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Early postoperative oral feeding impacts positively in patients undergoing colonic resection: results of a pilot study

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Resumen

Background and aims: Early oral feeding after colorectal resections is one of the many factors that contributes to enhance recovery after surgery, mainly impacting on postoperative ileus. The aim of this study was to evaluate the impact of early postoperative oral feeding in patients undergoing elective colorectal resection.

Methods: Patients were randomly assigned to either a conventional postoperative dietary regimen or a free diet on the first postoperative day.

Results: Altogether 29 patients were enrolled. Clinical characteristics were similar in both groups. Good nutritional status was seen in 86% of patient in the traditional care (TRAD) group versus 46% in the early fed (EF) group (p<0.05). There was no difference between groups in terms of procedures. Median hospital stay was 5.0 days in the TRAD group versus 3.0 days in the EF group (p<0.05). Complication rates and acceptance of diet were similar in both groups. Diarrhea occurred more frequently in the TRAD group (OR=1.86; IC95%: 1.08-3.20).

Conclusion: Early oral intake is well tolerated, leads to significant shorter hospital stay and does not increase complications.

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Key words: Early nutrition, Postoperative ileus, Colorectal resection.

Introduction

Fasting or diet restriction postoperatively which contributes to exacerbation of catabolism with concomitant weight loss and muscle wasting. On the other hand, oral nutrition and early enteral nutrition can improve the organic response to stress and thus facilitate the recovery of patients. Some aspects of the perioperative care of patients undergoing colorectal anastomosis are based on dogmas. The timing of the reintroduction of oral diet after surgery is an example. It has been shown that patients remain exposed to unnecessarily prolonged fasting. In consequence, the nutritional status is affected, which is important in
those patients previously malnourished. In addition, the length of hospital stay and risk of complications increases. After colon resection, patients remain in the hospital on average six to 12 days and the complication rates range from 15% to 20%12. Epidural analgesia, minimally invasive surgery, antiemetic medications, early mobilization after surgery and psychological preparation of the patient, all together, are some of the elements associated with the diet which have been shown to improve early postoperative results13-15. Several authors13-14 argue that although multimodal treatment is of extreme importance, the single contribution of each variable remains unclear, probably due to the enormous variety of protocols for rapid recovery. Therefore, in the current study we investigated if only early feeding in patients undergoing colon resection contributes to a faster and more eventful recovery and early return to normal functions at home.

Materials and methods

From July 2006 until January 2008, patients older than 18 years admitted for either open or laparoscopic elective colonic resection with a primary anastomosis were eligible for this trial. Exclusion criteria were emergency procedures, patients who underwent Hartmann’s colonic resection or with protective colostomy and those who did not agree to participate. The study was approved by the university and hospital ethical committees and all patients provided written informed consent. On admission all patients were nutritionally assessed by subjective global assessment and body mass index (BMI). Data were collected by a single observer. All patients received thromboprophylaxis and perioperative antibiotics. Neither nasogastric tubes nor intra-abdominal drains were used postoperatively. All anesthetic procedures and agents were standardized, but epidural anesthesia was not performed. Patients were randomized to either traditional care (TRAD) or the early fed group (EF). In both groups, there were 12hs of nil by mouth before surgery. Postoperatively, on the 1st day, patients in the EF group received 500mL of restricted fluid as the first diet intake and if no nausea and vomits were observed they were able to eat a free diet, immediately thereafter. The TRAD group received nil by mouth until flatus or evacuation happened. All fluids in EF group were discontinued on day 1 after surgical procedure unless there was a medical reason to do otherwise. All patients were encouraged to early mobilization starting immediately after surgery in both groups. Patient follow up was performed daily with special attention to nausea, emesis and other signs of diet intolerance. Criteria for insertion of a nasogastric tube were two consecutive episodes of vomiting greater than 400mL. Discharge from the hospital was possible when patients were fully mobile, pain was controlled with only oral analgesics and tolerance of oral food was adequate. All patients were daily contacted by telephone until day seven after surgery. All complications were recorded.

Study population sample size was based on the assumption that the EF group would present at least one day of difference in hospital stay. To achieve an 80% power with a 2-sided P value of less than 0.05 as significant, 30 patients per group were required. An interim analysis was planned after inclusion of a half of the calculated sample size with a premature study end, if any differences in the primary end point were reached. Statistical analysis was based on an intention-to-treat analysis and it was performed with the Statistical Package for Social Science software (version 10.0; SPSS, Chicago, IL). Calculations of diet intake were performed with Diet PRO (version 4.0). The Mann-Whitney U and Wilcoxon tests were used to compare continuous variables, the chi-square test and the Fisher exact test were used to compare discrete variables. The length of hospital stay was assessed by survival analysis, due to censorship in follow-up time and due to better matching of such analysis for this variable.

Results

From July 2006 until January 2008 there were 29 patients who fulfilled inclusion criteria and were randomly assigned to the EF and TRAD groups. Characteristics and surgical details are shown in table I. The most common diagnosis was colorectal cancer (males n=12, females n=12). Laparoscopic procedures were performed in 42.9% of patients in TRAD group and 46.7% of EF group, with no statistical difference between groups (p=NS). Nutritional status of patients before surgery according to subjective global assessment is depicted in figure 1 A and B. When BMI was used, overnutrition (BMI>25kg/m2) was present in 62.1% of patients. There was significant reduction in total length of stay between EF group and TRAD group (p<0.01), as presented in figure 2. The median length of hospital stay was 5.0 days in TRAD group versus 3.0 days in EF group.

Table I

Patients' characteristics and surgical details

<table>
<thead>
<tr>
<th></th>
<th>Traditional care (N=14)</th>
<th>Early fed (N=15)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean age, y (range)</td>
<td>47.4 ± 16.7 (21-79)</td>
<td>54.5 ± 10.1 (35-75)</td>
<td>NS</td>
</tr>
<tr>
<td>Male/female</td>
<td>5/9</td>
<td>4/11</td>
<td>NS</td>
</tr>
<tr>
<td>Type of surgery</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sigmoid resection</td>
<td>6</td>
<td>7</td>
<td>NS</td>
</tr>
<tr>
<td>Left hemicolectomy</td>
<td>2</td>
<td>0</td>
<td>NS</td>
</tr>
<tr>
<td>Resection of transverse colon</td>
<td>0</td>
<td>1</td>
<td>NS</td>
</tr>
<tr>
<td>Right hemicolectomy</td>
<td>1</td>
<td>6</td>
<td>NS</td>
</tr>
<tr>
<td>Total colectomy</td>
<td>5</td>
<td>1</td>
<td>NS</td>
</tr>
</tbody>
</table>

Traditional group = diet after flatus or stool evacuation. Early fed group = diet on the 1st PO day. NS = not significant.
Time taken to passage of first flatus was statistically different between the two groups (TRAD = 2nd day versus EF = 1st day; p<0.05). Diet intake in TRAD and EF group is showed in figures 3 and 4 respectively. Nine patients presented with postoperative complications. Five patients in the TRAD group and four patients in the EF group (p=NS). There was no statistical difference in the occurrence of nausea and vomiting between the groups. Patients in the TRAD group were 1.86 times more likely to have diarrhea than patients in EF group (IC95%: 1.08 – 3.02; p<0.05). The rate of anastomotic leak was not different between groups (p>0.05). One patient died during the follow-up.

Discussion

The results of this randomized pilot clinical trial indicate that early oral diet alone can impact positively in postoperative outcome of patients undergoing colorectal resection.

Although the EF group presented with higher number of malnourished individuals (53%) than the TRAD group (14%) it still had better postoperative recovery reflected by shorter hospital stay, lower incidence of diarrhea and similar complication rates. It is known that nutritional status is directly associated with worse organic response to trauma, increased postoperative ileus and slower recovery. However, it is also known that the passage of food at the anastomosis site enhances healing. It reduces the risk of developing fistulas, the occurrence of nausea and vomiting by increasing local blood flow and peristalsis and, thus stimulates intestinal motility and resolution postoperative ileus.

Multimodal treatments do impact on surgical outcomes, however the contribution of each procedure alone remains unclear. Indeed, this could be due to the diversity of the protocols and its many variables. Each aspect influencing postoperative recovery should be investigated individually, and consensus reached on its place in fast-track protocols.

The current study only assessed the important role of timing of PO diet reintroduction and it has shown that it alone impacted on recovery of the patients with no increased complications.

In our study, the event diarrhea was 1.86 times more likely to occur in patients who received diet only after passage of flatus. This might be explained by the fact that fasting is associated with greater likelihood of intestinal stasis which contributes to increased bacterial growth and imbalance of the intestinal microbiota. Finally, when motility is recovered diarrhea might occur.

In conclusion, our study shows that early postoperative feeding protocol alone in patients undergoing colon resection results in earlier hospital discharge, quicker postoperative recovery and no changes in complication rates. This result reinforces the idea that early nutrition is crucial in the recovery of the patient.

Fig. 1.—Nutritional status according to subjective global assessment of patients undergoing colonic resection.

Fig. 2.—Length of hospital stay of patients undergoing colorectal surgery.

Fig. 3.—Diet intake in traditional care (TRAD) group during the three first days postoperatively of patients undergoing colorectal surgery.

Fig. 4.—Diet intake in early fed (EF) group during the three first days postoperatively of patients undergoing colorectal surgery.
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