

# Bowel Preparations for Colonoscopy: Current Medical Practices in Pakistani Hospital Settings

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## ABSTRACT

**Aim:** To evaluate the quality of bowel preparations concerning the Boston Bowel Preparation Score (BBPS) and to analyze the administration, ease, palatability, and side effects of practices.

**Study design:** Cross-sectional study

**Place and Duration:** this study was conducted in Liaquat University of Medical and Health Sciences Jamshoro from October 2021 to March 2022

**Methodology:** The present study incorporated 132 patients who visited the hospital for a colonoscopy. Patients above 18 years of age were included, whereas patients with surgical procedures were excluded from the study. Participants were evaluated through pre-designed proforma for demography, dietary recommendations, side effects, procedure indications, bowel preparations, and patient ease of the bowel preparations. BBPS was used to assess the bowel preparation. A score  $\geq 5$  was regarded as satisfactory.

**Results:** Out of 132 patients, 73 (55.3%) were males. Seventy-one (53.8%) patients received Polyethylene glycol-based bowel preparation, and sixty-one (46.2%) patients received sodium phosphate-based preparation. Chronic constipation was the most typical cause of colonoscopy. Common side effects were vomiting (12.1%), nausea (1.5%), and bloating (3%). More than half of them responded that the preparations were palatable. A satisfaction rate of 80.3% was observed in patients with both preparations. BBPS of above five was observed in 109 (82.6%) patients.

**Conclusion:** Polyethylene glycol and sodium phosphate preparations have been widely used in clinical practices for cleansing the colon. Sodium phosphate-based preparation was found more effective.

**Keywords:** Bowel cleansing agents, Colonoscopy, Endoscopy, Polyethylene Glycol, Sodium phosphate.

## INTRODUCTION

Colonoscopy is a widely used procedure for the diagnosis and therapeutic evaluation of colon cancer. (1) Large and small intestines must be thoroughly cleansed before colonoscopy procedures to diagnose precarious lesions and adenoma. (2) Good bowel preparation is the most critical aspect of the success of the colonoscopy. The treatment can be finished earlier due to good preparation, and minor mucosal lesions are prone to be overlooked with inadequate preparations. (3) Adenoma miss rates during colonoscopies with insufficient bowel preparations have been reported to be 42% and 27%, respectively. (4) Insufficient intestinal preparation causes operations to take longer and require repeat colonoscopies more frequently, placing a heavy financial strain on the health system. (5) A clean colon is also necessary to incorporate sophisticated mucosal imaging techniques like narrow-band imaging. According to reports, the effectiveness of colon preparation has a direct impact on the frequencies of ileal intubation and adenoma diagnosis. (6) Inadequate planning leads to incomplete or protracted procedures, which can result in issues with the anesthesia and the treatment itself. The best colon preparation should make it possible to find colonic polyps as small as 5 mm. (7)

Bowel preparations come in many different varieties, each with unique volume, tolerability, and composition. Despite the significance of colon cleaning, national societies offer little advice on the best preparations or how to choose among the various choices. (8) According to current recommendations, a pretreatment should only be used if it considers the patient's medicine profile, medical history, and degree of prior exam-related cleaning. This general statement is due to a shortage of comparative effectiveness studies that thoroughly assess the preparation options in real situations. (9) Most of the information is derived from randomized controlled trials (RCTs) that compare two or three preparations within the framework of strictly regulated research protocols that might not fully represent actual situations. Although the effectiveness of the different bowel preparations has been thoroughly examined in these trials, the clinical efficacy of these

preparations in routine clinical practice has received less attention. (10) Patients, doctors, and other stakeholders are unclear about which bowel preps to employ in cancer screening programs due to the absence of comparative evidence data. (11) Furthermore, clinicians may use preparations that promise random trials, are affordable, and are available to third-world countries. Patient knowledge, attitudes, and beliefs about cancer screening interact with tolerability concerns, complicating the administration of and achieving adequate bowel preparations. The study's main goal was to evaluate the bowel preparation quality as indicated by the Boston Bowel Preparation Score (BBPS). The study also analyzes patient input on the bowel preparation's palatability, the convenience of administration, and adverse effects. We also assessed the elements influencing bowel cleaning.

## METHODOLOGY

The present cross-sectional study was performed after the approval of the Institutional Ethical Committee. Patients above 18 years of age who visited the hospital for outpatient colonoscopy were incorporated in the study. In contrast, patients who had colon surgeries were excluded from the study. Informed consent was taken from the patients before integrating them into the study. In our daily practice, consultants' most popular bowel preparations have been sodium phosphate preparations (20 ml) or polyethylene glycol-based preparations with electrolyte (2000 mL), given on various schedules—some split, others given all at once—along with variable dietary recommendations. Randomly, an oral stimulant laxative is administered before night.

Senior consultants decide the patient's preparation plan for the colonoscopy. An observer filled out a pre-designed proforma with the procedure's indication, patient's demographics, preparation specifics, preparation information, side effects, any food advice, and comfort level with preparation. Consultants conducted the colonoscopy after the intravenous sedation was employed. After an hour of the surgery, vital signs were monitored. The bowel preparation was evaluated using the BBPS. While

having the colonoscopy, the scores were recorded. A score of 5 indicated insufficiency, while >5 indicated adequate performance.

**RESULTS**

The present study incorporated 132 patients who underwent colonoscopy in our Hospital. Seventy-three (55.3%) were males, and fifty-nine (44.7%) were females. Polyethylene glycol-based bowel preparation was received by 71 (53.8%), whereas sodium phosphate-based preparation was given to 61 (46.2%) patients. Hypertension was noted in 6 (4.5%), Diabetes in 9 (6.8%), Kidney disease in 2 (1.5%) and Coronary artery disease in 3 (2.3%) patients. Chronic constipation was the most typical reason for endoscopy, followed by iron deficiency anemia. Eighty (60.6%) patients received a single dose of same-day preparation, and the other 52 (39.4%) patients received a split dose of same-day and previous night preparation (As shown in Table 1).

After receiving bowel preparations, few side effects like vomiting in 16 (12.1%), nausea in 2 (1.5%), and bloating in 4 (3%) patients were observed. As observed, 80 (60.6%) patients had the first loose stools after receiving preparation within an hour. One hundred and four (78.8%) patients followed regular stool. Nineteen (14.4%) patients said that the bowel preparations were tolerable, forty-two (31.8%) patients responded to it as non-palatable, whereas seventy-one (53.8%) responded it as palatable. Overall, one hundred and six (80.3%) patients were satisfied with their bowel preparations. The average time duration of colonoscopy was about 30 minutes. BBPS of the above five were observed in 109 (82.6%) patients (As shown in Table 2).

No significant association was observed with the patient's age, gender, dose schedule, and dietary schedule. In comparison, sodium phosphate preparations were associated with higher BBPS than the polyethylene glycol preparations (p<0.01) (As shown in Table 3).

Table 1: Description of baseline characteristics of patients (n=132)

Characteristics	Parameters	Frequencies (%)
Mean age (years)		39.2 ± 8.3
Gender	Male	73 (55.3)
	Female	59 (44.7)
Bowel Preparations	Polyethylene glycol-based	71 (53.8)
	Oral sodium phosphate-based	61 (46.2)
Comorbid conditions	Chronic kidney disease	2 (1.5)
	Coronary artery disease	3 (2.3)
	Diabetes + hypertension	4 (3)
	Hypertension	6 (4.5)
	Diabetes mellitus	9 (6.8)
	Miscellaneous	2 (1.5)
Indications	IBD	13 (9.8)
	Diarrhea	7 (5.3)
	Constipation	51 (38.6)
	Cancer screening	19 (14.4)
	Iron deficiency anemia	42 (31.8)
		52 (39.4)
Same-day or split-dose preparation (n= 132)	Split-dose	52 (39.4)
	Same-day	80 (60.6)
Diet recommendation	Early dinner, liquid diet, low, fiber diet	27 (20.4)

Table 2: Description of patient's procedures, preparation details and side effects (n=132).

Parameters	Outcome	Frequency (%)
Mean Procedure Duration (min)	31 ± 8.3	
First motion after receiving preparation (min)	< 1 hour	80 (60.6)
	1-2 hours	31 (23.4)
	> 2 hours	21 (15.9)
Stool Details	Yellow	28 (21.2)
	Normal	104 (78.8)
Side Effects	Nausea	2 (1.5)
	Vomiting	16 (12.1)
	Bloating	4 (3)
Patient's review of preparations	Not Satisfied	26 (19.7)
	Satisfied	106 (80.3)
Palatability	Tolerable	19 (14.4)
	Bad	42 (31.8)
	Good	71 (53.8)

BBPS	< 5	23 (17.4)
	≥ 5	109 (82.6)

BBPS=Boston Bowel Preparation Score

Table 3: Description of factors affecting preparations

Categories	BBPS ≥ 5 (n= 23)	BBPS < 5 (n=109)	P value
Male	13 (56.5)	60 (55)	0.56
Female	10 (43.5)	49 (45)	
Sodium phosphate-based preparation	16 (69.6)	66 (60.5)	0.01
Polyethylene glycol	7 (30.4)	43 (39.5)	
Split preparations	13 (56.5)	45 (41.2)	0.17
laxatives	14 (60.8)	70 (64.2)	0.54
Diet modification	9 (39)	42 (38.5)	0.37

**DISCUSSION**

Colonoscopy is the current best procedure for visualizing the entire intestinal mucosa. Numerous significant studies have demonstrated that people having colorectal cancers develop adenomas, and colonoscopy detection can reduce mortality with colorectal cancer. (12) Good intestinal cleansing is essential for the high diagnostic performance of colonoscopy, particularly for early tumour lesions. Since the effectiveness of bowel cleansing is a critical element in determining the speed, difficulty, and thoroughness of colonoscopy, a well-cleansed colon is a necessary prerequisite for colonoscopy success. (13) For bowel preparation, colonoscopy solutions are frequently recommended. There are several colonoscopy options available. Case studies demonstrate how bowel preparation solutions for colonoscopy can result in aberrant electrolyte levels. The type of bowel preparation solution used, the patient's age, and other comorbidities all affect the likelihood of electrolyte imbalances. (14)

In Pakistan, polyethylene glycol preparation is typically used during colonoscopies and is superior to other medications due to its affordability. (15) In the present study, polyethylene glycol-based preparations are utilized less frequently than sodium phosphate-based preparations for bowel cleansing before colonoscopy. Divided doses and same-day early morning preparation were used; however, neither impacted bowel cleansing. Better bowel preparation was achieved with sodium phosphate preparations. A previous study compared our results showed that patients have higher chances of successful colonoscopy with sodium phosphate bowel preparations. (16) Dong et al. (2020) showed no significant difference in Polyethylene glycol and sodium phosphate solution preparations. (17) The present study observed that the male ratio for colonoscopy was higher than the females. Similar results were observed in the previous study. (18)

Time for bowel preparation administration is the critical variable impacting the effectiveness of cleansing. It would seem incredible to prepare it on the same day as the patients experience less abdominal pain when there is minimal disruption while taking food, uninterrupted sleep, and their work schedule. (19) Our study does not report any significant difference in the bowel cleansing and BBPS score. Few studies are available to analyze diet with the effectiveness of colonoscopy. For an outpatient colonoscopy, a specified low, fiber diet is usually sufficient. In some circumstances where there is a high risk of insufficient cleansing, a liquid diet seems appropriate. (20, 21) Dietary modifications were suggested for 20.4% of patients before the colonoscopy. The primary reason for the dietary change may be due to constipation. The study's limitations were small sample size, single-centred study, lack of standard diet protocols, and prospective follow-ups.

**CONCLUSION**

Our research reveals that the quality of bowel cleansing is unaffected by dietary changes, premedication, or dose schedule. In most situations where PEG cannot be utilized either to patient desire or due to its adverse effects, sodium phosphate can be used as an alternate treatment. In patients whose colonoscopy

revealed insufficient intestinal cleansing, sodium phosphate may be used. These results must be confirmed in larger, more practical multicenter comparative effectiveness studies to expand them and assess their influence on different outcomes.

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