Comparative study between early versus late enteral nutrition after gastrointestinal anastomosis operations

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Introduction
An anastomosis of the digestive tract is a common operation, whether it be an unexpected medical crisis or a planned procedure. Feeding soon after gastrointestinal anastomosis is not only physiological, but also protects against morphologic and functional trauma-related modifications in the gut.

Aim of work
This research aimed to evaluate the advantages and disadvantages of initiating Enteral Nutrition immediately following gastrointestinal anastomosis surgery versus delaying it for a later time. Additionally, the frequency of Adverse Events.

Patients and methods
Thirty patients underwent abdominal surgery, with treatments ranging from small- to large-intestine anastomosis, for both urgent and elective reasons. Early postoperative enteral feeding in the early feeding group commenced within 24 h of surgery or immediately following nasogastric tube removal. The delayed feeding group began enteral feeding using the standard technique once bowel sounds were restored, distention was gone, and the patient passed flatus or stool. 14 patients were in the early enteral feeding group (A) while 16 patients were in the late enteral feeding group (B). Data regarding blood loss and transfusion, NGT removal time, time of intestinal sounds return, time of passage flatus and stool, hospital stay and postoperative complications were recorded.

Results
Among those who ate too early (46.6%), those who ate late (53.3%), abdominal distension was noted in 28.6%,in the early group and 43.8% in late feeding group and vomiting was reported in 50.0%, and 62.5%, respectively. In the first group, 57.1% of those who fed early experienced fever, while in the second group, 75.0% of those who fed late did so. Late feeding is associated with a statistically significant rise in both the Day of NGT removal and the Length of stay. When patients were admitted for early feeding, they stayed in the hospital for an average of 5.71 days. There was no statistically significant difference according serum albumin between the early feeding (3.79) and late feeding (3.50). There was a significantly higher concentration of potassium in the blood in the early feeding group (3.93) compared to the late feeding group (3.219). Anastomotic leaking, surgical site infection, and intensive care unit admission were not significantly different between early and late feeding.

Conclusion
Early enteral feeding has the upper hand on late enteral feeding as it goes with GIT physiology, we found that early postoperative feeding following gastrointestinal anastomosis surgery significantly reduced the day of NGT removal and the length of hospitalization, which may be attributable to fewer problems and better gut motility and healing.

Keywords:
anastomosis, enteral, nutrition

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Introduction

An anastomosis of the digestive tract is a common operation, whether it be an unexpected medical crisis or a planned procedure. Traumatic rupture, benign (strangulated hernia) or malignant perforation or obstruction, and certain other inflammatory diseases are the most common reasons for doing anastomosis after gut resections in an emergency setting. Some cases of anastomosis are performed voluntarily, most commonly for the treatment of gastrointestinal cancer. Following gut anastomosis, patients are typically kept NIL BY MOUTH until bowel sounds have returned. The patient keeps the nasogastric tube in place during this time to let the stomach and intestines relax without being compressed [1]. As a precaution against problems, enteral food has traditionally been withheld after an anastomosis. The reasoning for this is to shield the anastomotic site and prevent postoperative sickness. However, the anastomotic site is permeable to secretions such as about 5–5.5 litres of saliva, gastric juice, bile, pancreatic, and intestinal. There's no reason to delay oral feeding out of concern for leakage if this goes through without a hitch. Physiological research shows that the small intestine returns to normal motility within 4 to 8 h following intestinal surgery, while the stomach and colon are more susceptible to postoperative dysmotility. Physiological studies showing the existence of peristalsis and food absorption add more weight to the idea that early feeding is well tolerated, leading to quick wound healing and a shorter hospital stay [2]. After a bowel anastomosis, the patient is usually instructed to abstain from eating and drinking until he or she passes flatus or faeces. However, many reviews of the literature have shown that early feeding after gastrointestinal anastomosis is safe, physiological, prevents morphologic and functional trauma-related alterations of the gut, and helps to modulate immune and inflammatory responses. It is also cheaper than total parenteral nutrition [3]. Preventing postoperative problems such anastomotic dehiscence and wound infection, pneumonia, and intra-abdominal abscesses with early feeding has been demonstrated to shorten the average length of hospital stay. As a result, early positive nitrogen balance is promoted and weight loss is mitigated. Patients benefit from early enteral nourishment because it decreases their risk of complications after surgery [3]. After the first day after surgery, the gut mucosal epithelium is shown to have sealed up completely. Maintaining a fast for 5 days before surgery is not necessary to reduce the risk of problems and should not be done frequently [4]. There are many advantages to starting early on enteral nutrition as opposed to total parenteral nutrition (TPN), including the maintenance of gut immunity and motility, the avoidance of TPN catheter-associated infections, and the simplicity of the access route. Malnutrition affects 30–50% of hospitalised patients due to poor food quality. Poor nutrition slows recovery from surgery, increases the risk of infection, and worsens postoperative complications. Though most healthy people can go without food for up to 7 days (provided they get enough glucose and fluids), those who have suffered serious trauma or are undergoing the physiological stress of surgery, sepsis, or cancer-related cachexia need nutritional intervention much sooner [5], The current study aims to assess the feasibility, safety, efficacy, ease of Recovery, the incidence of Complications, the necessity for re-entry to the Operating Room or other interventions, and length of hospital stay between early and late Enteral Nutrition after Gastrointestinal Anastomosis operations.

Patients and methods

Type of study: It's a prospective randomized study to assess and compare the efficacy and safety of Early Versus Late Enteral Nutrition after Gastrointestinal Anastomosis Operations.

Place of the study: Beni-suef university hospital.

Period of the study: Four months starting from October 2021

Patients: Thirty patients were operated upon by different abdominal surgical procedures which include small or large intestine anastomosis on emergency or elective issues

Type and sampling techniques to choose a representative sample: The sample size was determined using G Power for sample size calculation. Base on confidence level of 95%, power 80% and effect size of difference 0.50 (calculated based on findings from a similar study [6]) a sample size of 30 patients; should be enrolled in the study. Sample size calculation: n=[DEFF*Np(1-p)]/ [(d2/Z21-α/2*(N-1)+p*(1-p)]. The patients were subjected to randomized classification to group (A) or (B) where early or late enteral feeding were adapted.

(1) In group (A), early postoperative enteral feeding started after 24 h of surgery or just after removal of the nasogasteric tube. Clearwater about 50 ml/hour was increased gradually according to patients tolerance to 100 ml/hour allowed. In well-tolerated patients clear juice followed by semisolid diet were taken. Patients who are not tolerating early feeding were stopped from taking any oral fluids for 12 h then refeeding started again more slowly.
(2) In group (B), the enteral feeding started in the traditional method regaining bowel sounds, absence of distention, passage of flatus or stool.
(3) In both groups, the outcome of early versus late enteral feeding were assessed

(a) clinically: time of presence of audible intestinal sounds, passage of flatus or stool, presence of nausea,vomiting, abdominal pain, discomfort or distention, the necessity of nasogastric tube reinsertion, surgical wound infection, leaking from anastomosis, burst abdomen, intraabdominal abcess and hospital stay.
(b) Laboratory: cbc, s. albumin, Na, K or others.
(c) Radiological: pelviabdominal US, X-ray abdomen erect or supine or others. All the above-mentioned parameters were compared in both groups.

Inclusion criteria

(1) Patients undergoing GIT Anastmosis Operations
(2) Age: 18–60 years
(3) Sex: both males and females

Exclusion criteria: Patients more than 60 years, less than 18 years, with co-morbidities (Renal –Hepatic-diabetic- hypertensive-Cardiac), with Autoimmune diseases, with revisional Anastomosis surgery. Patients presenting with Septicemia, with mesenteric vascular occlusion. Patients with adhesive intestinal obstruction, with gross contamination of peritoneal cavity before surgery, presence of pre-anastomotic diversion as gastrostomy, enterostomy or colostomy, Neo adjuvant radiotherapy, Neo adjuvant chemotherapy or antituberculous drugs –Vitally unstable patients, polytraumatized patients associated with spinal fracture all were excluded from the current study.

Methods

Preoperative Assessment and Documentation:

(1) History/examination:
  (a) Detailed history taking as (age, sex, smoking or not, . . .)
  (b) Thorough clinical examination including general and local examination
  (c) Preoperative body weight and body mass index (BMI) increased BMI is a predictor of increased postoperative complications, including anastomotic leak [7].
  (d) Laboratory assessment :
    (1) Routine preoperative labs:
    complete blood count (CBC) and cross-matching – alanine transaminase (ALT) – serum electrolytes Na,K –INR – serum creatinine –arterial blood gases (ABG) – random blood sugar (RBS)
    (2) labs to diagnose chronic diseases
    2 h postprandial, HBA1C in DM, serum albumin, ALT, AST, Billirubin Total and Direct and Alkaline phosphatase in liver diseases.
    (3) tumor markers (if needed) to diagnose any cancer specially if gastrointestinal tumor e.g. {carcinoembryonic antigen (CEA), cancer antigen (CA) 19-9 and Alpha-Fetoprotein (AFP)}

(4) Preprocedural Preparation:
  (a) Preoperative fluid resuscitation to optimize hydration status is imperative because patients who present in emergency settings are frequently dehydrated in the form of intravenous crystalloids e.g. normal saline or ringer lactate or colloids in patients severly dehydrated
  Intra venous fluids were given in elective patients with colonic preparation
  (b) Preoperative antibiotic prophylaxis is a must to prevent infective complications in emergency settings, as well as in elective settings in the form of third-generation cephalosporins (cefotriaxone 2 gm) intra venous 30 min preoperative.
  (c) A nasogastric tube and indwelling urinary catheter should be inserted to decompress the stomach and the urinary bladder, respectively. Decompression of the stomach reduces the risk of aspiration of gastric contents during induction of anesthesia.
  (d) Traditionally, mechanical bowel preparation has been given before elective colorectal procedures in nonobstructed patients to prevent anastomotic complications. Mechanical bowel preparation is oral preparation given before surgery to clear fecal material from the bowel lumen [8].
    (1) Mechanical bowel preparations were initially thought to decrease the bacterial load of the colon and therefore decrease infection. Traditional bowel preps include osmotic, laxative, and combination regimen.
    (2) Combination of ciprofloxacin and metronidazole was givin patients in addition to diet restriction two days before surgery, enemas and rapid bowel preparation by orally ingested electrolyte solution containing sodium sulfate and polyethylene glycol as preparation for elective bowel surgery.good bowel

preparation was assessed by the passage of nearly clear fluid.

(e) Venous thromboembolism prophylaxis the form of (enoxaparin sodium) Heparin analougue 4000anti-Xa IU/0.4 ml pre-filled syringes, Subcutaneous injection once daily initiated 12 h preoperatively is a must to prevent deep vein thrombosis of lower limbs and possibly mesenteric venous thrombosis in high-risk elective patients e.g. old ages, malignancy and other hypercoagulable state.

Incision

For most abdominal surgeries, the midline incision is the most practical option,but varies according suspected etiology.

Bowel resection

(1) Mobilize the resected bowel. Small bowel mobilization is usually easy. However, splitting the lateral peritoneal reflection should mobilize the big bowel, particularly the retroperitoneal segments. Bowel mobilization facilitates excision and tension-free anastomosis.
(2) After bowel mobilization, divide the mesentery. The mesentery division rules are: To prevent intraluminal fluids from spilling into the abdominal cavity, a noncrushing clamp is placed on the bowel end utilized for anastomosis and crushing clamps on the colon to be resected. Gut anastomosis (Fig. 1): polyglactin 910 3-0 round sutures were hand sewn continuously in two layers. end-to-end anastomosis in gastro-enteric, entero-colic, or colico-colic.
(3) Anastomotic Leakage following colorectal surgery is often detected by intraoperative air-leak testing. The colon anastomosis is irrigated with saline while a syringe insufflates 60 cc of air into the rectum. It reduces time, risk, and expense while potentially detecting leaks in 25% of cases.

Intraoperative air-leak testing in small intestine anastomosis involves retrograde or antigrade milking of one edge while the other is closed by assistance [8].

(1) Intraoperative bleeding and blood loss depended on elective or emergency procedure and resected component size. Control bleeding by cauterising or ligating bleeders. High-blood-loss surgeries required blood transfusions.
(2) Intra-abdominal drains: facilitate detection of anastmotic leaking.

Postoperative data and complications: Vitals (pulse, blood pressure, temperature and respiratoy rate), depletes, Urine production, Nasogastric tube quantity, removal time, and reinsertion, Intestinal noises return, Vomiting, stomach distension, Stool time, ICU admission, Re-operation needed.

Laboratory follow-up: (Routine labs as CBC, serum electrolytes (Na and K), serum creatine and other labs to detect sepsis as C-reactive protein (CRP) serum albumin.

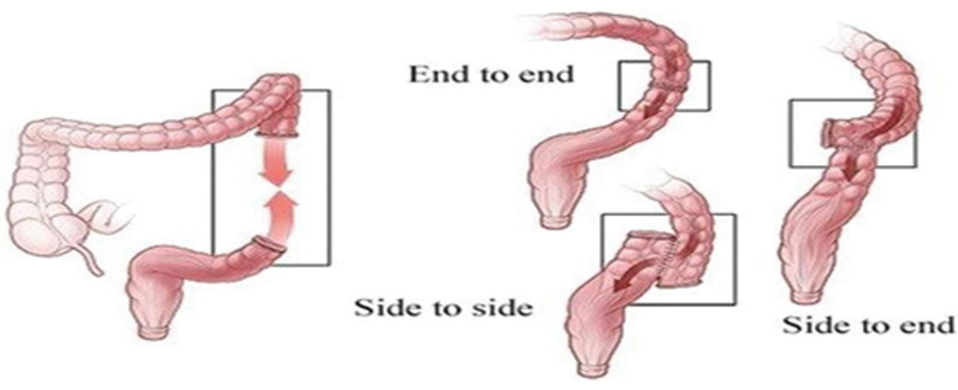
Ethical considerations

Participants gave informed consent. Beni-Suef Faculty of Medicine's local ethical committee on human subjects research accepted the project.

Statistical analysis

All data were entered into Excel and exported to SPSS (Statistical Package for Social Sciences); SPSS Inc., Chicago, IL, USA Program version 20. Numbers and percentages were used for qualitative data, mean, standard deviations, and ranges for parametric

Figure 1



Types of anastomosis technique [8].

quantitative data, and median with interquartile range (IQR) for non-parametric quantitative data.

When the predicted count in any cell was less than 5, Fisher exact test was employed instead of Chi-square test to compare two qualitative groups.

Independent *t*-test and Mann-Whitney test were used to compare two quantitative groups with parametric and non-parametric distributions, respectively.

95% confidence interval and 5% margin of error were selected. The p-value was significant: [$P>0.05$: Nonsignificant (NS), $P<0.05$: Significant (S), $P<0.01$: Highly significant] (HS)].

Results

Table 1 reveals that demographic characteristics like gender, age, smoking, and preoperative body mass index were not statistically different between early and late feeding (BMI).

Table 2 reveals Preoperative labs were not statistically different between early and late eating.

Table 3 illustrates that surgical time did not significantly affect early and late feeding. Early feeding was faster than late feeding.

Table 4 reveals that blood loss or transfusion did not significantly affect. early and late eating

Table 5 reveals that Late feeding had statistically significant increases in NGT removal day and hospitalisation duration. In the early feeding group, NGT was planned to be removed the day following surgery, but 4 patients suffered stomach distension and vomiting, so NGT was re-inserted and symptoms were eased. After that, NGT was to be closed and feeding

Table 1 Comparison between studied groups concerning demographic data

			Chi square test	
	Early feeding No (%)	Late feeding No (%)	χ^2	*P* value
Gender				
Male	7 (50.0%)	8 (50.0%)	0.000	1.000
Female	7 (50.0%)	8 (50.0%)		
Smoking				
No	10 (71.4%)	8 (50.0%)	1.429	0.232
Yes	4 (28.6%)	8 (50.0%)		
Age				
Mean±SD	47.50 (10.01	42.75 (12.73	1.124	0.271
Pre BMI				
Mean±SD	30.29 (5.03)	31.00 (6.00)	–0.350	0.729

Table 2 Comparison between studied groups concerning preoperative labs

	Early feeding	Late feeding			Independent *t* test	
	Mean	SD	Mean	SD	T	*P* value
Hemoglobin	12.00	1.30	12.25	1.13	-0.565	0.577
WBC	12.50	2.93	12.06	4.63	0.304	0.763
Platelets	250.71	61.15	246.88	63.30	0.168	0.868
albumin	3.79	0.43	3.50	0.52	1.638	0.113
RBG	159.43	34.94	164.31	39.61	-0.356	0.725
INR	1.00	0.00	1.00	0.00	NA	NA
Na	138.50	3.92	138.44	2.71	0.051	0.959
K	3.93	0.27	3.51	0.51	3.219	0.003
Bilirubin total	0.58	0.18	0.88	0.29	–3.349	0.002
Bilirubin direct	0.21	0.06	0.32	0.10	–3.313	0.003

Table 3 Comparison between studied groups concerning Operative time

	Early feeding		Late feeding		Independent *t* test	
	Mean	SD	Mean	SD	T	*P* value
Operative time	101.71	19.02	103.13	25.43	–0.170	0.866

begun if no abdominal distension or vomiting occurred. Early-feeding post-op patients had shorter hospital stays than late feeders.

Table 6 reveals that digestive noises and stool passage were not significantly different between early and late meals.

Table 7 reveals that postoperative BMI was not significantly different between early and late eating. Early feeders have higher BMIs than late feeders.

Table 8 reveals that Early eating increased potassium statistically.

Table 9 reveals that Late feeding increased postoperative CRP levels significantly more than early feeding.

Table 10 reveals that postoperative complications were not significantly different between early and late feeding.

The following problems were not significantly different between early and late feeding:

Early feeding (4 patients) had less abdominal distension than late feeding (7 individuals). Poor postoperative patient mobility was a prevalent problem. Distension was determined by patient complaints, clinical examination (inspection-palpation-percussion), and imaging using pelviabdominal ultrasonography and X-ray abdomen erect. Patients were instructed to walk and not remain immobile.

Vomiting: early feeding (7 patients) had less postoperative vomiting than late feeding (10 patients). Postoperative pain was prevalent in all patients, inadequate intravenous fluids in 4 patients (1 in the early feeding group and 3 in the late feeding group), and early nasogastric tube removal in one patient was planned to start feeding early but he complained of persistent vomiting. The patient complaining and vomiting confirmed it.

Vomiting was treated with appropriate analgesics, intravenous hydration, medicines (antiemetics and

Table 4 Comparison between studied groups concerning blood loss and blood transfusion

	Early feeding No (%)	Late feeding No (%)	Chi square test	
			x^2	*P* value
Blood transfusion				
No	10 (71.4%)	13 (81.2%)	0.403	0.526
Yes	4 (28.6%)	3 (18.8%)		
Blood loss				
Mean±SD	288.57±84.66	263.75±78.05	0.835	0.411

Table 5 Comparison between studied groups concerning NGT amount, removal and duration of hospitilization

	Early feeding		Late feeding		Independent *t* test	
	Mean	SD	Mean	SD	T	*P* value
NGT amount	385.00	156.34	507.81	177.87	−1.995	0.056
Day of NGT removal	2.50	0.52	3.25	0.77	−3.067	0.005
Duration of hospitalization	5.71	1.73	7.94	1.24	−4.089	0.001

Table 6 Comparison between studied groups concerning time of presence of intestinal sounds and time of passage flatus or stool

	Early feeding		Late feeding		Independent *t* test	
	Mean	SD	Mean	SD	T	*P* value
Time of Presence of intestinal sounds	2.14	0.86	2.56	0.81	−1.369	0.182
Time of passage flatus or stool	2.57	0.65	3.06	0.77	−1.873	0.071

Table 7 Comparison between studied groups concerning postoperative BMI

	Early feeding No (%)	Late feeding No (%)	Chi-square test	
			x^2	*P* value
Postoperative BMI				
Mean±SD	30.96 (5.35)	30.91 (6.02)	0.024	0.981

Table 8 Association between laboratory markers and style of feeding

	Feeding				
	Early		Late		
	Mean	Standard Deviation	Mean	Standard Deviation	*P* value
Hgb	11.6	0.9	11.6	0.7	0.866
Wbc	14.6	1.7	14.3	2.0	0.869
Platlets	240	66	242	73	0.631
Na	139	3	139	3	0.627
K	3.9	0.3	3.4	0.3	0.007
S.creat	1.00	0.17	0.91	0.22	0.234
Albumin	3.9	0.2	3.5	0.3	0.000

Table 9 Comparison between studied groups concerning postoperative CRP

			Chi-square test	
Post CRP (mg/dl)	Early feeding No (%)	Late feeding No (%)	X2	*P* value
<10	11 (78.6%)	8 (50.0%)	2.625	0.004
>10	3 (21.4%)	8 (50.0%)		

Table 10 Comparison between studied groups concerning complications

			Chi-square test	
	Early feeding No (%)	Late feeding No (%)	χ^2	*P* value
Abdominal distension				
No	10 (71.4%)	9 (56.2%)	0.741	0.389
Yes	4 (28.6%)	7 (43.8%)		
Vomiting				
No	7 (50.0%)	6 (37.5%)	0.475	0.491
Yes	7 (50.0%)	10 (62.5%)		
Fever				
No	6 (42.9%)	4 (25.0%)	1.071	0.301
Yes	8 (57.1%)	12 (75.0%)		

proton pump inhibitors), and reinsertion of the nasogastric tube in a patient who became a late feeder.

Both groups had postoperative fever. Twenty patients had postoperative fever (8 in the early feeding group and 12 in the late feeding group), possibly due to respiratory tract infection. Six patients (3 early feeding and 3 late feeding) had urinary tract infections 3 patients (1 early and 2 late feeding) had surgical site infections One patient in the late feeding group leaked.

Patients complained of fever, temperature measurement, productive cough, dysuria, frequent urine, pus, and other wound discharges. Chest X-ray, CT chest, pelviabdominal ultrasound, CBC, CRP sputum, and urine cultures. It was treated with cold fomentation, intravenous antipyretics (paracetamol 1000 mg every 8 h), empirical IV antibiotics adjusted by cultures, chest physiotherapy, expectorants, spirometry, and recurrent wound dressing.

Table 11 reveals that Anastomotic leaking, surgical site infection, and ICU admission were not statistically different between early and late feeding.

Only one patient had anastomotic leakage: a 48-year-old male with a history of rectal mass who underwent low anterior resection and loop ileostomy. After the closure of the ileostomy, it was planned to start early feeding, but the patient complained of repeated vomiting, fever, and abdominal distension after NGT removal. The NGT was reinserted, but the same symptoms continued on the second day. The patient improved and started late feeding after conservative treatment with oral and IV fluids and pelviabdominal ultrasonography and labs.

Table 11 Comparison between studied groups concerning anastomotic leakage, surgical site infection and need for ICU

	Early feeding No (%)	Late feeding No (%)	Chi-square test	
			$x2$	*P* value
Anastomotic leakage				
No	14 (100.0%)	15 (93.8%)	0.905	0.341
Yes	0 (0.0%)	1 (6.2%)		
surgical site infection				
No	11 (78.6%)	8 (50.0%)	2.625	0.105
Yes	3 (21.4%)	8 (50.0%)		
Need for ICU				
No	9 (64.3%)	9 (56.2%)	0.201	0.654
Yes	5 (35.7%)	7 (43.8%)		

11 patients had surgical site infections (3 patients in the early feeding group and 8 patients in the late feeding group) 10 patients had superficial surgical site infections and one had an organ or space infection. Fever, warmth, redness, and wound discharge were symptoms, as were leukocytosis in CBC, positive CRP, and wound culture and sensitivity. Repeated dressing, drainage of pus and other discharges, antipyretics, and antibiotics adjusted after cultures were performed.

Five early-feeders and seven late-feeders were admitted to ICU).

Discussion

One of the most common operations done in both urgent and elective situations is a gut anastomosis [1]. After bowel anastomosis, patients must fast until they pass flatus or faeces. However, multiple literature studies suggest that early feeding after the gastrointestinal anastomosis is safe, physiological, reduces gut morphologic and functional stress, modulates immunological and inflammatory responses, and is cheaper than whole parenteral nutrition [9].

This study compared early versus late enteral nutrition after gastrointestinal anastmosis surgery for the hospital stay, recovery, and complications. Thirty emergency or elective abdominal surgery patients had small or large intestine anastomosis. This study was intended to compare early and late enteral feeding following GIT anastomosis.

Both groups had similar postoperative BMIs in this study. Hortencio *et al.* (2018) found no correlation between mineral problems and BMI-identified malnutrition [10]. BMI reveals nutritional status but not recent weight loss, which is linked to mineral problems. Weight variations in hospitalised patients largely reflected fluid balance related to hemodynamic and inflammatory issues, not energy balance.

Early and late feeding did not significantly affect blood loss or transfusion in this trial.

28.6% of early feeders and 18.8% of late feeders received blood transfusions due to blood loss of 288.57±84.66 and 263.75±78.05, respectively. Marwah *et al.* (2008) found that 68% of early feeders and 60% of late feeders had blood loss <250 ml (mean 242±89.52 and 284±143.41, respectively). Both groups had statistically insignificant blood loss [11].

In this investigation, NGT removal day increased statistically. Early feeding had 2.50 NGT removal days and late feeding 3.25. Negi *et al.* (2019) found that the early feeding group received their first free drink at 38.14±38.50 h post-op, while the late feeding group received theirs after 50.09±51.80 h [5].

In this investigation, digestive sounds and stool passing were not statistically different between early and late feeding. Early feeding returned bowel sounds after 2.57 days and late feeding after 3.06 days. Ikrar Ali & Bhuvan (2020) found no significant variation in flatus transit time across groups [12]. Negi *et al.* (2019) also showed that the early feeding group's bowel sound returned at 30.57±31.19 h postsurgery, while the late feeding group's returned after 46.90 ±48.65 h, a significant difference [5].

Early feeding stimulates gut motility and postoperative patients' gastro-colic reflex stimulates colonic motility [13]

In this study, statistically significant increase in early feeding hospitalization lasted 5.71 days and late feeding 7.94 days. Late feeding also increased hospital stay [12]. The mean postoperative hospital stay was 5.8 3.09 days in early feeding and 10.56 7.01 days in late feeding [11].

Negi *et al.* (2019) found that early feeding reduced hospital stays. The early feeding group spent 52.58 ±54.71 h in the hospital, while the late feeding group spent 71.00±73.99 [5]. Early removal of the nasogastric tube and early feeding resulted to a shorter hospital stay in the study group compared to the control group, which may have had more issues and a longer stay (upper respiratory tract infection, pneumonia). Mokhtari *et al.* (2019) reported that EEN reduced surgical site infections and hospital stays [14].

Toxin absorption and foreign antigen immune response diminish with gut immunity. Bacterial translocation promotes wound infection and hospital stay [15].

They In this study, 35.7% of early feeders and 43.8% of late feeders needed ICU care. Faris *et al.* (2021) found that the mean ICU stay in enteral feeding was 4.65 ±2.29 days and in parenteral nutrition was 5.68±2.74 days, with no significant difference between the two groups [16]. (Nematihonar *et al.*, 2019) found comparable outcomes, including improved gut motility and healing with fewer infections and leakages [17].

Postoperative CBC was not statistically significant in this research. Nematihonar *et al.* (2019) discovered lower haemoglobin levels in late feeders than early feeders [17]. Due to poor absorption, late feeding and parenteral nutrition might produce iron-deficiency anaemia.

Early feeding did not raise postoperative albumin (3.9) compared to late feeding (3.50). Marwah *et al.* (2008) also found that postoperative blood protein levels of early feeders were considerably greater than those of late feeders despite no change in preoperative levels [11]. Early oral feeding improved nutritional status in early feeders.

In this study, early feeding increased potassium by 3.93 and late feeding by 3.40. According to Zhu *et al.* (2018), dietary restrictions, oral cathartics, cathartic enemas, and colon-cleansing agents are used to prepare the gastrointestinal tract for abdominal surgery and anaesthesia. However, perioperative hypokalemia is common, which may affect postoperative gastrointestinal function [18].

Hortencio et al. (2018) noted that hypokalemia occurred within 7 days of exclusive parentral feeding [10]. Mineral imbalances occur 24–120 h after meals. Parental nourishment causes large insulin production, which increases glucose uptake and cell requirement for phosphate, potassium, and magnesium, lowering plasmatic blood concentrations.

In this trial, stomach distension, vomiting, and fever were not significantly different between early and late feeding. Early feeding had 28.6% abdominal distension and late feeding 43.8%. 50.0% early feeding and 62.5% late feeding vomited. Early feeding fever was 57.1% and late feeding 75.0%. Ikrar Ali and Bhuvan (2020) found no significant difference in stomach distension and vomiting between early and late feeding [12]. Both groups had little stomach distension but 10% of early feeders vomited. Marwah *et al.* (2008) also found no significant difference in distention rates across groups [11]. They also found no statistical difference in nausea and vomiting between groups.

According to Negi *et al.* (2019), the early-feeding group's main issues were vomiting (35.24%) and abdominal distension (28.68%), while the late-feeding group's main complications were pharyngitis (55.46%) and cough followed by vomiting (27.73%) [5].

Postsurgical GI tract motility, disordered electrical activity, and lack of coordinated propulsions may cause vomiting and distension. In the late feeding group, the migrating motor complex (MMC), which drives intraluminal contents during fasting, is shortened and may cause small bowel retrograde contractions. If patients are not fed enterally after surgery, MMC activity is the only stimulation to bowel contractions [13].

Early enteral feeding may reduce postoperative ileus. Enteral eating stimulates coordinated propulsive bowel motility and raises GI hormones that increase it [19].

Food intake increases colonic motility in postoperative patients and healthy controls via the gastro-colic reflex [20].

In this study, early eating reduced infection (fever) 57.1% and postoperative CRP 21.4%. Faris *et al.* (2021) found that enteral 10/40 (25%) cases had less postoperative infections than parenteral 16/40 (40%) cases [16]. Early feeding reduces famine, improving nutrition, metabolism, and perioperative stress response. Starving the gut causes mucosal atrophy, transluminal endotoxemia, and bacteremia [14].

Early and late feeding did not significantly affect anastomotic leakage or surgical site infection in this investigation. Anastomotic leaking 0.0% early, 6.2% late, surgical site infection 21.4% early and 50.0% late feeding. Ikrar Ali & Bhuvan (2020) found no anastmotic leakage and no significant difference between groups [12]. ***Marwah et al. (2008) found Four (16%) early-feeders and seven (28%) late-feeders developed wound discharge. Three (12%) late feeders and two (8%) early feeders developed anastomotic leak postoperatively*** [11].

Nematihonar *et al.* (2019) found that most patients tolerated early oral feeding without substantial problems [16]. Intriguingly, the EOF group defecated sooner than the typical group.

Early feeding group requires shorter hospital stay than late feeding group due to better hemodynamic state and biochemical stability [17].

Conclusion

This study was conducted to compare feasibility, safety and efficacy of early versus late Enteral Nutrition after gastrointestinal anastmosis surgery concerning: duration of hospital stay, ease of Recovery and incidence of Complications. Thirty patients were operated upon by different abdominal surgical procedures which include small or large intestine anastomosis on emergency or elective issues. Postoperative: In the early feeding group: early postoperative enteral feeding started after 24 h of surgery or just after the removal of the nasogasteric tube. In the late feeding group, the enteral feeding started in the traditional method regaining bowel sounds, absence of distention, passage of flatus or stool.

It was noticed that early feeding has the upper hand on late enteral feeding as it goes with GIT physiology, we found that early postoperative feeding following gastrointestinal anastomosis surgery significantly reduced the day of NGT removal and the length of hospitalization, which may be attributable to fewer problems and better gut motility and healing. significant decrease of potassium level in late feeding group which may lead to several complications as paralytic ileus

So early enteral nutrition is preferred and more physiological and associated with less complications than late enteral feeding.

Limitations

Despite the high prevalence of obesity, diabetes, and hypertension in our nation, our study found no associations. Early enteral nutrition after abdominal surgery should be studied if diabetes or hypertension are present.

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Conflicts of interest

No conflict of interest.

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