

Bowel Preparation for Colonoscopy in Nigeria

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ABSTRACT

Background: Bowel preparation is a part of necessary preparation for all gastrointestinal endoscopic procedures. Its goal is to have a comfortable, safe, and complete examination for a possibly well motivated patient. The aim of this study was to evaluate bowel preparation carried out for lower gastrointestinal endoscopy by gastrointestinal endoscopy practitioners in Nigeria in the year 2021. **Materials and Methods:** A cross-sectional descriptive study was carried out among gastrointestinal endoscopy practitioners at a conference using self-administered questionnaires. Data was collected, and analysed using the Statistical Package for the Social Sciences (SPSS) version 20.0. **Results:** A total of eighty-two (82) respondents participated in the study. Twenty-two (26.8%) respondents asserted to carrying out ≥ 15 colonoscopies per month in their center of practice, and 56 (68.3%) respondents had practiced for 1-14 years. Three-day bowel preparation was carried out by 22 (26.8%) respondents, and other regimens were carried out by fewer number of respondents. Bisacodyl (Dulcolax) tablets and Magnesium Sulphate (Epson salt) combination was used by 20 (24.4%) respondents. Forty (48.8%) respondents asserted to achieving $\geq 90\%$ bowel preparation adequacy for colonoscopy with preferred regimen. However, twenty (24.4%) respondents have had to abandon the procedure 11 - 20% of the time due to poor bowel preparation, and 54 (65.9%) experienced procedure abandonment in less than 10% of the time. **Conclusion:** The practitioners of gastrointestinal endoscopy are relatively few. There is need to improve on practice by training more practitioners, and ensure uniform practice to improve outcome and patient care.

Keywords: Bowel preparation, Lower Gastrointestinal Endoscopy, Colonoscopy, Port Harcourt, Nigeria.

INTRODUCTION

Bowel preparation for elective colorectal surgery though described as controversial,[1] has long been routine despite some emerging evidence challenging the practice.[2-5] It is a common practice though with some variation among surgeons in different countries.[6-10] Several reasons are given for the practice of bowel preparation including - easy manipulation of bowel, enable passage and firing of surgical staplers, and allow for intraoperative colonoscopy, and reduction of surgical site infections – with clinical practice guidelines available from interest groups.[5, 11-13] The issue is however different for bowel preparation for endoscopy, though there are different methods available. There is unanimity in opinion on the need for bowel preparation for lower gastrointestinal endoscopy,[14-16] especially as the diagnostic / therapeutic yield is directly related to quality of the bowel preparation performed.

Bowel preparation is a part of necessary preparation for all endoscopic procedures whose goal is to have a comfortable, safe, and complete examination for a possibly well motivated patient.[17, 18] Poor bowel preparation is therefore considered as a potential risk factor for complications in colonoscopy,[16, 19, 20] in addition to possible missed lesions, cancelled procedures, and increased procedure time. Although there is no consensus on the ideal method of bowel preparation, proper cleaning is regarded as one that allows the detection of colonic polyps 5 mm or larger.[20, 21] Inadequate bowel preparation has been reported in 15% to 48% of all colonoscopies with documented risk factors,[22-26] including higher prevalence among African-Americans.[27] In a study done in Lagos Nigeria, bowel preparation was done with low residue diet and stimulant laxatives was considered good in 81.4% of the patients.[28] Use of laxatives (comprising Bisacodyl, Magnesium sulphate and lactulose syrup) in a three-day bowel preparation has been reported in Ilorin.[29] A three-day regime of a combination of liquid diet, bisacodyl tablets, night dose of bisacodyl suppository, and normal saline was used in Ibadan, Nigeria.[30]

There is need to improve on the quality of lower gastrointestinal endoscopy carried out in our setting. Among others, the quality of bowel preparation is known to affect output and hence cardinal to achieving this goal. We therefore set out to evaluate the bowel preparation carried out before endoscopy in terms of the agents used, the duration of preparation, the outcome, and challenges encountered.

MATERIALS AND METHODS

Study Area: The study was carried out in Port Harcourt the capital of Rivers State, being one of the Niger Delta states in the Federal Republic of Nigeria.

Study Sites: The 13th Conference of the Society for Gastroenterology and Hepatology in Nigeria (SOGHIN) that held in Port Harcourt from 26th to 30th of July 2021 was the study site.

Research Design: A cross-sectional descriptive study

Study Population: Gastrointestinal endoscopists formed the study population.

Sample Size Determination: A total sample was taken.

Sampling Method: All those who gave consent for the study were included in the study.

Study Instrument: Self-administered semi-structured questionnaires was used for data collection.

Data Analysis: Information on socio-demographics, regimen used for bowel preparation for lower gastrointestinal endoscopy, the outcome of the regimen used for bowel preparation, the challenges associated with the regimen used for bowel preparation, were collated and analysed using the Statistical Package for the Social Sciences (SPSS) version 20.0.

Validity/Reliability of Instrument: The study instrument was scrutinized by all authors, the study instrument was pre-tested in a similar work environment and corrections made before commencement of study. The Cronbach alpha (in SPSS) was used for the validity of the study instrument.

RESULTS

A total of eighty-two (82) respondents participated in the study.

Table 1: Socio-demographic characteristics of respondents (n = 82)

Variables	Number	Percentage
<i>Sex</i>		
Male	42	51.2
Female	40	48.8
<i>Age</i>		
Less than 30 years	10	12.2
30- 39 Years	36	43.9
40- 49 Years	20	24.4
50- 59 Years	16	19.5
<i>Number of years in endoscopy practice</i>		
Less than 1year	20	24.4
1-4 years	26	31.7
5 - 9 years	20	24.4
10 - 14 years	10	12.2
15 - 19 years	4	4.9
20 years and above	2	2.4
<i>Category of Respondents</i>		
Consultants	18	22.0
Senior Registrar	22	26.8
Registrar	6	7.3
General Practice	8	9.8
Endoscopy Nurse	28	34.1
<i>Institution of Practice</i>		
Public	48	58.5
Private	12	14.6
Both Public and Private	22	26.8

Specialty of Respondents

Physician	40	48.8
Surgeon	6	7.3
Nursing	36	43.9

The demographic characteristics of the respondents is summarized in Table 1. There were 42(51.2%) males and 40 (48.8%) females. Fifty-six (68.3%) respondents were within the age range of 30-49years. The endoscopy practice experience of 56 (68.3%) respondents ranged from 1-14years. Among the respondents were 18 (22%) consultants, 22 (26.8%) senior registrar, 28 (34.1%) endoscopy nurses etc. Forty-eight (58.5%) respondents worked in the public sector, while 12 (14.6%) respondents were practitioners in the private health sector.

Table 2: Regimen used for bowel preparation for lower GI endoscopy (n = 82)

Variables	Number	Percentage
<i>Approximate number of colonoscopies performed per month</i>		
Less than 5	16	19.5
5 - 9	28	34.1
10 - 14	12	14.6
15 or more	22	26.8
No response	4	4.9
<i>How long diet restriction was prescribed before colonoscopy</i>		
Nil	4	4.9
One-day	20	24.4
Two-day	20	24.4
Three-day	28	34.1
Four-day	6	7.3
Five-day	4	4.9
<i>Number of days for bowel preparation for colonoscopy patients</i>		
Same-day Single dose	6	7.3
Split-dose overnight	6	7.3
A day before	12	14.6
Two-day	20	24.4
Three-day	22	26.8
Four-day	8	9.8
Five-day	2	2.4
No response	6	7.3
<i>Period of waiting after bowel preparation before colonoscopy</i>		
Less than one hour	8	9.8
1-2 hours	10	12.2
3-4 hours	18	22.0
5-6 hours	2	2.4

7-8 hours	24	29.3
more than 8 hours	14	17.1
No response	6	7.3

Table 2 shows the monthly number of procedures and the regimen used for bowel preparation for lower GI endoscopy. Twenty-two (26.8%) respondents asserted to carrying out ≥ 15 colonoscopies per month in their center of practice. For 12 (14.6%) respondents it was about 10-14, while 28 (34.1%) opined 5-9 per month. Twenty-eight (34.1%) respondents asserted to prescribing three-day diet restriction before conducting colonoscopy; 20 (24.4%) emphasized two-days, and another 20 (24.4%) respondents opined one-day diet restriction. Three-day bowel preparation was carried out by 22 (26.8%) respondents; two-day bowel preparation by 20 (24.4%); a day before – done by 12 (14.6%) respondents; split-dose overnight – carried out by 6 (7.3%); and same day single dose by 6 (7.3%) respondents. The period of waiting after bowel preparation before colonoscopy was also variable, with 24 (29.3) respondents – highest number for a single option – routing for 7-8 hours.

Table 3: Regimen used for bowel preparation for lower GI endoscopy continued (n = 82)

Variables	Number	Percentage
<i>Agent use for bowel preparation for colonoscopy</i>		
Bisacodyl (Dulcolax) Tablets	4	4.9
Bisacodyl (Dulcolax) Suppository	8	9.8
Magnesium Sulphate (Epson salt)	4	4.9
Sodium Phosphate (Visicol)/ Aqueous Sodium Phosphate	6	7.3
Castor oil, PEG and electrolytes combination	4	4.9
Bisacodyl (Dulcolax) Tablets and Castor oil	4	4.9
Polyethylene glycol (PEG) and electrolytes combination	6	7.3
Low-volume PEG/PEG-3350 and Bisacodyl	2	2.4
Sulphate-free-PEG (SF-PEG)	2	2.4
Bisacodyl (Dulcolax) Tablets and Magnesium Sulphate (Epson salt)	20	24.4
Picolax (Sodium Pico phosphate)	8	9.8
Dulcolax, Castor oil and PEG and electrolyte combination	10	12.2
No response	4	4.9
<i>Adjuncts to colonic cleansing used</i>		
Flavoring	6	7.3
Nasogastric/Orogastric Tube Administration of Colonic preparation	8	9.8
Metoclopramide	4	4.9
Carbohydrate-Electrolyte Solution	4	4.9
Bisacodyl	22	26.8
None	4	4.9
No response	34	41.5

Table 3 shows the drugs/agents used for bowel preparation for lower GI endoscopy. Several drugs were used for bowel preparation before lower gastrointestinal endoscopy, however, the drugs asserted to by larger number of respondents were: Bisacodyl (Dulcolax) tablets and Magnesium Sulphate (Epson salt) by 20 (24.4%); and Dulcolax, Castor oil and polyethylene glycol-electrolyte solution (PEG) – assented to by 10 (12.2%) respondents. Respondents' opinion on the use of adjuncts to colonic cleaning witnessed a mention of Bisacodyl by 22 (26.8%), and use of some other drugs by a few other respondents. Thirty-four (41.5%) respondents did not assent to using any agent as adjuncts to bowel preparation.

Table 4: Outcome of regimen used for bowel preparation (n = 82)

Variables	Number	Percentage
<i>Percentage of bowel preparation adequacy achieved with preferred regimen for colonoscopy</i>		
90% and above	40	48.8
80 - 89%	16	19.5
70 - 79%	6	7.3
60 - 69%	10	12.2
Less than 60%	6	7.3
No response	4	4.9
<i>Percentage of patient abandoned or deterred due to poor bowel preparation</i>		
Less than 10%	54	65.9
11 - 20%	20	24.4
31 - 40%	4	4.9
No response	4	4.9

Table 4 shows the outcome of regimen used for bowel preparation. Forty (48.8%) respondents asserted to achieving $\geq 90\%$ bowel preparation adequacy for colonoscopy with preferred regimen, while 16 (19.5%) respondents achieved 80 - 89%. Twenty (24.4%) respondents have had to abandon the procedure 11 - 20% of the time due to poor bowel preparation, and 54 (65.9%) experienced procedure abandonment in less than 10% of the time.

Table 5: Challenges with regimen used for bowel preparation (n = 82)

Variables	Frequency	Percentage
<i>Challenges encountered in bowel prep with the regimen used</i>		
None	10	12.2
Patients fail to comply with scheduled regimen	18	22.0
Bowel not properly emptied	14	17.1
Dehydration	4	4.9
Poor taste of drug and stooling complain	10	12.2
No response	26	31.7

Table 5 shows the challenges encountered with regimen used for bowel preparation. Although 10 (12.2%) respondents did not experience any challenge with regimen used for bowel preparation, for some others they encountered the following: patients failed to comply with scheduled regimen (18 = 22%), bowel not properly emptied (14 = 17.1%), etc.

Table 6: Relationship between the agents used for bowel preparation before colonoscopy and percentage bowel preparation adequacy achieved with preferred regimen for colonoscopy

Percentage of bowel preparation adequacy achieved with preferred regimen for colonoscopy									
Agent use for bowel preparation for colonoscopy	90% and above	80 - 89%	70 - 79%	60 - 69%	Less than 60%	No response	Total	(X ²)	P-Value
Bisacodyl (Dulcolax) Tablets	0(0.0%)	4(100%)	0(0.0%)	0(0.0%)	0(0.0%)	0(0.0%)	4	188.088	0.000
Bisacodyl (Dulcolax) Suppository	6(75.0%)	2(25.0%)	0(0.0%)	0(0.0%)	0(0.0%)	0(0.0%)	8		
Magnesium Sulphate (Epson salt)	2(50.0%)	0(0.0%)	0(0.0%)	2(50.0%)	0(0.0%)	0(0.0%)	4		
Sodium Phosphate (Visicol)/ Aqueous Sodium Phosphate	2(33.3%)	0(0.0%)	0(0.0%)	4(66.7%)	0(0.0%)	0(0.0%)	6		
Castor oil, PEG and electrolytes	2(50.0%)	2(50.0%)	0(0.0%)	0(0.0%)	0(0.0%)	0(0.0%)	4		
Bisacodyl (Dulcolax) Tablets & Castor oil	4(100%)	0(0.0%)	0(0.0%)	0(0.0%)	0(0.0%)	0(0.0%)	4		
Polyethylene glycol (PEG) & electrolytes combination	4(60.7%)	2(33.3%)	0(0.0%)	0(0.0%)	0(0.0%)	0(0.0%)	6		
Low-volume PEG/PEG-	0(0.0%)	2(100%)	0(0.0%)	0(0.0%)	0(0.0%)	0(0.0%)	2		

3350 and Bisacodyl Sulphate- free-PEG (SF-PEG) Bisacodyl (Dulcolax) Tablets & (Epson salt) Picolax (Sodium Pico phosphate) Dulcolax, Castor oil and PEG & electrolyte combinatio n No response	2(100%) 6(30.0%) 2(25.0%) 10(100%) 0(0.0%)	0(0.0%) 4(20.0%) 0(0.0%) 0(0.0%) 0(0.0%)	0(0.0%) 4(20.0%) 2(25.0%) 0(0.0%) 0(0.0%)	0(0.0%) 4(20.0%) 0(0.0%) 0(0.0%) 0(0.0%)	0(0.0%) 2(10.0%) 4(50.0%) 0(0.0%) 0(0.0%)	0(0.0%) 0(0.0%) 0(0.0%) 0(0.0%) 4(100%)	2 20 8 10 4
Total	40	16	6	10	6	4	82

Table 6 shows relationship between the agents used for bowel preparation for colonoscopy and percentage bowel preparation adequacy achieved with preferred regimen for colonoscopy. The relationship between the agents used for bowel preparation for colonoscopy and percentage of bowel preparation adequacy achieved with preferred regimen for colonoscopy was statistically significant ($P < 0.05$) for Bisacodyl and Bisacodyl suppository with other drugs.

DISCUSSION

Modern gastrointestinal endoscopy practice is relatively new in this part of the world, with some steady growth from foreign-trained to indigenous endoscopists, especially with the establishment of more centres and the impact of professional bodies such as the Society for Gastroenterology and Hepatology in Nigeria.[31] The relative “newness” of the practice in our setting could account for why the practitioners are relatively few with 56 (68.3%) respondents asserting to having practised for varying period of 1-14years. About a fifth of the respondents were consultants (both physicians and surgeons), and another one-fifth were senior registrars. Almost a third of respondents were endoscopy nurses. The category of respondents whose majority work in the public sector, authenticates the quality of information provided.

Only about a quarter of respondents carried out 15 or more colonoscopies per month in a country with a population of more than 180million people, with a smaller number of procedures done by greater number of other practitioners. About a third of respondents asserted to prescribing three-day diet restriction before colonoscopy. Less than a quarter of respondents used two-day diet restriction, while about another quarter prescribed a one-day regimen. Three-day bowel preparation was prescribed by the largest number of respondents - about a quarter, closely followed by two-day regimen by less than a quarter respondent. The

dominant use of three-day bowel preparation may have resulted from the trainings of the endoscopists, and also from already existing published works in Nigeria in which three-day bowel preparation was popularised.[29, 30] A few others used varying number of - a day before, split-dose overnight, and same day single dose regimen. Waiting period asserted by greatest number of respondents was 7-8hours before colonoscopy.

Although several drugs were asserted to being in use by gastrointestinal endoscopy practitioners, Bisacodyl (Dulcolax) tablets used in combination with Magnesium Sulphate (Epson salt) was mentioned by about a quarter of respondents. This finding share similarity with an Ilorin study,[29] except that there was inclusion of lactulose suspension in the later report. Castor oil and polyethylene glycol-electrolyte solution (PEG) usage was next in descending order, opined by about 10% of respondents. Bisacodyl was also opined by more than a quarter of respondents as adjuncts to colonic cleaning for colonoscopy, thus making Bisacodyl the most commonly used drug for bowel preparation for lower GI endoscopy, as opined by respondents. Additionally, the relationship between use of Bisacodyl / Bisacodyl suppository with other drugs and adequacy of achieved bowel preparation for colonoscopy was statistically significant. This outcome of using Bisacodyl is not surprising as other researchers have published record of its use in some centres independently.[29, 30]

Almost half of respondents asserted to achieving $\geq 90\%$ bowel preparation adequacy for colonoscopy with preferred regimen, while less than a fifth achieved 80 - 89%. This finding is relatively different from the findings of a study in Lagos Nigeria where the outcome of bowel preparation was described to be "good" in 81.4% of patients.[28] The reason for this difference could lie in the evaluation methods used, and also the fact that the study in question was a single city-based report. There were cases of abandonment of procedure on account poor bowel preparation as reported by a few respondents. The findings may not be surprising, as the prevalence of inadequacy of bowel preparation has been reported to be higher among African-American.[27] However, poor bowel preparation has been associated with risk of complications in colonoscopy,[16, 19, 20] hence this findings is worrisome. There were those who reported not having challenges with the regimen that they use for bowel preparation, though about a tenth of respondents. Those who asserted to encountering challenges mentioned poor bowel preparation, failure of patients to comply with scheduled regimen, etc.

CONCLUSION

Different regimens are in use by different practitioners of gastrointestinal endoscopy in Nigeria. Three-day bowel preparation involving the use of Bisacodyl (Dulcolax) tablets used in combination with Magnesium Sulphate (Epson salt) was prescribed by largest number of respondents. Good outcomes have been recorded, and some challenges abound, including termination of procedures on account of poor bowel preparation. The practitioners of gastrointestinal endoscopy are relatively few. There is need to improve on practice by training more practitioners, and ensure uniform practice to improve outcome and patient care.

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