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Original Research Article

Assess the Safety of Colorectal Surgery without Mechanical Bowel Preparation

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Abstract: ***Background:*** Mechanical bowel preparation (MBP) for elective available colorectal surgical procedure has been practiced as a clinical routine for many decades. However, earlier randomized medical trials (RCTs) and meta-analyses endorse that MBP ought to be deserted earlier than colorectal surgical treatment due to the fact of the futility in decreasing postoperative problems and motility. The new published outcomes from three RCTs evaluating MBP with no MBP in colorectal surgical treatment in 2010 make the updating of systemic overview and meta-analysis necessary. ***Objectives:*** The aim of this study is to assess the safety of colorectal surgery without mechanical bowel preparation. ***Methods:*** This is an observational study. The study used to be carried out in the admitted patient's Department of Surgery Rajshahi Medical College Hospital, Rajshahi, Bangladesh. In Bangladesh for the duration of the period from June 2014 to May 2015. ***Results:*** This study shows that the according to age of 80 patients aged 20-above 51 years where, 4(10%) were 20-30 years, 10(25%) were 31-41 years, 10(25%) were 41-50 years, 16(40%) were 51 and above years in Group A, and 6(15%) were 20-30 years, 6(15%) were 31-40 years, 13(32.5%) were 41-50 years and 15(37.5%) were 51 and above years in Group B. And 28(70%) were males and 12(30%) were females in group A. And 27(67.5%) were males and 13(32.5%) were females in group B. ***Conclusions:*** Mechanical bowel preparation before elective colon and rectal surgery cannot prevent complications like anastomotic leakage, wound infection, intra-abdominal sepsis, abdominal abscess and extra abdominal complications.

Keywords: Colorectal surgery; Mechanical bowel preparation; Meta-analysis.

INTRODUCTION

Mechanical bowel preparation (MBP) for elective abdominal surgical treatment used to be brought in the late nineteenth century. For over a century, MBP for elective colorectal surgical operation has been the preferred in surgical practice. It is believed that MBP decreases intraluminal fecal mass and possibly decreases bacterial load in the bowel, which has been argued that this minimizes in fecal load and bacterial contents reduces the rates of infectious postoperative complications, such as anastomotic leakage and surgical site online infection [1]. However, extra and greater research challenged this thought structure 1972 [2]; long-term survival study is additionally in no choosing of MBP earlier than colonic most cancers surgical operation [3]. Furthermore, quite a few randomized medical trials have been published to assess the omission of MBP [4], however the actual means of MBP is nevertheless unclear, particularly in laparoscopic colorectal surgical treatment and rectal surgical procedure with low anterior resection. Until now, 10 meta- analyses of randomized medical trials (RCTs) evaluating MBP with no MBP have been published [5–8]. They concluded that MBP have to be ignored considering the fact that MBP ought to now not reduce infectious postoperative problems and even with greater risk of anastomotic leakage. Most recently, three RCTs have come to be reachable [9, 10] and one suggested that rectal most cancers surgical procedure except MBP was once related with greater chance of usual and infectious morbidity quotes barring any

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substantial expand of anastomotic leakage rate [9]. The large the range of patients included in a meta-analysis, the larger is its power to become aware of a feasible therapy effect, and so it appears reasonable to perform a further analysis, taking into account all the information currently available. We update the systematic evaluation and meta-analysis of RCTs on the function of MBP for colorectal surgical operation aiming to reply the query base on the latest published data.

In the first half of the 20th century, mortality from colon and rectal surgical procedure regularly handed 20%, [10] in most cases attributed to sepsis. Modern surgical methods and extended perioperative care have significantly lowered the mortality rate. Infectious complications, however, nonetheless are an important motive of morbidity in colorectal surgery, main to accelerated cost, extended medical institution stay, and occasional mortality [11].

Mechanical bowel preparation is aimed at cleaning the massive bowel of fecal content, thereby decreasing the rate of infectious complications following surgery. Traditionally, bowel cleaning was once finished the use of enemas in combination with oral laxatives [12]. More recently, oral cathartic agents to induce diarrhea and cleanse the bowel from stable feces have been developed. These new bowel guidance agents, such as polyethylene glycol and sodium phosphate, provide superior cleansing compared to the more traditional methods [13-16] and are used through most surgeons in training for colorectal surgery [17]. The exercise of bowel cleaning earlier than colorectal surgical operation grew to become a surgical dogma, and predominant colonic anastomosis is regarded dangerous in the face of an unprepared bowel. There is, however, a paucity of facts displaying that mechanical bowel guidance by means of itself, one by one from different operative and perioperative measures, genuinely reduces the rate of infectious complications.

In pressing colon surgical treatment for penetrating trauma, current research has proven that important colonic anastomosis is protected even although mechanical bowel practice is now not carried out earlier than surgery [18-20]. This information consequently might also carry into query the utility of mechanical bowel practice in non-obligatory colon and rectal surgery. Recently two studies [21-23] exhibit no advantage of mechanical bowel training in non-obligatory colorectal resection and Bretagnol [24] says that, avoidance of bowel training might also be related with reduced postoperative mortality and morbidity in non-obligatory rectal most cancers surgery.

To enhance the effect of the patients with colonic evidence-based perioperative care protocol used to be utilized in various hospitals to prevent the anastomotic leakage after colorectal surgical operation barring mechanical bowel preparation. They found large gut primary anastomosis barring mechanical bowel instruction used to be higher & decreased the mortality rate with lowering the anastomotic leakage.

METHODS

This is an observational study. The study used to be carried out in the admitted patient's Department of Surgery Rajshahi Medical College Hospital, Rajshahi, Bangladesh. In Bangladesh for the duration of the period from June 2014 to May 2015. This study was carried out on 80 patients the find out about the population including male and female patients above 20 years of age in the Department of Surgery Rajshahi Medical College Rajshahi Hospital, Bangladesh. The surgeons, cardiologist, pulmonologist, oncologist and diabetologist were involved in the decision-making process. The choice of treatment was made by the multidisciplinary team consisting of surgeons, cardiologist, pulmonologist, oncologist and diabetologist.

The data for this study about had been accumulated from patients' medical information and radiographs. Statistical evaluation of the results used to be got via the use of a window-based computer software program devised with Statistical Packages for Social Sciences (SPSS-24).

RESULTS

Table 1: Distribution of the study population according to age (n=80)

Age (in years)	Groups	
	Group A	**Group B**
20 -30	4 (10%)	6(15%)
31- 40	10 (25%)	6(15%)
41 -50	10(25%)	13(32.5%)
51 and above	16(40%)	15(37.5%)
Total	**40(100%)**	**40(100%)**

The total study population was 80 patients aged 20-above 51 years, 4(10%) were 20-30 years, 10(25%) were 31-41 years, 10(25%) were 41-50 years, 16(40%) were 51 and above years in Group A, and 6(15%) were 20-30 years, 6(15%) were 31-40 years, 13(32.5%) were 41-50 years and 15(37.5%) were 51 and above years in Group B. Table I demonstrated the distribution of studied population according to age.

Table 2: Distribution of the study group according to sex (n=80)

Gender	Groups	
	Group A	**Group B**
Male	28 (70%)	27(67.5%)
Female	12 (30%)	13(32.5%)
Total	**40(100%)**	**40(100%)**

The total study population was 80 patients aged 20-above 51 years, 28(70%) were males and 12(30%) were females in group A. And 27(67.5%) were males and 13(32.5%) were females in group B. Table 2 demonstrated the distribution of the study group according to sex.

Table 3: Distribution of the study group according to clinical diagnosis among groups

Clinical diagnosis	Groups	
	Group A	**Group B**
Carcinoma of		
Right colon	8(20%)	4(10%)
Transverse colon	4(10%)	3(7.5%)
Left colon	12(30%)	8(20%)
Rectum	6(15%)	5(12.5%)
Sigmoid volvulous	0(0%)	15(37.5%)
Polyp (left colon)	5(12.5%)	2(5%)
IBD (ulcerative colitis of sigmoidcolon)	2(5%)	2(5%)
GIST (left colon)	2(5%)	1(2.5%)
Diverticular disease (left colon)	1(2.5%)	0(0%)
Total	**40(100%)**	**40(100%)**

The total study population was 80 patients according to clinical diagnosis. Based on Carcinoma of Right colon, Transverse colon, left colon, Rectum were 8(20%), 4(10%), 12(30%), 6(15%) respectively in group A and in group B Right colon, Transverse colon, left colon, Rectum were 4(10%), 3(7.5%), 8(20%), 5(12.5%) respectively. And according to Sigmoid volvulous, Polyp (left colon), IBD (ulcerative colitis of sigmoid colon), GIST (left colon), Diverticular disease (left colon) were 0(0%), 5(12.5%), 2(5%), 2(5%), 1(2,5%) respectively in group A and 15(37.5%), 2(5%), 2(5%), 1(2.5%), 0(0%) respectively in group B.

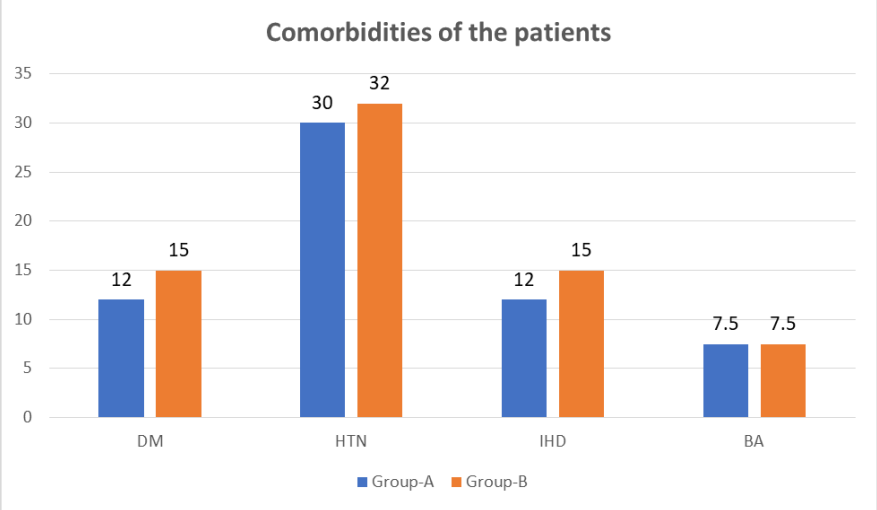

Figure 1: Distribution of the study group according to comorbidities of the patients

Figure 1 demonstrated the distribution of the study group according to comorbidities of the patients. In present study DM (12.5%), HTN (30%), IHD (12.5%) and BA (7.5%) were present in group-A compared to DM (15%), HTN (32.5%), IHD (15%) and BA (7.5%) in group-B. Statistically it was not significant between two groups (P=0.968).

Table 4: Distribution of the study according to surgical infectious complications among groups (N = 53)

Surgical infectious complications	Groups		Total	P Value
	Group – A (n = 39)	**Group –B (n = 14)**	**N**	
Wound infection	24(45.28%)	11(20.76%)	35(66.04%)	0.003
Abdominal abscess	10(18.87%)	1(1.89%)	11(20.76)	0.012
Wound dehiscence	5(9.43%)	2(3.77%)	7(13.20%))	0.090
Total	**39(73.58%)**	**14(26.42%)**	**53(100%)**	

Table 4 demonstrated the distribution of the study according to surgical infectious complications among groups (N = 53). Here according to Surgical infectious complications of Wound infection,

Abdominal abscess and Wound dehiscence were 24(45.28%), 10(18.87%) and 5(9.43%) respectively in group-A, in group B 11(20.76%), 1(1.89%) and 2(3.77%) respectively and P value were 0.003, 0.012 and 0.090 respectively.

Table -5 Distribution of the study according to non-surgical infectious complications among groups (N = 26)

Non-surgical infectious complications	Groups		Total	P Value
	Group – A (N = 24)	Group – B (N = 2)		
Pulmonary complications	8(30.77%)	0(0%)	8(30.77%)	0.003
Urinary tract infections	11(42.31%)	2(7.69%)	13(50%)	0.006
Thrombophlebitis	2(7.69%)	0(0%)	2(7.69%)	0.152
Paralytic ileus	3(11.54%)	0(0%)	3(11.54%)	0.077
Total	**24(92.31%)**	**2(7.69%)**	**26(100%)**	

Table 5 demonstrated the distribution of the study according to non-surgical infectious complications among groups. (N = 26). Here according to non-surgical infectious complications of Pulmonary complications, Urinary tract infections, Thrombophlebitis and Paralytic ileus were 8(30.77%), 11(42.31%), 2(7.69%) and 3(11.54%) respectively in group-A, in group B 0(0%), 2(7.69%), 0(0%) and 0(0%) respectively and P value were 0.003, 0.006, 0.152 and 0.077 respectively.

DISCUSSION

Traditionally, the bowel was once organized via mechanical cleaning the usage of a combination of diet, purgatives and enemas (e.g., senna, Picolax). This method is now used greater selectively, with many surgeons reserving full bowel guidance for those undergoing a low anterior resection, and clearing only the distal bowel the use of enemas in the rest. Prophylactic systemic antibiotics are given preoperatively. The antibiotic routine should be active in opposition to each aerobic and anaerobic organism. At present, an appropriate prescription would be cefuroxime 750 mg plus metronidazole 500 mg given on induction of anesthesia. If a patient comes to surgical treatment with a loaded colon, on-table intraoperative irrigation can be carried out (Baily & Love's Short Practice of Surgery 26th Edition) [25].

More recent proof suggests that the use of bowel instruction prior to colonic surgical operation effects in a multiplied danger for infectious problems and probably anastomotic leaks, calling into query the conference of routine preparation (Current Diagnosis & Treatment: Surgery, thirteenth Edition) [26].

In this study population was 80 patients aged 20-above 51 years, 4(10%) were 20-30 years, 10(25%) were 31-41 years, 10(25%) were 41-50 years, 16(40%) were 51 and above years in Group A, and 6(15%) were 20-30 years, 6(15%) were 31-40 years, 13(32.5%) were 41-50 years and 15(37.5%) were 51 and above years in Group B.

In this present study population was 80 patients aged 20-above 51 years, 28(70%) were males and 12(30%) were females in group A. And 27(67.5%) were males and 13(32.5%) were females in group B.These findings suggested that colorectal cancer was the common diagnosis in both groups. These figures have much similarity with a study [27].

The specific types of surgical processes like hemicolectomy, antcrior resection, and sigmoidectomy had been completed observed via anastomosis in each the groups. But there used to be no big distinction amongst them. In the existing find out about has a good deal version with that of Altaee, W.J. procedures. He carried out proper hemicolectomy 9(7.38%), left hemicolectomy 19(15.58%), anterior resection 15(12.3%), sigmoidectomy 20(16.41%) in group-A and proper hemicolectomy 12(9.96%), left hemicolectomy 18(14.94%), anterior resection 10(8.3%), sigmoidectomy 23(19.09%) in group-B.52. This method version may also be due to a smaller range of case selections. A study [28] additionally had comparable end result in recognize to spillage of gut content with mechanical bowel preparation. The distribution of unique anastomoses amongst corporations did no longer vary significantly. This study about has variant with that of a study [29] in appreciate to special kinds of anastomoses. This variability possibly due to a smaller wide variety of samplings.

Over the previous decade a variety of controlled trials have been introduced evaluating patients receiving preoperative bowel guidance with patients receiving no structure of bowel cleaning. The effects of the trials proven that patients receiving preoperative bowel practice fared no higher and once in a while even worse than these receiving no preoperative bowel preparation earlier than surgery [30]. Zomra *et al.,* (2003) concluded that elective colon and rectal surgical procedure may also be safely performed besides the use of routine mechanical bowel preparation.

Our study shows that, the total study population was 80 patients according to clinical diagnosis. Based on Carcinoma of Right colon, Transverse colon, left colon, Rectum were 8(20%), 4(10%), 12(30%), 6(15%) respectively in group A and in group B Right colon, Transverse colon, left colon,

Rectum were 4(10%), 3(7.5%), 8(20%), 5(12.5%) respectively. And according to Sigmoid volvulous, Polyp (left colon), IBD (ulcerative colitis of sigmoidcolon), GIST (left colon), Diverticular disease (left colon) were 0(0%), 5(12.5%), 2(5%), 2(5%), 1(2,5%) respectively in group A and 15(37.5%), 2(5%), 2(5%), 1(2.5%), 0(0%) respectively in group B.

Preoperative bowel preparation was once brought as a popular in elective colorectal surgical procedure to decrease the hazard of infection and to enhance operative dealing with of the bowel. Experimental and clinical research has proven they have an effect on of intraluminal fecal loading on the incidence of anastomotic disruption and subsequent leakage [31-33]. The retained feces may additionally act both via potentiation of local ischemia and anxiety or by means of institution of perianastomotic infection. The addition of preoperative antibiotic bowel preparation to mechanical instruction has been proven to minimize infectious morbidity after colorectal surgical procedure by as much as 45 percent [34-36]. Numerous protocols and merchandise exist for preoperative bowel preparation. [37-38] However, some requirements of a best mechanical bowel preparation for colorectal surgical procedure are extensively appreciated, such as a low incidence of facet effects, low cost, and excellent quality of cleansing. In addition, it needs to be without difficulty administered, be simple, be effective, and have desirable tolerance.

Our present study demonstrated the distribution of the study group according to comorbidities of the patients. In present study DM (12.5%), HTN (30%), IHD (12.5%) and BA (7.5%) were present in group-A compared to DM (15%), HTN (32.5%), IHD (15%) and BA (7.5%) in group-B. Statistically it was not significant between two groups (P=0.968).

The original traditional techniques for bowel-cleansing have been estimated as 70 percentages adequate [39] Elemental diets, total bowel irrigation, and oral bowel preparation with a mannitol solution has proven efficacy in the range of 75 to 80 percent [40]. An extraordinary wide variety of negative aspects in the use of these techniques have led to the introduction of new nonabsorbable osmotic agents such as polyethylene glycol in an isotonic balanced electrolyte answer (PEG) [41, 42]. The use of this solution is related with desirable to notable effects in larger than 90 percentages of patients and has unexpectedly end up the favored approach of mechanical bowel cleaning with the aid of colon and rectal surgeons [41]. Despite their established efficacy, the accomplishment of mechanical bowel-cleansing with these options stays problematic, ordinarily due to the fact of the massive volume needed the related facet effects, and the remarkably salty taste [42]. Therefore, a low-volume modality for mechanical bowel instruction was once delivered by way of Vanner *el al.*, in 1990 [43]. The smaller quantity sodium-phosphate solution (NAP) brought confirmed superiority in each efficacy and tolerance in contrast with standard PEG solution as training for colonoscopy.

Limitations of the Study

The present study was conducted in a very short period due to time constraints and funding limitations. The small sample size was also a limitation of the present study.

CONCLUSION

This study strongly proposes that elective colon and rectal surgical operation can also be safely carried out except the use of activities mechanical bowel preparation. Bowel cleaning has to consequently be used selectively—for instance, in cases the place intraoperative colonoscopy is likely be required. Multicenter studies, with their limitation of variety of techniques, ought to grant records on the reproducibility of these consequences to help a chance in this established surgical practice.

RECOMMENDATION

This study can serve as a pilot to a much larger research involving multiple centers that can provide a nationwide picture, validate regression models proposed in this study for future use and emphasize points to ensure better management and adherence.

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DECLARATION

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