Early Enteral Nutrition Following Small Bowel Surgery- Our Experience in a Tertiary Care Hospital in North Coastal Andhra Pradesh

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ABSTRACT

BACKGROUND
The aim of this study was to determine as to whether early enteral feeding within 48 hrs. of small bowel anastomosis is tolerable and beneficial to the patient. Specific objectives were, feasibility, safety and efficacy of early enteral feeding after small bowel anastomosis in terms of morbidities like- incidence of vomiting, rate of anastomotic leak, rate of infective complications and length of post-operative hospital stay in days. Also, this study will focus on any difference in mortality and cost-effectiveness.

METHODS
This study is a prospective randomized controlled study which was conducted at Department of General Surgery, King George Hospital, Visakhapatnam from January 2018 to December 2018. 60 cases with bowel perforation were recorded.

RESULTS
Appearance of intestinal peristaltic sounds is earlier in early enterally fed group. Mean duration of post-operative hospital stay is lower in early enterally fed group. Mean post-operative day 4 albumin level is higher in early enterally fed group. The rate of infective complications (UTI, RTI, wound complications) is equal in both the groups. The rates of clinical leakage, nausea/vomiting are equal in both the groups. The rate of re-exploration for anastomotic leakage is equal in both the groups.

CONCLUSIONS
Bowel secretes and reabsorbs about 7 liters of fluid per day irrespective of oral intake, so giving 'rest to gut and protecting anastomotic site' is based on a false notion. Gut recovers from dysmotility within 24 to 48 hours in case of stomach and colon while 4 to 6 hours in case of small bowel. It prevents translocation of bacteria or virus by maintaining integrity of gut mucosa which may become atrophied if gut remains in rest. Many patients remain malnourished before the surgery; they are predisposed to more postoperative complications. Starvation reduces the collagen content in the scar tissue and diminishes the quality of healing, whereas feeding reverses mucosal atrophy induced by starvation and increases anastomotic collagen deposition and strength. So, in order to avoid these, early enteral feeds within 48 hrs needs to be started, to reduce the complications.

KEYWORDS
Early Enteral Feeding, Small Bowel Anastomosis, Post-Operative Feeds

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BACKGROUND

Based on the conventional practice, after bowel anastomosis, patients are kept nil by mouth until he passes flatus or stools. However, recent studies have shown that early enteral feeding after bowel anastomosis is safe and more physiological in coping up with the morphologic and functional trauma related to alterations of the gut and helps to modulate immune and inflammatory responses and more affordable than total parenteral nutrition. Early enteral feeds have shown to reduce the post-operative complications like anastomotic leak, wound infections, pneumonia, intra-abdominal abscesses, thus reducing the hospital stay. In fact, the poor pre-operative nutritional status of the patient combined with delayed enteral feeds post-operatively leads to weight loss, further malnourishment and poor wound healing. Small bowel gains early motility within 4-6 hours when compared to stomach and colon, so early enteral feeds following small bowel surgeries especially bowel anastomosis improves the nutritional status, decreases morbidity and better patient outcome. The rationale behind this practice is that post-operative gut dysmotility mainly affects stomach and colon along with the small gut in lesser magnitude, to protect the anastomotic site, to avoid passage of food through it. Also, recent emphasis has been made on early enteral feeding within 6 to 24 hours after operation.

So, this study was conducted to know feasibility of early enteral feeding.

METHODS

This is a prospective study of 60 cases admitted in department of General Surgery, King George Hospital, Andhra Medical College, Visakhapatnam during January 2018 to December 2018.

Inclusion Criteria

- Patients undergoing small bowel anastomosis and uncomplicated simple biliary-enteric anastomosis in both emergency and elective setup.
- Feeding proximal to anastomotic site within 48 hours following operation either per orally or through nasogastric tube.

Exclusion Criteria

- Patients who underwent large bowel and gastric anastomosis.
- Patients who underwent Re-laparotomies following anastomosis
- Surgery requiring operative time > 4 hours
- Post-operative patients requiring ventilator support
- Gross contamination of peritoneal cavity prior to surgery
- Immunocompromised patients
- Paediatric patients (<12 years)
- Pregnant patients

RESULTS

Out of the 60 cases who underwent small bowel surgeries, they were divided into group A and group B based on enteral nutrition started before 48 hours an after 48 hours respectively.

DISCUSSION

Traditionally after abdominal surgery, it is customary to keep the patients “nil by mouth” after gastrointestinal anastomosis till patient passes flatus. It is now recognized that withholding oral feeds for few days after surgery in such cases leads to nutritional depletion and its further consequences. Lewis et al. in his meta-analysis of 11 studies along with some other studies have examined the role of

<table>
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<th>Criteria</th>
<th>Group A (30)</th>
<th>Group B (30)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Age</td>
<td>38.1</td>
<td>36.13</td>
<td>0.549</td>
</tr>
<tr>
<td>Sex distribution</td>
<td>21 (M) &amp; 9 (F)</td>
<td>23 (M) &amp; 7 (F)</td>
<td>0.559</td>
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<tr>
<td>Emergency (Em) &amp; elective (El) Cases</td>
<td>18 (El) &amp; 12 (Em)</td>
<td>20 (El) &amp; 10 (Em)</td>
<td>0.788</td>
</tr>
<tr>
<td>Benign &amp; Malignant</td>
<td>18 (B) &amp; 12 (M)</td>
<td>19 (B) &amp; 11 (M)</td>
<td>1</td>
</tr>
<tr>
<td>Mean Pre op S. Albumin</td>
<td>3.513</td>
<td>3.463</td>
<td>0.676</td>
</tr>
<tr>
<td>Healthy (H) or Gangrenous (G) Gut</td>
<td>24 (H) &amp; 6 (G)</td>
<td>26 (H) &amp; 4 (G)</td>
<td>0.720</td>
</tr>
<tr>
<td>Staped Vs Hand sewn</td>
<td>4 (S) &amp; 26 (HS)</td>
<td>6 (S) &amp; 24 (HS)</td>
<td>0.720</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Criteria</th>
<th>Group A (30)</th>
<th>Group B (30)</th>
<th>p</th>
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</thead>
<tbody>
<tr>
<td>Patients on steroid therapy</td>
<td>0</td>
<td>1</td>
<td>1</td>
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<tr>
<td>Comorbidities</td>
<td>3 (HTN)+2 (DM)</td>
<td>4 (HTN)+1 (DM)+1 (COPD)</td>
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<td>Mean time of Appearance of IPS</td>
<td>42.8 hrs</td>
<td>53.6 hrs</td>
<td>0.013</td>
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<td>Clinical leakage</td>
<td>4</td>
<td>2</td>
<td>0.667</td>
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<tr>
<td>Wound infection rate</td>
<td>8 (26.67%)</td>
<td>6 (20%)</td>
<td>0.760</td>
</tr>
<tr>
<td>Mean PCD &amp; Serum Albumin</td>
<td>3.147</td>
<td>2.747</td>
<td>0.001</td>
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<tr>
<td>Post op Hospital stay (Mean duration)</td>
<td>7.4</td>
<td>10.13</td>
<td>0.039</td>
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<tr>
<td>Mortality</td>
<td>2</td>
<td>0</td>
<td>0.472</td>
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</table>
early feeding after gastrointestinal anastomosis and found that it improved immunocompetence, decreased septic complications, improved wound healing and possibility of improved anastomotic strength.7

In this study majority of the cases of both the groups underwent enteric anastomosis for closure of stoma (ileostomy/colostomy), malignancy of gut requiring resection and anastomosis of small gut. All the operations in both the groups are done under general anaesthesia. In the present study, abdominal drain was put in all cases in group A and group B which was comparable. In a similar study by Stewart et al on early feeding after elective open resections, intra-abdominal drainage was done in 37% cases of study group and 40% in control group.8 The present study out of 4 cases (13.33%) in group A and 2 cases (6.67%) in group B who had post-operative leak, re-exploration was done in 2 patients in group A and 1 patient in group B.

The drain was able to pick up all anastomotic leakage in both the groups and some cases of anastomotic leakage manifested as faecal/bilious discharge from main abdominal wound. Another important observation is that tolerance to oral feeds is same in present as well as most of the previous studies despite the fact that early oral feed was started within 48 hours in the present study as in all other studies, oral feed was started within 24-72 hours of surgery. This indicates that oral feed can safely be started after 48 hours of surgery with good tolerance because effect of anesthetic drugs is over by that time.

Post-operative day 4 serum albumin values were significantly more in group A compared to group B (p<0.05). This occurred possibly due to early oral feeding which helped in improvement in nutritional status of patients of group A. In the present study 8 cases (26.67%) in group A and 6 cases (20%) in group B had wound infection which was not statistically significant. The results of meta-analysis of 11 studies by Lewis et al have also shown that incidence of wound infection, although not statistically significant, is less in early fed group (p=0.074).9 The reverse findings have been observed in present study, although not statistically significant.

In group A, out of 4 cases of intestinal leakage, first patient had undergone right hemicolecotomy with ileo-colic anastomosis and the leakage was managed by forming an ileostomy. The other three cases were found to have ileal perforation and had undergone ileo-ileal anastomosis. This patient had undergone re-exploration and ileostomy, but the patient died due to severe sepsis and acute myocardial infarction on post-operative period 4 and 5.

In group B, out of two cases of intestinal leakage, first case had undergone ileo-ileal anastomosis for ileal perforation. This case was managed by performing proximal ileostomy. In the past, various workers have observed that wound healing as well as anastomotic strength improves in cases of early oral feeding.10,11

One significant observation made by all these workers including present study is that post-operative hospital stay is significantly shorter in group A cases as compared to group B cases. It is possibly due to the fact that early feeding helps in early bowel movements, faster recovery, less post-operative complications, leading to early discharge from hospital.

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 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.12,13,14 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

Gianotti et al concluded that early post-operative enteral feeding in 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.18

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 sounds and early passage of flatus and stool, decreased usage of intravenous medications.19,20

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 post-operative 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

Appearance of intestinal peristaltic sounds is earlier in early enterally fed group. Mean duration of post-operative hospital stay is lower in early enterally fed group. Mean post-operative day 4 albumin level is higher in early enterally fed group. The rate of infective complications (UTI, RTI, wound complications) is equal in both the groups. The rate of clinical leakage, nausea/vomiting is equal in both the groups. The rate of re-exploration for anastomotic leakage is equal.
in both the groups. On the basis of this study, we can conclude that the conventional withholding of enteral feeds for prolonged periods to coincide with the appearance of peristaltic sounds might not stand the test of time. The practice of early enteral feeding doesn't have any impact on anastomotic outcome. However, further large volume studies will be required to justify such an approach.

REFERENCES


