



The use of pentazocine, promethazine, and midazolam in colonoscopy in adults at the University of Benin Teaching Hospital

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Abstract

Context: Colonoscopy is a valuable armamentarium for the diagnosis of lesions in the colon. Sedation/anaesthesia makes the procedure easier and tolerable in patients with good bowel preparation. Poor tolerability is one of the reasons for incomplete colonoscopy.

Objectives: To share our experience with the use of Pentazocine, Promethazine, and Midazolam during colonoscopy, highlighting, the indication for colonoscopy, the tolerability of the procedure, success rate (Caecal intubation rate), and lesional findings.

Materials and Methods: This is a 2-year descriptive cross-sectional study of patients referred for colonoscopy in the University of Benin Teaching Hospital. All patients received intravenous single-dose Pentazocine, Promethazine, and Midazolam. They were monitored during the procedure. Patients who required additional doses of Midazolam were adjudged to have poorly tolerated the procedure. The patient's demographics, indication for colonoscopy, colonoscopy findings, histology of specimens, and the tolerability of the procedure were entered into a proforma and analyzed.

Results: Over the study period, 129 colonoscopy were performed. The male-to-female ratio was 2:3 The peak age was 65, and the cluster age group was 5th – 8th decade of life. The caecal intubation rate was 97.7%. Bleeding per rectum was the main indication for colonoscopy in 48 patients (37.2%). Colon cancer was found in 20 patients (15.5%) at colonoscopy, while haemorrhoids was found in 32 patients (24.8%). In 16 patient (12.4%) there was more than one lesional finding. A hundred and twenty-five patients (97%) tolerated the procedure, while four (3%) poorly tolerated the procedure. Colonoscopy was poorly tolerated in males (3) compared to females (1).

Conclusion: Bleeding per rectum was the main indication in our study with colonoscopy well-tolerated in 97% of study participants with the use of Pentazocine, Promethazine, and Midazolam.

The authors' advocate the use of single-dose Promethazine, Pentazocine, and Midazolam for elective colonoscopy.

Key words: Colonoscopy, Conscious sedation, Tolerability

Introduction

Colonoscopy, which is the visualization of the colon, is an invasive procedure that requires administering analgesics and sedatives to make it tolerable for the patients. During a colonoscopy, the discomfort or pain is due to the colonic insufflation with air, the colonic stretch, and looping of the scope¹. Other factors that make colonoscopy less painful are good bowel preparation and good counseling^{2,3}. Though most

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endoscopists agree that colonoscopy requires some form of analgesia or sedation, the procedure can be done with no analgesia or sedation as well as under general anaesthesia^{4,5,6,7}. The analgesics/sedatives are mainly opioid analgesics, antihistamines, and Benzodiazepines^{8,9}. The experience of the

endoscopist and the side effect profile of the agents determine the choice of medications. The paucity of anesthetists in the services of most centres where colonoscopy is done, as an investigative tool, in a low-resource setting serves as a limiting factor for the use of general anaesthesia^{10,11}.

Pentazocine, Promethazine, and Midazolam combination is an option for analgesics/sedatives in colonoscopy. However, the optimum analgesic/sedative combination for use in colonoscopy is yet to be established in a resource-poor setting^{12,13}. Various regimens are in use, but none has been assessed for their effectiveness. The effectiveness of the analgesic/sedative combination used for the procedure may determine how well the patient tolerates the colonoscopy⁶. Other factors that contribute to the tolerance of colonoscopy are the experienced endoscopist, the colonic flexures which accounts for difficult insertion, poor bowel preparation, previous pelvic surgeries, and female gender^{14,15}.

Colonoscopy is indicated for colonic diseases that manifest as rectal bleeding, discharge of mucus, constipation, diarrhea, and screening those at risk of developing colon cancer^{14,16,17}. Bowel preparation, which involves modifying diet and taking laxatives, clears the colon of its content and enables a clear view of the colonic lumen^{18,19}. During the procedure, the colon is insufflated with air. A flexible colonoscopy passed through the anal canal into the colon, navigating the flexures until the caecum is reached. Colonoscopy is complete only when the caecum is reached^{20,21}. The process of insufflating the colon and navigating the colonic flexures produces pain and discomfort¹. The use of analgesics and sedatives and general anaesthesia help mitigate the pain and discomfort and enable the patient to tolerate colonoscopy^{4,5,6,7}.

This study was done in the endoscopy suite of the University of Benin Teaching Hospital. The University of Benin is the premier Teaching hospital, located in Edo state, in South-south Nigeria. Its endoscopic services started in the last 11 years. All patients referred for colonoscopy, over a 2-year period, took part in the study. Pentazocine, Promethazine, and Midazolam (analgesic and sedatives – conscious sedation) were given by the endoscopist before the commencement of colonoscopy. How well the patients tolerated the

procedure was assessed by the requirement of additional doses of Midazolam and then used to determine the effectiveness a single dose of Pentazocine, Promethazine, and midazolam combination. The use of the visual analog scale (VAS) for assessing pain would have been of added value if used for this study²¹.

The study aims to highlight; the use of a single dose of Pentazocine, Promethazine, and Midazolam for analgesia and sedation, and the ability to tolerate colonoscopy with these medications in a resource-poor setting.

Materials and methods

Study Design and Study Area: This is a 2-year descriptive cross-sectional study of patient referred for colonoscopy in the University of Benin Teaching Hospital. The University of Benin teaching Hospital (UBTH) is the premier tertiary and teaching hospital in South-south Nigeria. The endoscopy unit of UBTH is led by trained endoscopists with the support of endoscopy nurses and receives referral from within and outside the hospital.

Sampling technique and sample size determination: A convenient sampling technique was used and the sample size included all adult patient referred for colonoscopy during the study period. Children were excluded from our study because they routinely receive deep sedation/anaesthesia during colonoscopy in our centre.

Study procedure: Bowel preparation was done for all the patients. This consisted of low residue diet (pap) for three days, oral Magnesium sulphate: 9 sachets in three equally divided doses (25gm/sachets), and castor oil: 70mls taken between the 2nd and 3rd dose of Magnesium Sulphate, which is commenced 36hrs before the colonoscopy. The bowel preparation was done on outpatient-basis following a written instruction.

The equipment used for this study was the Olympus Evis Exera III CLV - 190. The Colonoscope has a length of 160CM and a diameter of 1.2CM.

All patients had intravenous single-dose Pentazocine(30mg),Promethazine(12.5mg),and Midazolam(1mg) five minutes before the commencement of colonoscopy. Blood pressure, pulse rate, respiratory rate, and oxygen saturation were checked before and then monitored during the

procedure. There was Oxygen and resuscitation medications/devices available within the suite and an anesthetist available on call basis during all our procedures for patients who may develop cardio-respiratory complications during the colonoscopy procedure. Patients who became uncomfortable or restless during the procedure but with stable vital signs and, saturation were administered additional doses of Midazolam and adjudged to have poorly tolerated the procedure.

Specimens from tumours, polyps, ulcers, or inflammation were subjected to histopathologic analysis.

The patient's demographics, indication for colonoscopy, findings at colonoscopy and the tolerability of the procedure were entered into a proforma.

Data Analysis: Data were entered into Excel sheet and then analysed. Categorical data were summarized as frequencies and percentages. Data were presented in tables and figures.

Ethical Principles for Medical Research Involving Human Subjects protocol by the World Medical Association Declaration of Helsinki was followed during the study 22. Institutional Ethical approval obtained; Protocol Number: ADM/E 22/A/VOL. VII/14831263.

Results

A total of 129 colonoscopies were done over the study period. The male-to-female ratio was 2:3 (Fig 1). The mean age the patients was 56.7 years with a standard deviation of 16.6 years, while peak age was 65 years and the cluster age group was the 5th – 8th decade of life (76.7%) (Tab 1).

Bleeding per rectum was the main indication for colonoscopy in 48(37.2%) patients. Others were

altered bowel habits, abdominal pains, suspected colon cancer, anal protrusion, surveillance, and screening. (Tab 2)

Table 1: Age distribution

Age Range(years)	Frequency(n=129)	Percentage (%)
11-20	3	2.33
21-30	5	3.88
31-40	17	13.18
41-50	21	16.28
51-60	21	16.28
61-70	32	24.81
71-80	25	19.38
81-90	4	3.10
91-100	1	0.78

Table 2: Indications for colonoscopy

Indication	Frequency(n=129)	Percentage(%)
Bleeding per rectum	48	37.21
Altered bowel habit	35	27.13
"Suspected colonic tumour"	22	17.05
Abdominal pains	8	6.20
Anal protrusion	8	6.20
Anaemia	1	0.78
Surveillance	5	3.88
Screening	2	1.55

The following were the findings from the procedure: the colon was normal in 37 patients (28.7%). Hemorrhoids were most common abnormal finding in 32 patients (24.8 %), Colon cancer was found in 20 patients (15.5), others were Diverticular disease - 13 patients (10.1%),

Table 3: Tolerability of colonoscopy

Tolerance level	Frequency(n=129)	Percentage(%)
Well tolerated	125	97
Poorly tolerated	4	3

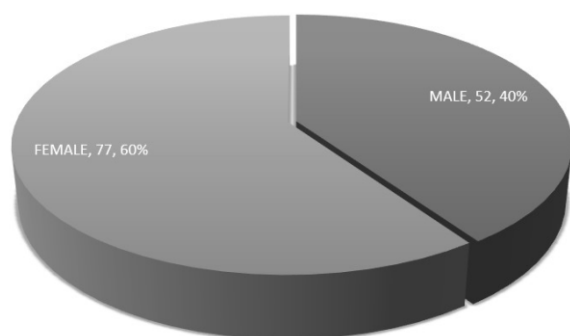


Figure 1: Sex distribution

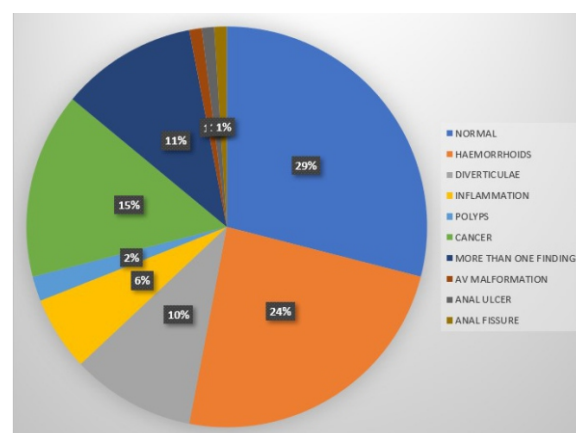


Figure 2: Findings at colonoscopy

Inflammatory disease – 8 patients (6.2%), and Polyps- 3 patients (2.3%). (Fig 2)

In 16 patients (12.4%) there was more than one lesional finding.

A hundred and twenty-five patients (97%) tolerated the procedure while 4 patients (3%) poorly tolerated the procedure (Tab 3). Three (75%) of the patients with poor tolerability had incomplete colonoscopy.

The caecum was intubation in 126patient (97.7%) and 3patients (2.3%) had their colonoscopy terminated at the hepatic flexure (Tab 4)

Colonoscopy was poorly tolerated in males (3) compared to females (1) (Table 3 and Table 4).

The complication rate was nil.

Table 4: Poorly tolerated colonoscopy (n=4)

Sex	Age (years)	Indication	The extent of colon reached	Findings (extent examined)
Male	77	Constipation	Hepatic flexure	Normal colon
Male	67	Lower GI bleeding	Hepatic flexure	Splenic flexure diverticulum
Male	32	Bleeding per rectum	Hepatic flexure	Normal colon and haemorrhoids
Female	38	Right lower abdominal pain	Full length	Normal colon

Discussion

This study involved a total of one hundred and twenty-nine patients with more female participants (male to female ratio is 2:3). Pentazocine, Promethazine, and Midazolam combination used for conscious sedation made colonoscopy tolerable in 97% of the patients. The major findings were haemorrhoids (24.8%) and colon cancer (15.5%) in participants with a peak age of sixty–five years. Our study showed that the combination of pentazocine, promethazine, and midazolam is effective for conscious sedation in a low-resource setting.

The focus of this study was on the usefulness/effectiveness of conscious sedation practice: looking at the tolerability and caecal intubation rate. Our study seems to have put a value on conscious sedation in our locale though previous studies have compared deep sedation and conscious sedation. Alatis and Adigun found that propofol used for deep sedation is better and safer compared to conscious sedation Midazolam and pentazocine for colonoscopy but no other study has evaluated the effectiveness of conscious sedation for colonoscopy in Nigeria^{12,13}. The 97% tolerability of

colonoscopy with the use of Pentazocine, Promethazine, and midazolam for conscious sedation demonstrates the usefulness of this combination. Due to the paucity of anaesthetist in low-resource settings, our findings is of importance as the endoscopist could effectively conduct colonoscopy with conscious sedation with the combination of Pentazocine, Promethazine, and Midazolam^{10,11}. This assertion is completely different in high-resource settings where there are enough anaesthetists and who deliver deep sedation and anaesthesia for colonoscopy procedures^{24,25}. Sedation delivered by the endoscopist is safe and apparently has a better outcome when compared to those delivered by anaesthetist as demonstrated by a previous study by Poincloux et al²⁶.

Conscious sedation for colonoscopy has been validated and has been shown to be superior to deep sedation/anaesthesia assisted or anaesthesia based on cost, the duration of the procedure, and complication rate^{27,28,29,30,31}. A recent review described deep sedation as ‘unnecessary and wasteful’³². It should be noted that there is a quiet drift toward no sedation at all during colonoscopy, especially with the development of small-diameter colonoscopes^{4,22}. The presence of more females in our study may be coincidental and may not be unrelated to women having better health-seeking behaviour in South-south Nigeria³³.

The main indications for colonoscopy were rectal bleeding (37.2%) and altered bowel habit (24.1%) while haemorrhoids (24%) and colon cancer (15%) were the main findings in our study (Table 1 and Fig 3). This is in tandem with a previous study that demonstrated haemorrhoids as the main cause of rectal bleeding in our setting³⁴. The indications and findings at colonoscopy in our study were very similar to other regions in Nigeria where colonoscopy is mainly for symptomatic patients^{16,35,36,37}.

Colon cancer (15%) becomes the main finding in symptomatic patients who had colonoscopy if an adjustment is made for the haemorrhoids (Fig 3). This is comparable to studies within Nigeria and low resource settings/other climes^{16,35,36}. The high incidence of colon cancer among patients in our study was because colonoscopy was indicated for symptomatic patients as against screening and surveillance in high-resource settings³⁸. Screening

colonoscopy when compared to colonoscopy for symptomatic patients has a lower yield of colon cancers³⁹.

Adenocarcinoma was the main histologic type of cancer found in our study. Adenocarcinoma being the most common histologic type of tumour found in the colon is well documented in the literature⁴⁰.

The presence of more than one lesional finding at colonoscopy in this study has previously been demonstrated in a published work by the same author³⁴. The impact of this is the dilemma it may pose in a subset of patients especially if they had presented with bleeding that had abated before colonoscopy.

Our study utilized the need for an additional dose of Midazolam in the course of colonoscopy to assess for tolerability. A more objective assessment would have been the use of the visual analog scale (VAS) for assessing pain^{22,41}. There are also the Patient-reported outcome measures (PREMs) and the more recent patient-reported scale for tolerability of endoscopic procedures (PRO-STEP)⁴². These outcome measures essentially assess pain, anxiety, and awareness during procedures on patients.

It is worthy of note that females tolerated colonoscopy more than males in our study (3 times more). This is in contrast to other studies where poor tolerance was noted among females^{14,15,43}. Further studies involving larger participants, using objective scales to assess tolerability, will be required to validate this female tolerance of colonoscopy in our study setting.

Incomplete colonoscopy was observed in three of patients that had poor tolerability in our study. This seems to be in tandem with studies that showed caecal intubation rate; a marker for complete colonoscopy, increased in patients who had sedation on demand and deep sedation/aneesthesia^{6,44}. The colonoscopy procedure was aborted at the hepatic flexure, a known factor responsible for incomplete colonoscopy^{21,38}.

The high caecal intubation rate (97.7%) in our study may be attributable to the use of sedation as a previous study demonstrated that sedation increased the caecal intubation rate⁶. This attests to the quality of colonoscopy done during the study period as the caecal intubation greater than or equal to ninety percent ($\geq 90\%$) is one of the recommended key quality indicators in

colonoscopy^{45,46}. A study done in Nigeria demonstrated a comparable high caecal intubation rate of 92.2% in contrast to another study with caecal intubation of 88.6%^{35,36}.

Though there were no complications in our study, we advocate caution in the elderly and those with severe respiratory disease because these groups of individuals are more likely to develop complications with conscious sedation especially when Opioids are used. The endoscopist should be aware of the side effect profile and appropriate dose adjustments of medications used for conscious sedation and seek the assistance of an anaesthetist when necessary⁹.

Limitation of study

Our study was an observational study set out to assess our routine practice. Non utilization of pain scoring during the colonoscopy section may affect the interpretation of results.

Conclusion

The most common indication for colonoscopy was bleeding per rectum. The top two lesions were haemorrhoids and colon cancer in our environment. Colonoscopy was well-tolerated (97% tolerance) with the use of Pentazocine, Promethazine, and Midazolam.

We thus recommend that single-dose Promethazine, Pentazocine, and Midazolam are adequate for elective colonoscopy and are so advocated after bowel preparation using magnesium sulfate and castor oil.

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