

Original Article

Early Enteral Feeding Versus Traditional Feeding After Colostomy Closure in Paediatric Patients: A Comparative Study of Postoperative Outcome

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Abstract:

Traditional practice of postoperative starvation after abdominal surgery recently has been changed. Early enteral feeding has been shown benefits in reduction of postoperative ileus and hospital stay by various clinical trials. In this study postoperative outcome was analyzed after colostomy closure in paediatric patients in relation to early versus traditional enteral feeding. This is a prospective comparative study done in Dhaka Shishu (children) Hospital between January 2009 to December 2013. Total 125 patients were included and divided into two groups. Group-A (n=55) and Group-B (n=70) underwent traditional enteral feeding and early enteral feeding in post-operative period respectively. Unpaired 't' test were used for statistical analysis. Post-operative hospital stay and complications such as vomiting, diarrhoea, wound disruption were assessed. Lower gastro-intestinal bleeding, urinary tract infection (UTI), upper respiratory tract infection (URTI) and unspecified fever >48 hours were used as parameters of study. In group-B, post-operative hospital stay and complications such as vomiting, diarrhoea, wound disruption, lower G.I bleeding, UTI, URTI and unspecified fever >48 hours were significantly lesser than group-A. Parents were satisfied with early enteral feeding in post-operative period. By this study early enteral feeding patients found to be more advantageous than the traditional feeding patients undergoing colostomy closure.

Key words: Paediatric patient, colostomy closure, early enteral feeding, traditional feeding, Post-operative outcome.

Introduction:

The traditional practice of postoperative starvation after abdominal surgery recently has been challenged. Early enteral feeding has been shown by various clinical trails as having benefits in reduction of postoperative ileus and hospital stay¹. From clinical studies it suggests that starting feeding early is advantageous in postoperative patients. Postoperative dysmotility predominantly affects the stomach and colon with the

small bowel recovering normal function 4-8 hours after laparotomy. Feeding within 24 hours after laparotomy is tolerated and feed is absorbed².

Children and infants are always eager to take food early after operation. As there were history of two operations previously in case of anorectal malformation or Hirschsprung's the nutritional status of patients are usually not satisfactory. So early oral feeding improved the nutritional status of patients which helped them to healing the wound properly. Early feeding also had reduced the postoperative complications.

When children were admitted in a hospital parents or their relatives had to stay with them. So extra staying hospital hampers the normal life style of parents. Moreover staying in the hospital increases the hospital acquired infections such as URTI and diarrhoea which were present more in late oral feed patients. Early feeding helps the patients to reduce post operative hospital stay and nosocomial infection.

Materials and Methods:

It is a prospective comparative study conducted in the Dept. of Paediatric Surgery, Dhaka Shishu Hospital

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during the period January 2009 to December 2013. Total 125 patients having colostomy for either Hirschsprung's disease or anorectal malformation were selected in such a way that there age, body weight, sex, colostomy site and operative time for colostomy closure were matched well for this comparative study. Patients were divided into two groups.

Group-A (n=55): Traditional feeding patients in postoperative period and designated as 'control group.'

Group-B (n=70): Early enteral feeding patients and designated as 'study group.'

As parameter postoperative hospital stay and postoperative complications (vomiting, diarrhoea, wound disruption, lower GI bleeding, UTI, URTI and unspecified fever more than 48 hours) were observed.

Protocol of feeding after colostomy closure:

Group-A

- a. Patients were kept nothing by mouth until documentation of bowel function, which means a passage of flatus or faeces. Usually one 3rd postoperative day (POD).
- b. A nasogastric tube was kept in situ until content reduced and turned clear.

Group-B

- a. Enteral diet was started within 16-24 hours usually in the morning of 1st POD. At first clear water was given. Then other liquid diet or breast milk was allowed after 3-4 hours interval. Normal feeding was started on 3rd POD.
- b. A nasogastric tube was removed in the morning of 1st POD.

Unpaired 't' test was used to show that statistically group-A and group-B matched well and that there was no significant difference ($P>0.05$) between them with respect to age, body weight, diseases having colostomy, colostomy site and operation time which could influence the study parameters. The same test was also applied for statistical analysis with respect to postoperative hospital stay parameter which shows significant difference between the two groups to meet the study purpose.

Postoperative complications such as vomiting, diarrhoea, wound disruption, lower GI bleeding, UTI, URTI and unspecified fever (more than 48 hours) were compared in between two groups by percentage.

Results:

Age range (Table-I) of the patients in group-A and group-B our study ranged from 10 months to 96 months (mean 34.54 months) and from 14 months to 144 months (mean 59.43 months) respectively. Unpaired 't' test should no significant difference ($p>0.05$) between two different groups. Thus two groups were age matched and coincide the study purpose.

Body weight distribution (Table-I) of the patients in group-A and group-B ranged from 6.5kg to 19.5kg (mean 8kg) and from 8kg-18kg (mean 10.5kg) respectively. Unpaired 't' test showed no significant difference ($p>0.05$) between the two different groups. Thus two groups were matched in body weight and compatible for the study.

Table-I: Age and weight distribution of two groups

Characteristics	Group-A (n=55)	Group-B (n=70)	P value *
	Range (mean)	Range (mean)	<0.05
Age (months)	11-95 (18)	12-142 (11.58)	0.11 ^{NS}
Weight (kg)	6-19 (8)	8-28 (10.5)	0.10 ^{NS}

* Unpaired 't' test, NS= non significant

Colostomy site distribution (Table-II) of the patients in group-A and group-B had 35 patients (63.63%) with transverse colostomy, 20 patients (36.36%) with sigmoid colostomy and 40 patients (57.14%) with transverse colostomy, 30 patients (42.85%) with sigmoid colostomy respectively. Unpaired 't' test showed no significant difference ($p>0.05$) between group-A and group-B with respect to colostomy site. Thus two groups were matched with respect to colostomy site and meet the usefulness of comparative study.

Table-II: Distribution of colostomy site in two groups

Colostomy site	Group-A	Group-B	P value for unpaired 't' test
Transverse colon	35	40	> 0.05 ^{NS}
Sigmoid colon	20	30	> 0.05 ^{NS}

NS= non significant



Figure-1: A patient of transverse Colostomy ready for closure



Figure-2: A patient of sigmoid colostomy

Operative time for colostomy closure (Table-III) of the patients in group-A and group-B ranged from 40 minutes to 90 minutes (mean 59.0 minutes) and 25 minutes to 90 minutes (mean 51.43 minutes) respectively. Unpaired 't' test showed no significant difference ($p > 0.05$) between two different groups. Thus two groups with respect to operative time matched and accepted for comparative study.

Table-III: Operation time required for colostomy closure in two groups

Operation time (minute)	Group-A (n=55)	Group-B (n=70)	P value for unpaired 't' test
Range	45-90 min	30-90 min	$P > 0.05^{NS}$
Mean	58.08 min	50.42 min	$P > 0.05^{NS}$

NS= non significant

Postoperative hospital stay (Table- IV) of the patients in group-A and group-B ranged from 6 days to 17 days (mean 8.09 days) and from 3 days to 5 days (mean 4.14 days) respectively. Unpaired 't' test showed significant ($p \text{ value} < .002^{**}$) difference in postoperative hospital stay in group-A and group-B patients.

Table- IV: Post-operative hospital stay in two groups

Group	Number of patient	Minimum hospital stay (days)	Maximum hospital stay (days)	Mean \pm S.D	P value unpaired 't' test
Group-A	55	7	17	8.09 ± 3.24	$< .002^{**}$
Group-B	70	4	5	4.14 ± 0.53	$< .002^{**}$

** Highly significant

In table-V showed that 2(8%) patients developed diarrhoea, 1(4%) patient developed lower GI bleeding. 3(12%) patients developed URTI in group-A, whereas group-B, only one (4%) patient developed URTI in postoperative period.

Table-V: Post-operative complications between two groups

Post-operative complications	Group-A (n=55)	Group-B (n=70)
Vomiting	0	0
Diarrhoea	10 (8 %)	0
Wound disruption	0	0
Lower GI bleeding	5 (4%)	0
UTI	0	0
URTI	15 (12%)	5 (4%)
Unspecified fever (>48 hours)	0	0

In group-A post-operative complication were observed in 30 (24%) patients.

In group -B post-operative complication were observed in 5 (4%) patients.

Discussion:

Post-operative starvation recently has been challenged. Randomized trials in adult lower gastrointestinal tract surgery showed benefit of early enteral feeding in terms of reduction in length of hospital stay and post-operative complications³.

In this study, nasogastric tube was given in all patients before operation or during operation. In case of early enteral feeding nasogastric tube omitted on 1st POD in all patients. But in traditional feeding nasogastric tube were omitted from 1st POD to 3rd POD.

A study by Tong Zhou et al, nasogastric tubes were removed within 12 to 24 hours after operation in early feeding group. In control group (late feeding group) nasogastric tubes were removed upon report of passage of flatus by patients usually within 3 to 5 days after surgery⁴.

Elimination of post operative nasogastric tube early decreases post operative fever, pulmonary problems and improves patients comfort by decreasing sore throat and nausea.

Post-operative hospital stay between group-A and group-B patients of our study showed statistically significant difference (P value 0.002) with lesser hospital stay for early enteral feeding patients over traditional feeding patients.

In a study by Akira Tsumoda and his colleagues showed the length of hospitalization in early feeding was significantly shorter than in late feeding group (7 days and 10 days)⁵.

A study by Chandramouli et al. showed that post-operative complications such as fever (3.73% vs 9.68% p <0.05). Pulmonary infection (0.62% vs 4.5%, p <0.05) were mass more in control group than in study group⁶.

In another study, 104 patients underwent colorectal surgery including closure of colostomy. Oral diet was given in 89 patients on 1st or 2nd post-operative day. Sixty five patients (73%) tolerated early feeding but 24 patients did not, 16 patients had nausea or vomiting and 8 patients required readmission for post-operative complications (such as wound dehiscence, anastomotic leakage). Univariate analysis revealed that use of volume expanders contributed to intolerance of early feeding⁷.

In late feeding negative impact of metabolic response to surgery may increase the post-operative complications⁸. More staying in hospital post-operatively also increase the nosocomial infection (URTI, diarrhoea etc)⁹.

On the contrary early enteral feeding can help to improve energy and protein intake and thus improve general health¹⁰. Decrease the negative impact of the metabolic response to injury, stimulate motor, resorption, synthetic and barrier functions of the small intestine, improved the return of gastrointestinal function and reduced the duration of post-operative ileus and reduced risk of serious complications¹¹. Positive psychological impact of feeding after surgery may have an important role in recovery process¹².

Conclusion:

Our study showed that early removing nasogastric tube and early oral feeding in the patient undergoing colostomy closure is feasible, safe and associated with reduced post-operative complications and discomfort. This study also showed significant decreased length of post-operative hospital stay in early oral feeding group.

Thus early oral feeding may become in routine feature of management after colostomy closure in paediatric patients.

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