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ORIGINAL ARTICLE

The Indications and Findings at Colonoscopy in a Tertiary Hospital in North-Central Nigeria: A Seven-Year Review

Les Indications et les Résultats de la Coloscopie dans un Hôpital Tertiaire du Centre-Nord du Nigéria: Une Revue de Sept Ans

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ABSTRACT

BACKGROUND: Colonoscopy is an invaluable tool used in the diagnosis of colorectal diseases. It is also useful in the prevention and treatment of some of these diseases. The knowledge of the prevailing colorectal diseases is key to planning for prevention. **OBJECTIVES:** This study aimed at determining the spectra of indications and findings at colonoscopy in a tertiary health facility.

METHODS: This was a hospital-based cross-sectional study of all patients who underwent colonoscopy between March 2013 and February 2020. The patients' biodata, indications and findings at colonoscopy were retrieved from the Endoscopy Register.

RESULTS: A total of 385 colonoscopy reports were included in the analysis. The age of the patients ranged from 14 to 95 years with a mean age (standard deviation) of 55.9 (15.4) years. There were 219 (57.0%) males and 166 (43.0%) females. The commonest indication for colonoscopy was haematochezia 150 (38.9%) followed by suspected colorectal malignancy 98 (25.5%), abdominal pain 28 (7.3%), altered bowel habit 21 (5.5%), constipation 20 (5.2%), chronic diarrhoea 19 (4.9%), surveillance/screening 16 (4.2%), occult bleeding and anal pain 7 (1.8%) each, and others 19 (4.9%). The colonoscopy findings were normal findings 116 (30.1%), haemorrhoids 127 (32.9%), colorectal polyps 70 (18.2%), diverticulosis 46 (11.9%), rectal tumour 43 (11.2%), colonic tumour 32 (8.3%), colitis 23 (5.9%), angiodysplasias 6 (1.6%), others 12 (3.1%). The findings were not mutually exclusive. Our diagnostic yield was 69.9%.

CONCLUSION: The commonest indication and diagnosis for colonoscopy were haematochezia and haemorrhoids respectively. Our diagnostic yield was 69.9%. *WAJM 2021; 38(9): 885–891.*

Keywords: Colorectal diseases, colonoscopy, indications, spectra, diagnostic yield.

RÉSUMÉ

CONTEXTE: La coloscopie est un outil précieux utilisé dans le diagnostic des maladies colorectales. Il est également utile dans la prévention et le traitement de certaines de ces maladies. La connaissance des maladies colorectales prédominantes est essentielle à la planification de la prévention.

OBJECTIFS: Cette étude visait à déterminer les spectres d'indications et les résultats à la coloscopie dans un établissement de santé tertiaire.

MÉTHODES: Il s'agissait d'une étude transversale en milieu hospitalier portant sur tous les patients ayant subi une coloscopie entre mars 2013 et février 2020. Les données biographiques, les indications et les résultats de la coloscopie des patients ont été extraits du registre d'endoscopie.

RÉSULTATS: Un total de 385 rapports de coloscopie ont été inclus dans l'analyse. L'âge des patients variait de 14 à 95 ans avec un âge moyen (écart type) de 55,9 (15,4) ans. Il y avait 219 (57,0%) hommes et 166 (43,0 %) femmes. L'indication la plus courante de la coloscopie était l'hématochézie 150 (38,9%) suivie d'une suspicion de malignité colorectale 98 (25,5%), de douleurs abdominales 28 (7,3%), d'altération des habitudes intestinales 21 (5,5%), de constipation 20 (5,2%), de diarrhée chronique 19 (4,9 %), surveillance/dépistage 16 (4,2 %), saignement occulte et douleur anale 7 (1,8 %) chacun, et autres 19 (4,9 %). Les résultats de la coloscopie étaient normaux 116 (30,1%), hémorroïdes 127 (32,9%), polypes colorectaux 70 (18,2%), diverticulose 46 (11,9%), tumeur rectale 43 (11,2%), tumeur colique 32 (8,3%), colite 23 (5,9 %), angiodysplasies 6 (1,6), autres 12 (3,1 %). Les résultats n'étaient pas mutuellement exclusifs. Notre rendement diagnostique était de 69,9 %.

Conclusion: L'indication et le diagnostic les plus courants de la coloscopie étaient respectivement l'hématochézie et les hémorroïdes. Notre rendement diagnostique était de 69,9 %. *WAJM 2021; 38(9): 885–891.*

Mots clés: Maladies colorectales, coloscopie, indications, spectres, rendement diagnostique.

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INTRODUCTION

High-quality colonoscopy is the recognized gold standard diagnostic tool for colorectal diseases and large bowel symptoms.¹ The indications for colonoscopy can be divided into diagnostic, therapeutic, surveillance, or screening categories.² Racial disparities exist not only in the use of colonoscopy but also in the indications for the procedure.² Differences in the availability, accessibility and affordability of colonoscopy services and/or the required expertise as well as differences in the regional or national colonoscopy practice guidelines where these exist are some of the factors that may be responsible for these observed disparities.

In the United States, routine screening examinations and polyp surveillance accounted for half of the indications for colonoscopy.³ Albeit a high-income country (HIC), minorities in the United States have been reported to be disproportionately faced with issues of access to care, which may extend beyond the availability of affordable services, transportation, the ability to miss work for a colonoscopy or its preparation, and other factors which may be difficult for minorities with lower socioeconomic status.² In low-and middle-income countries (LMICs) such as Nigeria, these services are not widely available and where they are available, the cost is prohibitive to many who need them.⁴ Colonoscopy remains highly underutilized and underreported in sub-Saharan Africa with low level of practice of colorectal cancer (CRC) screening.⁵

CRC screening is not fully operational in Nigeria due to challenges of implementing sustainable screening programs. These challenges include the high cost of colonoscopy, poor health insurance coverage with many having to pay out of pocket for the procedure, poor basic infrastructure such as transport facilities and power supply which further limits access to the few colonoscopy services available. This is probably responsible for the increasing number of reported cases of CRC in the country with many presenting to health facilities for the first time with advanced disease.^{6,7}

Differences in the spectrum of diagnoses at colonoscopy also exist

across racial and geographical divides due to differences in the genetic and environmental risk factors for some of the colorectal diseases.⁸ The prevailing colorectal diseases in a region may also change over a period of time. Colonic diseases such as CRC, colonic polyps and diverticulosis were previously thought to be rare but recent reports have suggested otherwise.^{6,9,10} The first documented experience on the practice of colonoscopy in the State where our hospital is located, emanated from a private hospital seven years ago.¹¹ This study aimed at determining the indications and the spectrum of colonic diseases at the only tertiary health care facility in Kwara State, North-Central Nigeria.

SUBJECTS, MATERIALS AND METHODS

Study Design

This was a hospital-based cross-sectional study.

Methods

A retrospective analysis of prospectively collected data retrieved from the Endoscopy Register of the University of Ilorin Teaching Hospital, Ilorin, Nigeria was carried out. The hospital is the only tertiary health facility in the state and referrals for endoscopy services are received from the clinical departments in the hospital, other hospitals in the state and neighbouring states. This is the first report on the indications and findings at colonoscopy from this hospital since the inception of regular endoscopy services in the year 2013. The information obtained from the register between March 2013 and February 2020 (7-year period) included the age and sex of the patients, year of procedure, indication, diagnosis and the Endoscopist.

The study complied with all ethical protocols as contained in the Helsinki declaration. All the patients underwent a 3-day bowel preparation before the procedure. The bowel preparation consisted of liquid diet, daily divided doses of 30 mg of bisacodyl tablets, and polyethylene glycol (MOVICOL®) solution. Syrup lactulose or in some cases enema saponis, was added in

patients who had poor bowel preparation and the procedure re-scheduled. All patients signed an informed written consent prior to undergoing colonoscopy. Pre-medications were given to all the patients, which consisted of intravenous midazolam 2.5–5 mg and tramadol 50–100 mg in titrated doses. The patients' vital signs were monitored before, during, and after the procedure. Digital rectal examination was carried out on all the patients before the insertion of the colonoscope.

The Olympus CF-180 Evis Exera II Video colonoscope was used from the year 2013 to 2018, thereafter the Sonoscape HDL-320E Video colonoscope was used. The procedures were carried out with the patient in the left lateral position. Supine posture and abdominal pressure were applied where necessary. Caecal intubation was defined as deep intubation into the caecum with visualization of the appendiceal orifice. Caecal intubation rate (CIR) was calculated by dividing the total number of caecal intubations by the total number of procedures performed.

Data Analysis

All data were collated and analyzed using the statistical package for social sciences (SPSS) version 20.0 (IBM, Armonk, NY, USA). The ages of the patients were summarized using mean and standard deviation (SD). Categorical variables such as age groups, sex, colonoscopy indications and diagnoses were summarized using proportions/percentages and presented in frequency tables and charts. The associations between continuous and categorical variables were determined using Student's t-test and Chi-square test respectively. P-values less than 0.05 were considered statistically significant.

RESULTS

The first author, MOB, performed 85% of all colonoscopies done in the period under review. The highest number of colonoscopies performed in a single year was 92 in the year 2019 closely followed by 89 in the year 2016 (Figure 1). The crude CIR obtained over the study period was 89.1% (343/385). The adjusted CIR taking into consideration the

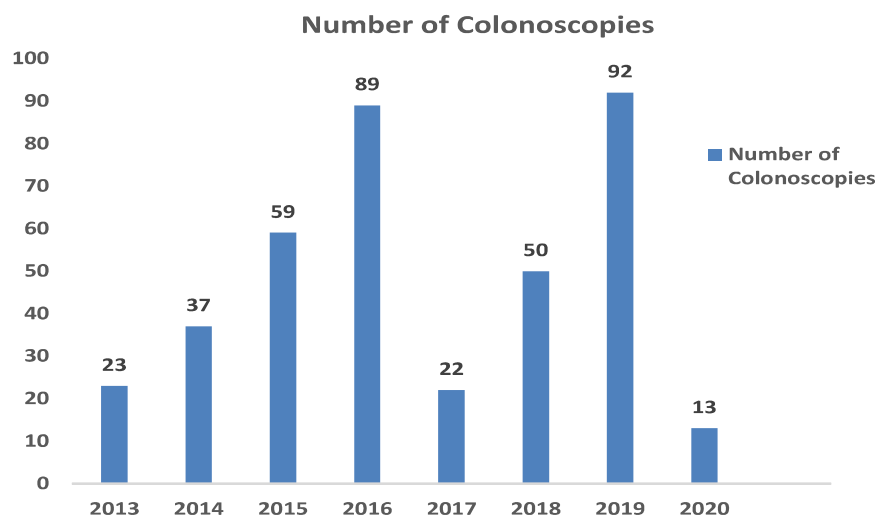


Fig. 1: Bar Chart showing the number of Colonoscopies per Year (n=385).

presence of obstructive tumours that prevented further intubation was 92.2% (343/372).

Of the 416 colonoscopies performed, complete data was available for a total of 385 patients and only these were included in the data analysis. Their ages ranged from 14–95 years with a mean (SD) of 55.9 (15.4) years. There were 219 (57.0%) males and 166 (43.0%) females giving a male to female ratio of 1.3:1. The mean age (SD) of the male patients was 55.3 (14.4) years whereas that of the females was 56.6 (16.6) years. The difference in the two means was not statistically significant ($p = 0.407$). The highest frequency of 101 was recorded among the 51–60 year age group (Table 1).

The most common indication was lower gastrointestinal (GI) bleeding 150

(38.9%) followed by suspected colorectal malignancy 98 (25.5%) and abdominal pain 28 (7.3%). Other indications are as shown in Table 2.

At least one lesion was identified at colonoscopy in 269 of the 385 patients whereas the remaining 116 patients had normal findings resulting in a diagnostic yield of 69.9% (Figure 2).

The most common lesions seen at colonoscopy were haemorrhoids in 127 (32.9%) followed by colorectal tumour in 75 (19.5%). The latter comprised rectal mass in 43 (11.2%) and colonic mass in 32 (8.3%). The polyp detection rate was 18.2% (Table 3).

The prevalence of internal haemorrhoids and diverticulosis was significantly higher among persons aged ≥ 50 years than persons aged < 50 years as shown in Table 4.

Table 1: Age Group and Sex Distribution of The Study Population (n=385)

Age Groups (in years)	Male	Female	Frequency (%)
≤ 20	2	3	5 (1.3)
21–30	10	8	18 (4.7)
31–40	19	17	36 (9.4)
41–50	52	29	81 (21.0)
51–60	53	48	101 (26.2)
61–70	51	31	82 (21.3)
71–80	27	17	44 (11.4)
81–90	5	11	16 (4.2)
> 90	0	2	2 (0.5)
Total	219	166	385 (100.0)

Chi-Square (χ^2) = 11.64; $P = 0.168$

Table 2: Spectrum of Indications for Colonoscopy (n=385)

Indications	Frequency (%)
Haematochezia	150 (38.9)
Suspected colorectal mass	98 (25.5)
Abdominal pain	28 (7.3)
Altered bowel habit	21 (5.5)
Constipation	20 (5.2)
Chronic diarrhoea	19 (4.9)
Screening/Surveillance	16 (4.2)
Positive Faecal occult blood	7 (1.8)
Anal pain	7 (1.8)
Others *	19 (4.9)
Total	385 (100.0)

*External Haemorrhoids 4; Rectal prolapse 3; Faecal impaction 2; 1 each for the following indications: Complex fistula-in-ano, CT scan suggestive of bowel lesion, Anaemia, Sigmoid volvulus, Faecal incontinence, Pruritus ani, anal protrusion, unexplained weight loss, Cancer of the cervix with suspected invasion of the sigmoid colon and abdominal swelling.

Table 3: Spectrum of Findings at Colonoscopy (n=385)

Colonoscopy Findings	Frequency (%)
Haemorrhoids	127 (32.9)
Colonic polyps	70 (18.2)
Diverticulosis	46 (11.9)
Rectal tumour	43 (11.2)
Colonic tumour	32 (8.3)
Colitis	23 (5.9)
Angiodysplasias	6 (1.6)
Extrinsic compression	5 (1.3)
Anal fissure	3 (0.8)
Rectal ulcers	2 (0.5)
Ileocaecal Crohn's ulcers	1 (0.3)
Anal mass	1 (0.3)
Normal findings	116 (30.1)

NB: The colonoscopy findings were not mutually exclusive.

There was no significant difference between the males and females with respect to the prevalence of the 6 most common colonoscopy diagnoses as shown in Table 5.

Among the patients who presented with haematochezia, the most frequent lesions seen at colonoscopy were haemorrhoids in 45 (30.0%), colorectal

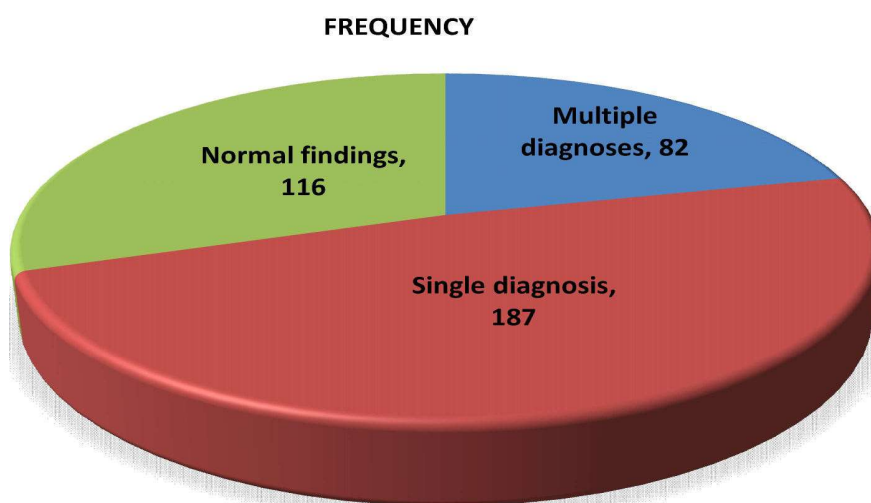


Fig. 2: Pie Chart Depicting the Diagnostic Yield at Colonoscopy (n=385)

Table 4: Relationship between Age and the Six most common Diagnoses in the Study Population (n=385)

Colonoscopy Diagnosis		Age > 50 years (n)	Age ≥ 50 years (n)	Total (N)	Chi-Square	P-value
Internal Haemorrhoids	Yes					
	No	2697	34228	60325	4.238	0.04*
External Haemorrhoids	Yes					
	No	2796	40222	67318	2.602	0.11
Colorectal Mass	Yes					
	No	21102	54208	75310	0.668	0.41
Colonic Polyps	Yes					
	No	18105	52210	70315	1.529	0.22
Diverticulosis	Yes					
	No	1122	45217	46339	21.302	>0.001*
Colitis	Yes					
	No	10113	13249	23362	1.496	0.22

*Clinically significant (p -value > 0.05).

N:B: The colonoscopy findings were not mutually exclusive

Table 5: Colonoscopy Diagnoses in Males and Females (n = 385)

Diagnoses	Males n=219 (%)	Females n=166 (%)	P value
External Haemorrhoids	34 (15.5)	33 (19.9)	0.26
Internal Haemorrhoids	36 (16.4)	24 (14.5)	0.60
Colorectal Tumour	36 (16.4)	39 (23.5)	0.08
Colonic Polyps	44 (20.1)	26 (15.7)	0.27
Diverticulosis	25 (11.4)	21 (12.6)	0.71
Colitis	15 (6.8)	8 (4.8)	0.41

NB: The colonoscopy findings were not mutually exclusive.

tumour in 29 (19.3%), colonic polyps in 25 (16.7%), diverticulosis in 20 (13.3%), and colitis in 7 (4.7%). The commonest lesions among patients with suspected colorectal malignancy were colorectal tumour in 28 (28.6%), colonic polyps in 12 (12.2%) and haemorrhoids in 6 (6.1%). Each of these three lesions had the same frequency of 3 (10.7%) among the 28 patients who presented with abdominal pain as shown in Figure 3.

DISCUSSION

In this study, the total number of 416 colonoscopies performed (385 reported because 31 patients were excluded due to missing data) over a 7-year period (March, 2013–February, 2020) is higher than the 320 colonoscopies performed in Ile-Ife between 2007 and 2011 (4 years).¹² It is, however, similar to the 415 colonoscopies carried out in the same centre over a 7-year period but a different period of time (January, 2007–December, 2013).⁹

In our study, the volume of colonoscopies performed in the years 2017 and 2018 was relatively low due to the disruption of services from faulty equipment and/or staff industrial actions that occurred in these years. These challenges, nevertheless, the total number of colonoscopies performed in this study is higher than the 250 and 369 colonoscopies in Ibadan and Pakistan respectively.^{13,14} It is, however, much lower than the 1398 colonoscopies performed in a single centre in Iran over a 3-year period,¹⁵ and 48,838 colonoscopies in China over a 7-year period.¹⁶ Differences in the accessibility, affordability and selection criteria for colonoscopy may account for these observed variations in the number of colonoscopies performed.

The mean age (SD) of 55.9 (15.4) years of the patients in this study is comparable to the 53.4 (14.5) years obtained in an earlier study from Ilorin, albeit, in a different hospital and carried out about 7 years ago.¹¹ It is also consistent with findings from studies within and outside Nigeria that showed majority of persons presenting for colonoscopy were in the middle age group.^{12–14,17} However, it is higher than the mean age of 43.5 years observed in a

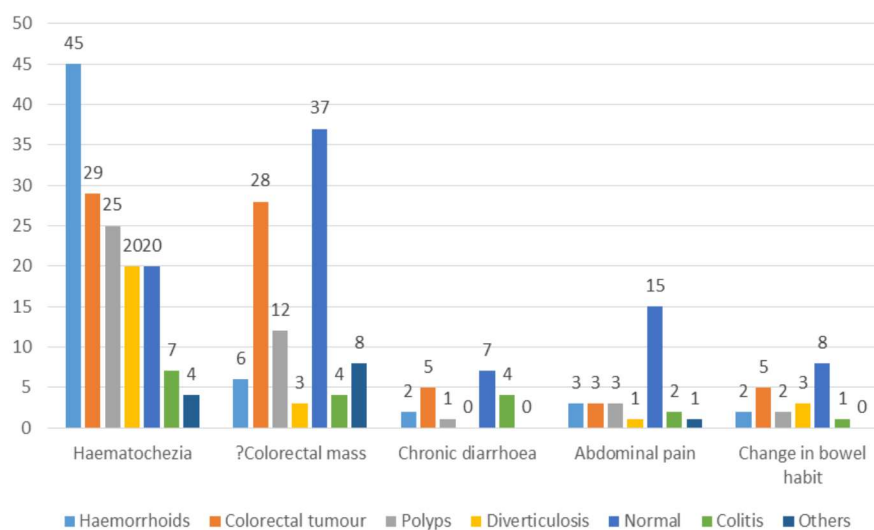


Fig. 3: Spectra of Lesions seen based on the Top Five Indications for Colonoscopy (n=316).

tertiary hospital in Jos, the capital city of Plateau State, North-Central Nigeria.¹⁸ The observed difference may be due to the small sample size of 43 in the study from Jos, Plateau State.

More males than females presented for colonoscopy over the study period which is consistent with findings in previous studies.^{11–14,17–19} This may be due to gender differences in health seeking behavior and the conservative nature of women. It may also be due to the procedure being more affordable to men who are generally considered to be more financially empowered than women. Our finding of haematochezia, which is usually indicative of lower GI bleeding, as the commonest indication for colonoscopy is similar to findings in previous studies in Ilorin, Ibadan and Ile-Ife.^{11–13} It, however, contrasts with the reports of abdominal pain as the commonest indication in Kenya, Iran and South Korea.^{5,20,21}

In this study, haemorrhoids were the commonest lesions diagnosed at colonoscopy and this is consistent with the findings from similar studies in Lagos,⁴ Ile-Ife,¹² Jos,¹⁸ Ghana²² and Zambia.²³ Our observed prevalence rate of 32.9% is however lower than the 43.2% in Lagos and 41.7% in Jos but higher than the 20.6% in Ile-Ife and 26.0% in Zambia. Haemorrhoids are thought to be more common in developed countries. Notably, the top four findings of haemorrhoids,

colorectal tumours, colonic polyps and diverticulosis, in this study are the same with that observed in Ile-Ife and Lagos.^{4,12}

Our finding of haemorrhoids as the most prevalent lesion at colonoscopy, contrasts with the finding of colorectal tumours as the commonest diagnosis at colonoscopy in a previous report from a private hospital in Ilorin,¹¹ which may be due to the larger sample size in our study. It also contrasts with the finding of colonic polyps as the most frequently observed lesion at colonoscopy at the University College Hospital in Ibadan,¹³ and colitis (especially amoebic) as the most common lesion by Obonna *et al.*²⁴ at Okitipupa in Ondo State. The commonest colonoscopy diagnosis reported by Elbatea *et al.*²⁵ in Egypt and Sahu *et al.*²⁶ in India was ulcerative colitis. Differences in the indications for colonoscopy, sample sizes, geographical and racial differences in the spectrum of colorectal diseases may account for the differences in the prevailing lesion at colonoscopy observed in these studies. The indication with the highest diagnostic yield of 86.7% was haematochezia, an observation similar to those of previous studies.^{11,12,22} Our overall diagnostic yield of 69.9% is lower than the 74.0%, 79.6%, 79.0% obtained by Akere, *et al.*, Olokoba, *et al.* and Ismaila, *et al.* respectively.^{11,13,18} It is, however, higher than the diagnostic yield

of 48.4% by Dakubo, *et al.*²² in Ghana, 53.0% by Ogutu, *et al.*⁵ in Kenya and 67.3% by Bafandeh, *et al.*²⁰ in Iran. Variations in the selection criteria for patients, effectiveness of bowel preparation, caecal intubation rates and the experience of the Endoscopist are factors that may influence the diagnostic yield.

The most common diagnoses at colonoscopy in this study were associated with the age 50 years and above, however, the association was only statistically significant for internal haemorrhoids and diverticulosis; $p = 0.04$ and $p < 0.001$ respectively. This is similar to the finding in Zambia where diverticulosis was observed to be significantly more common in older age groups with a median age of 70 years compared to the median age of 47 years for those who were without the disease.²³

Colorectal cancer is the most common gastrointestinal cancer diagnosed in Nigeria, and is one of the leading causes of cancer deaths worldwide.²⁷ Over the study period, 75 patients had a diagnosis of colorectal tumour at endoscopy giving a prevalence rate of 19.5%. This rate is similar to the 20.4% obtained from an earlier study in Ilorin, but higher than the rates of 15.6%, 12.1% and 4.7% in Ile-Ife, Ibadan and Jos respectively. In other parts of Africa, rates of 5.8%, 9.0%, 15.0% and 16.8% were found in Cameroon, Ghana, Egypt and Zambia respectively.^{22,23,25,28} The differences in the sample sizes and the period in which these studies were conducted may account for the varying prevalence rates.

The anatomic location of the colorectal tumours seen in this study were rectum 43 (57.3%), sigmoid colon 15 (20.0%), descending colon 2 (2.7%), splenic flexure 1 (1.3%), transverse colon 2 (2.7%), ascending colon 6 (8.0%) and caecum 3 (4.0%). Three (4.0%) patients had synchronous tumours. These findings are similar to those from previous studies in West Africa where most of the tumours were reported to be located in the rectum with 53.1%, 58.0% and 46.8% of tumours present in the rectum in Ile-Ife,²⁹ Niger delta region (Port-Harcourt and Yenagoa)³⁰ and Accra³¹ respectively. In a North American

centre, however, the rectum (32.3%) was second to the left colon (35.6%) in contrast to our findings.²⁹

The mean age of the patients with colorectal tumour was 57.6 ± 15.2 years and 72.0% of them were aged 50 years and above. Haematochezia was the indication with the highest yield of colorectal tumour. This is consistent with previous studies that indicate that non-bleeding colonic symptoms have a substantially lower yield for cancer than bleeding symptoms.³² Our crude CIR of 89.1% is lower than the 97.1% reported by Hoff, *et al* in Norway,³³ which may be due to their larger sample size of 6917. In the Netherlands, higher CIRs ranging from 89.4 % to 99.2 % (overall CIR of 94.8%), were reported from 7 hospitals.³⁴ Our CIR is, however, similar to the 89.2% reported by Akere and Akande in Ibadan,³⁵ but higher than the 81.2% reported by Onyekwere, *et al* in a multi-centre study in Lagos,⁴ and 59.0% at the Korle-Bu Teaching Hospital by Dakubo, *et al*² in Ghana. Differences in the level of experience of the Endoscopists, quality of bowel preparation and the use or non-use of anaesthesia during the procedure are other factors that may be responsible for the different CIRs.

Our polyp detection rate of 18.2% from diagnostic colonoscopy is consistent with reported rates ranging from 6.8% to 22.9% in Africa.^{4,9,11–13,23} These rates are likely to be higher if screening endoscopy is adopted as a National policy for colorectal screening for average risk individuals in the population as is the case in most developed nations of the world especially in the United States where adenomatous polyps are detected in 20–40% of screening colonoscopies in people older than 50 years of age.³⁶

Limitations

The findings in this study, being a hospital based one, may not be extrapolated to the larger community. Information on the histology of the colorectal lesions especially the colorectal tumours and polyps seen at colonoscopy is also not available.

CONCLUSION

Colonoscopy remains an invaluable investigative tool with a high diagnostic

yield particularly when the patients are properly selected. In this study, the commonest indication and diagnosis at colonoscopy were haematochezia and haemorrhoids respectively. The presence of internal haemorrhoids and diverticulosis was significantly associated with age ≥ 50 years.

Conflicts of Interest

Authors declare that they have no conflicts of interest.

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