Original Article

J Nepal Health Res Counc 2011 April;9(18):1-5

Early Enteral Feeding in Intestinal Anastomosis

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ABSTRACT

Background: Routine practice after major GI surgery has been to keep patient nil per oral till the return of bowel sound with a belief that this will prevent post operative nausea and vomiting and protect the anastomotic site where as the trend has been changing to encourage enteral feeding as soon as possible as various studies has shown early enteral feeding to be beneficial in terms of nutritional, immunological aspect and for faster recovery of patient.

Methods: Patients undergoing major elective GI surgery in department of Surgery, Kathmandu Medical college Teaching Hospital who were given early enteral feeding (within 24 hrs of operation) were studied prospectively and were compared retrospectively with historical control who underwent similar procedure .

Results: Early enteral feeding in patient undergoing major G.I surgery showed early return of bowel movement, decreased ICU and hospital stay with a significant reduction in postoperative cost.

Conclusions: Early enteral feeding promotes faster recovery while reducing hospital stay and treatment cost in patient undergoing major GI surgery.

Keywords: anastomosis, enteral feeding, intestine

INTRODUCTION

According to conventional practice, after bowel anastomosis, patient are kept nil by mouth till patient passes flatus or faeces. However, there are many literature reviews showing early feeding after gastrointestinal anastomosis is safe[1] and is more physiological as well as prevents morphologic and functional trauma related alterations of the gut[2] and helps to modulate immune and inflammatory responses,[3] besides being less expensive than total parenteral nutrition.[4]

Early feeding has been shown to decreasepost operative infectious complications like anastomotic dehiscence and wound infection, pneumonia, intra- abdominal abscesses[5], hence reduce mean length of hospital stay.[6] It leads to lower weight loss and early positive nitrogen balance.[7] Hence, overall early enteral nutrition leads to reduced post operative morbidity and better patient outcome.

The objective of this study was to study and compare the effects of early enteral feeding with those of conventional management in patients undergoing intestinal anastomosis; the end points being return of bowel activity, incidence of septic complications, length of hospital stay, and post operative morbidity.

METHODS

This is a prospective case control study conducted in Department of General Surgery, Kathmandu Medical

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College Teaching Hospital, fromMarch 2010 to August 2010. Approval from ethical committee was taken and informed consent was taken from patient. All patients who underwent elective upper gastrointestinal surgery involving anastomosis were included. Pregnant patients, patients below twenty years of age and those undergoing emergency surgery were excluded from the study.

Patient who underwent elective upper gastrointestinal surgery were started with early enteral feeding (per oral) within 24 hours of the surgery. It started with clear sips, progressing to liquid diets and then as tolerated. Patient demographics i.e. age, gender, date of admission, diagnosis and procedure performed, type of anaesthesia, use of epidural analgesia, were recorded. A record was made of abdominal discomfort, pain or distension if experienced by the subject during feedingThe outcome of the study was assessed with time of removal of nasogastric tube, time of appearance of bowel sound, time of passage of flatus /stools post operatively, duration of ICU stay, use of drain, complications (including incidence of vomiting, time of NG -reinsertion, wound infection, leakage from anastomosis, intraabdominal abscess), duration of hospital stay, post operative days of intravenous fluids and medications and estimated postoperative cost.

These parameters of the early feeding group were compared with the conventional feeding group. The conventional feeding group was historical controls who had undergone similar form of surgery but had received enteral feeding according to the conventional routine practice i.e.in whom oral feeding was started only after the evidence of return of bowel sound either with the return of bowel sound or passage of flatus.

Data were compared using Student's t test for continuous data and x2 test were used for categorical data or Fisher's exact test, as appropriate. P < 0·050 was considered statistically significant. Data were analyzed with use of SPSS version 16 statistical software (SPSS, Chicago, Illinois, USA).

RESULTS

There were 20 cases in the early feeding group. The parameter of this group was compared with the conventional feeding group which included 20 patients from September 2009 to February 2010 who had undergone similar elective surgery of the upper gastrointestinal tract.

The mean age of patients in early feeding group was 50.9 years (SD±18.44) with a male to female ratio of 6:14 in early feeding group and the mean age of the conventional feeding group was 47.3 years (SD±16.75) with the male to female ratio was 8:12 (Table 1).

Table 1. Demographic profile of patient and different surgical procedure underwent.

Characteristic		Early feeding	conventional	P value
Age(yrs)		50.95± 18.44	47.30± 16.75	0.516
Sex(M:F)		6:14	8:12	0.507
Procedure	Gastric	3	8	
	Hepatobiliary	6	3	
	Pancreatic	5	3	
	Small Bowel	6	6	
Anaesthesia	General anaesthesia	7	18	
	GA + Epidural	9	1	
	Epidural	4	1	

The gastric surgery included subtotal gastrectomy and gastro-jejunostomy, Hepato-biliary surgery included hepatico-jejunostomy with or without partial liver resection i.e. as part of extended cholecystectomy for gall bladder carcinoma or hepatolithiasis. Pancreatic surgery included pancreaticoduodenectomy and Frey's procedure, whereas procedures performed in distal part of GI tract included ileostomy reversals, or those with ileoileal or ileocolic anastomosis.

Table 2. Comparison between postoperative outcomes between two groups.

Outcome	Early feeding	Conventional	P - value
NG out(days)	1.15±0.74	3.65±0.93	<0.001
Vomitting	7/13	16/4	0.004
Bowel Sound(days)	1.80±0.69	2.60±1.04	0.007
Flatus/ Stool(days)	3.00±0.91	3.80±1.32	0.032
ICU stay(days)	1.20±0.69	3.25±1.33	<0.001
Intravenous Medications (days)	2.95±0.94	7.60±2.64	<0.001
Hospital Stay(days)	5.65±1.04	12.25±4.60	<0.001
Post operative Cost(NRs)	8487±1560	19667±2283	<0.001

On comparing the early feeding group with the conventional feeding group, the outcome of the early feeding group was found to be better with earlier removal of the nasogastric tube (1.15±0.74 vs 3.65±0.93;p value <0.001), earlier return of bowel sounds(1.80±0.69 vs 2.60±1.04;p value -0.007), lesser episodes of vomiting (p value : 00.4), lesser number of ICU days(1.20±0.69 vs 3.25±1.33;p value < 0.001),and shorter hospital stay postoperatively(5.65±1.04 vs 12.25±4.60;p value < 0.001) (Table 2).

Two (20%) among 20 patients in early feeding had re-insertion of nasogastric tube due to delayed gastric emptying after pancreaticoduodenectomy (Table 2.1). One patient had anastomotic leak after postpancreaticoduodenectomy in early feeding after development of post operative acute pancreatitis where as two patient in conventional feeding had anastomotic leak, one following D2 gastrectomy and palliative gastrojejunostomyrespectively (Table 3-7).

Table 3. Comparison after Whipple's procedure (Pancreaticoduodenectomy)

	No. of patients	NG out (days)	NG re-insertion	Post op stay (Days)	Anastomotic leak	ICU stay (Days)	Bowel sound (days)	Flatus/ Stool (days)
Early feeding	3	1.67±0.57	1	6.33±1.53	1	2.00±0.00	3.00±1.60	3.33±2.08
Conventional	2	4.50±0.70		13.00±4.24		3.50±0.50	4.50±0.70	4.00±1.41

Table 4. Comparison after Frey's procedure

	Patients	Mean Age(yrs)	NG out (d)	Post op stay (d)	ICU stay (d)	Bowel Sound(d	Flatus/ Stool (d)
Early feeding	2	31.00±5.66	1.00±0.00	5.00±0.00	1.00±0.00	2.00±0.00	3.00±0.00
Conventional	1	25.00±0.00	4.00±0.00	11.00±0.00	2.00±0.00	4.00±0.00	3.00±0.00

Table 5. Hepatobiliary surgery (Hepatico-jejunostomy)

	Patients	Mean Age(yrs)	NG out (d)	Post op stay(d)	ICU stay (d)	Bowel Sound(d)	Flatus/ Stool (d)
Early feeding	6	49.67±14.20	1.17±0.41	5.67±1.21	1.33±0.52	2.00±0.63	3.00±0.63
Conventional	3	40.33±15.50	4.00±0.00	9.67±1.15	2.67±1.16	2.67±1.16	4.00±1.00

Table 6. Gastric surgeries(D2 gastrectomy and gastrojejunostomy)

	Patients	Mean Age(yrs)	NG out (d)	NG-Re insertion	Post op stay (d)	Anastomotic leak	ICU stay (d)	Bowel Sound(d	Flatus/ Stool (d)
Early feeding	3	63.00±20.66	1.67±0.58	1	6.33±0.58		0.67±0.58	2.33±0.58	3.33±1.15
Conventional	5	41.60±15.34	3.80±0.48		16.20±7.26	2	4.00±1.58	3.00±0.70	4.20±1.79

Table 7. Right hemicolectomy

	Patients	Mean Age(yrs)	NG out (d)	Post op stay(d)	ICU stay (d)	Bowel Sound(d	Flatus/ Stool (d)
Early feeding	4	60.75±22.78	0.75±0.50	5.50±0.58	1.25±0.50	1.25±0.50	3.00±0.00
Conventional	4	51.75±19.34	3.00±0.82	9.50±2.89	2.25±1.50	2.00±0.82	4.25±1.70

DISCUSSION

The key finding in our study showed that there was earlier return of bowel sounds, lesser episodes of vomiting, lesser number of ICU days, and shorter hospital stay postoperatively in patient who had early enteral feeding. This study shows that early feeding after upper gastrointestinal surgery is feasible and safe in contrast to traditional practice of keeping the patient "Nil per Oral" until clinical evidence of bowel movement with return of bowel sounds or passage of flatus.

Schilder et al.[8] showed that bowel activity occurred before passage of flatus, and that the patient tolerated 1-2 l of fluid secretions from the stomach and pancreas immediately after surgery. Other studies have shown tolerance to clear liquids on postoperative day 1 after GI surgeries.[9,10] Furthermore, physiologic studies reveal that myoelectric and motor activity in the stomach is not affected after abdominal surgery.[11] Thus, these studies do not support the traditional practice of enteral feeding based on auscultation of normal bowel sound and passage of flatus and bowel movement.

Rather, the progression of postoperative feeding based on physical signs of bowel function may not be based on postoperative GI physiology. It has been demonstrated by many that the surgical patients are often malnourished[12-14] which in severe cases increases the morbidity and mortality. Starvation due to nausea or deliberate starvation for investigations adds to this state, moreover the traditional method of nil per oral after

surgery immensely complicates the state. It has been shown by studies that within 24h of starvation, changes in the body's metabolism are evident including increased insulin resistance and reduced muscle function.[15,16] Studies have shown that early enteral feeding improves wound healing and reduce sepsis.[17-21]

Gianotti et al.[22] concluded that early postoperative enteral feeding is a valid alternative to parenteral feeding in patients undergoing major surgery as immunonutrition enhances the host response, induces a switch from acute phase to constitutive proteins and hence improves outcome.

The fact that patients undergoing major G.I. surgery tolerate early enteral feeding (<24 hours) has been demonstrated by our study also. Our study shows that the patients are benefitted with shorter period of post operative stay, lesser duration of ICU stay, early return of the bowel sound and early passage of flatus and stool, decreased usage of intravenous medications.

Similar, results has been demonstrated by many other studies. Suehiro et al.[23] showed that early oral feeding after gastrectomy is safe and the incidence of complications including anastomosis leak and wound infection occurred equally in both groups. Seenu and Goel[24] showed that early oral feeding after elective colorectal surgery is safe and can be tolerated by most patients. Similarly, Stewart et al.[25] demonstrated a high tolerability (86.5%) to early postoperative oral feeding after elective open colon resection. Meta-analysis reviewed by Lewis et al.[26,27] and Shrikhande et al.[28] also confirmed no obvious benefit for keeping patients 'nil by mouth' after gastrointestinal surgery. Though the benefits of early feeding have been demonstrated by many, the preferred feeding site for enteral nutrition remains controversial.

Early feeding is also credited with significant reduction in postoperative costs. This parameter is of great significance in the setting our economic status. A reduced postoperative cost may improve the social implications of the disease and the treatment.

Thus, our study shows that early enteral feeding improves the postoperative outcome of all the patients. The method of treatment is also significantly more economical. However, we did not assess the long term effects of feeding such as wound infection, intra-abdominal abscess. Our study is also limited by the statistical power of our study with only 20 patients in each group. Although the data are clearly insufficient to conclude that early enteral feeding is of proved benefit, we understand the need for an adequately powered clinical trial to assess early enteral feeding in such patient. Temporal relation could have been possible because of advances in surgical techniques, patient management and advances in anaesthesia.

CONCLUSIONS

Despite the documentation of safety of early feeding long time back, the practice is not common. Upon reviewing various literature and by this research we have demonstrated that early feeding after G.I surgery is beneficial than conventional feeding practice. It also showed lesser hospital stay enables to lower the cost of hospital service.

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