



A Study On Early Vs Delayed Enteral Feeding In Patients Undergoing Gastrointestinal Surgeries At Govt. Vellore Medical College And Hospital

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Abstract

Introduction: Nutritional support plays important role in wound healing and postoperative recovery. A poor nutritional status is strongly associated with delayed wound healing and longer hospital stays after surgery. After emergency gastrointestinal (GI) surgery, nutritional status is impaired and basal energy expenditure is raised, and thus, nutritional support is of considerable importance. Early enteral feeding is one of the fundamental options for preventing postoperative complications and duration of hospital stay in gastrointestinal surgeries. Paralytic ileus, wound infection, the anastomotic leak is a common complication in major gastrointestinal surgeries.

Aim Of The Study: to compare the outcome of early feeding vs routine delayed oral feeding after gastrointestinal surgeries.

Methods: The study included 60 cases those who all undergone gastrointestinal surgeries in government medical college Vellore in the year – May 2018 to July 2019, then randomized to 2 groups, GROUP A – cases who are all undergone early enteral feeding (within 48hrs), GROUP B – controls who are all undergone routine delayed enteral feedings (after 48-72hrs). a postoperative complication is monitored in all patients.

Results: The mean preoperative hemoglobin among the cases in the study group was 12.g%. On a postoperative day 1, it was 12.6g%, but levels increased to 13.1g% by postoperative day 7. But in the control group, the mean preoperative hemoglobin was 12.6g%, on a postoperative day 1 was 12.2g% and by postoperative day 7 was 12g%. This is statistically not significant as the p-value is 0.022 on postoperative day 7. The preoperative Sr. albumin levels among the patients started on early feeding were 3.492g/dl. On postoperative day 1 the same was 3.628g/dl and by postoperative day 7, it was 3.992g/dl. among the control cases the mean preoperative Sr. albumin levels was 3.308g/dl. On postoperative day 1 it was 3.156g/dl and by postoperative day 7, it was 2.984g/dl. This is statistically significant as the p-value is <0.001. This signifies the advantage of starting early enteral feeding to maintain the nutritional status of the post-operative patient. The mean number of days of paralytic ileus among cases started on early feeding in the study group was 2.2 days while it was 4.04 days among the cases started on the late feeding in the control group. Since the p-value is <0.001 the difference is statistically significant. Wound infection as 3 (12%) among 25 cases developed an infection. Whereas in the control group were late feeding 5 (20%) of the patients developed an infection of the surgical site. This difference is statistically not significant as the p-value is 0.44.

Conclusion: Nutritional status of the patient clinically and biochemically is better in early feeding. Duration of paralytic ileus is lesser in early feeding. The rate of surgical site infections risk is very less in early feeding. Anastomotic leak rate relatively less among early feeding patients. Duration of hospital stay is lesser in early

feeding. This study clearly shows the advantages of starting enteral feeding in patients undergoing gastrointestinal surgeries over delayed enteral feeding.

Keywords: Enteral Feeding, Post Operative Complications, Healing Process

Introduction

Nutritional support plays important role in wound healing and postoperative recovery. A poor nutritional status is strongly associated with delayed wound healing and longer hospital stays after surgery.[1] After emergency gastrointestinal (GI) surgery, nutritional status is impaired and basal energy expenditure is raised, and thus, nutritional support is of considerable importance. Several reports have emphasized that early enteral feeding should be started as soon as possible after resuscitation because the immunomodulatory effect of enteral feeding could assist recovery. The gut secretes and reabsorbs about 7 liters of fluid per day irrespective of oral intake, so giving rest to the gut and protecting the anastomotic site is based on a false notion. [2]Gut recovers from dysmotility within 24-48hrs in case of stomach and colon while 4-6 hrs in case of the small bowel. So early enteral feeding prevents translocation of bacteria or viruses by maintaining the integrity of gut mucosa which may become atrophied if the gut remains in rest for 5 days. Many patients remain malnourished before the operation, they are predisposed to more postoperative complications. Starvation reduces collagen content in scar tissue and diminishes the quality of healing whereas feeding reverses mucosal atrophy induced by starvation and increases anastomotic collagen deposition and strength.[3] Based on the above ideas, this study was to evaluate the efficacy of early enteral feeding in patients undergoing bowel anastomosis. Patients who undergo emergency GI surgery have an edematous or ischemic bowel and are at high risk of postoperative complications, such as ileus, obstruction. For these reasons, the majority of surgeons are wary of early feeding after emergency GI surgery.[4] Relatively few reports have been issued on the safety of early feeding after emergency GI surgery. Thus, this study is undertaken to assess

Observations And Results

the feasibility of early feeding in patients after emergency GI surgery.[5]

Methods

The study included 60 cases those who all undergone gastrointestinal surgeries in government medical college Vellore in the year – May 2018 to July 2019, then randomized to 2 groups, GROUP A – cases who are all undergone early enteral feeding (within 48hrs), GROUP B – controls who are all undergone routine delayed enteral feedings (after 48-72hrs). a postoperative complication is monitored in all patients. inclusion criteria: All Patients undergoing emergency gastrointestinal surgeries in acute abdomen within 24 hours.Exclusion Criteria: Patients with severe shock. Patients managed in ICU for more than 2 days postoperatively. Patients requiring bowel resection and anastomosis. All patients in the general surgical ward undergoing emergency gastrointestinal surgeries in acute abdomen within 24 hours under criteria will be subjected to 2 groups. Group 1 getting early enteral feeding(E group) by oral or nasogastric 24 to 48 hrs after surgery(POD - 2) and group 2 getting late enteral feeding(L group)(more than 48 hrs). After that patient is followed up closely for various complications namely wound infections, pulmonary complications, and post-op ileus along with the duration of hospital stay. Tender coconut water/fruit juices(carbohydrate drinks)+protein powder solution in 2:1 ratio. Patients were started on 500mL of the above-mentioned feed within the first 48 hours and the feeds increased by 500mL incrementally on each consecutive post-operative day.

Statistical Analysis: All the data were subjected to statistical analysis using Statistical Package for Social Sciences (SPSS), version 15. Independent t-test for statistical analysis. P-value < 0.05 was considered as statistically significant and P < 0.001 as highly significant.

Table :1 Case Distribution

DIAGNOSIS	CASES	CONTROL
SIGMOID VOLVULUS	2	2
EARLY DUODENAL PERFORATION	12	12
SUB ACUTE INTESTINAL OBSTRUCTION	12	10
LARGE BOWEL GROWTH	4	6
TOTAL	30	30

Table :1 Among the cases admitted and underwent emergency laparotomy, the most common case operated was early duodenal perforation.

Table :2 Wound Infections

WOUND INFECTION	CASE	CONTROL
YES	3	9
NO	27	21
Total	30	30

Table:2 In case group 3 patients developed wound infection with discharge (2 cases on POD 3 and one case on POD 5) of which 2 cases developed wound gaping and needed secondary suturing control group 9 patients developed wound infection with discharge (3 cases on POD 2 and 3 cases on POD 3) Another 3 cases developed wound gaping and needed secondary suturing. The rates of wound infections were significantly lower in the case group when compared to the control group (p=0.0213). The incidence of postoperative ileus was significantly lower in the case group when compared to the control group (p=0.049)

Table :3 Pulmonary Complications

PULMONARY COMPLICATION	CASE	CONTROL
PNEUMONIA	0	4
ATELECTASIS	2	2
PULMONARY EDEMA	1	2
PLEURAL EFFUSION	0	2
TOTAL	3	10

Table :3 The pulmonary complications were **significantly lower** in the case group when compared to the control group (P= 0.028).

Table:4 Length Of Hospital Stay (Los)

LOS	CASE	CONTROL
<10	24	15

11 - 25	6	13
26 - 40	0	0
>40	0	2
Total	30	30

Table:4 The length of hospital stay is significantly lower in the case group as a result of a significant reduction in the rate of complications like pulmonary complications wound infections and postoperative ileus. (p=0.014)

Discussion

For a long time, the functional status of the gastrointestinal tract was assessed in the surgical wards by the onset of bowel movements. The traditional teaching was “don’t flog the tired horse”; comparing the adynamic bowel to an overworked stressed horse. [7]As long as the paralytic ileus persisted and the patient had not passed flatus, it was considered ideal to keep him nil by mouth. But this concept, like several others in the management of patients with acute pancreatitis and those in the postoperative period, is more empirical than evidence-based. [8] The traditional method of initiation of enteral nutrition was to begin when the bowel movements have started or the patient had passed flatus. Patients were maintained on dextrose-containing IV fluids and kept NPO for up to 7 days until evidence of bowel function returned. But, collective data suggest that the presence of bowel sounds and the passage of flatus or stool are not absolute prerequisites for initiation of enteral nutrition. In fact in this study, the mean return of bowel sounds in the test group undergoing GIT surgeries was 2.32 days (control group - 3.4 days) while among the patients with acute pancreatitis it was 1.8 days (control group - 2.9 days), both achieved statistical significance.[9] This brings us to a causality dilemma - “which situation leads one to the other? Should enteral feeding be delayed until the bowel starts functioning or does early feeding cause the bowel to resume its function normally?.” Clearly, the results in the study show that early enteral feeding. In this study, 60 patients (30 cases and 30 controls) who underwent emergency gastrointestinal surgeries in acute abdomen presenting within 24 hours were studied postoperatively. In the control group oral feeding was started according to the standard practice of Appearance of bowel sounds, Ryles tube aspirate less than 150ml, [0] In the study group early enteral feeding was started within

48hours by oral or via Ryles tube. In our study, as we have seen the most common case operated was Early duodenal perforation. (40 %) in case and control group.[11]In this case, group wound infection was also significantly lesser (p=0.0213) which gives results as same as that of study by Moore et al *Annals of surgery* 1992;216:172-83. Postoperative ileus was significantly lesser (p=0.049) in patients who were given early enteral feeding which was consistent with the study by Knaus et. al,[12]The follow up of the patients revealed that the rates of pulmonary complications like pneumonia, atelectasis, pleural effusions were found to be significantly more in the control group who were kept in starvation for around 6 days with parenteral fluids only and with no immunomodulatory effects of nutrition. (p=0.028).This finding was consistent with the study by Malhotra Aet. al.Compiling the results of the above complications the length of hospital stay among the case group was also significantly low. (p=0.014) [13,14,15]

Conclusion

In this study, we have documented and analyzed cases of patients undergoing emergency gastrointestinal surgeries and studied the outcome of early enteral feeding versus late enteral feeding in such patients. The postoperative follow-up and documentation of various complications in the postoperative period were noted and statistically analyzed comparing the case and control group. In conclusion, we infer that. Early enteral feeding is feasible in patients undergoing emergency gastrointestinal surgeries post-operatively. The rates of complications like pulmonary complications wound infections and ileus in post-operative patients is found to be significantly lower in the Early enteral feeding group. The length of hospital stay in patients started on early enteral feeds was significantly lower.

References

1. Bankhead R, Boullata J, Brantley S, Corkins M, Guenter P, Krenitsky J, et al. Enteral nutrition practice recommendations. *JPEN J Parenter Enteral Nutr* 2009;33:122-67.
2. Barlow R, Price P, Reid TD, Hunt S, Clark GW, Havard TJ, et al Prospective multicentre randomized controlled trial of early enteral nutrition for patients undergoing major upper gastrointestinal surgical resection. *Clin Nutr* 2011;30:560-6.
3. Bisgaard T, Kehlet H. Early oral feeding after elective abdominal surgery--what are the issues? *Nutrition* 2002;18:944-8.
4. Bone RC, Balk RA, Cerra FB, Dellinger RP, Fein AM, Knaus WA, et al. Definitions for sepsis and organ failure and guidelines for the use of innovative therapies in sepsis. The ACCP/SCCM Consensus Conference Committee. American College of Chest Physicians/Society of Critical Care Medicine. *Chest* 1992;101: 1644-55.
5. Braga M, Ljungqvist O, Soeters P, Fearon K, Weimann A, Bozzetti F. ESPEN Guidelines on Parenteral Nutrition: surgery. *Clin Nutr* 2009;28:378-86.
6. Daly JM, Lieberman MD, Goldfine J, Shou J, Weintraub F, Rosato EF, et al. Enteral nutrition with supplemental arginine, RNA, and omega-3 fatty acids in patients after operation: immunologic, metabolic, and clinical outcome. *Surgery* 1992;112:56-67.
7. Dissanayake S, Pham T, Shalhoub S, Warner K, Hennessy L, Moore EE, et al. Effect of immediate enteral feeding on trauma patients with an open abdomen: protection from nosocomial infections. *J Am Coll Surg* 2008;207:690-7.
8. Fearon KC, Luff R. The nutritional management of surgical patients: enhanced recovery after surgery. *Proc Nutr Soc* 2003;62: 807-11.
9. Giner M, Laviano A, Meguid MM, Gleason JR. In 1995 a correlation between malnutrition and poor outcome in critically ill patients still exists. *Nutrition* 1996;12:23-9.
10. Hill GL, Blackett RL, Pickford I, Burkinshaw L, Young GA, Warren JV, et al. Malnutrition in surgical patients. An unrecognized problem. *Lancet* 1977;1:689-92.
11. Kaur N, Gupta MK, Minocha VR. Early enteral feeding by gastroenteric tubes in patients with perforation peritonitis. *World J Surg* 2005;29:1023-7.
12. Knaus WA, Draper EA, Wagner DP, Zimmerman JE. APACHE II: a severity of disease classification system. *Crit Care Med* 1985;13: 818-29
13. Lassen K, Soop M, Nygren J, Cox PB, Hendry PO, Spies C, et al. Consensus review of optimal perioperative care in colorectal surgery: Enhanced Recovery After Surgery (ERAS) Group recommendations. *Arch Surg* 2009;144:961-9
14. Lewis SJ, Egger M, Sylvester PA, Thomas S. Early enteral feeding versus "nil by mouth" after gastrointestinal surgery: systematic review and meta-analysis of controlled trials. *BMJ* 2001;323:773-6.
15. Malhotra A, Mathur AK, Gupta S. Early enteral nutrition after surgical treatment of gut perforations: a prospective randomized study. *J Postgrad Med* 2004;50:102-6.
16. Moore FA, Feliciano DV, Andrassy RJ, McArdle AH, Booth FV, Morgenstein-Wagner TB, et al. Early enteral feeding, compared with parenteral, reduces postoperative septic complications. The results of a meta-analysis. *Ann Surg* 1992;216:172-83.
17. O'Keefe SJ, Buchman AL, Fishbein TM, Jeejeebhoy KN, Jeppesen PB, Shaffer J. Short bowel syndrome and intestinal failure: consensus definitions and overview. *Clin Gastroenterol Hepatol* 2006;4:6-10.
18. Pennington CR, Powell-Tuck J, Shaffer J. Review article: artificial nutritional support for improved patient care. *Aliment Pharmacol Ther* 1995;9:471-81.
19. Pupils G, Selga G, Austrums E, Kaminski A. Jejunal feeding, even when instituted late, improves outcomes in patients with severe pancreatitis and peritonitis. *Nutrition* 2001;17:91-4.
20. Singh G, Ram RP, Khanna SK. Early postoperative enteral feeding in patients with nontraumatic intestinal perforation and peritonitis. *J Am Coll Surg* 1998;187:142-6.

21. Wilmore DW, Long JM, Mason AD Jr, Skreen RW, Pruitt BA Jr. Catecholamines: mediator of

the hypermetabolic response to thermal injury. Ann Surg 1974;180:653-69.