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## Early Versus Late Enteral Nutrition In Patients Undergoing Emergency Gastrointestinal Surgery.

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### ABSTRACT

Following gastrointestinal surgery, there has been a trend among surgeons to postpone enteral feeding in order to avoid complications as well as to give the operated site time to heal. Recent research suggests that early enteral feeding is beneficial in compared to the traditional technique of feeding, which is waiting for bowel function to restore. The goal of our study was to determine the safety and acceptability of early enteral feeding following gastrointestinal procedures in terms of postoperative complications and length of hospital stay. In our study 60 patients who underwent Emergency gastrointestinal surgery MVJ Medical and Research Hospital were included. Patients were randomly divided into two groups (30 patients each). Group A patients were received early enteral feeding; 24-48hrs and Group B patients received delayed enteral feeding; more than 48 hrs. In our study, Male outnumbered the females. Most common acute gastrointestinal emergency operated was hollow viscus perforation (56.7%) followed by intestinal obstruction (40%). Outcomes such as postoperative complications and duration of hospital stay was observed. In our present study, complication rate in early group was 13.3% and in delayed conventional group was 30%. Duration of hospital stay was lesser in early group as compared to delayed conventional group. Early oral feeding after emergency gastrointestinal surgery is safe, effective and associated with lower incidence of complications and shorter duration of hospital stay.

**Keywords:** nutrition, gastrointestinal, surgery, enteral feeding.

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## INTRODUCTION

Malnutrition is believed to affect 20% to 70% of patients who undergo major abdominal surgery [1,2], and it is associated with higher rates of morbidity, including poor wound healing, hospital-acquired infections, postoperative complications, longer hospital stays, and higher mortality [3-5].

Many authors believe that nutritional deficiency is a significant independent predictor of severe complications following major gastrointestinal surgery. Nutritional deficiencies in surgical patients pose a serious danger to their clinical outcomes. It can be caused by increased resting energy expenditure by surgical injury and protein loss. However, the most important contributing factor is the lower intake of these patients immediately after surgery [6]. Traditionally, feeding for patients after gastrointestinal surgery started when flatus or defecation indicated the return of bowel function [7]. The rationale of nil by mouth is to prevent postoperative nausea and vomiting and to protect the anastomosis, allowing time to heal before being stressed by food [8]. Early postoperative feeding (within 24 hours of surgery) was one of the numerous preventive multimodal therapies included to the Enhanced Recovery After Surgery protocols (ERAS) over the past few years [7]. The ERAS has been proven effective in accelerating the post-surgical recovery and reducing hospital length of stay [7].

The European Society for Parenteral and Enteral Nutrition (ESPEN) and the Enhanced Recovery After Surgery (ERAS) Society guidelines [9,10,11] recommend that enteral nutrition (EN) should be implemented for patients after surgery as soon as possible if the gastrointestinal tract works. Early enteral nutrition specifically increases motility and enables the digestive system to regain its physiological status and functions more quickly than parenteral nutrition [12]. Furthermore, early oral nourishment would quickly supply the essential elements for surgical wound healing while simultaneously preventing the substantial metabolic alterations that happen within 24 hours of starvation, such as enhanced insulin resistance [13].

## MATERIALS AND METHOD

All patients in general surgical ward in MVJ Medical and Research Hospital undergoing emergency gastrointestinal surgeries in acute abdomen within 24 hours from December 2021 to December 2022. All patients subjected to 2 groups such as Group A getting early enteral feeding by oral or nasogastric 24 to 48 hrs after surgery and Group B getting late enteral feeding- conventional feeding (more than 48 hrs). After that patients are followed up closely for various complication namely wound infections, pulmonary complications and paralytic ileus along with duration of hospital stay.

### Statistical analysis

The data was collected in individual patient proforma and was entered systematically in a Microsoft Excel sheet (Redmond, WA, USA). Statistical analysis determined using Statistical Package for the Social Sciences (SPSS) 19.0 software (IBM Corp., Armonk, NY, USA). The data on categorical variables, such as gender, and clinical characteristics were expressed as frequency and percentages. The normal distribution of data was tested using Kolmogorov-Smirnov (K-S) test.

**Inclusion Criteria**

All Patients undergoing emergency gastrointestinal surgeries in acute abdomen within 24 hours.

**Exclusion Criteria**

- Patients with severe shock.
- Patient who underwent Resection and anastomosis of bowel.
- Patients who required Re-exploration

**RESULTS**

In our study, Gender distribution among cases and controls was demonstrated and there was 44 males and 16 females. Among the cases admitted and underwent emergency laparotomy, most common case operated was hollow viscus perforation (56.7%) includes Pre pyloric perforation and duodenal perforation. Other cases operated were subacute intestinal obstruction (40%) which includes obstructed hernia and adhesion followed by sigmoid volvulus (3.33%).

Gender distribution	No of cases
Male	44
Female	16
Total	60

Diagnosis	No of cases
Hollow viscus perforation	34
Subacute Intestinal obstruction	24
Sigmoid volvulus	2
Total	60

In our study there were a total of 60 patients, out of which 30 patients are in Group A (cases) and 30 patients are in Group B (Controls). Outcomes such as length of hospital stay and postoperative adverse outcomes were observed in both groups.

**Average duration of hospital stay**

Length of hospital stay	Group A	Group B
< 7 days	24	8
> 7 days	6	22
Total	30	30

Out of 30 patients in Group A, 24 patients had lesser duration of hospital stay which was <7 days and only 6 patients had longer duration of hospital stay more than 7 days.

Out of 30 patients in Group B, Only 8 patients had lesser duration of hospital stay (<7 days) and 22 patients had longer duration of hospital stay more than 7 days.

### Postoperative complications

In our present study, Total complication rate was 21.6% (13 out of 60). 4 out of 30 (13.3%) in early group (3 wound infection and 1 pulmonary infection ) and 9 out of 30 (30%) in late group (5 wound infection cases, 2 pulmonary complication, and 2 paralytic ileus ) was observed.

Postoperative complications	In cases group	In control group
Wound infection	3	5
Pulmonary infection	1	2
Paralytic ileus	0	2
Total	4	9

In our study, the incidence of wound infection was seen in 3 cases in early enteral group (Group A), while in conventional group (Group B) it was seen in 5 patients. Pulmonary complications was seen in one patient of early enteral feeding groups (Group A) while in conventional feeding group (Group B), it was seen in 2 patients. There was no complication of paralytic ileus in Group A while Group B had two cases of it.

### DISCUSSION

The gastrointestinal tract motility of patients undergoing abdominal surgery is transiently impaired (postoperative ileus). It is believed that a number of factors such as electrolyte imbalance, neural reflux, pharmacological physical intestinal manipulation, surgical agents such inhalation anesthetics and usage of stress, changes in opioids for postoperative analgesia, inflammatory mediators, and electrolyte imbalance, play a role in the etiology [14]. It is widely known that the postoperative catabolic reaction to surgery results in the loss of vital nutrients, which raises the risk of complications, particularly infectious problems. Therefore, maintaining optimal cell and organ function, encouraging wound healing, and reducing infection problems following surgery all depend on prompt and appropriate energy delivery [15].

Adequate nutrition has always been a major goal of post operative care. However, because of ileus, early oral feeding after abdominal surgery is usually avoided and routine nasogastric tube decompression has been used instead [16]. Traditionally, tolerance of oral feeding is based on the passage of flatus. However, the physiology of postoperative ileus suggests that such an approach is excessively conservative. It has been shown that paralysis of the small bowel is transient; the gastric paralysis lasts 24h and paralysis of the colon lasts 48-72h [17]. Postoperative gastrointestinal dysfunction commonly develops in individuals who have undergone abdominal surgery due to gut injury, bowel wall edema, and dysmotility and which also increases the risk of malnutrition and gastrointestinal intolerance [15].

Chapman and colleagues [18] reported that early postoperative feeding compared with traditional (or late) timing was safe and reduced length of hospital stay. There is no evidence that fasting and a

period of starvation are beneficial for healing of wounds and anastomotic integrity. Indeed, there is evidence to suggest that luminal nutrition, especially in patients who are malnourished, may improve wound healing and heighten anastomotic strength [19].

Several factors make enteral nutrition (EN) preferable to total parenteral nutrition (TPN) when it comes to the management of surgical patients. Enteral access is easy, avoids the catheter infection associated with TPN and preserves gut immunity, integrity and motility. Bacterial translocation may also be diminished by this route of feeding [20]. When compared to parenteral nutrition, early enteral nutrition in surgical patients offers the advantages of reducing septic complications and overall morbidity [21,22]. Because of concerns about potential anastomotic leakage brought on by mechanical stimulation and the increased intraluminal pressure early oral feeding has not been tried after upper gastrointestinal anastomosis [23].

In our study, Male (73.3%) outnumbered the females (26.7%). Out of 60 patients, most common case operated was hollow viscus perforation (56.7%) includes Pre pyloric perforation and duodenal perforation. Other cases operated were subacute intestinal obstruction (40%) which includes obstructed hernia and adhesion followed by sigmoid volvulus (3.33%).

For patients given early enteral feeding, the mean hospital stay for patients was 6.8 days lower as compared to those who were given conventional feeding, where it was observed to be 9.1 days.

Various other studies shows similar mean postoperative hospital stay are study by Bajwa et al [24] in 2017 (7.4 days in early and 10.133 days in the late group), Thapa et al study [25] in 2011 (5.5±0.58 days in early enteral feeding group and 9.5±2.89 days in the conventional feeding group), Soni DK et al [26] study (10.26 days in early enteral feeding group and 13.40 days in conventional feeding group) and Rakshitha D et al [27] study (9.03±2.60 days in early enteral feeding group and 16.31±3.04 days in conventional feeding group)

### **Complications rate**

In our present study, Total complication rate was 21.6% (13 out of 60), 4 out of 30 (13.3%) in early group (3 wound infection and 1 pulmonary infection ) and 9 out of 30 (30%) in late group (5 wound infection cases, 2 pulmonary complication, and 2 paralytic ileus ) was observed. However, Kishore et al [28] in 2014 also found almost same results when compared with our studies which shows 4 out of 37 in early (2 pulmonary complication, one leak, one abdominal distension) and 7 out of 37 in late group (3 anastomotic leak, 3 pulmonary complication and one abdominal distension) [28]. The study by Soni DK et al [26] shows that total complication rate was 18.5% (13 out of 70). 4 out of 35 (11.4%) in early group (3 wound infection, one anastomotic leak) and 9 out of 35 (25.7%) in late group (6 wound infection cases, 2 pulmonary complication, and one anastomotic leak).

### **Surgical wound infection**

In our study, 3 patients(10%) in the early enteral group and 6 patients(20%) in conventional group had wound infection. Study by Soni DK et al [26] shows similar results in which the incidence of wound

infection was seen in 3 cases(10%) in early enteral group, while in conventional group it was seen in 5 patients(16.6%).

Study by Rakshitha D et al [27] shows Wound infection was present in 22 (27.4%) subject and higher proportion of subject in the delayed enteral feeding group had wound infection 16 (40%).

In 2001, Stephen et al [29] presented a meta-analysis in which they found that the early feeding group had lower wound infection rates. Sunder et al [30] in 2014 and Chatterjee et al [31] in 2012 also observed lesser number of wound infection cases in early group but failed to reach the significance ( $p>0.05$ ).

### **Pulmonary complications**

In our study, one patient (3.33%) in early enteral feeding group and two patient (6.66%) in conventional feeding group had developed pulmonary complications.

In the study by Soni DK et al [26], no patient had developed pulmonary complications in early enteral feeding group while two patient (6.66%) had developed in conventional feeding group.

According to Lewis et al.'s meta-analysis from 2001, the early feeding group had a lower incidence of abdominal abscess and pneumonia but results were not significant statistically ( $p=0.85$  and  $0.84$  respectively) [29]. A meta-analysis of high-risk surgical patients was presented by Moore et al. in 1992 [32] was discovered that early feeding was linked to a decreased risk of pneumonia and other septic consequences [32].

### **Paralytic ileus**

In our study, no patient had developed paralytic ileus in the early enteral group but 2 patients had developed in conventional group. But study by Rakshitha D et al [27] shows 12.5% patients in early enteral feeding group and 30% in conventional feeding group had developed paralytic ileus.

In our study, it was found that the lesser incidence of paralytic ileus, wound infection, and pulmonary infection in early enteral feeding group, thereby reducing length of hospital stay was significantly less in the study group as compared to the control group. The average length of hospital stay in the study group was 6 days while that in the control 10 days and the results are statistically significant. Finally, there was no death in both groups.

### **CONCLUSION**

Early feeding is feasible, safe and it is also associated with very good postoperative outcome and early recovery of the patients.

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