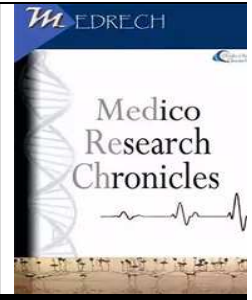




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EVALUATION OF MECHANICAL BOWEL PREPARATION IN ELECTIVE COLORECTAL SURGERY IN A SINGLE CENTER STUDY.

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ABSTRACT

Background: Mechanical bowel preparation (MBP) is mechanically carried out earlier than colon and rectal surgery, aimed at decreasing the danger of postoperative infectious complications. However, in instances of penetrating colon trauma, fundamental colonic anastomosis has proven to be protected even though the bowel is not prepared. Mechanical bowel preparation is not necessary in elective colorectal surgery. **Objectives:** The aim of this study is to assess the Evaluation of Mechanical Bowel Preparation in Elective Colorectal Surgery in a single center study. **Methods:** This is an observational study. The study used to be carried out in the admitted patient's Department of Surgery Rajshahi Medical College Rajshahi Hospital, Bangladesh. In Bangladesh for the duration of the period from June 2013 to May 2014. **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 earlier than elective colon and rectal surgical treatment cannot stop problems like anastomotic leakage, wound infection, intra-abdominal sepsis, abdominal abscess and more abdominal complications. The colorectal surgical method can be executed safely barring mechanical bowel preparation.

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INTRODUCTION

Postoperative infectious problems account for a substantial rate of morbidity in colon and rectal surgery. Most of these infections are induced by way of enteric bacteria, which are regular hosts of the large bowel and can also contaminate extraintestinal sites at some stage in surgical operation or in the early postoperative period. The medical presentation of these post-operative infections may also vary from wound infection to anastomotic leak or disruption, abdominal abscess, and diffuse peritoneal infection.

Mechanical bowel preparation earlier than colon and rectal surgical operation is aimed to rid the bowel of feces, in order to decrease the postoperative infection rate. In the previous decades, this exercise has grown to be a surgical dogma, and main colonic anastomosis is regarded risky in an unprepared bowel. Several researches suggested, however, that when an ileocolonic anastomosis is planned, for instance in a right, subtotal or whole abdominal colectomy, surgical treatment can be safely carried out except mechanical bowel instruction [1, 2]. Advocates of this method advised that because the column of stool proximal to the anastomosis, which may additionally mechanically disrupt the anastomosis, is prevented in these cases, mechanical cleaning might also no longer be required. We have formerly said that mechanical bowel preparation did no minimize infectious problems in patients present process colon and rectal surgical treatment with range types and areas of colonic anastomosis [3]. There is no literature, however, particularly addressing the security of elective colon and rectal surgical treatment with fundamental Colo colonic, colorectal or colo-anal (“left-sided”) anastomosis barring mechanical bowel preparation.

For functions of any future meta-analysis, it is vital to emphasize that a large component of these patients had been covered

in our preceding records [3]. However, primarily based on our experience and feedback to our preceding report, we felt that this subgroup evaluation (with modest increase in the quantity of patients) would be of sensible interest to surgeons.

Mechanical bowel preparation is aimed at cleansing the large bowel of fecal content, thereby decreasing the rate of infectious complications following surgery. Traditionally, bowel cleaning was once performed the usage of enemas in aggregate with oral laxatives. [4] More recently, oral cathartic retailers to induce diarrhea and cleanse the bowel from solid feces have been developed. These new bowel preparation agents, such as polyethylene glycol and sodium picosulfate, provide superior cleaning in contrast to the extra traditional strategies [5-7] and are used via most surgeons in preparation for colorectal surgery. [8-10] The practice of bowel cleaning earlier than colorectal surgical treatment has come to be a surgical dogma, and predominant colonic anastomosis is regarded dangerous in the face of an unprepared bowel. There is, however, a paucity of data displaying that mechanical bowel preparation by way of itself, separately from other operative and perioperative measures, clearly reduces the rate of infectious complications.

In vital colon surgical operation for penetrating trauma, latest research has proven that foremost colonic anastomosis is protected even although mechanical bowel preparation is no longer carried out earlier than surgery. [11,12] These facts consequently may additionally bring into query the utility of mechanical bowel preparation in elective colon and rectal surgery.

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 2013 to May 2014. 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 Hospital, Rajshahi, Bangladesh. The medical Pediatricians, Neonatologist and the surgeon were primarily involved in the decision-making process. The choice of treatment was made by the multidisciplinary

RESULT

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).

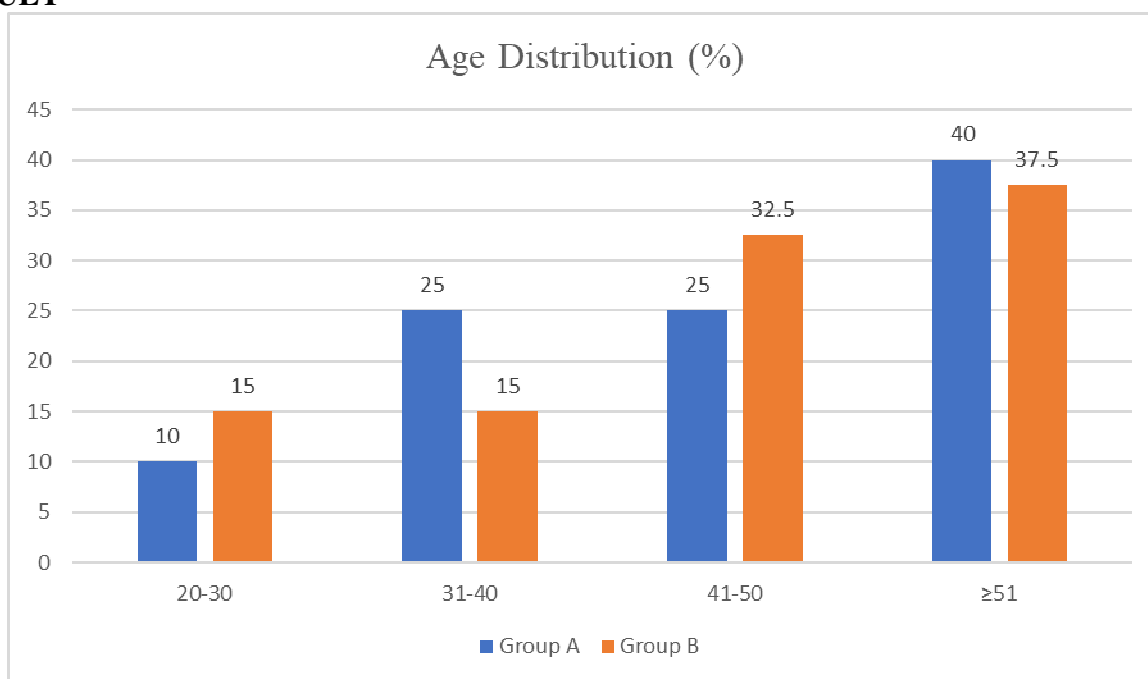


Fig. I: Distribution of the study population according to age (n=80)

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. Fig. I demonstrated the distribution of studied population according to age.

Table I: 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 I demonstrated the distribution of the study group according to sex.

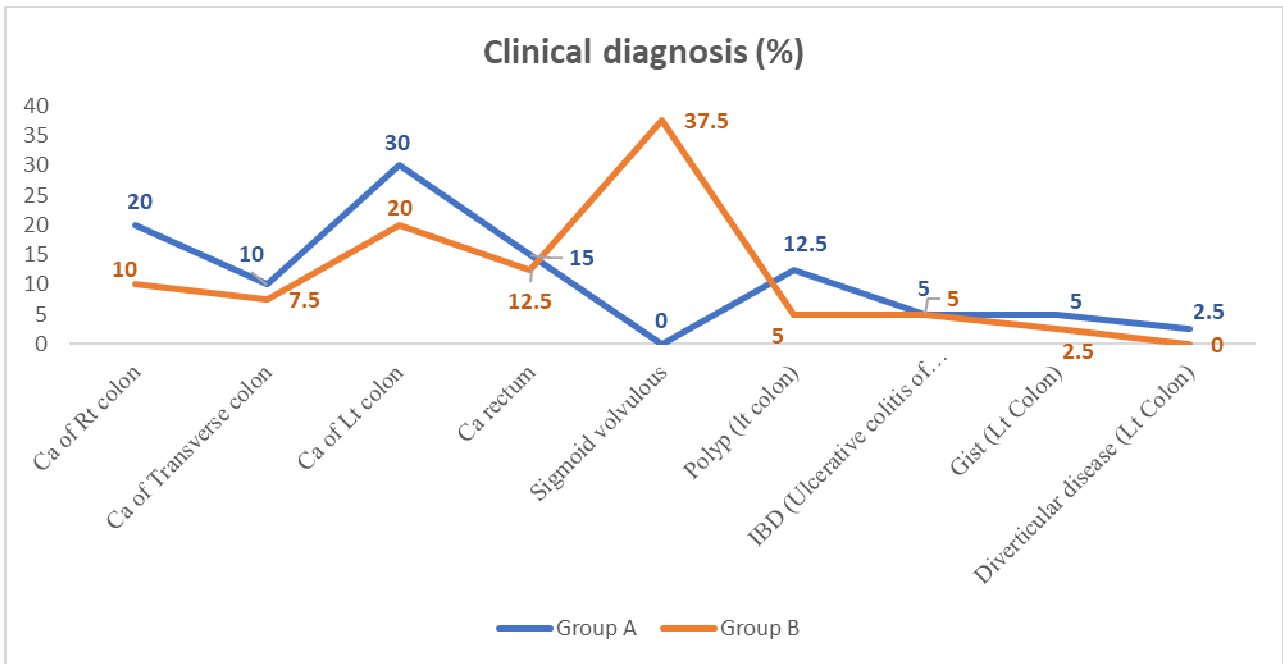


Fig. II: Distribution of the study group according to clinical diagnosis among groups.

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 volvulus, 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.

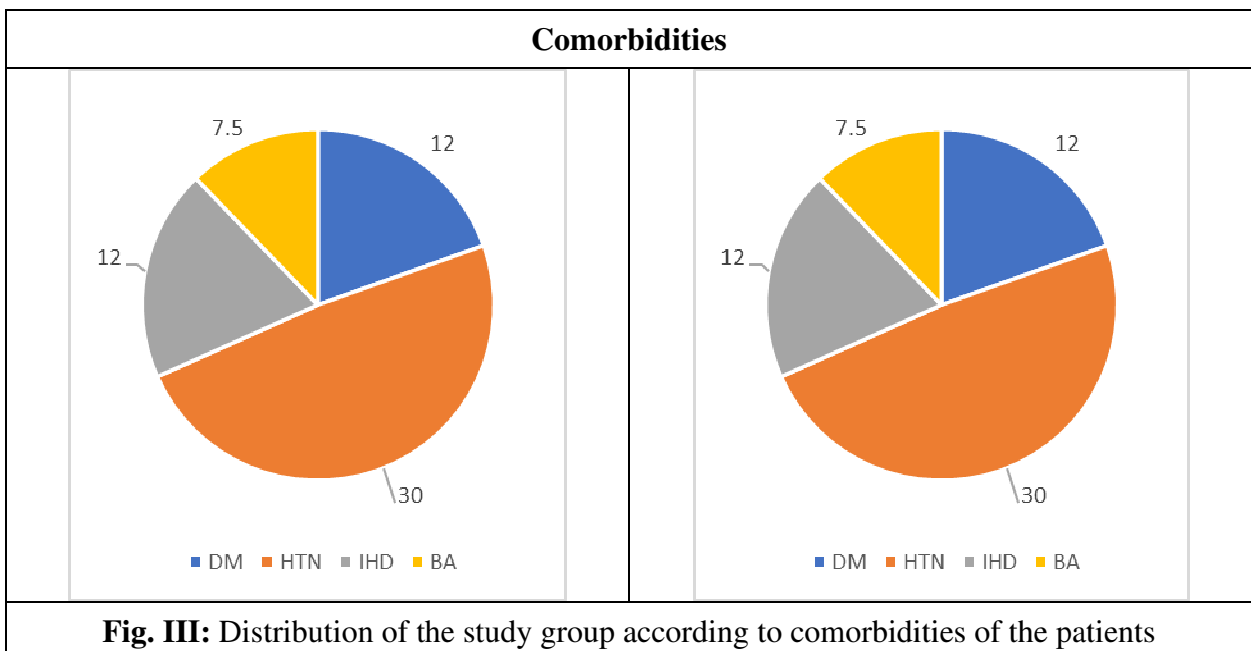


Fig. III: Distribution of the study group according to comorbidities of the patients

Figure III 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 ($P=0.968$).

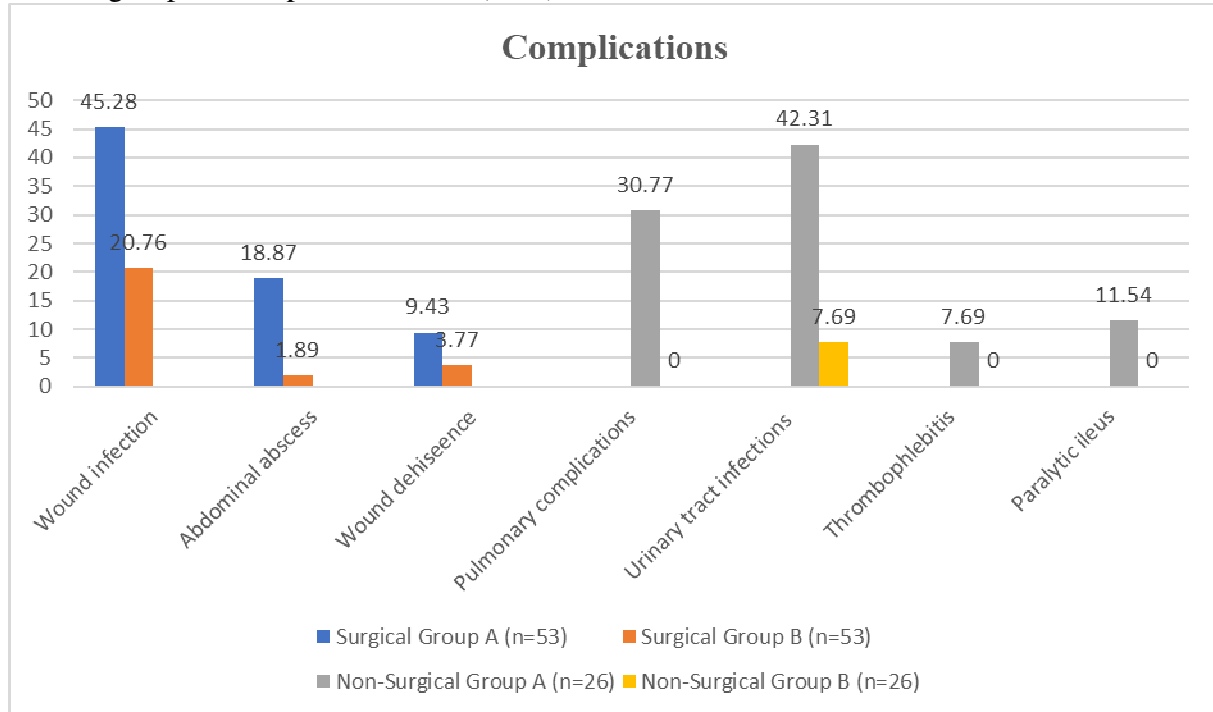


Fig. IV: Distribution of the study according to surgical and non-surgical infectious complications among groups. (N = 53)

Fig. IV 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. 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

Preoperative bowel instruction used to be introduced as a preferred in elective colorectal surgical procedure to limit the hazard of infection and to enhance operative dealing with of the bowel. Experimental and medical research have proven the effect of intraluminal fecal loading on the incidence of anastomotic disruption and subsequent leakage. [13-15] The retained feces can also act either through potentiation of local ischemia and anxiety or by means of establishment of perianastomotic infection. The addition of preoperative antibiotic bowel instruction to mechanical training has been proven to minimize infectious morbidity after colorectal surgical treatment via as much as 45

percent. [16, 17] Numerous protocols and products exist for preoperative bowel preparation. [18, 19, 20] However, some requirements of an ideal mechanical bowel preparation for colorectal surgical operation are broadly appreciated, such as a low incidence of aspect effects, low cost, and good quality of cleansing. In addition, it ought to be without difficulty administered, be simple, be effective, and have good patient tolerance.

The original traditional techniques for bowel-cleansing have been estimated as 70 percentage adequate. [21, 22] Elemental diets, entire bowel irrigation, and oral bowel education with a mannitol answer has proven efficacy in the vary of 75 to 80 percent. [23, 24] A terrific wide range of disadvantages in the use of these strategies have led to the introduction of new nonabsorbable osmotic agents such as polyethylene glycol in an isotonic balanced electrolyte solution (PEG). [25, 26] The use of this solution is related with good to excellent outcomes in larger than 90 percentage of patients and has hastily come to be the favored approach of mechanical bowel cleansing through colon and rectal surgeons. [19, 27] Despite their validated efficacy, the accomplishment of mechanical bowel-cleansing with these options stays problematic, mainly due to the fact of the massive volume needed, the related aspect effects, and the remarkably salty taste. [28, 29] Therefore, a low-volume modality for mechanical bowel instruction was once delivered through Vanner *et al.* in 1990. [30] The smaller volume sodium- phosphate solution (NaP) delivered confirmed superiority in each efficacy and tolerance in contrast with trendy PEG answer as a preparation for colonoscopy. More than 85 percentage of patients described their potential to entire the NaP as being convenient or tolerable, in contrast with only 31 percent of these who acquired PEG. A current potential randomized endoscopist-blinded trial in contrast PEG, a sulfate-free PEG solution, and NaP as guidance for colonoscopy. [31] In a

collection of 422 patients, 97 percentage of the NaP team referred to that they ingested 100 percentage of their lavage, in contrast with only 19 and 35 percentage of the PEG and PEG-sulfate-free groups, respectively ($P < 0.05$). To date, there have been no posted potential randomized surgeon-blinded research that have in contrast NaP with PEG-solutions as guidance for elective colorectal surgery.

In the current study, we prospectively randomized 80 patients who underwent elective colorectal surgery.

As in preceding publications, [32-34] this sequence suggests that patient tolerance to these bowel options used to be larger with NaP (65 percentage noted they would take the identical guidance again) than PEG (25 percent noted they would take the equal guidance once more and only 37 percentage took 100 percentage of the solution; $P < 0.0001$). Similarly, the incidence of aspect consequences was once higher with the PEG team than with the NaP group. Hyperphosphatemia is a regarded sequelae of NaP however appears to be without delay associated to the administered dose. [35] This alteration used to be monitored in a preceding find out about from this institution; therefore, only serum calcium blood level had been measured at this time. Contrary to different publications, [36, 37] serum calcium stages diminished after administration of each PEG and NaP options. This finding used to be additionally stated with the aid of Clarkston *et al.* [38] in a current trial evaluating oral NaP and PEG options in outpatient preparation for colonoscopy. The outcomes of oral sodium phosphate on serum electrolytes had been additionally suggested by means of Lieberman *et al.* [39] They analyzed 32 patients scheduled for elective colonoscopy who had normal serum creatinine levels and determined a modest decline in serum potassium and an extend in serum sodium. However, as in the past mentioned, an enormous extend in serum phosphate and a decline in serum calcium

levels have been noted, with no clinically obvious sequelae.

However, based on the literature, we support the idea that care ought to be taken when deciding patients to get hold of oral NaP bowel-cleansing solutions due to the fact it is contraindicated in patients with renal failure, congestive coronary heart failure, ascites, or congenital megacolon. [40, 41] Furthermore, hypokalemia related with ingestion of NaP solution can extend the chance of cardiac arrhythmias in patients who are receiving diuretics, digitalis, or different concomitant medications. [42] Both options have been demonstrated effective relative to bowel-cleaning capacity for bowel surgery. For excellent of cleansing, surgeons scored NaP as "excellent" or "good" in 87 percentage in contrast with 76 percentage after PEG, with no statistically considerable variations ($P > 0.05$). The rates of septic and anastomotic problems have been 4 percentage and 1 percentage for PEG and 1 percent and 1 percentage for NaP, respectively ($P = NS$).

Two latest publications counseled that NaP solution can produce aphthous ulcers in the left colon, particularly in the distal sigmoid and rectum, when utilized as an oral lavage answer 3s (Filipiak CL, De-Ridder PH, William FA, private communication). This discovering brought on Zwas *et al.* [43] to randomize patients to get hold of PEG or NaP options as bowel preparation for colonoscopy. These authors discovered these mucosal abnormalities in 24 percentage of patients who acquired NaP solution however additionally observed these ulcers in 2.3 percentage of patients in the PEG group ($P < 0.05$). Biopsies of the lesions did no longer exhibit lymphoid aggregates or proof of authentic aphthoid hyperplasia, as advised by using others. In the current study, this phenomenon used to be no longer determined both endoscopically or in the surgically resected specimen. Vanner *et al.*, [31] Kolts *et al.*, [34] Marshall *et al.*, [44] and Cohen *et al.* [22] additionally failed to

describe these ulcers. Moreover, they have been no longer referred to in the resected specimens, through both the blinded surgeon or by way of the pathologist in the cutting-edge study. Therefore, the real incidence of these ulcers is unknown.

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

We are in conclusion that mechanical bowel preparation earlier than elective colon and rectal surgical treatment can't stop complications like anastomotic leakage, wound infection, intra-abdominal sepsis, abdominal abscess and extra abdominal complications. The colorectal surgical procedure can be achieved safely besides mechanical bowel preparation.

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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The wide range of disciplines involved in durability and versatility of Mechanical Bowel Preparation in Elective Colorectal Surgery research means that an Editors needs much assistance from referees in the evaluation of papers submitted for publication. I am very grateful to many colleagues for their thorough, helpful and usually prompt response to requests for their opinion and advice.

DECLARATION

Conflict of interest: None declared.

Ethical approval: The study was approved by the ethical committee of Rajshahi Medical College, Rajshahi.

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