

Screening colonoscopy in Port Harcourt, Nigeria

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Abstract

Colonoscopy is a screening tool for colorectal cancer. The cost of this service, ready availability and expertise are factors limiting its routine use in low-/middle-income countries. The aim was to study premalignant colonic polyps in asymptomatic middle-aged Nigerians and highlight the usefulness of screening colonoscopy in a sub-Saharan African population. We carried out an observational study on asymptomatic patients undergoing screening colonoscopy in a referral endoscopy facility in Port Harcourt, Rivers State, Nigeria from January to December 2018. The variables collated were demographics, endoscopic and histologic findings. Statistical analysis was done using IBM SPSS Statistics for Windows, version 20 Armonk, NY. A total of 144 colonoscopy procedures were performed during the study period with 70 asymptomatic cases for screening indication. Sixty-five were males and 5 females. The age range was from 48 years to 60 years; mean 54.8 ± 3.6 years. A polyp-detection rate of 53.7% was recorded with multiple polyps seen in 13 cases. Adenoma(s) detected in 19 persons were: 22 tubular adenomas with low grade dysplasia; 3 tubulo-villous adenomas with low grade dysplasia; 1 sessile serrated adenoma. The adenoma detection rate was 28.8%. No abnormality was detected in 19 cases. There is a worrisome prevalence of adenomatous polyps; villous adenoma is rare. A targeted policy of screening and surveillance by colonoscopy will curb the rising incidence of colorectal cancer.

Introduction

Globally, colorectal cancer (CRC) is the third leading cancer diagnosis and fourth cause of cancer mortality.¹ It is an observed fact that countries which are undergoing

rapid economic and societal changes are afflicted with a rise in incidence and increasing mortality.² Traditionally, CRC was reported to be uncommon in sub-Saharan Africa, but emerging reports reveal a rise in incidence.^{3,4} A transformation to CRC from premalignant adenomatous lesions is common to most cases. The prevalence of adenomas in a population varies based on age, gender and family history. In comparison, an estimated 25% to 40% of the asymptomatic over-50 years population in US have at least one adenoma.⁵ These early disease forms are asymptomatic at the initial stage. Screening is an effective tool for early detection and removal of these neoplasms. The screening tests for CRC are stool-based, radiographic or endoscopic.⁶ Endoscopy screening tests are sigmoidoscopy, capsule endoscopy and colonoscopy. There is a tendency to miss about one third of adenomas and CRCs during sigmoidoscopy as the right colon is not examined.⁷ The stool-based tests can easily be performed; however, an abnormal stool-based, radiology test, sigmoidoscopy or capsule endoscopy requires a colonoscopic evaluation. Therein lies the option of offering colonoscopy first to affording clients. Colonoscopy is a choice screening tool for colorectal cancer disease with a sensitivity of detecting adenoma more than 10mm in size ranging from 89-98%.⁸ There is paucity of African literature on screening colonoscopy; hence, the need to report this study conducted in a metropolitan city of Nigeria comprising asymptomatic individuals on periodic medical assessment.

Materials and Methods

Study setting and design

This is an observational study conducted from January to December 2018 in a referral endoscopy facility in Port Harcourt, Rivers State, Nigeria. This ambulatory endoscopy centre receives referrals from nearby states in Nigeria. The inclusion criterion for study was patients who received a colonoscopy with indications for CRC screening. Exclusion criteria included: symptomatic patients undergoing colonoscopy for lower-intestinal bleeding, altered bowel habits, weight loss, or anaemia; age younger than 45 years; previous personal history of CRC or other neoplasia; at high risk for CRC (intestinal polyposis syndrome, inflammatory bowel disease, non-polypoid colorectal cancer syndrome or a first degree relative with CRC). Also excluded were individuals with a his-

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tory of colorectal resection for indications other than CRC. A prospective collection of data on demographic, clinical, endoscopic and histopathologic findings on Microsoft Excel software was done.

Pre-procedure

An informed consent for the procedure was obtained according to Helsinki declaration at a pre-procedure visit for clinical evaluation. A two-day dietary restriction was instructed. Bowel cleansing preceding the morning of procedure was commenced using polyethylene glycol or sodium picosulphate citrate. During the period of non-availability of listed agents, a castor oil/bisacodyl regimen was used. Conscious sedation was the choice of anaesthesia and

was administered by assisting physician or nurse anaesthetist for patients of American Society of Anaesthesiology class I-II. Beyond these grades, the procedure was performed under the supervision of an anaesthesiologist. The drugs administered were intravenous diazepam 5-10mg, pentazocine 30mg and hyoscine 40mg. The latter was used after exclusion of obstructive urinary symptoms and history of glaucoma. Intravenous propofol was administered only by an anaesthesiologist.

Procedure

The endoscopy equipment used was Karl Storz (Germany) video-colonoscopy 13925 PKS, high definition video-monitor, Telecam DXII camera unit and Xenon 100W gastro insufflation pump. All colonoscopies were performed by the same surgeon endoscopist. A full colonoscopic examination was performed after digital rectal examination. The intubation of the caecum was confirmed by visualization of convergence of the *Taenia coli* (crow-foot appearance) and appendiceal orifice. An occasional intubation of the ileo-caecal valve was performed in atypical cases for completion. The video image was captured and stored for the medical report. The sites of polyps were recorded according to the endoscopic assessment of the segment of bowel involved as against using distance from anal verge which is variable depending on mechanical shortening or lengthening of colon caused by the endoscope during navigation. A snare loop was used for removal of polyps of 5-20mm size and simple cold biopsy for polyps <5mm in size.

Pathological examination

The tissue samples were immediately fixed after removal in 10% buffered formalin and safely transported by air courier to the laboratory for processing. Sections were stained with routine haematoxylin and eosin and examination under the microscope. All specimens of the screening colonoscopy cases were reviewed at the same laboratory by an experienced gastro-intestinal pathologist. The polyp was assessed and classified as appropriate while the adenomatous polyps were further evaluated for the level of dysplasia using the two-tier grading system (low- or high-grade dysplasia), as well as the whether there is involvement of the margins.

Post procedure

The vital signs of patients were monitored for a minimum of fifteen minutes before discharge home and instructed on a follow-up visit to discuss the histopathology.

Statistical analysis

The statistical analysis was done using IBM SPSS Statistics for Windows, version 20 Armonk, NY. Mean age and standard deviation were calculated. The categorical variables were analysed in simple percentages. The association between the variables was made using the chi-square test and a value of $P < 0.05$ was considered statistically significant.

Results

There were 144 colonoscopy procedures performed during the study period out of which 70 were asymptomatic cases for screening indication. Sixty-six of these asymptomatic cases were included in study analysis after exclusion of a sole case of poor bowel with incomplete study and 3 cases of unavailable histology report. The age range of participants was from 48 years to 60 years: mean 54.8 ± 3.6 years (Figure 1). There were 62 males and 4 females.

A caecal intubation rate of 98.5% was recorded in the screening colonoscopies with inability to navigate endoscope into caecum due to loop formation despite repeated attempts at reduction in one case.

Thirty-six cases had polyps – polyp detection rate of 53.7%. These polyps were multiple per individual in 13 cases (2 polyps per individual in 10 cases and 3 polyps in 3 individuals). The size of polyps

and the site of distribution of polyps/adenomas are as shown in Table 1.

An adenoma detection rate (ADR) of 28.8% was recorded from 19 persons. From histology, there were: 22 cases of tubular adenomas with low grade dysplasia (Figure 2); 3 tubulo-villous adenomas with low-grade dysplasia; and 1 sessile serrated adenoma (Table 2). The remaining polyps were inflammatory polyps and 6 of these cases were seen co-existing with adenomas. There was no malignant polyp or incidental colorectal cancer recorded.

The incidental endoscopic findings were: 17 cases of haemorrhoids; 8 asymptomatic cases of diverticulosis, 1 case of angiodysplasia and 1 case of melanosis coli. No abnormality was detected in 19 cases.

Discussion

Colorectal cancer incidence is rising in countries that recently experienced rapid economic growth.⁹ Hence, the need for screening as about 90% of CRC cases arise from an adenoma and it takes about 10 years for a polyp greater than 1 cm in size to become an invasive malignancy.¹⁰ In this colonoscopy study the indication for nearly half of cases (47.9%) performed during study period was for screening purpose. A search of African literature on colonoscopy shows mostly studies conducted on symptomatic patients with few cases of screening as indication.¹¹⁻¹⁴ A colorectal cancer

Table 1. Site distribution of polyps and adenomas detected in study.

Site	Polyps	%	Size			Adenoma
			≤5 mm	6-10 mm	>10 mm	
Rectum	22	39.3	14	4	4	7
Sigmoid colon	11	19.6	3	3	5	4
Descending colon	3	5.4	1	1	1	1
Transverse colon	12	21.4	5	3	4	9
Ascending colon	7	12.5	2	1	3	4
Caecum	1	1.8	1	1	0	1
Total	56	100	26	13	17	26

Table 2. Histologic classification of adenomatous polyps recorded in study population.

Histology	Frequency	%
Tubular adenoma with low grade dysplasia	22	84.6
Tubulo-villous adenoma with low grade dysplasia	3	11.5
Serrated adenoma	1	3.8
Villous adenoma	0	0
Total	26	100

awareness campaign conducted by the study centre, highlighting screening colonoscopy to national and multinational companies in the locality and health-care providers of this major metropolitan city, was probably responsible for the significant percentage recorded. A one-time choice test designed to detect both early cancer and adenomatous polyps-colonoscopy, was advocated if resources were available. An effective colorectal screening test has the primary aim to ameliorate the disease by an early detection of premalignant adenomas and removal then secondarily to detect early CRC for prompt treatment.^{15,16}

The quality metrics for screening colonoscopy include caecal intubation and an adequate bowel preparation; however, ADR has emerged as one of the most important. The ADR is the proportion of patients with at least one adenomatous polyp visualized at endoscopy.¹⁷ An acceptable 28.8% ADR was recorded since the benchmark for ADR as recommended by international standard is 25% overall, 30% in men, and 20% in women.¹⁸ There is a high dependence on the skill of the pathologist as there is variance among pathology laboratories. All specimens from the screening colonoscopy cases were reviewed by an experienced gastro-intestinal pathologist. Several factors are associated with an increase in ADR, such as the use of image enhancement technology, withdrawal time, quality of intestinal preparation, and the use of antispasmodic drugs.¹⁸ In the low-/middle-income country setting of this study, white-light endoscopy with high definition imaging was used with a withdrawal time of at least six minutes and the removal of polyps found during insertion and withdrawal phases adopted. Finding better quality metrics in screening colonoscopy rather than improving technology is more cost-effective. An adequate withdrawal technique, including looking behind every fold, a protocol of copious irrigation with water in segments of non-optimal bowel preparation for cleaning debris and needed distension were carefully performed. A caecal intubation rate (98.5%) higher than the reported rates of 62.3-94% from African studies may have positively affected the ADR.¹¹⁻¹⁴

Approximately two-third-36 (64.3%) of polyps were seen in the left side of the colon comprising the rectum, sigmoid and descending colons. In all, 30% of polyps detected were more than 1cm in size but no villous adenoma, high grade dysplasia or early CRC was recorded. There was a near even distribution of adenoma between the right and left sides of the colon with the transverse colon as the most frequent

anatomic site of adenoma detection. This distribution varies from the right colon predominated distribution of adenoma in the East and left sided predominance in Western populations. The reason for this variation in this African population is uncertain. There is however a documented trend in recent literature of a rising incidence of colorectal cancer in sub-Saharan Africa and invariably of pre-mitotic adenomas.¹⁹ Data from this colonoscopy study forecast a further rise in colorectal cancer incidence if unchecked. This is inferred holding true the established transition from early form adenoma to carcinoma over 10 years. Previous studies from Nigeria had shown rising inci-

dence of CRC.^{20,21} For instance, Iliyasu reported a four-fold increase over 2 decades from The Ibadan Cancer Registry in the 90s.²⁰ Rotimi and Abdulkareem in their systematic review of Nigerian literature over 53 years reported increase in annual frequency from 18.2/annum in the early years (1954-1969) to 86.8/annum in the latter years (1991-2007).²¹

Colonoscopy has its limitations including adequacy of intestinal preparation, risks related to sedation, the risk of perforation, missing neoplasia, and high cost. No perforation or major complication was recorded. The limitations to this study include the small sample size and the fact that it is a sin-

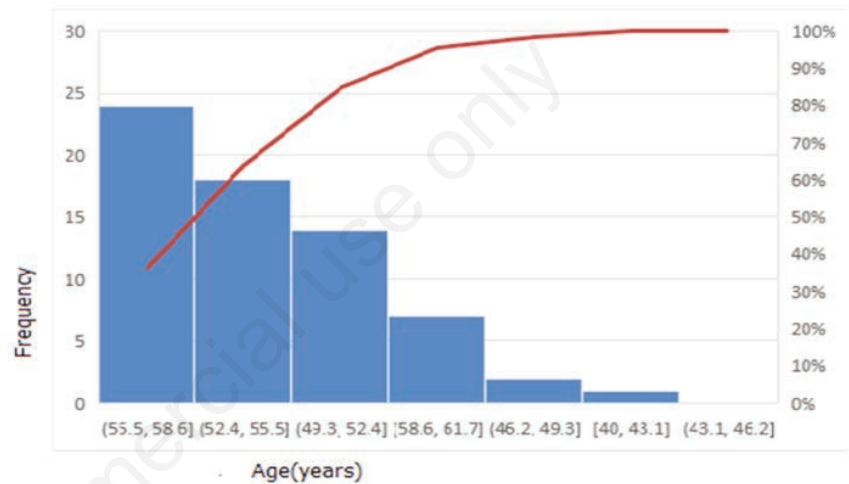


Figure 1. Age distribution of study asymptomatic patients who had screening colonoscopy.

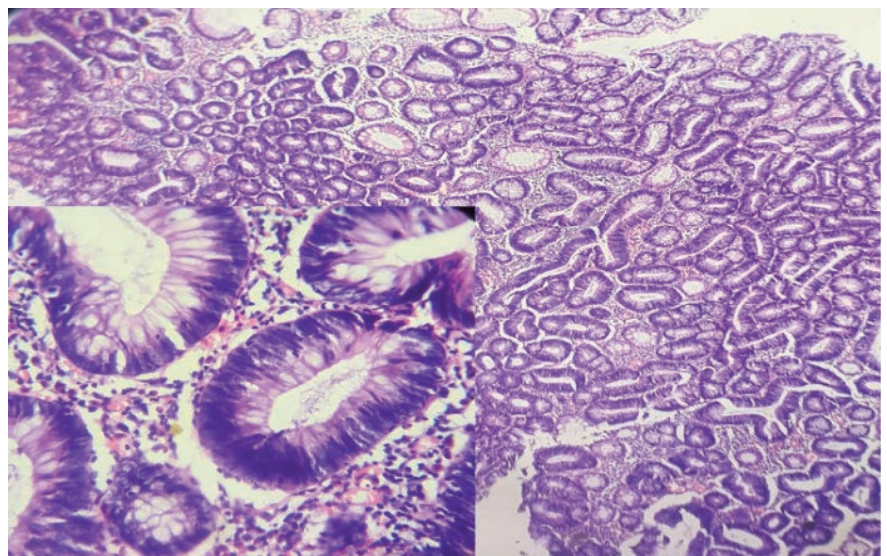


Figure 2. Photomicrograph of a case of colonic tubular adenoma with low-grade dysplasia (haematoxylin and eosin stain $\times 100$). The lower left insert shows the same lesion at high magnification ($\times 400$).

gle centre study. The notable barriers to screening identified include lack of comprehensive health insurance, non-optimal physician recommendation and low awareness of the importance of CRC screening. A guideline as formulated by US Multi-Society Task force for the detection of adenomatous polyps and CRC is needed in our setting.²² This will logically yield a similar reduction in mortality from CRC. In the African sub-region, screening for CRC by colonoscopy at age 50 in combination with treatment costs is <\$Int 6000 per disability adjusted life years averted based on WHO-CHOICE analysis and can be considered cost-effective.²³ A targeted policy on screening for colorectal cancer is hereby recommended with an emphasis on screening colonoscopy as adults may have different preferences and acceptance among the available CRC screening tests.

Conclusions

There is a worrisome prevalence rate of adenomatous polyps in this middle-aged sub-Saharan African population. Villous adenoma, however, is not a common pathology. A targeted policy of screening colonoscopy with removal of abnormal lesions and surveillance will reduce the upward trend of incidence and significant mortality from colorectal cancer.

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