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Effect of early enteral feeding versus nill by mouth after gastrointestinal surgery

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Abstract

Background: The purpose of the study was to compare between early and traditional feeding after gastro intestinal surgery during 24 months of study period. 60 patients were selected to compare for early and traditional feeding after gastro intestinal (GIT) surgery. They were followed up under two groups. Traditional feeding group (Group-I, 30 patients) & early feeding (group II. 30 patients). There were no statistically significant variations in age, sex, body weight, average haemoglobin level, antibiotic, suture material used in both groups.

General Objectives: To evaluate the early enteral feeding than nil by mouth following gastrointestinal surgery on the improvement of nutritional status and reduce wound complications.

Specific Objective: To list the numbers of wound complications & list the numbers of anastomosis leakage.

Study design: Prospective comparative study.

Period of study: From July' 2007 to June' 2009.

Place of study: Department of Surgery, Sher-E-Bangla Medical College Hospital.

Sample Size: Sixty post-operative abdominal surgical cases which were undergone small gut and large gut resection and anastomosis.

Methods: Detailed information's were obtained in each cases according to protocol. Complete history was taken either from patient or accompanying attendants and thorough clinical examination was done. Relevant investigations reports were collected. All the information was recorded according to protocol. Collected data was classified, edited, coded and entered into the computer for statistical analysis by using SPSS version-11.

Outcome Variables: 1. to detect wound infections 2. to detect anastomotic leakage of gut 3. to detect the duration of hospital stay.

Results: Age distribution revealed that among the 60 cases of the study population among traditional feeding group 06 patients (20%) were 30-40 years age group, 09 patients (30%) were 41-50 years age group, 15 patients (50%) were 51-60 years age group. In early feeding group 07 patients (23.3%) were 30-40 years age group, 15 patients (50%) were 41-50 years age group and 08 patients (26.7%) were 51-60 years age group. Traditional feeding group male were 18patients (60%) and female were 12 patients (40%). In early feeding group male were 19 patients (63.3%) and female were 11 patients (36.7%). ($p>0.05$) that was not statistically significant. Traditional feeding group large gut were 10 patients (33.3%) and early feeding group were 13 patients (43.3%). ($p>0.05$) that was not statistically significant. Small gut operations in traditional feeding group were 20 patients (66.7%) and early feeding group were 17 patients (56.7%). ($p>0.05$) that was not statistically significant. In traditional feeding group : wound infection were 05 patients (16.7%) and Wound dehiscence were 02 patients (6.7%), Leakage of anastomotic site were 1patient(3.3%) and Respiratory Tract Infection (RTI) were 1 patient (3.3%). In early feeding group; Wound infection were 02 patients (6.7%), wound dehiscence nil, anastmosis leakage nil, respiratory tract infection nil. Total postoperative complications: In traditional feeding group were 09 patients (30%) and in early feeding group were 02 patients (6.7%) $p<0.05$ that was statistically significant. Mean nasogastric tube removal in traditional feeding group were 3.46 days and early feeding group were 2.1 days ($p<0.05$) that was statistically significant. Mean hospital stay in traditional feeding group were 8.26 days and early feeding group were 6.53 days ($p<0.05$) that was statistically significant.

Conclusion: From present study it can be concluded that early oral feeding may become a routine feature of management after gastrointestinal surgery. This study reveals that early oral feeding in the patient who has under gone gastrointestinal surgery is safe.

Keywords: enteral, feeding, nill, gastrointestinal, surgery

Introduction

Every doctor pays attention to the nutritional needs of the patients. Malnutrition or under nutrition has damaging effects on psychological status, activities and appearance of the patient. Malnutrition or nutritional deficiency affects wound healing [1]. Nutritional status is an important determinant of outcome after surgical treatment and the adverse influence of malnutrition on recovery has been recognized for almost a century, malnutrition may be present in as many as 50% of patients admitted to surgical wards & assessment of nutritional needs and inclusion of nutritional requirements in treatment plans is an important

components of surgical care [2]. Provision of effective nutritional support requires appreciation that the metabolic and nutritional needs of postoperative patients differ from those of healthy individuals. The aim of nutritional support is to identify in a timely manner those patients in need of nutritional support & to ensure their requirements are met by the most important route and in a manner that minimizes the risk of complications [2].

After a short fast (12 hrs or less), the majority of the food ingested in the previous meal will have been utilized, with increasing duration of fast (more than 24 hrs), glycogen stores are depleted and de novo glucose production (gluconeogenesis) occurs, primarily in the liver. Much of this glucose production utilizes amino acid precursors derived from catabolism of skeletal muscle protein (up to 75 gm/day) and if infection occur, muscle protein breakdown may reach 250 gm/day, leads to profound muscle wasting. Approximately 400 Kcal (equivalent to 100 gm) of exogenous glucose is sufficient to prevent skeletal muscle protein breakdown during simple fasting.

A period of starvation (nil by mouth) is common practice after gastrointestinal surgery. Conventional treatment after abdominal surgery has typically entailed starvation with administration of intravenous fluids until passage of flatus, principally due to concerns over postoperative temporary period of ileus. This was based on the assumption & belief that oral feeding may not be tolerated in the presence of temporary ileus & specially in case of anastomosis of the gut after enteral feeding gut wall stretched and cause anastomosis leakage [2].

Metabolic response to surgical operation generates increased demand for nitrogen and energy. If the demand are not met, the patient develops protein energy malnutrition which causes risk of chest infection, slow wound healing, wound infection, wound dehiscence or even death [1]. The optimal method of administering additional nutrients is by oral feeding in the form of sips of feeds [1]. Small intestinal motility recovers 6-8 hours after surgical trauma and moderate absorption capacity exists even in the absence of normal peristalsis [1]. Postoperative enteral feeding in patients undergoing gastrointestinal surgery including resection anastomosis is safe and well tolerated even when enteral feeding starts within 12 hrs of surgery. In Hypermetabolic response to trauma enteral feeding maintain gut mucosal mass, maintain gut barrier function and prevent disruption of gut flora. It may contribute to maintaining splanchnic blood flow and the direct provision of nutrients for enterocytes [3]. Intestinal permeability undergoing gastrointestinal surgery increases and increase chance of sepsis and systemic inflammation bacterial translocation may occur and higher proportion to development of sepsis instead of exogenous bacteria [4]. Early postoperative luminal nutrition have a beneficial effect on the function of intestinal barrier in respect of permeability, bacterial translocations and development of septic complications and can prevent bowel atrophy and maintain intestinal absorptive mass and thus reducing post-operative morbidity & mortality [4].

Rationale of the Study

Early enteral feeding improve nutritional status of the patient prevent malnutrition and prevent catabolism of postoperative patients even those patients preoperatively malnourished. Such beneficial effect to reduce postoperative infections which lead to short hospital stay, reduce anastomosis dehiscence, and reduce postoperative surgical fatigue and malnutrition [7]. Enteral or oral feeding is the appropriate route for nutritional support, provided it is functioning normally. Because gastrointestinal function is better maintained postoperatively without the appearance of peristalsis movement. So, enteral or oral feeding can start early following gastrointestinal operation [7].

Study undergone in Britain as meta-analysis comparing any type of enteral feeding within 24hrs after surgery and with traditional nil by mouth & then measure the main postoperative outcome of anastomosis dehiscence, wound infection, pneumonia, length of hospital stay and mortality. Occurrence of anastomosis dehiscence was reported - in case of early feeding group ranged from 2% (2/95) to 7% (2/30) and in control group ranged from 5% (4/81) to 25% (4/16). Wound infection and pneumonia were in case of early feeding group ranged from 3% (1/29) to 30% (29/97), and in control group ranged from 5% (4/81) to 47% (14/30). Mortality reported ranged from 0 to 7% (2/30) in case of early feeding group, 13% (4/30) in case of control group. Length of hospital stay was reported ranged from 6.2 days to 14.0 days in early feeding group & 6.8 days to 19 days in control groups [4]. Considering this point, this observational study was carried to determine whether early enteral feeding better than traditional nil by mouth after gastrointestinal surgery.

Research Question

Is early feeding more beneficial than nil by mouth after gastrointestinal surgery in term of nutritional parameter and does early feeding reduce postoperative wound complications?

Aim and Objective

General objective

The general objective of the study is to evaluate the effect of early enteral feeding and traditional nil by mouth following gastrointestinal surgery on the improvement of nutritional status and wound complications.

Specific Objective

1. To observe the incidences of wound complications & Incidences of anastomosis leakage with regard to enteral feeding.

Literature Review

After abdominal surgery it is generally agreed that there is a certain period when peristalsis of the intestine diminishes/less or halts that may depend on the extent of operation, type of anaesthesia, nature of abdominal operation, post-operative enteral feeding, if feeding starts late there will be less abdominal distension and less complications about operation but this conception is not true, different study reveals that early feeding is safe.

Randomized trials in lower gastrointestinal surgery showed benefits of early enteral feeding in term of reduction in length of hospital stay and post-operative complications. Reductions of complications with early feeding also are reported in recent studies. Earlier bowel movements possibly are the result of gastrocolic reflex. From present study, it could be concluded that early removal of nasogastric tube and early oral feeding in the patients who has under gone GIT surgery are feasible and safe. It can

reduce the post-operative complications and discomfort. It could also decrease the length of post-operative hospital stay. Early oral feeding may become a routine feature of management after gastrointestinal surgery. Early oral feeding improved the nutritional status of patients which helped of healing the wound properly.

Paul Boulos, consultant colorectal surgeon, Mervyn Singer, denior lecturer in intensive care study was done in Britain on randomized trial of immediate post-operative enteral feeding through a nasojejunal tube versus conventional postoperative intravenous fluids until the reintroduction of normal diet and shows immediate postoperative enteral feeding in patients undergoing intestinal resection seems to be safe, prevents an increase in gut mucosal permeability and produces positive nitrogen balance.

Stephen J Lewis, consultant, Paul A Sylvester, Steven Thomas, Studied in Britain systemic review and meta-analysis of randomized controlled trials comparing any type of enteral feeding stated within 24 hours after surgery with nill by mouth management in gastrointestinal surgery-shows early feeding is beneficial to the patients and reduction of anastomotic dehesence and wound infection.

Braga M *et al* [2] Showed that feeding gut early after surgery is safe and well tolerated and it may represent the first choice for nutritional support in GIT surgery patients [5].

Han-Geurts JM *et al* [4] showed that early resumption of oral intake does not diminish the duration of post-operative ileus or lead to a significantly increased rate of naso-gastric reinsertion. Tolerance of oral diet is not influenced by gastrointestinal recovery as there is no reason to withhold oral intake following open colo-rectal or abdominal vascular surgery. Post-operative management should include early resumption of diet [6].

Lewis SJ *et al* [5] showed that comparative study of early enteral feeding versus nil by mouth after gastro intestinal surgeries. He stated that it may be beneficial [7].

Petrelli NJ *et al* [6] showed that early oral feeding is safe and feasible for post colectomy patients with history of colo rectal neoplasms [8].

Repin VN *et al* [7] showed that enteral tube feeding permits to improve stomach and duodenal surgeries and to reduce cost of treatment. He presented there was no disorder after gastrectomy and surgeries for chronic duodenal obstruction [9].

D B A Silk [8] comparative study of early enteral feeding versus nil by mouth after gastro intestinal surgery. He has shown that early feeding is beneficial [10].

Study undergone in Britain as meta-analysis comparing any type of enteral feeding within 24hrs after surgery and with traditional nil by mouth & then measure the main postoperative outcome of anastomosis dehiscence, wound infection, pneumonia, length of hospital stay and mortality. Occurrence of anastomosis dehiscence was reported - in case of early feeding group ranged from 2% (2/95) to 7% (2/30) and in control group ranged from 5% (4/81) to 25% (4/16). Wound infection and pneumonia were in case of early feeding group ranged from 3% (1/29) to 30% (29/97), and in control group ranged from 5% (4/81) to 47% (14/30). Mortality reported ranged from 0 to 7% (2/30) in case of early feeding group, 13% (4/30) in case of control group. Length of hospital stay was reported ranged from 6.2 days to 14.0 days in early feeding group & 6.8 days to 19 days in control groups [4].

Methods and Materials

Detailed information were obtained in each cases according to protocol. Complete history was taken either from patient or accompanying attendant. Thorough clinical examination and relevant investigation was done. Patients were selected of age-15 years to 60 years in both sexes, and need resection and anastomosis of gut which included emergency and routine cases. In case of early feeding group- feeding started after 24 hours of operation. Initial feeding started with 100 ml clean water and then glucose water and it is tolerated, started liquid diet irrespective of appearance of bowel sound or passing of flatus or bowel movement. In case of traditional feeding group-feeding started after passing of flatus or after bowel movement. The patients of both groups were followed up to enumerate the incidences of wound infections, wound dehiscence, incidences of anastomosis leakages, duration of nasogastric tube removal and duration of hospital stay. Collected data compiled on a master data sheet, data was analyzed and drawn a conclusion in respect of the objectives of the study by chi-square test, p value less than 0.05 was taken as significant.

Results

Table 1: Post-operative complications of the study population

	Traditional feeding group	Early feeding group	Total
Wound infection	06(16.7)	02(6.7)	07
Wound dehiscence	02(6.7)	00	02
Leakage of anastomotic site	01(3.3)	00	01

Table 1 shows post-operative complications, In Traditional feeding group wound infection were 06 patients (16.7%) and early feeding group were 02 patients (6.7%) Traditional feeding group- wound dehiscence were 02 patients (6.7%) & Early feeding group were nil. Traditional feeding group, leakage of anastomotic sites was 01 patient (3.3%).and early feeding group were nil.

Table 2: Nasogastric tube removal and hospital stay

	Traditional feeding group Mean	Early feeding group Mean	P values
nasogastric tube removal (days)	3.46	2.10	p<0.01(s)
Hospital stay (days)	8.26	6.53	p<0.001(s)
S: significant			

Mean nasogastric tube removal in traditional feeding group were 3.46 days and early feeding group were 2.10 days p<0.05 that was statistically significant mean hospital stay in traditional feeding group were 8.26 days and early feeding group were 6.53 days p<0.05 that was statistically significant.

Table 3: Post-operative complications of the study population

	Traditional feeding group	Early feeding group		P values
Complications	09 (30%)	02 (6.7)	11	P<0.01 (s)
No complications	21 (70%)	28 (93.3%)	49	
Total	30(100)	30(100)	60	

Table 3 shows association between post-operative complications of the study population. In Traditional feeding group 09 patients (30%) had post-operative

complications and in early feeding group 02 patiets (6.7%) had post-operative complications. p<0.05 that was statistically significant.

Table 4: Anastomotic site of the study population

	Traditional feeding group n=30	Early feeding group n=30	Total	P values
Large gut	10(33.3)	13(43.3)	23	p>0.42(NS)
Small gut	20(66.7)	17(56.7)	37	p>0.59(NS)
n: Number of patients NS: Non-Significant				

Table 4 shows Anastomotic site of the study population. In Traditional feeding group, large gut was anastomotic site for 10 patients (33.3%) and in early feeding group and large gut was anastomotic site for 13 patients (43.3%). In Traditional feeding group, small gut was anastomotic site for 20 patients (66.7%) and in early feeding group and small gut was anastomotic site for 17 patients (56.7%).

Table 5: Age distribution of the study population

Age	Traditional feeding group	Early feeding group	Total
30-40 years	06(20)	07(23.3)	13
41-50 years	09(30)	15(50.0)	24
51-60 years	15(50)	08(26.7)	23
Total	30(100)	30(100)	60

Age distribution of the respondents has shown in the above table 5. From the result it was found that in case of Traditional feeding group, age group 51-60 years was 50% which was maximum but age group 30-40 years was 20% which was minimum. On the other hand age group 41-50 years was 30%. The result also revealed that in case of early feeding group, age group 41-50 years was 50% which was maximum but age group 30-40 years was 23.3% which was minimum. On the other hand age group 51-60 years was 26.7%.

Table 6: Socio-economic status of the study group

	Traditional feeding group	Early feeding group	Total
Low class	23(76.7)	20(66.7)	43
Middle class	07(23.3)	10(33.3)	17
Total	30(100)	30(100)	60

Socio-economic status of the study group has shown in the above table 6. From the result it was found that in case of Traditional feeding group, low class was 76.7% which was maximum but middle class was 23.3% which was minimum. In case of early feeding group, low class was 66.7% which was maximum but middle class was 33.3% which was minimum.

Table 7: Sex distribution of the study group

	Traditional feeding group n=30	Early feeding group n=30	Total
Male	18(60)	19(63.3)	37
Female	12(40)	11(36.7)	23
n: Number of patients			

Sex distribution of the study group has shown in the above table 7. From the result it was found that in case of traditional feeding group, male was 60% which was maximum but female was 40%. On the other hand in case of early feeding group, male was 63.3% which was maximum but female was 36.7%.

Table 8: Weight and Haemoglobin percentage of study population

	Traditional feeding group Mean	Early feeding group Mean
Weight	55.93(Kg)	51.70 (Kg)
Hb%	9.33 (g/dl)	9.38(g/dl)

Weight and Haemoglobin percentage of study population has shown in the above table 8. From the result it was found that in case of Traditional feeding group, Mean of weight was 55.93 Kg but Mean of Hb% was 9.33 (g/dl). On the other hand in case of Early feeding group, Mean of weight was 51.70(Kg) but Mean of Hb% was 9.38(g/dl).

Discussion

Study was carried out in the department of surgery Shere-E Bangla Medical College and Hospital. During the period of July 2007 to June 2009 total of 60 patients were taken as sample that were underwent gastrointestinal surgery. The patients were randomly selected and grouped into group-1, 30 patients received post-operative traditional feeding (control group). And group-2, 30 patients received early post-operative feeding and feeding started after 24 hours of operation irrespective of appearance of bowel sound or pass of flatus or bowel movement (study group) to evaluate the early enteral feeding more beneficial than traditional nil by mouth.

In this series the average age of the patients were 49.60 years (range 30 to 60 years) group-I on the other hand it were 46.73 years (range 36 to 60 years) in group-II paired t test showed no significant difference p>0.05. In this study average body wt of the patient were 55.93 kg (range 35 to 76 kg) in group-I and 51.70 kg (range 44 to 68 kg) in group-II. Thus both groups were matched for body weight in this comparative study.

A study by Zong Zhoo *et al*, naso gastric tubes were removed within 12 to 24 hours after operation in early feeding group. In control group (late feeding group) nasogastric tubes were removed usually within 3 to 5 days after surgery [30]. In our study mean nasogastric tube removal in traditional feeding group were 3.46 days and early feeding group were 2.10 days p<0.05 that was statistically significant.

In a study by Tsunoda and his colleagues showed that the length of hospitalization in early feeding group was significantly shorter than in late feeding group (7 days and 10 days) [31]. But in our study the average post-operative hospital stay were 8.26 days (range 6 days to 17 days) in group- 1 and 6.53 days (range 4 days to 9 days) in group-II. Unpaired t test showed statistically significant difference p value 0.001.

In this study post-operative complications-in traditional feeding group wound infection were 06 patients (16.7%) and early feeding group were 02 patients (6.7%) In traditional feeding group- wound dehiscence was 02 patients (6.7%) and early feeding group were nil. In traditional feeding group-leakage of anastomotic site was 01 patient (3.3%) and early feeding group were nil. In traditional feeding group total comlications 09 patients (30%) and in early feeding group total complication 02 patients (6.7%).p value p<0.05 that was statistically significant.

Conclusion

From this study it can be concluded that early oral feeding may become beneficial after resection and anastomosis of gastrointestinal surgery. This study reveals that early oral feeding in the patient who had under gone gastro intestinal surgery was found safe.

Recommendations

Further prospective randomized trial with large sample size and longer duration with the operative and post-operative assessment of nutritional parameters recommended.

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