

Diet restriction is not mandatory with sodium picosulphate/magnesium citrate based bowel preparation

Diet is not mandatory in bowel preparation

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Abstract

Aim: This study aimed to investigate whether a 3-day diet restriction before colonoscopy is necessary as part of a bowel preparation regimen.

Material and Methods: This retrospective trial was conducted as a single-blinded study at a tertiary hospital. Overall, 60 adult patients who used sodium picosulphate with magnesium citrate regimen for bowel preparation were divided into two groups (Group 1: diet restriction = 29; Group 2: no diet restriction = 31) based on whether they used a 2-day diet restriction before the colonoscopy. The colonoscopy video records were evaluated by a clinician who was blinded to the type of bowel preparation. The Ottawa Bowel Preparation Quality Score was used to evaluate the quality of bowel cleansing.

Results: No significant intergroup differences were observed regarding the bowel cleansing quality, both overall and all segments of the colon. The overall adequate colon cleansing was 93.1% in Group 1 and 77.4% in Group 2. The percentage of patients with a score of 0 on the Ottawa scale based on the cleansing was higher in Group 2 than Group 1 (6.9% vs. 22.6%)

Discussion: This study observed that sodium picosulphate with magnesium citrate regimen without diet restriction delivered similar bowel preparation and successful colonoscopy results like those achieved with diet restriction. Sodium picosulphate with magnesium citrate, which requires less fluid volume and has a better taste, can be chosen without diet restriction for bowel preparation to ensure adequate patient compliance.

Keywords

Bowel preparation; Diet restriction; Sodium picosulphate; Colonoscopy

DOI: 10.4328/ACAM.20294 Received: 2020-07-27 Accepted: 2020-09-04 Published Online: 2020-09-10 Printed: 2021-04-01 Ann Clin Anal Med 2021;12(4):388-391

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Introduction

Adequate bowel cleansing is crucial for evaluating the colon mucosa and performing colonoscopic interventions safely. Despite the various combinations of bowel preparation regimens and agents, the rates of inadequate bowel preparation are reported to be between 20% and 30% [1].

Currently, all bowel preparation protocols for colonoscopy are performed using a combination of laxative agents and a clear or less fibre diet [2]. In Europe, three bowel preparation agents are commonly used, namely high-volume osmotically balanced polyethylene glycol (PEG); low-volume hyperosmotic sodium phosphate; and sodium picosulphate with magnesium citrate (SPMC), a low-volume osmotic laxative and its combination [2]. Nevertheless, there are contradictions regarding the PEG solutions owing to their taste and high-volume, as well as the NaP solutions because of concerns regarding their safety [3,4]. Sodium picosulphate with magnesium citrate is effective because of its small volume, besides being easy to administer and a well-tolerated bowel preparation agent [5]. Notably, the primary purpose of an ideal bowel cleansing is not only to empty the bowel completely but also to ensure that the agents used are suitable and tolerable by the patient. Various additional products have been used in conjunction with conventional regimens to provide more effective bowel cleansing and improve patient compliance. One of these methods is to combine the bowel preparation agents with pineapple juice, which has been reported to be successful [6-8].

Several studies have focused on the comparison between a low residue diet and a clear liquid diet in bowel preparation [9-11]. However, studies that explored bowel preparation regimens without diet restriction are scarce [12, 13]. Diet restriction during bowel preparations is often considered a normal protocol. Therefore, the effect of diet restriction is unknown because of the lack of studies on bowel preparation protocols without diet restriction. In fact, one of the reasons for patient noncompliance and dissatisfaction in bowel cleansing regimens is dietary restrictions [14].

In this study, we evaluated the effect of no diet restriction on bowel preparation before colonoscopy.

Material and Methods

Patients and study design

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. Informed approval was obtained from every participant in the study. Our study was a retrospective single-blind study that examined the data of patients who underwent elective colonoscopy at KTO Karatay University, Hospital of Medical Faculty between January 2018 and January 2019. This study was approved by the local ethics committee of the KTO Karatay University, Hospital of Medical Faculty. Exclusion criteria included pregnancy, age under 18 years, chronic constipation, major psychiatric illness and serious medical conditions, such as severe cardiac, renal, liver or metabolic disease, stroke or dementia. We included patients of two experienced endoscopy teams who applied SPMC with a

two-day liquid diet protocol (Group 1 = 29) and SPMC without diet restriction (Group 2 = 31). The patients were divided into two groups based on the type of bowel preparation protocol.

Bowel preparation procedure

Patients in Group 1 were instructed to avoid foods that contain a lot of fibre, such as vegetables, seaweeds, mushrooms and fruits for 2 days before the scheduled colonoscopy. No dietary restriction was recommended to patients in Group 2. SPMC (PICOPREP, Ferring Arzneimittel Ges.m.b.H, Vienna, Austria) was used as the bowel cleansing agent. Patients were instructed to mix two sachets of PICOPREP powder (10 mg of sodium picosulphate, 3.5 g light magnesium oxide and 12 g anhydrous citric acid per sachet), each separately, with 150 mL of water. The first 150 mL was ingested at 18:00 the day before the colonoscopy, followed by at least 2 L of clear liquids. The remaining 150 mL was ingested the next morning at least 4 hours before colonoscopy, followed by at least 2 L of clear liquids. All patients underwent rectal enema (BT enema 210 mL, Yenişehir lab, Çankaya, Ankara) at 23:00 and 6 am before colonoscopy.

Colonoscopy evaluation and bowel cleansing assessment

The colonoscopy video records of patients were reassessed by the endoscopist, who was blinded to the patient's regimen, and bowel cleansing was evaluated. Bowel cleansing adequacy was assessed using the Ottawa Bowel Preparation Scale, with scores ranging 0–4 (Table 1) [15]. The score comprised a subscore of 0–4 for each colon segment, namely right, transverse, left, rectosigmoid, as well as the entire colon. Ottawa scores of 3 and 4 were considered inadequate bowel cleansing. Moreover, it was recorded whether ileum intubation could be performed.

Statistical analysis

Statistical analyses were performed using SPSS version 21.0 computer-based software (SPSS Inc, Chicago, IL, USA). Statistical significance was accepted as <0.05. The chi-square test and Mann-Whitney U test were employed to analyse the categorical and continuous variables, respectively.

Results

Overall, 60 patients were enrolled in this study. The demographic features of the patients are presented in Table 2. No intergroup differences were observed regarding demographic features. The mean age of the patients was 45.7 years (range 20–85 years), and 60% of them were men.

Rates of bowel preparation adequacy were similar for both groups regarding each colonic segment, as well as the entire colon (Table 3). Similarly, the ileum intubation rates were similar for both groups. However, favourable results were observed in Group 1 compared with Group 2. The overall colon cleansing adequacy was 93.1% in Group 1 and 77.4% in Group 2.

The mean bowel cleansing scores per the Ottawa Scoring System were similar for Group 1 vs Group 2, regarding right, transverse, left and rectosigmoid region of colonic segment and overall colon evaluation (respectively, $p=0.983$, $p=0.569$, $p=0.367$, $p=0.509$, $p=0.277$). The mean score of the overall colon was 1.13 in Group 1 and 1.45 in Group 2. Notably, the percentage of patients with a score of 0 on the Ottawa Score according to the cleansing in the overall, transverse and left segment of the colon was higher in Group 2 than Group 1

(35.5%, 32.3%, 51.6% vs. 27.6%, 20.7%, 41.4%, respectively; $p > 0.05$). However, the percentage of inadequate cleansing of the overall, transverse and left segment of the colon was lower in Group 1 than Group 2 (6.9%, 13.8%, 6.9% vs. 22.6%, 22.6%, 25.8%; $p > 0.05$).

Table 1. Ottawa bowel preparation grading system (10-19)

Score	Description
0	no fluid
1	able to see mucosa without aspiration
2	able to see mucosa after aspiration
3	able to see mucosa after both washing and aspiration
4	solid stool, incapable of aspiration

Table 2. Demographic features of patients according to colon preparation regime

		Group 1	Group 2	Total	P value
		N/% Mean \pm SD	N/% Mean \pm SD	N/% Mean \pm SD	
Number of patients		29/48.3	31/51.7	60/100	
Age (years)		43.58 \pm 11.17	47.74 \pm 16.12	45.73 \pm 13.99	0.171
Sex	male	16/55.1	20/64.5	36/60	0.460
	female	13/44.9	11/35.5	24/40	

Table 3. The effectiveness of the groups in the different segments of the colon and ileum intubation ratio according to the Ottawa Scoring System

Score	Group 1 N/%	Group 2 N/%	P value
Right colon			
Adequate	17/58.6	21/67.7	0.46
Inadequate	12/41.4	10/32.3	
Transverse colon			
Adequate	25/86.2	24/77.4	0.37
Inadequate	4/13.8	7/22.6	
Left colon			
Adequate	27/93.1	23/74.2	0.05
Inadequate	2/6.9	8/25.8	
Rectosigmoid colon			
Adequate	25/86.2	27/ 87.1	0.91
Inadequate	4/13.8	4/ 12.9	
Overall			
Adequate	27/93.1	24/77.4	0.08
Inadequate	2/6.9	7/22.6	
Ileum intubation rate			
None	8/27.6	5/16.1	0.355
Yes	21/72.4	26/83.9	

Discussion

Even though PEG solutions are considered the gold standard in bowel preparation regimens for a colonoscopy, there is still no consensus regarding the ideal bowel preparation protocol. The primary aim of intestinal cleansing is not only achieving a well-cleansed colon lumen but also ensuring maximum patient compliance and tolerance. Currently, the most common problems in bowel preparation regimens are the necessity for

high-volume fluid intake, difficulty in drinking the preparation owing to bad taste and side effects after the regimen, such as nausea, vomiting and excessive bowel sensitivity. However, SPMC protocols have gained popularity because of its small volume and good taste, as well as for being easy to administer and well tolerated by patients [2]. Several studies have reported that SPMC solutions have similar effects on the bowel preparation for colonoscopy procedures compared with PEG solutions [16-19].

One of the major reasons that affect a patient's compliance with bowel preparation protocols is the liquid or less fibre diet that lasts 2-3 days. Notably, diet restriction is a crucial component for adequate bowel preparation, and the current guidelines recommend a low residue or full liquid diet on the day before colonoscopy [19]. Previous studies have demonstrated that reduced dietary restriction does not affect bowel cleansing quality [20, 21]. On the other hand, few studies have reported only regarding the effect of diet in colon preparation [20-23]. In the first study on this subject, Sayed et al. [24] reported excellent patient compliance and colon cleansing results (66% vs. 75%, $p < 0.05$) in patients with a less restricted diet compared with the liquid diet. Aoun et al [22] used PEG solutions for bowel preparation and reported similar results with a liquid diet and no dietary restrictions. Nevertheless, to our knowledge, this is the only study that addressed the use of an unrestricted diet for colonoscopy preparation with SPMC solutions in adults.

Our study compared the results of the SPMC regimen with a 2-day liquid diet and SPMC regimen without any dietary restriction. Based on our results, we observed that dietary restriction with the SPMC regimen did not provide superiority in colonoscopy results. Adequate bowel preparation and ileum intubation rates of both colon segments and overall colon evaluation were similar between the two groups (Tables 3). Notably, the perfect cleansing rate of the overall, transverse and left segment of the colon was higher in the unrestricted diet group. In addition, inadequate cleansing rates in both bowel preparation groups were consistent with previous studies (6.9% vs. 22.6%) [25].

Nonetheless, this study had some limitations. First, we could not conduct patient compliance and patient satisfaction survey because it was a retrospective study. Second, we could not exclude some factors that may affect colon cleansing, such as BMI, chronic constipation. Moreover, we could not distribute patients to random groups because of the retrospective nature of this study.

Nevertheless, based on the study results, it can be suggested that excellent colon cleansing results can be obtained using SPMC solutions without any dietary restrictions, thereby facilitating patient compliance during bowel preparation in clinical practice. Furthermore, this technique allows colonoscopy to be performed a day after the examination because no dietary restriction is required.

Scientific Responsibility Statement

The authors declare that they are responsible for the article's scientific content including study design, data collection, analysis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.

Animal and human rights statement

All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. No animal or human studies were carried out by the authors for this article.

Funding: None

Conflict of interest

None of the authors received any type of financial support that could be considered potential conflict of interest regarding the manuscript or its submission.

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How to cite this article:

Süleyman Kargın, Nisa Çetin Kargın. Diet restriction is not mandatory with sodium picosulphate/magnesium citrate based bowel preparation. *Ann Clin Anal Med* 2021;12(4):388-391