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ORIGINAL ARTICLE

NON MECHANICAL BOWEL PREPARATION FOR ELECTIVE LEFT SIDED COLORECTAL CANCER SURGERY

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Abstract

Aim: Although Mechanical Bowel Preparation (MBP) is considered as an integral feature of intestinal antisepsis before left-sided colorectal surgery, there is a lack of scientific evidence demonstrating the efficacy of this practice in reducing the rate of infectious complications. The aim of this study was assessment of safety of non MBP in elective left colon and rectal surgery.

Methods: After exclusion of patients with obstruction or abdominoperineal resection, 62 patients with left - sided colorectal cancer were included, and randomized into two groups. Mechanical bowel preparation was performed for patients in Group A (29 cases as 2 cases were excluded during the study), while those in Group B (31 cases) did not receive mechanical preparation.

Results: There was no statistically significant difference comparing both groups regarding demographic data and anatomical presentations of the colorectal cancer. During the MBP, (Group B) patients significantly encountered difficulty in drinking the preparation, abdominal pain, nausea and vomiting compared with (Group A) patients (P=0.00). There were no statistically significant difference comparing both groups as regards wound infection (P=0.438), anastomotic leakage (P=0.800), reoperation (P=0.961), or length of hospital stay (P=0.924).

Conclusion: Elective left-sided colorectal surgery can be performed safely without MBP.

Keywords: Colorectal malignancy, Bowel cleaning, Bowel surgery.

INTRODUCTION

In the first half of the 20th century, mortality from colon and rectal surgery were mainly attributed to sepsis, therefore, it was a major aim to reduce the rate of postoperative infectious complications, especially of anastomotic dehiscence.[1] Efficient mechanical bowel preparation (MBP) is considered to be one of the critical factors in preventing infectious complications after colorectal procedures, by leaning the large bowel of fecal content.[2,3] Since the seventies, MBP was nearly uniformly accepted as a "dogma",[4] and has long been an essential step in intestinal antisepsis. However, the evidence questioning the utility of MBP in colorectal surgery comes from the literature regarding the management of urgent cases, such as patients with penetrating colonic trauma, in which prospective randomized studies have shown that primary colonic anastomosis is safe, even though MBP is not performed before surgery.[5] General criteria for primary repair in trauma patients include absence of prolonged shock or hypotension, absence of gross contamination of the peritoneal cavity and absence of associated colonic vascular injury.[6] These criteria can be applied safely in elective left colonic surgery. Even though the colon is not prepared, the mechanism of injury is not as

controlled as in elective cases, and there is often a delay between the injury and the repair.[7] Moreover, twenty reviews have been published together with randomized prospective studies on the role of MBP in preventing postoperative complication rates,[8] however, none of them had sufficient power to conclude on the role of MBP.

The aim of this study was to assess whether elective left colon and rectal surgery can be safely performed without preoperative mechanical bowel preparation.

PATIENTS AND METHODS

The study protocol was approved by the Ethics Committee at Menoufyia University. The study included patients with left colonic or rectal cancer admitted to Menoufyia University Hospital in the period from August 2005 to July 2008. After exclusion of patients with colonic obstruction or those with very low rectal cancer (in whom abdominoperineal resection was needed), 62 patients were enrolled in the study. After obtaining a clear informed consent, the patients were randomized into two groups; 31 patients each by computer-generated random allocation software. Group (A) patients received preoperative MBP, while those of Group (B) did not. MBP was done for (Group A) the day before surgery in the form restriction of solid diet, oral intake of Mannitol 250 ml/6 hours[9] together with evacuating enema/6 hours. Patient discomfort (including difficulty in drinking the preparation, nausea, vomiting and abdominal pain) was recorded for this group.

Patients in (Group B) were allowed for regular diet until midnight the evening before surgery with no MBP done, except for patients undergoing rectal surgery, for whom one evacuating enema on the day of surgery was performed to avoid extrusion of stool when using a transanally inserted stapling device. All the patients in both groups received preoperative oral antibiotics (three doses of Neomycin and Erythromycin), and perioperative broad-spectrum intravenous antibiotics (first generation Cephalosporin with Aminogylcosides) combined with Metronidazole, that were continued for at least 5 days postoperatively. Infectious complications were assessed including wound infection and anastomotic leak, together with the rate of reoperation for abdominal complications. Other parameters as length of hospital stay and mortality were recorded.

Statistical analysis was performed using Chi Square test for qualitative parameters and Student "t" test for quantitative parameters using SPSS-17 (Statistical Package for Social Sciences version 17). Probability values of less than 0.05 were considered significant.

RESULTS

Throughout the study, further two patients in (Group A) were excluded. In one of them, an intraoperative element of obstruction was found, while the other patient died in the immediate postoperative period from pulmonary embolism, to have a final number of 29 cases in this group (Table 1). The mean age of the studied patients was 53.83±9.27 years for (Group A) and 52.29±10.30 years for (Group B). Sixty two percent of the patients in (Group A) and 54.84% of the patients in (Group B) were males and the rest in both groups were females. As shown in (Table 1), there was no statistically significant difference in comparing age and gender distribution between the two groups.

(Table 2) shows the anatomical presentations of the left-sided and rectal cancer and the type of surgery performed for them. Three patients in (Group A) (10.34%) and four patients in (Group B) (12.9%) presented with descending colon carcinoma for whom left hemicolectomy was performed, while 14 patients in (Group A) (48.28%) and 12 patients in (Group B) (38.71%) presented with sigmoid carcinoma for whom sigmoidectomy was performed with colorectal anastomosis. On the other hand, anterior resection was performed for patients presented with rectal cancer in both groups. It was done for 12 patients (41.38%) and 15 patients (48.39%) in (Group A) and (Group B) respectively. There was no statistically significant difference in comparing number of patients in each group with the same presentation.

None of the patients in (Group B) encountered the discomfort that has been reported in (Group A) cases during mechanical preparation. In (Group A), 21 patients (72.4%) found difficulty in drinking the preparation, 14 patients (48.3%) felt abdominal pain, while nausea and vomiting were encountered in 9 patients (31%). As shown in (Table 3), there was a statistically significant difference between the two groups.

As regards the postoperative infectious complications, wound infection occurred in higher percentage in (Group A) (24.13%), than (Group B) (16.12%), however, there was no statistically significant difference between the two groups (P=0.438). Anastomotic leakage occurred in 4 patients (13.79%) in (Group A) and in 5 patients (16.12%) in (Group B) (P=0.800). One patient in each group, (3.44% and 3.22% for Group A and Group B, respectively) required operative interference in the form of lavage and proximal colostomy for a major leak with still no statistically significant difference between the two groups (P=0.961).

The length of hospital stay ranged from 8-26 days in (Group A) with a mean of 12.03±4.32, while in (Group B) it ranged from 7-30 days with a mean of 10.38±5.56 with no statistically significant difference between the two groups (P=0.924).

Table 1. Patients' number and demographic data.

		GROUP A (PREPARED)	GROUP B (NON PREPARED)	P
Total number		31	31	
Excluded	Obstruction	1		
	Death	1		
Included		29	31	
Mean age		53.83±9.27	52.29±10.30	0.606
Gender	Males	18 (62.1%)	17 (54.84%)	0.570
	Females	11 (37.9%)	14 (45.16%)	

Table 2. Presentation and surgery performed.

PRESENTATION	SURGERY	GROUP A (PREPARED)		GROUP B (NON PREPARED)		P
		No.	%	No.	%	
Desinding colon	Left hemicolectomy	3	10.34	4	12.9	0.322
Sigmoid	Segmoidectomy	14	48.28	12	38.71	0.564
Rectum	Anterior resection	12	41.38	15	48.39	0.745
TOTAL		29	100	31	100	

Table 3. Complications and hospital stay.

		GROUP A (PREPARED)		GROUP B (NON PREPARED)		P
		No.	%	No.	%	
Patient discomfort	Drinking difficulty	21	72.41	0	0	0.000
	Nausea & vomiting	9	31.03	0	0	0.001
	Abdominal pain	14	48.28	0	0	0.000
Infectious complications	Wound infection	7	24.13	5	16.12	0.438
	Anastomotic leak	4	13.79	5	16.12	0.800
	Reoperation	1	3.44	1	3.22	0.961
Mean length of hospital stay (days)		12.03±4.32		10.38±5.56		0.924
Mortality		1	3.22	0		0.329

DISCUSSION

Preoperative MBP (including oral laxatives, retrograde enemas and/or diet restriction before surgery) is the standard practice in colorectal surgery.[9] However, MBP is not harmless. It has been shown to have potentially negative sideeffects in terms of bacterial translocation[10,11] and electrolyte disturbance[12,13] which may complicate the induction of anesthesia and perioperative care and require longer preoperative admission which is time-consuming and requires more costs. It almost invariably causes significant discomfort to the patient, including nausea, abdominal bloating, and diarrhea.[14,15] In the current study, patient discomfort was significantly present in (Group A) while none of the patients in (Group B) encountered these problems.

In recent years, reduction of postoperative infections has been mostly due to a correct use of prophylactic measures such as preoperative selective bowel decontamination, adequate antibiotic prophylaxis and better anesthetic and intensive care management. Currently, while there is a general consensus on the indication of the utilization of prophylactic antibiotics intravenously worldwide,[16] some surgeons, mainly in North America, prefer administering antibiotic prophylaxis both orally and systemically.[2] So, in the current study it was a routine to administer prophylactic antibiotic therapy for all the patients. The aim of antibiotic prophylaxis is not the sterilization of the clinical field, but rather to facilitate the function of the host immune defense mechanisms by decreasing/suppressing bacterial growth in the surgical site. The surgical opening of the large bowel causes contamination of the surgical field by bacteria, so patients undergoing these types of procedures are associated with particularly high risk of postoperative wound infection.[16] It is reported that without antibiotic prophylaxis, wound infections after colorectal surgery develops in approximately 40% of patients.[17]

Associated with antibiotic prophylaxis, MBP is, for many surgeons, an integral feature of intestinal antisepsis. There are several theoretical advantages of MBP. It may decrease the intraluminal bacterial content, prevent disruption of the anastomosis by the passage of hard feces, and decrease operating time by improving bowel handling during construction of an anastomosis. Therefore, the risks of fecal contamination or infection of the peritoneal cavity and the abdominal wound are thought to be decreased.[18] However, there is a lack of scientific evidence demonstrating the efficacy of this practice in reducing the rate of infectious complications, which has led surgeons to re-evaluate their current clinical practice in colonic surgery.[19] In this study, there was no statistically significant difference comparing the both groups as regards the overall infectious complications. In similar studies, general infectious complications and extra-abdominal morbidity rates reported by Zmora et al,[3] Miettinen et al,[8] Fillmann et al,[20] and Bucher et al,[21] were similar between the two groups. A recent review of 12 randomized prospective trials comparing MBP vs non-MBP involving 4,919 patients showed that there was no proof that MBP reduces the risk of infectious complications after elective colorectal surgery.[22] On the contrary, there is evidence that this intervention may be associated with an increased rate of anastomotic leakage[23] and wound complications.[24] This might be explained by the fact that current methods of MBP rarely provide a completely clean bowel, but often result in fluid bowel content and risk of intraoperative spillage.[25] The new agents used for MBP such as polyethylene glycol and sodium phosphate are strong cathartic agents, however, the colon is frequently not completely clean and dry at the time of surgery.[3] Moreover, if MBP decreases the amount of solid feces, it does not alter the concentration of the intra-luminal fecal flora and only slightly alters their relative composition, as the large number of microorganisms in the digestive tract makes this almost impossible.[26] Therefore, the dogma that "mechanical bowel preparation is necessary before elective colorectal surgery" should be reconsidered.[24]

In conclusion elective left-sided colorectal cancer resection can be performed safely without preoperative mechanical bowel preparation.

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