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Compliance of Early Feeding As A Part of Enhanced Recovery After Surgery Protocols in Patients After Gastrointestinal Surgeries

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ABSTRACT

Objective: To assess the compliance of early feeding as a part of enhanced recovery after surgery protocols in patients after gastrointestinal surgeries and factors related with poor compliance

Study Design: Comparative Cross-sectional Study

Place and Duration of Study: Surgical Department Combined Military Hospital Rawalpindi, Pakistan from May 2021 to Apr 2022.

Methodology: A prospective study was conducted on 95 patients undergoing different types of gastrointestinal surgeries at surgical unit of CMH RWP during the study period. All the patients were started with early feeding as a part of enhanced recovery after surgery protocols. They were observed for 72 hours for presence of poor tolerability or non-compliance. Relationship of relevant socio-demographic factors was assessed with poor tolerability of early feeding.

Results: A total of 95 patients with gastrointestinal surgeries performed during the study period were included in the study. All of them were given early feeding as a part of enhanced recovery after surgery protocols. Out of 95, 73(76.8%) had good compliance and tolerability to early feeding while 22(23.1%) patients had one or more non-tolerability parameters within 48 hours of surgery. Advancing age, raised total leucocyte count and presence of comorbid illness had statistically significant relationship with non-tolerability of early feeding (p-value<0.05).

Conclusion: Most of the patients undergoing gastrointestinal surgeries showed good compliance and tolerability to early feeding as a part of enhanced recovery after surgery protocols. Elderly patients, patients with comorbid medical problems or those with high post-operative total leucocyte count were found more at risk of poor compliance to early feeding.

Keywords: Compliance; Early feeding; Gastrointestinal surgery

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INTRODUCTION

Abdominal and gastrointestinal surgeries are routinely performed by general, laparoscopic and oncology surgeons across the globe.[1] As all surgeries may bring about some local or systemic complications, gastrointestinal surgeries are no exception to it.[2] Multiple factors may increase or decrease the rate of complications in these surgeries. These factors may be patient related, underlying disease related, procedure related, treating team related and most importantly post-surgical care related.[3]

Start of feeding and other routine activities is area of concern after any major surgical procedure but it becomes extremely important when resection and anastomosis of gastrointestinal tract has been done at any location from esophagus till rectum.[4,5] Post-operative recovery indices include as well as depend upon time at which oral feeding is started after the surgery and tolerated by the patient.[6] There had been different views and practices of surgeons regarding best time to start the feeding after gastrointestinal surgeries.

Multiple studies with different designs have evaluated the role of early post-operative feeding in overall physiological wellbeing of patients after the surgery. Early enteral nutrition within 24 hours of lower gastrointestinal surgery versus later commencement for length of hospital stay and postoperative complications was published by Herbert et al. in 2019. They concluded that length of stay was significantly reduced in patients who got early feeding but all other complications were similar in both the groups.[7] Charoenkwan et al. in 2014 studied early versus delayed oral fluids and food for red ucing

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complications after major abdominal gynecologic surgeries. It was revealed that faster recovery of bowel function, lower rates of infectious complications, shorter hospital stay, and higher satisfaction were seen more in patients who got early feeding after the surgery as compared to those who got traditional feeding.[8] Zheng *et al*. published a meta-analysis in 2017 on patients undergoing colo-rectal surgeries and concluded that early post-operative feeding was a better option in terms of reducing complications, hospital stay and overall cost as well.

Post-surgical care is an evolving area in our part of the world and a lot of teams though equipped with best surgical equipment lack this aspect of patient care. Being from a developing country if any strategy could be devised which could not only shorten post-operative hospital stay but also prevent complications would be best for our patients and health system. A recent trial has been registered from Pakistan to compare early versus late enteral feeding after gastrointestinal surgeries.[10] Limited local data has been available regarding this aspect of post-surgical care. We therefore planned this study with the rationale to assess the compliance of early feeding as a part of enhanced recovery after surgery protocols in patients after gastrointestinal surgeries and factors related with poor compliance.

METHODOLOGY

This comparative cross-sectional study was conducted at the Department of Surgery, Combined Military Hospital Rawalpindi, Pakistan from May 2021 to April 2022. Sample size was calculated by WHO Sample Size Calculator by using population prevalence proportion of prolonged hospital stay with early feeding after surgery as 24.9%.[11] Non-probability Consecutive sampling technique was used to gather the sample.

Inclusion Criteria: All patients between the age of 18 and 65 years who underwent any type of elective gastrointestinal surgery were included in the study. Patients who were referred from other military, public sector and private hospitals for gastrointestinal surgery were also included in the analysis in addition to the patients of own hospital.

Exclusion Criteria: Patients who were undergoing emergency or second surgery in less than one-month time were excluded. Patients with bleeding disorders, solid malignancies or leukemia and lymphomas Immuno-compromised patients, autoimmune disorder patients and patients on long term steroids were also excluded. Patients who had complications during the surgery or had any contraindications to start oral feeding after the surgery were excluded as well.

After ethical approval from the ethical review board committee (letter no XXX) and written informed consent from potential participants, patients fulfilling the above mentioned inclusion and exclusion criteria were included in the study. Patients underwent routine preanesthetic evaluation and then surgery as per set protocols.[12] Enhanced Recovery After Surgery (ERAS) concept and the special nutritional needs of patients undergoing major surgery was followed as per ESPEN guidelines and early feeding (within 24 hours of surgery) was started in all the patients.[13] A structured proforma was made to look for return of satiety, bowel sounds and evidence of sepsis. Length of hospital stay was also charted in proforma for all the patients. Total leucocyte count was done as part of routine investigations in surgical intensive care for all the patients and interpreted as high if more than 11.0x10^9/L.[14]

All statistical analysis was performed by using the Statistics Package for Social Sciences version 24.0 (SPSS-24.0). Frequency and percentages for gender, type of procedures and all the complication during the study were calculated. Mean and standard deviation for age was also calculated for the study participants. Chi-square test was used to establish association. Association of age, presence of comorbid illnesses and raised TLC was assessed with non-tolerability of early post-operative feeding in study participants by keeping the *p*-value less than or equal to 0.05 as significant.

RESULTS

A total of 95 patients with gastrointestinal surgeries performed during the study period were included in the study. Out of these 65(68.4%) were males while 30(31.6%) were female. All of them were given early feeding as a part of enhanced recovery after surgery protocols. Table-I summarized the general characteristics of study participants. Out 0f 95, 73(76.8%) had good compliance and tolerability to early feeding while 22(23.1%) patients had one or more non-tolerability parameters within 48 hours of surgery. Out of total surgeries performed anterior resection 30(31.5%) was most performed followed by right hemicolectomy 29(30.5%).

Table-II summarizes the results of chi-square analysis. It was revealed that advancing age (*p*-value<0.001), raised total leucocyte count (*p*-

value<0.001) and presence of comorbid illness (*p*-value-0.001) has statistically significant relationship with non-tolerability of early feeding in patients undergoing various types of gastrointestinal surgeries while gender has no statistically significant relationship (*p*-value-0.978) in our study participants.

Table-I: Characteristics of Study Participants (n=95)

Age (years)	
Mean + SD	39.93±9.445
Range (min-max)	19 - 60 years
Gender	
Male	65(68.4%)
Female	30(31.6%)
Surgeries performed	
Anterior resection	30(31.5%)
Right hemicolectomy	29(30.5%)
Colostomy reversal	16(16.8%)
Ileostomy reversal	16(16.8%)
Others	04(4.2%)
Compliance parameters	
Return of satiety	88(92.6%)
Return of bowel sounds	85(89.5%)
Recovery without evidence of sepsis	91(95.7%)
Length of hospital stay<4 days	82(86.3%)

Table-II: Factors Associated with Poor Compliance and Tolerability Among Patients Undergoing Gastrointestinal Surgeries (n=95)

Factor(s)	Good compliance and tolerability	Poor compliance and tolerability	*p*-value
Age			
≤55 years	54 (73.9%)	07 (31.8%)	<0.001
>55 years	19 (26.1%)	15 (68.2%)	
Gender			
Male	50(68.4%)	15(68.2%)	0.978
Female	23(31.6%)	07 (31.8%)	
Raised total leucocyte count			
No	67(91.8%)	9(40.9%)	<0.001
Yes	6(8.2%)	13(59.1%)	
Presence of comorbid illness			
No	65(89.1%)	12 (54.5%)	0.001
Yes	8(10.9%)	10 (45.5%)	

DISCUSSION

In this study, most patients tolerated early feeding and remained compliant to it. Older patients and those with comorbid medical conditions or raised TLC were more a risk of non-compliance. Post-operative care is an important aspect of surgical care which if not up to mark can ruin the whole effort of surgical team. Procedures involving resection and anastomosis of GI tract pose a unique challenge to the team regarding start of oral feeding. Traditional model of starting the feeding after 48 to 72 hours of surgery is discouraged in most recent guidelines and early feeding is preferred. We have been mostly relying in data not generated on our own patients.

Traditional postoperative care was compared with early feeding protocols by a randomized controlled trial in 2013 performed by Klappenbach *et al.*[15] It was concluded that early feeding was safe though it resulted in more vomiting, but it was easily manageable. This study did not compare two methods but early feeding results and they were promising in patients who underwent any type of gastrointestinal surgeries.

Hao *et al*. in 2021 published a systematic review and meta-analysis regarding efficacy and safety of early oral feeding in postoperative patients with upper gastrointestinal tumor.[16] They highlighted that early feeding as compared to traditional feeding was associated with lower risk of pneumonia, shorter hospital length of stay, lower cost of hospitalization, and significantly improved postoperative immune function of patients. Our results are in alignment with the findings generated by Hao *et al.*

Ahmed *et al.*, published a local study with an objective to evaluate the outcome of early versus late oral feeding in elective intestinal anastomosis in terms of postoperative ileus, anastomosis leakage, wound infection and hospital stay.[17] They revealed that early feeding was better tolerated as compared to traditional feeding. Our results showed that most of the patients undergoing gastrointestinal surgeries showed good compliance and tolerability to early feeding as a part of enhanced recovery after surgery protocols. Elderly patients, patients with comorbid medical problems or those with high post-operative total leucocyte count were found more at risk of poor compliance to early feeding.

Early enteral nutrition within 24h of colorectal surgery versus later commencement of feeding for postoperative complications was studied by Anderson *et al.*[18] They highlighted merits and demerits of both methods, but early feeding seemed more feasible. Our results were similar to that of Anderson *et al.*, as early feeding turned out to be better and safe option and most of the patients remained compliant to this method of feeding.

LIMITATION OF STUDY

The major limitation of our study is the lack of generalizability as patients from one surgical unit of a tertiary care hospital of Pakistan were studied instead of all

hospitals of the country. The sample size, and design of study pose methodological issues as well. It was not a randomized controlled trial comparing traditional and early feeding. A lot of other factors in addition to time of feeding may also impact our outcome variables therefore we cannot conclude that these events were related to time of feeding in our study.

CONCLUSION

Most of the patients undergoing gastrointestinal surgeries showed good compliance and tolerability to early feeding as a part of enhanced recovery after surgery protocols. Elderly patients, patients with comorbid medical problems or those with high post-operative total leucocyte count were found more at risk of poor compliance to early feeding.

Conflict of Interest: None.

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Authors' Contribution

Following authors have made substantial contributions to the manuscript as under:

UG & MQB: Data acquisition, data analysis, critical review, approval of the final version to be published.

JI & JIK: Study design, data interpretation, drafting the manuscript, critical review, approval of the final version to be published.

QTUH & TU: Conception, data acquisition, drafting the manuscript, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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