolonged ileus in patients undergoing ileostomy reversal with and without ERAS protocol.

Material and methods: This comparative study was conducted in Chaudhry Muhammad Akram research and Teaching Hospital, Azra Naheed Medical College Lahore, Pakistan over a period of 6 months from 1st January 2024 to 30th June 2024. A total of 60 patients planned for elective ileostomy reversal were selected from the OPD of CMARTH Lahore. After relevant workup and random division into two equal groups, A and B, patients underwent surgery. In group A, ERAS while in group B, conventional protocol was followed, and frequency of prolonged ileus was measured.

Results: The mean age was 33.92 ± 9.65 years. The duration of ileus was significantly different among groups as p value was 0.044. The frequency of prolonged ileus was significantly higher in conventional group as compared to ERAS group i.e., 16.7% versus 43.3% (p value 0.024).

Conclusion: The ERAS protocol after ileostomy reversal is associated with less duration of ileus. Further large sample studies would validate the results.

Keywords: Elective Surgical Procedures, Postoperative ileus, ERAS, Ileostomy closure, enhanced recovery,

INTRODUCTION

Conventionally in the past the bowel surgery had been associated with prolonged hospital stay and a list of complications. The surgery involving bowel anastomosis was managed in the past by keeping patients fasting and vigorous perioperative care. This included preoperative mechanical bowel preparation which is very cumbersome but a fundamental element for successful elective bowel anastomosis.(2) Post operatively the patients were kept nil per oral for multiple days with the belief that oral intake can risk the integrity of the bowel anastomosis, and NPO was not broken until the return of bowel sounds and passing of flatus. All these measures were introduced to avoid the anastomotic leakage and related complications. These measured put a lot of surgical stress response and the complication rate remained more than 15%.(3) [2]

To reduce the surgical stress response, enhance recovery after surgery (ERAS) protocol was introduced in 1999 by Professor Henrick. (3)[2] The ERAS challenged the old concepts and introduced measures to be undertaken in preoperative, per-operative and post-operative period aimed at early recovery of the patient. These evidence-based protocols include early mobilization, good analgesia, avoiding opioid analgesics, early resuming of oral intake and omission of intensive mechanical bowel preparation. ERAS aimed to reduce surgical stress response and optimize outcomes (4),(5). the ERAS protocols vary in their specifics with the specifics of the surgical procedure. Pirzada, M. T., et al. (2017) (3) showed that patients in which ERAS protocol was followed ileostomy reversal has significantly less frequency of prolonged ileus compared to patients with conventional management i.e. 10.7% versus 83% for groups with and without ERAS protocols respectively (p=0.00).

The bowel anastomosis outcomes with and without ERAS has been a hot topic among surgeons in recent years. Evidence on the significance of the practicality of the ERAS guidelines has been a debate with some studies showing no significant benefit of ERAS protocol in maintaining the integrity of bowel anastomosis to reduce morbidity (morbidity without and with ERAS 8% vs 10% respectively, P = 1.0) (6) Another study found that there was no difference between groups in terms of vomiting i.e. 26% versus 29% (p = 0.41) (7) while some studies strongly advocated the application of ERAS (3),(4),(8). Here we compare the outcomes of ileostomy reversal with and without ERAS protocol in terms of frequency of prolonged ileus in a tertiary care hospital.

MATERIALS AND METHODS

Observational comparative study conducted in Department of Surgery, Chaudhry Muhammad Akram Research and Teaching Hospital, Azra Naheed Medical College Lahore over period of 6 months (1st January 2024 to 31st June 2024). Sample size of 60 cases was observed (30 in each group) was calculated with 90% power of test, 5% level of significance. Consecutive non-probability sampling technique was used, The frequency of prolonged ileus for conventional protocol was taken as 83% and for ERAS protocol as 10.7% (3). The inclusion criteria included Patients with ileostomy stoma fashioned due to trauma or enteric pathology as per operational definition, Patients with the age range of 15 to 70 years Both male and female patients were included. The exclusion criteria included History of abdominal tuberculosis from clinical data, History of chronic steroid intake, Patient with chronic comorbid conditions like diabetes mellitus, ischemic heart disease, chronic liver, and renal insufficiency.

RESULTS

The study was conducted over a period of 6 months and data of 60 (n) patients was collected and analyzed. The mean age was 33.92 ± 9.65 years. The age distribution is as below in the bar graph (Figure I).

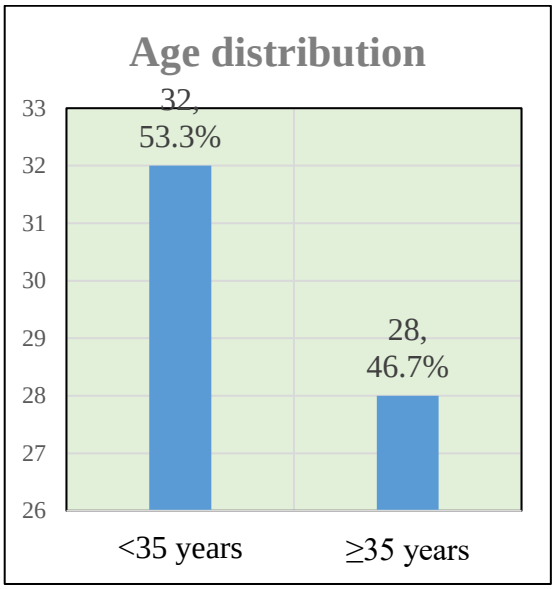

Figure I. Age distribution. Total sample n = 60.

The gender distribution showed 39 (65%) were males (Figure II).

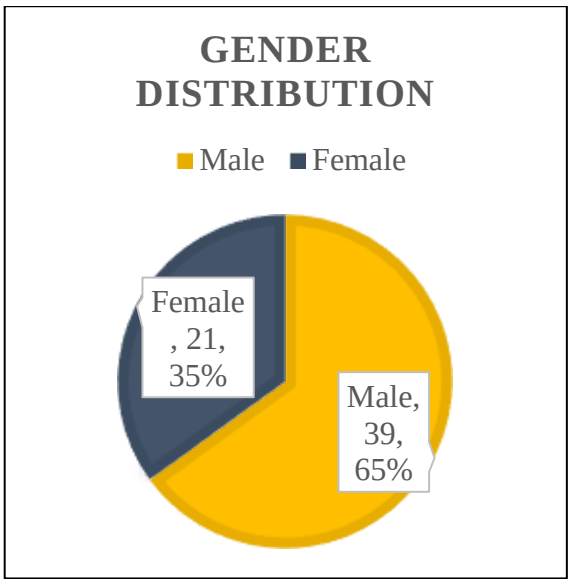

Figure II. Gender distribution.

The mean BMI was 26.17 ± 3.211 kg/m^2. The mean duration of ileostomy was 7.45 ± 2.83 months. Among the causes of ileostomy, 27 (45%) had history of trauma while 33 (55%) had history of enteric perforation. All the patients underwent stoma reversal under General anesthesia through a peristomal incision. The mean duration of ileus was 44.02 ± 24.98 hours. The prolonged ileus was noted in 18 (30%) of patients and anastomotic leakage was noted in 2 (3.3%) patients. The qualitative variables were compared among groups and analysis revealed that there was no difference between groups A and B in terms of mean age, BMI, duration of ileostomy as p values were 0.861, 0.396 and 0.325 respectively. The duration of ileus was significantly different among groups as p value was 0.044 (Table I).

Table I. Quantitative variables among groups. [1] Independent sample t test

Variable	Group	N	Mean	Std. Deviation	P value[1]
Age (years)	**A**	30	34.23	10.013	0.861
	B	30	33.60	9.442	
BMI (kg/m2)	**A**	30	26.43	3.081	0.396
	B	30	25.90	3.367	
Duration of ileostomy (months)	**A**	30	7.17	2.627	0.324
	B	30	7.73	3.028	
Duration of ileus (hours)	**A**	30	37.30	22.069	0.044
	B	30	50.73	26.257	

The comparison of qualitative variables showed that there was no difference between groups in terms of distribution of gender, cause of ileostomy and anastomotic leakage (p values 0.787, 0.436 and 0.228 respectively) (Table II). The frequency of prolonged ileus was significantly higher in conventional group as compared to ERAS group i.e., 43.4% versus 16.7% for conventional vs ERAS groups respectively (p value 0.024) (Table II).

Table I. Qualitative variable among groups

Variable			Group		Total	P value[2]
			A	B		
Gender	**Male**	N	20	19	39	0.787
		%	66.7%	63.3%	65.0%	
	Female	N	10	11	21	
		%	33.3%	36.7%	35.0%	
Cause of ileostomy	**Trauma**	N	12	15	27	0.436
		%	40.0%	50.0%	45.0%	
	Enteric	N	18	15	33	
		%	60.0%	50.0%	55.0%	
Anastomotic leakage	**Yes**	N	1	1	2	0.472
		%	3.4%	3.4%	3.4%	
	No	N	29	29	58	
		%	96.6%	96.6%	96.6%	
Prolonged ileus	**Yes**	N	5	13	18	0.024
		%	16.7%	43.3%	30.0%	
	No	N	25	17	42	
		%	83.3%	56.7%	70.0%	

The data was stratified according to age, BMI, gender, cause, and duration of ileostomy. The results showed that there frequency of prolonged ileus was different for following stratification groups; age >35 years, female gender, BMI <27 kg/m2 and ileostomy duration >7 months (p value 0.043, 0.034, 0.029 and 0.019 respectively) (Table III to Table VII).

[2] Chi square test

Table II. Prolonged ileus among groups after age stratification

Age (years)			Group		Total	P value[3]
			A	B		
<35	Yes	N	3	6	9	0.238
		%	18.8%	37.5%	28.1%	
	No	N	13	10	23	
		%	81.3%	62.5%	71.9%	
≥35	Yes	N	2	7	9	0.043
		%	14.3%	50.0%	32.1%	
	No	N	12	7	19	
		%	85.7%	50.0%	67.9%	

Table III. Prolonged ileus among groups after gender stratification

Gender			Group		Total	P value[4]
			A	B		
Male	Yes	N	5	9	14	0.146
		%	25.0%	47.4%	35.9%	
	No	N	15	10	25	
		%	75.0%	52.6%	64.1%	
Female	Yes	N	0	4	4	0.034
		%	0.0%	36.4%	19.0%	
	No	N	10	7	17	
		%	100.0%	63.6%	81.0%	

Table IV. Prolonged ileus among groups after BMI stratification

BMI (kg/m2)			Group		Total	P value[5]
			A	B		
<27	Yes	N	3	10	13	0.029
		%	17.6%	52.6%	36.1%	
	No	N	14	9	23	
		%	82.4%	47.4%	63.9%	
≥27	Yes	N	2	3	5	0.475

[3] Chi square test
[4] Chi square test
[5] Chi square test

		%	15.4%	27.3%	20.8%	
	No	N	11	8	19	
		%	84.6%	72.7%	79.2%	

Table V. Prolonged ileus among groups after DOI stratification

Duration of ileostomy			**Group**		**Total**	**P value**[6]
			A	**B**		
<7 months	**Yes**	N	3	4	7	0.512
		%	20.0%	30.8%	25.0%	
	No	N	12	9	21	
		%	80.0%	69.2%	75.0%	
≥7 months	**Yes**	N	2	9	11	0.019
		%	13.3%	52.9%	34.4%	
	No	N	13	8	21	
		%	86.7%	47.1%	65.6%	

Table VI. Prolonged ileus among groups after cause stratification

Cause of ileostomy			**Group**		**Total**	**P value**[7]
			A	**B**		
Trauma	**Yes**	N	1	6	7	0.062
		%	8.3%	40.0%	25.9%	
	No	N	11	9	20	
		%	91.7%	60.0%	74.1%	
Enteric	**Yes**	N	4	7	11	0.138
		%	22.2%	46.7%	33.3%	
	No	N	14	8	22	
		%	77.8%	53.3%	66.7%	

DISCUSSION

The postoperative restoration of bowel movements in stoma reversal is considered important parameter to assess for possible complications. The various techniques and modifications have led to reduction of ileus but still the ongoing research is focusing to optimize the results (2). The complications after stoma closure are associated with various factors which are related to patients as well as surgical technicalities (5). The introduction of ERAS protocol against conventional protocol

[6] Chi square test

has been the matter of debate over the years. The traditional protocol of mechanical bowel preparation and prolonged strict fasting regimen has remained mainstay of treatment after the stoma reversal (4) (6). Despite these measures the complications after stoma reversal have been more than 15%. The complications have wide range of possible associations and has been the area of extensive research over the years. The stress response after surgery has been blamed for the possible high rate of complications. This realization has led to development of fast-track programs which evoke less stress response in patients undergoing gut surgeries (3). The compliance of ERAS protocol in colorectal surgery is more than 80% in majority of surgical setups (9). The ERAS protocol after colorectal surgery has been evaluated in many recent research and majority of literature favored the ERAS over conventional protocols in terms of various short-term complications (10). The recent research with more comprehensive documentation are providing insight about the potential benefits of ERAS over conventional protocol (11).

Bracey E. et al (6) compared ERAS and conventional protocols in terms of various prognostic factors and found that ERAS is associated with shorter hospital stays i.e., mean hospital stay was 3.4 vs 5.6 days for ERAS versus conventional protocols respectively (p-value 0.033). There was no difference between complication rates among both groups. The adverse effects including readmission rates remained same for both groups. Pirzada, M. T., et al. (2017) (3) compared ERAS and conventional protocol in 60 participants who were divided into two groups of 30 (50%) each which matches exact number of participants in our study. The dominance of male was similar as 39 (65%) patients were males. In this study the mean age was 27.80 ± 9.99 years in conventional group and 23.87 ± 4.56 years in ERAS group. In my study the mean age was 33.92 ± 9.65 years. The prolonged ileus in i.e., >72 hours after surgery was 10.7% in ERAS group as compared to 83% in conventional group (p 0.00). The frequency of prolonged ileus in my study was significantly higher in conventional group as compared to ERAS group i.e., 43.3% vs 16.7% for conventional vs ERAS protocol respectively (p-value 0.024). Slieker, J., et al. (2018) evaluated the ERAS protocol in patients undergoing ileostomy reversal and found that the diet modification in the original ERAS protocol has significant benefits in enhancing gut motility. The frequency of vomiting has been major concern in some cases (7).

ERAS is associated with less morbidity and further quest found that in patients undergoing stapled anastomosis after ileostomy reversal may seem to neutralize the beneficial impact of each other (4). The literature showed that acceptance of ERAS is somewhat met with reluctance across the surgical communities. The changes of ERAS protocol are accepted by surgeons when the interference with their practice is minimum (12). The ERAS protocol has many variations and due to its apparent broad term texture, the various elements enhancing and optimizing recovery may be included e.g., early closure of protective ileostomy after rectal resection should be included in ERAS protocol (8). The various authors suggest that there should be standard checklist in colorectal surgeries for the implementation of standard ERAS protocol to that the standardization is maintained (1). The recommendations and guidelines from the ERAS society is the part of standardization across institutions for the implementation of ERAS (13). The literature is currently lacking the evidence of long-term benefits of ERAS protocol in colorectal surgeries. The short-term benefits are evident as reduced hospital stay with no extra short-term complications as compared to conventional protocols (14). The implementation of ERAS protocol in pediatric surgery has also shown significant reduction in morbidity associated with conventional protocols (15).

The data of my study was stratified according to age, BMI, gender, cause, and duration of ileostomy. The results showed that their frequency of prolonged ileus was different for following stratification groups; age >35 years, female gender, BMI <27 kg/m2 and ileostomy duration >7 months (p value 0.043, 0.034, 0.029 and 0.019 respectively).

CONCLUSION

The ERAS protocol after ileostomy reversal is associated with less duration of ileus and early return of bowel activity. Further large sample studies would validate the results.

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