

Early Versus Delayed Feeding in Pediatric Patients Following Stoma Reversal in a Resource Limited Environment

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Abstract

Introduction: Institution of early enteral nutrition is essential after stoma reversal. There is no consensus on the time feeding should be started after closure of a stoma in children. It is established that after stoma reversal early achievement of full feed and early discharge affects the overall cost in resource limited countries.

Materials and Methods: This Randomized control trial was conducted in the Paediatric Surgery Department of Services Hospital, Lahore. Over a period of 1 year, from April 2016 to March 2017, a total of 100 cases were included. In group A, early feeding (after 36 to 48hours) and in group B delayed (after 5days) feeding was given to the patients. Time for restoration of full feed and length of hospital stay and complications were compared in both groups. Each patient was observed in the ward till discharge and followed up to 30 days in the out-patient department. The data was recorded and analyzed in SPSS version 20. Independent sample t-test was applied to obtain the p-value for comparing the means. P-value ≤ 0.05 was considered significant.

Results: In both groups age, weight and etiology of stoma was comparable. The full feed was achieved within 56.66 ± 7.77 hours in group A and 156.76 ± 7.96 hours in group B ($P < 0.005$). Mean length of hospital stay was 5.84 ± 0.84 days in group A, while it was 9.50 ± 0.76 days in group B ($P < 0.005$).

Conclusion: Early enteral feeding after stoma reversal is well tolerated and beneficial. It is suggested that early feeding protocol should be encouraged in a resource limited environment.

Keywords

- Early feeding
- Delayed feeding
- Stoma reversal
- Children

Introduction

In many emergency and elective surgeries we have to divert the intestine. A period of starvation (nil by mouth) is a common practice after stoma reversal that usually lasts for 4-5 days. The rationale behind this is to prevent occurrence of ileus and provide bowel rest until the anastomosis heals.¹ Yet this idea does not have a scientific basis and prolonged fasting in children after stoma reversal has not been studied thoroughly.

Recent studies have proven that bowel function is recovered much earlier than 4-5 days after laparotomy: small bowel after 24-48 hours, large bowel after 24 hours and stomach after 24-48 hours.² Also mucosal epithelium is completely sealed after a day¹. Patients undergoing stoma reversal are usually malnourished and prolonged starvation after the surgery will result in various complications.³

In the animal studies early feeding is associated with enhanced wound and anastomosis repair. Early feeding after surgery is associated with a lower incidence of nosocomial infection, liver dysfunction, bacterial translocation, secondary malnutrition and increases peristalsis, evacuation and early ambulation in adult patients thus resulting in less postoperative hospital stay.^{1,5}

Perez et al. concluded in 2013 that time to achieve full feeds was earlier (2.1 ± 0.3 days) in the early feeding group as compared to the delayed feeding group (5.0 ± 0 days) and hospital stay was shorter (6.0 ± 2.9 days) in the early feeding groups as compared to the delayed feeding group (9.8 ± 4.1 days).⁶

Aslanabadi et al conducted a study in Tabriz, Iran in 2011 and concluded that there was significant difference in hospital stay between the two groups ($p < 0.001$). However there was no significant difference in the rate of postoperative complications such as, leakage of anastomosis, mesenteric embolus, wound infection, and wound dehiscence between the groups. Also, there were no Considerable Variation in mortality between the two groups.⁷

There is not much international data available on early feeding practice in children after stoma reversal. Also randomized controlled trials are not available in children in our part of the world. The main objective of our study was to compare the time period before resumption of full feed and the length of hospital stay after stoma reversal with early and delayed feed.

Materials and Methods

This Randomized control trial was carried out at the Department of Pediatric Surgery, Services Hospital, Lahore, over a period of 1 year from April 2016 to march 2017. A total of 100 children between 2- 12 years of age having stoma due to anorectal malformation, Hirschsprung's disease or enteric perforation were enrolled in this study. Severe malnourished children (weight < 3SD below the 50th centile for age according to CDC growth chart) & patient with co-morbid conditions and complicated anomalies e.g. tuberculosis or congenital heart disease were excluded. After approval of our hospital ethical committee, patients with stoma (ileostomy or colostomy) who fulfilled the inclusion criteria were admitted from our out-

patient setting. These patients were randomly divided into two groups (group A, early feeding and group B, delayed feeding) after surgery using the closed envelopes method. A written informed consent was taken from the parents. All patients underwent stoma reversal by senior residents of the pediatric surgical team. In group A feeding (1-2 ml/kg ORS, every 2 hours for 2 doses followed by milk, juices or tea, we used this local protocol and found it satisfactory) was started after 36-48 hours post-operatively keeping in view the following parameters: decrease in nasogastric aspirate, audible bowel sounds or passage of flatus. The feed was increased by 1ml/kg after every 2 feeds when adequately tolerated. The feeding was then advanced to regular diet as tolerated. If vomiting occurred NG was re-inserted and serum electrolytes were repeated and optimized before starting feed trial again after another 4-6 hours. In group B, feeding was started after 5 days and it was advanced as in group A patients. When a patient was tolerating (there was no vomiting or abdominal distension and patient is passing flatus) 80% of maintenance fluid volume as a liquid diet, the full feed was said to be established. Complications such as fever, abdominal distension, vomiting, anastomotic leak and wound infections encountered in both groups were noted. The demographic and

postoperative data was collected according to pre-designed proforma. The demographic data included name, age, sex, weight at admission and diagnosis. The postoperative details included date of surgery, time to sustain full feeds, signs and symptoms of feed intolerance, complications and post-operative hospital stay. The data regarding full feed resumption and length of hospital stay was collected. Each patient was observed in the ward till discharge and followed up-to 30 days in the out-patient department. The data was recorded and analyzed in SPSS version 20. Numeric data such as age, weight, time to sustain full feed and length of hospital stay were presented as mean and standard deviation; depending on the value of standard deviation, independent sample t-test was applied to obtain the p-value for comparing the means. Qualitative data such as, gender and complications were presented as frequency and percentages.

Results

A total of 100 cases (50 in each group) were included in this study. In both groups patients were between 2-12 years with a mean age of 6 years. In both group's gender distribution and weight and stoma etiology was comparable, details are shown in **Table 1**.

Table 1: Descriptive Statistics of Age, Gender, Weight and Diagnosis in Group A and B

| | Group A | Group B |
|------------------------|-----------|------------|
| Age | 6.1±2.2 | 5.9±2.0 |
| Gender | n= 50 | n= 50 |
| Male | 25 (50%) | 22 (44%) |
| Female | 25 (50%) | 28 (56%) |
| Weight | 19.9 ±6.7 | 18.8± 6.43 |
| Diagnosis | n= 50 | n= 50 |
| Enteric perforation | 23(46%) | 24(48%) |
| Anorectal Malformation | 22(44%) | 20(40%) |
| Hirschsprung's disease | 5(10%) | 6(12%) |

The mean time to tolerate full feeding in group A was significantly lower than group B, P- value < 0.0001. The mean post op Hospital stay was also less in group A, P < 0.0001. The length of hospital stay in children for group A ranged between 5 to 8

with a mean stay of 5.84 ± 0.84 days. In group B mean length of hospital stay was 9.5 ± 0.76 days, maximum stay was 12 days and minimum stay was 9 days, (P-value P < 0.0001) full details are given in [Table 2](#).

Table 2: Comparison of full feeding time and length of Hospital stay in Group A and B

| | Group A (Early feeding) | Group B (Delayed feeding) | P- value |
|-------------------------------------|----------------------------|------------------------------|------------|
| Time to Sustain Full Feeding | 56.6±7.77 | 156.76± 7.96 | P < 0.0001 |
| Length of Hospital Stay | 5.8± 0.84 | 9.5± 0.76 | P < 0.0001 |

In group A we found abdominal distension and vomiting more than group B whereas, fever wound infection were more common in group B. We also encountered one anastomotic leak in group B. Most

common complications in group A were vomiting and abdominal distension while fever and wound infection in group B. Complications are shown in **Figure 1**.



Figure 1: Complications in both groups

Discussion

This study was a randomized controlled trial, and Group A & B were comparable in terms of demography and etiology of studied patients.

According to our results, the mean time to tolerate full feed in group A, was significantly lower than group (B), 56.6 ± 7.77 versus 156.76 ± 7.96 hours ($P < 0.0001$). Mamatha B and Alladi A. also reported, mean time to sustain first feed, 16 hours and mean time for full feed resumption, 36 hours in early feeding group.⁸Yadav et al. also found, full feeds were achieved within 62.3 ± 19.2 hours vs. 196.0 ± 40.5 hours⁹. Ekingen G et al, concluded that in early feeding group, the toleration of full oral feed, first stool time, and hospital stay was significantly reduced than the control group.¹⁰Our results were also comparable with the study published in 2003 in Prince of Songkla University Thailand.¹¹

The hospital stay in our study was 5.8 ± 0.84 and

9.5 ± 0.76 in early and delayed feeding group respectively ($P < 0.0001$). Similarly, Aslanabadi et al. reported that the length of hospital stay in early feeding group was significantly shorter than in late feeding group ($p < 0.001$) which supported our results.⁷ Another study done in Dhaka shishu children hospital on 125 patients having colostomy reversal after Hirschsprung's disease and anorectal malformation reported enteral diet was started within 16-24 hours. Postoperative hospital stay of the patients in early feeding group and delayed feeding group ranged from 3-5 days (mean 4.14 days) to 6-17 days (mean 8.09 days) respectively with ($P < 0.002$) and there was no difference in complication between the two groups.¹²

We found no significant difference in abdominal distension and vomiting, fever, wound infection and anastomotic leak between two groups and these complications were similar to the study conducted by Aslanabadi et al and Yadav et al^{7,9}.

Conclusion

The present study supports the view that early feeding in pediatric patients after elective distal bowel anastomosis (ileostomy/ colostomy reversal) is well tolerated and beneficial and early feeding protocol should be encouraged.

Ethical Consideration

This study was approved by Institutional Review Board, Services Institute of Medical Sciences, Services Hospital, Lahore, with Ref No.

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Conflict of interests

There is no conflict of interest.

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