



Original Article

A COMPARATIVE STUDY BETWEEN PATIENTS WITH MECHANICAL BOWEL PREPARATION AND PATIENTS WITH NO BOWEL PREPARATION IN ELECTIVE COLO-RECTAL SURGERY

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Abstract

Background: Modern surgical techniques and improved preoperative care has reduced both morbidity and mortality of colorectal surgery but the role of mechanical bowel preparation is recently disputed. Primary colonic anastomosis without mechanical bowel preparation is still considered unsafe.

Objective: One of the objectives of this study was to evaluate pre-operative mechanical bowel preparation in preventing anastomotic and wound dehiscence in elective colon and rectal surgery.

Methods: Fifty patients who were included in this study were randomly divided into two groups (group A & Group B). Group A was the preparatory group and Group B was the non-preparatory group. In preparatory group oral poly ethylene glycol was used for mechanical bowel preparation and in non-preparatory group no bowel preparation done. All patients were operated on by qualified surgeons and followed up for outcome and collected data were analyzed.

Results: : 80% of the Patients in Group A had adverse effects of bowel preparation like nausea, vomiting, blotting, loose motion and precaution had to be taken for them. All the patients of both groups were given per-operative antibiotics whereas 24 patients of Group A and 23 patients of Group B were given transfusion. 15(60%) patients of Group A had developed post-operative surgical infectious complications. The majority number of patients of Group A had been suffered from surgical site infection (10, 40%) followed by Anastomotic Leak, Intra-abdominal abscess and Peritonitis whereas in Group B 10(40%) patients developed surgical complications.

Conclusion: Mechanical bowel preparation before elective colon and rectal surgery is not so effective in preventing complications and without any mechanical preparation of the bowel colorectal surgery can be done safely.

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Introductn

Infectious complications including anastomotic and wound dehiscence are major causes of mortality and morbidity in colorectal surgery¹. Pre-operative mechanical bowel preparation is practiced for many years to prevent post-operative complications in elective colon and rectal surgery. But there is paucity of data showing that mechanical bowel preparation by itself separately from other peri and per-operative measures actually reduce anastomotic and wound dehiscence. Mechanical bowel preparation is done to clean the large bowel of faecal content thereby reducing the rate of infection caused by colonic bacteria. Traditionally bowel cleansing was achieved using enemas in conjunction with laxatives². Recently more efficient cleansing can be done using new bowel preparation agent, and induce diarrhea and cleanse the bowel of solid faecal matter.

Mechanical bowel cleansing has some theoretical advantages. It may decrease the intraluminal bacterial load, prevent disruption of anastomosis by passage of hard faecal mass and decrease operating time by improving bowel handling during construction of anastomosis. A meta-analysis found that, contrary to expectation use of mechanical bowel preparation

significantly increased the risk of anastomotic leakage and wound infection³.

Materials and Methods

This study was conducted in the department of surgery of Bangabandhu Sheikh Mujib Medical University, Dhaka Medical College Hospital and SSMC-Mitford Hospital during the period of 1st January 2007 to 31st December 2007. Fifty patients between 30-50years of age irrespective of gender were included in this study. Patients over 50 years of age immunocompromised patients, patient with inflammatory bowel disease were excluded from the study. The total patients were randomly divided into two groups (group A & Group B). Group A was the preparatory group and Group B was the non-preparatory group.

In preparatory group oral poly ethylene glycol was used for mechanical bowel preparation and in non-preparatory group no bowel preparation done. All patients were operated on by qualified surgeons and followed up for outcome and collected data were analyzed.

Results

Table- 1: Distribution of study subjects by groups

Sex	Groups		P value
	Group A	Group B	
Male	18(72.0)	13(52.0)	0.145
Female	7(28.0)	12(48.0)	
Total	25(100.0)	25(100.0)	

Chi-square test was done to measure the level of significance
Figure within parenthesis indicates the percentage.

Table- 2: Distribution of patients by age

Age(in years)	Groups		P value
	Group A	Group B	
≤30	11(40.0)	9(36.0)	0.409
31 -50	13(52.0)	11(40.0)	
>50	1(4.0)	5(20.0)	
Total	25(100.0)	25(100.0)	
Mean ±SD	34.80 ±11.72	37.80 ±13.70	

*t test was done to measure the level of significance
Figure within parenthesis indicates the percentage

Table -3: Distribution of preoperative diagnosis (carcinoma) by groups

	Groups		P value
	Group A	Group B	
Carcinoma	25(100.0)	25(100.0)	0.999
Total	25(100.0)	25(100.0)	

*Fisher's exact test was done to measure the level of significance.
Figure within parenthesis indicates percentage.

Table - 4: History of previous abdominal surgery in patients

History of previous abdominal surgery	Groups		P value
	Group A	Group B	
Present	1(4.0)	3(12.0)	0.609
Absent	24(96.0)	22(88.0)	
Total	25(100.0)	25(100.0)	

*Fisher's exact test was done to measure the level of significance.
Figure within parenthesis indicates percentage.

Table - 5: Adverse effect and precaution taken

Poly -ethylene Glycol	Groups		P value
	Group A	Group B	
Adverse effect	20(80.0)	2(8.0)	0.001
Precaution	20(80.0)	2(8.0)	0.001

Chi square test was done to measure the level of significance.
Figure within parenthesis indicates percentage.

80% of the Patients in Group A had adverse effects like nausea, vomiting, blotting, loose motion and precaution had to be taken for them whereas only 8% of Group B had the same which is highly significant between two groups.

Table - 6: Per-operative events in patients

Per Operative events	Groups		P value
	Group A	Group B	
Per -operative antibiotic	25(100.0)	25(100.0)	Not done
Transfusion	24(96.0)	23(92.0)	0.999

*Fisher's exact test was done to measure the level of significance. Figure within parenthesis indicates percentage.

All the patients of both groups were given per-operative antibiotics whereas 24 patients of Group A and 23 patients of Group B were given transfusion, but it not differ significantly.

Table- 7: Post- operative complications related to surgical site infection(Follow up up to 7th POD)

Post -Operative complications	Groups		P value
	Group A	Group B	
Surgical Infectious Complications			
Wound Infection	10(40.0)	7(28.0)	0.001
Anastomotic leak	2(8.0)	2(8.0)	ns
Intra -abdominal abscess	2(8.0)	1(4.0)	0.001
Peritonitis	1(4.0)	0(0.0)	0.001
Total	15(60.0)	10(40.0)	0.001

*Chi-square test was done to measure the level of significance.

Figure within parenthesis indicates percentage.

15(60%) patients of Group A had developed post-operative surgical infectious complications. The majority number of patients of Group A had been suffered from surgical site infection (10, 40%) followed by Anastomotic Leak, Intra-abdominal abscess and Peritonitis whereas in Group B 10(40%) patients developed surgical complications. The post-operative complications were significant between the two groups.

Table-8: Post- operative complications other than surgical site infection (Follow up up to 7th POD)

Post -Operative complications	Groups		P value
	Group A	Group B	
Non -surgical Infectious Complication			
Respiratory	5(20.0)	2(8.0)	0.001
Cardiac	1(4.0)	0(0.0)	0.001
UTI	7(28.0)	3(12.0)	0.001
Total	13(52.0)	5(20.0)	0.001

Among non-surgical post-operative complications UTI was high in group A followed by respiratory and cardiac ones. On the other hand, respiratory complications and UTI had developed in 2 and 3 patients respectively in Group B

Table - 9: Distribution of re-intervention by groups

Re Operation	Groups		P value
	Group A	Group B	
Anastomotic leak	2(8.0)	2(8.0)	ns
Intra -abdominal abscess	2(8.0)	1(4.0)	0.001
Total	4(16.0)	3(12.0)	0.001

'Chi square test was done to measure the level of significance.

Out of 25 patients of Group A who had post-operative surgical complications, 4(16%) patients had undergone re-intervention. Among them 2(8%) were for Anastomotic leak and was managed by ileostomy and 2(8%) for intra-abdominal abscess was managed by per rectal drainage of abscess. But 2(8%) for Anastomotic leak and 1(4%) for intra-abdominal abscess from Group B had needed re-operation, which was significant statistically.

Discussion

Preparation for elective colon and rectal surgery with mechanical cleansing and antibiotic prophylaxis, in conjunction with improved surgical techniques and advances in perioperative care, served to reduce the rate of infectious complications in colorectal surgery. Although mechanical bowel preparation before elective colorectal surgery has become a surgical dogma, there is a paucity of scientific evidence demonstrating the efficacy of this practice in reducing the rate of infectious complications.

Further evidence questioning the utility of mechanical bowel preparation in colorectal surgery comes from the literature regarding the management of urgent cases, such as patients with penetrating colonic trauma or acute colonic obstruction. In cases of penetrating trauma, prospective randomized studies have shown that primary colonic anastomosis is safe even though the colon is not prepared⁴. In cases of acute colonic obstruction, resection with primary anastomosis in one stage is not the common practice, as the colon is not prepared. Few authors however, have challenged the dogma that colon resection with primary anastomosis is unsafe in patients with obstructing colon lesions. Few series suggested that anastomosis between the small bowel and the colon, as performed in right or subtotal colectomy, may be safe without mechanical preparation since this type of anastomosis avoids the stool column proximal to the anastomosis. Other authors have suggested that colo-colonic anastomosis may also be safe in an unprepared bowel in the face of an obstructed colon⁵. Efficient mechanical bowel preparation is generally supposed to help to prevent infectious complications after colorectal surgery. Theoretically, this procedure diminishes faecal load in the bowel and prevents disruption of the anastomosis by reduction of faecal impaction at the site of the anastomosis. Therefore, the risks of faecal contamination or infection of the peritoneal cavity and the abdominal wound are thought to be decreased. However, mechanical bowel preparation liquefies solid faeces, which could increase the risk of intraoperative spillage of contaminant. Although some investigators believe that mechanical bowel preparation can reduce the bacterial load in the bowel, the large number of microorganisms in the digestive tract makes this almost impossible⁶. Mechanical bowel preparation has been shown to have potentially negative side-effects in terms of bacterial translocation, electrolyte disturbance, and discomfort to patients⁷. Despite these drawbacks, mechanical bowel preparation is still commonly practiced in colorectal surgery, without evidence from randomized trials that it decreases complication rates in patients.

Mechanical bowel preparation is not harmless. It almost invariably causes significant discomfort to the

patient, including nausea, abdominal bloating, and diarrhea⁸. Mechanical bowel preparation is associated with electrolyte imbalance and dehydration which may complicate the induction of anesthesia and peri-operative care. According to Zomra -mechanical bowel preparation should be treated as a medication and used only when indicated⁹. The result of our study was consistent with their findings and we also agree with their proposal.

Conclusion

We were concluded that mechanical bowel preparation before elective colon and rectal surgery cannot prevent complications like anastomotic leak, wound infection, intra-abdominal sepsis, abdominal abscess and extra abdominal complications and without any mechanical preparation of the bowel colorectal surgery can be done safely.

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