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## The comparison of saline enema and bisacodyl in rectal preparation before anorectal surgery



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### ABSTRACT

**Background:** Given the limited data on the need of mechanical bowel preparation application before anorectal surgeries and the preferred method for bowel preparation, we aimed to compare saline enema and bisacodyl in rectal preparation before anorectal surgery.

**Materials and methods:** This is a randomized clinical trial study. Seventy-nine hospitalized patients for anorectal surgery (hemorrhoid, fissure, and fistula) were recruited by convenient sampling and then randomly allocated to receive 500 cc Saline by rectal enema or six bisacodyl tablets (Sobhan company) beginning from a day before the operation in order to prepare the bowel. After surgery, surgeons' satisfaction of the surgery and patients' satisfaction of the preparation process were evaluated in the ward using Likert score by a nurse blind to the study. Also, the patients were interviewed for pain after the first defecation, using numeric rating scale based on a 0–10 scores. All patients were actively followed-up after discharge for 1 mo concerning postoperative complications. The obtained data were analyzed by SPSS software (version 16), Mann–Whitney, chi-squared, and Fisher exact tests at the significant level of  $P < 0/0.5$ .

**Results:** A total of 79 patients participated in the study, 38 received 500-cc saline by rectal enema and 41 bisacodyl tablets. No significant differences were observed between the two groups in most variables except for pain after the first defecation ( $P = 0.032$ ).

**Conclusions:** According to the results, the bisacodyl approach results in less pain in the first postoperative defecation and fewer complications than the rectal enema. Thus, bisacodyl can be suggested as a superior counterpart for enema.

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## 1. Introduction

Preoperative mechanical bowel preparation (MBP) is a standard practice in colorectal and anal surgeries. The ideal MBP should be cost-effective, easy to administer, and have minimal side effects. The goal of MBP is to clear the colorectal of feces and therefore to reduce the number of bacteria in the lumen of the bowel to minimize the risk of infective and anastomotic complications [1–4]. Yet, the use of MBP in the colorectal surgery remains a controversial issue [2]. A meta-analysis in 2009 of 14 randomized clinical trials concluded that any kind of MBP should be omitted before elective colonic surgery [1]. On the other hand, the necessity of MBP before anorectal surgeries has not yet been reported [3], although, most colorectal and anal surgeons continue to emphasize the importance of MBP [2,3]. There is a general belief by most surgeons that MBP reduces fecal mass and bacterial count in the lumen, enabling the surgeon to work with a clean bowel [2,5]. However, the preferred method of bowel preparation method for elective colorectal and anal surgery can be challenging, and it may be difficult for a physician to determine the appropriate level of processing for bowel preparation to reduce surgical site infections while minimizing patient discomfort [2,6–8].

On the basis of the present literature and the lack of data on the need of MBP application before anorectal surgeries, we aimed to compare saline enema and bisacodyl in rectal preparation before anorectal surgery.

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## 2. Materials and methods

This is a randomized clinical trial study. Seventy-nine hospitalized patients for anorectal surgery (hemorrhoid, fissure, and fistula) were recruited by convenient sampling and then randomly allocated to receive 500-cc saline by rectal enema or six bisacodyl tablets (Sobhan company, Rasht Industrial City, Iran) beginning from a day before the operation in order to prepare the bowel.

The inclusion criteria were patients aged >18 y who hospitalized for anorectal surgery and willingness to participate. The exclusion criteria were pregnancy, breast feeding, and the presence of heart failure, coronary artery diseases, and acute or chronic renal failure. All patients gave written informed consent before enrollment. The protocol of the study was approved by the Institutional Ethics Committee and registered with the Iranian Registry of Clinical Trials under the identifier IRCT138905094477N1. Patients were randomly divided into two groups by a computer-generated randomization scheme. The surgical team did not know the randomization details. All patients were followed by the same surgeon who was blind to the randomization and to patient details. A group received six bisacodyl tablets, two tablets every 4 h and for the other group, a rectal enema was performed with the 500-cc saline one time from the day before operation in order to prepare the bowel. All patients were prepared for surgery by overnight fasting. Also, all patients had intravenous antimicrobial prophylaxis at the time of anesthesia induction with 1-g ceftriaxone vial. Surgery was performed under general anesthesia. After

surgery, surgeons' satisfaction of the surgery was evaluated in the ward using Likert score by a nurse blind to the study. The patients were interviewed for satisfaction of the preparation process in the ward using Likert score by a nurse blind to the study. Also, the patients were interviewed for pain after the first defecation using the numeric rating scale based on a 0–10 scores with zero indicating no pain and 10 meaning the most intolerable pain ever experienced. All patients were actively followed-up after discharge for 1 mo concerning postoperative complications.

Data analysis was done by SPSS 16 software (IBM Incorporation, Chicago, IL). Quantitative variables normality was determined in the Kolmogorov–Smirnov test. Categorical variables were analyzed using the chi-square analysis or Fisher exact test. Mann–Whitney and t-test were used for comparison of continuous variables. Also, the effect size and the power were calculated. The significance level is considered at  $P < 0.05$ .

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## 3. Results

A total of 79 patients participated in the study; 38 received rectal enema and 41 bisacodyl tablets. The groups were matched for age, gender, accompanying diseases, and type of surgery. The demographic and medical characteristics of the 79 patients are shown in Table 1. No significant differences were observed between the two groups in most variables (such as surgeons' satisfaction of surgery, patient satisfaction of the preparation process, postoperative urinary retention, and postoperative bleeding) except for the pain after the first defecation (Table 2). The effect of the two types of MBP on postoperative variables are shown in Table 2.

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## 4. Discussion

The use of MBP has long been a common preoperative practice for many elective colorectal surgeries. However, the current literature lacks the evidence to support its use in routine colorectal surgeries [2,9]. Increasing number of randomized clinical trials and meta-analyses over the last decades had not shown any evidence supporting the advantage of MBP application before colorectal surgeries [3,10–12].

In Saha's study (2014), wound infections were detected in 12 patients (37.5%) with the MBP group (oral polyethylene glycol with phosphate enema) and 11 patients (35.48%) without MBP. No statistically significant result was seen in postoperative incidence of persistent fever after the second postoperative day, postoperative change of blood picture indicating infections, and postoperative hospital stay [13].

Also, in Kim's study (2014), there were five incidences of anastomosis leakage (10.0%) in the rectal enema group and two incidences (4.0%) in the MBP group ( $P = 0.24$ ) after rectal cancer surgery. Surgical site infection occurred in three patients (6.0%) in each group. The major finding of this study was that right-sided and left-sided colon cancer surgery could be performed safely without an MBP or with an enema-only approach [14].

Despite these findings, a substantial proportion of surgeons still continue to prescribe MBP routinely [13].

**Table 1 – The demographic and medical characteristics of the 79 patients participated in the study.**

Characteristic	Bisacodyl (n = 41)	Enema (n = 38)	P value	Effect size	Power
Age, mean ± SD	40.4 ± 15.84	36.8 ± 13.00	0.324 <sup>*</sup>	0.25	0.28
Gender, n (%)			0.902 <sup>†</sup>	0.01	0.05
Male	33 (80.5)	31 (81.6)			
Female	8 (19.5)	7 (18.4)			
Accompanying, n (%)			0.404 <sup>†</sup>	0.01	0.05
Yes	2 (4.9)	2 (5.3)			
No	39 (95.1)	36 (94.7)			
Type of surgery, n (%)			0.784 <sup>†</sup>	0.078	0.09
Hemorrhoid	32 (78.0)	32 (84.2)			
Fissure	3 (7.3)	2 (5.3)			
Fistula	6 (14.6)	4 (10.5)			

SD = standard deviation.

<sup>\*</sup>Mann–Whitney.<sup>†</sup>Chi-square.

Nonetheless, in the authors' knowledge, data concerning anorectal preparation are very limited. Some suggest that MBP is not necessary before elective anorectal surgeries [3]. The Tokac's study (2013) showed MBP performed before surgery does not provide intraoperative or postoperative benefit for Milligan–Morgan hemorrhoidectomy; suggesting that MBP is not necessary before elective anorectal surgeries [3]. On the other hand, poor preparation may result in liquid feces, which increases the chances of intraoperative spillage [2]; in post anorectal surgery, pain can lead to fecal impaction [15]. Fecal loading and spillage have been reported as contributory factors to anastomotic leakage [2].

In Tokac's study, the rates of postoperative bleeding and infection in the enema group were 30% and 5%, respectively [3]. But in our study, the rates of postoperative bleeding and infection in the enema group were 5.3% and 0.0%, respectively. Also, in Tokac's study, the pain during the first stool after the operation in the enema group was  $5.1 \pm 1.69$  [3]. But in our study, the rate of pain after the first postoperative defecation in the enema group was  $4.1 \pm 1.33$ . Perhaps the difference between the two groups in Tokac's study can be due to insufficient time to perform enema to clean the area. In our study, this is done the night before the operation giving the patients enough chance to clean the area. Another reason

**Table 2 – The effect of two types of MBP on postoperative variables.**

Variables	Bisacodyl (n = 41)	Enema (n = 38)	P value	Effect size	Power
Pain after the first defecation, mean ± SD	3.3 ± 1.52	4.1 ± 1.33	0.032 <sup>*</sup>	0.56	0.78
Postoperative complications, n (%)			0.373 <sup>†</sup>	0.05	0.07
Present	5 (12.19)	6 (15.79)			
Not present	36 (87.81)	32 (84.21)			
Postoperative urinary retention, n (%)			1.000 <sup>†</sup>	0.11	0.16
Present	1 (2.4)	0 (0.0)			
Not present	40 (97.6)	38 (100.0)			
Postoperative pain, n (%)			1.000 <sup>†</sup>	—	—
Present	0 (0.0)	0 (0.0)			
Not present	41 (100.0)	38 (100.0)			
Postoperative bleeding, n (%)			1.000 <sup>†</sup>	0.04	0.06
Present	3 (7.3)	2 (5.3)			
Not present	38 (92.7)	36 (94.7)			
Postoperative bleeding and pain, n (%)			0.190 <sup>†</sup>	0.16	0.31
Present	1 (2.4)	4 (10.5)			
Not present	40 (97.6)	34 (89.5)			
Surgical site infection, n (%)			1.000 <sup>†</sup>	—	—
Present	0 (0.0)	0 (0.0)			
Not present	41 (100.0)	38 (100.0)			
Postoperative fecal impaction, n (%)			1.000 <sup>†</sup>	—	—
Present	0 (0.0)	0 (0.0)			
Not present	41 (100.0)	38 (100.0)			
Surgeons satisfaction of surgery, mean ± SD	9.3 ± 1.12	9.4 ± 1.07	0.750 <sup>*</sup>	0.09	0.1
Patients satisfaction of preparation process, mean ± SD	7.3 ± 1.36	7.0 ± 0.98	0.247 <sup>*</sup>	0.25	0.29

SD = standard deviation.

<sup>\*</sup>Mann–Whitney.<sup>†</sup>Chi-square.<sup>‡</sup>Fisher exact test.

for the difference between the two groups in Tokac's study was low sample size.

The preferred method of bowel preparation for elective colorectal and anal surgery can be challenging [2,6–8]. Therefore, the purpose of this study was to compare saline enema and bisacodyl in rectal preparation before anorectal surgery. In our study, no significant differences were observed between the two groups (rectal enema and bisacodyl tablets) in most variables except for pain after the first defecation, such that the pain was more in those who had received enema. On the other hand, the potential disadvantages of enemas include the requirement for admission at least 24 h before surgery, its time-consuming nature, expensiveness, and unpleasant for the patient, and the risk of fluid and electrolyte imbalance particularly in the elderly population [16]. Therefore, it can be said that the use of bisacodyl tablets is less invasive and has fewer complications than enema.

As a limitation, the number of patients in this trial is small; therefore, it would be better to perform a similar study in a larger sample size for a more definite conclusion. It is recommended to perform further investigations with a more limited type of anorectal surgeries and a more careful selection of patients based on preoperative status.

## 5. Conclusions

In summary, the findings of this research showed that bisacodyl approach leads to less pain in the first postoperative defecation and fewer complications than the enema approach. Thus, bisacodyl can be suggested as a superior counterpart for enema.

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## Disclosure

The authors declare no conflict of interest in this study.

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