

## Colorectal Cancer in Niger Delta, Nigeria: Multi-centre lower Gastrointestinal Endoscopy Study.

Emeka Ray-Offor<sup>1,2\*</sup>, Gbaranen BM Gbaanador<sup>3</sup>, Chinyere O. Madubuike<sup>4</sup>, Christopher C. Obiorah<sup>5</sup> and Nze J. Jebbin<sup>2</sup>

<sup>1</sup>Digestive Disease Unit, Oak Endoscopy Centre Port Harcourt, Rivers State, Nigeria

<sup>2</sup>Department of Surgery, University of Port Harcourt Teaching Hospital Port Harcourt, Rivers State, Nigeria

<sup>3</sup>Shawsand Medical Centre Port Harcourt, Rivers State, Nigeria

<sup>4</sup>Gastroenterology Unit, Federal Medical Centre Yenagoa, Bayelsa State, Nigeria

<sup>5</sup>Department of Anatomical Pathology, University of Port Harcourt Teaching Hospital Port Harcourt, Rivers State, Nigeria

**\*Corresponding Author:** Emeka Ray-Offor, Department of Surgery, University of Port Harcourt Teaching Hospital, P.M.B.6173, Port Harcourt, Rivers State, Nigeria.

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### Abstract

**Introduction:** Colorectal cancer (CRC) is a disease of global importance. The practice and formulation of effective health policies in developing countries is marred by lack of appropriate colorectal cancer screening and up-to-date cancer registry.

**Aims:** To study the frequency and presentation pattern of CRC in two metropolitan cities in a region of Nigeria.

**Materials and Method:** An observational study of lower gastrointestinal (GI) endoscopy performed from April 2013 to April 2018 at private/public health facilities with endoscopy service in 2 major cities in the Niger Delta area, Nigeria. A questionnaire was distributed for completion to all practicing endoscopists in the area. The variables collated included demographics, indications, endoscopic findings and histopathology. Analysis was done using IBM SPSS Statistics for Windows, version 20 Armonk, NY.

**Results:** A total of 466 flexible lower GI endoscopies were recorded: 434 colonoscopies; 32 sigmoidoscopies. Histologically confirmed cases of CRC were 45 (44 adenocarcinoma and 1 non-Hodgkin's lymphoma) with age range from 28 years to 79 years; mean age of 52.3±13.7 years. There were 30 males and 15 females; predominant site was the rectum with 25 (55.6%) cases recorded.

**Conclusion:** Colorectal cancer is not uncommon in this Nigerian population. A targeted screening policy is recommended.

**Keywords:** Colorectal cancer; Colonoscopy; Nigeria

### Introduction

Global emerging trend has non-communicable diseases leading to nearly two-third of annual mortality with 70% estimated to occur in low- and middle-income countries (LMIC) [1]. This is double

jeopardy as communicable diseases still pose an unresolved challenge in these countries. Globally, colorectal cancer is the third most common cancer responsible for over 600, 000 deaths annually. [2]

In Nigeria, colorectal cancer (CRC) is the most common gastrointestinal cancer diagnosed. [3] It is the second most common cancer in males and third most common in females according to two population-based cancer registries., [4] An adenoma-carcinoma sequence is well documented thus an early detection and removal of adenomatous polyps is an effective preventive measure. Flexible lower gastro-intestinal endoscopy is an effective screening, diagnostic and therapeutic modality. [5]

The risk factors for colorectal cancer are modifiable and non-modifiable. The former includes increased intake of red meat, high-fat diet, inadequate intake of fibre, obesity, sedentary lifestyle, smoking and high consumption of alcohol. These factors are rife with urbanization and increasing life expectancy. Evidence to this fact is the increasing incidence of CRC in countries that recently transitioned from a low to high -income economy like Japan, Singapore and Eastern European countries. [6,7] The non-modifiable risk factors include age, gene-related and personal history of chronic inflammatory bowel disease. A worrisome prevalence of adenomatous polyps in asymptomatic individuals in Niger delta region of Nigeria has been reported. [8] However, there is yet paucity of literature on the incidence and prevalence of colorectal cancer in this region which is experiencing rapid urbanization from oil exploration revenue. [9] The practice and formulation of effective health policies in developing countries is marred by lack of up-to-date cancer registry and appropriate colorectal cancer screening.

This study aims to evaluate the frequency and presentation pattern of CRC in two metropolitan cities in Niger delta region of Nigeria.

## Materials and Method

### Study setting

This collaborative study was conducted in Endoscopy referral centres in two cities in the Niger delta region of Nigeria- Port Harcourt and Yenagoa. Port Harcourt, is the capital of Rivers state and a major industrial centre lying along the Bonny River which is located in the Niger Delta area. According to the National Bureau of Statistics, Rivers State has a population of 7, 303,924 with Port Harcourt, its capital, being the fifth largest city in Nigeria- Africa's most populous country. [10] The second city is Yenagoa which is the capital of Bayelsa state and has a population of 2,277,961 with one fifth of this residing in the capital city.

### Study design

This was an observational study from April 2013 to April 2018 of patients undergoing flexible gastro-intestinal endoscopy. A study questionnaire was sent for completion to all endoscopists in centres with functional endoscopy facilities in the two states of Nigeria. Data from two Surgeon endoscopists and a Gastroenterologist were available representing the 5 centres with gastro-intestinal endoscopy facility in the two cities at the inception of study. The variables collated from centre records included: demographics, indications, endoscopic findings and histopathology.

### Statistical analysis

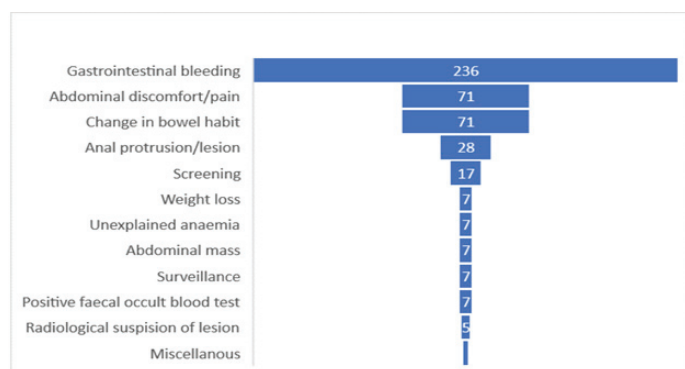
The statistical analysis was done using IBM SPSS Statistics for Windows, version 20 Armonk, NY. The mean age and standard deviation were calculated. The categorical variables were analysed in simple percentages. An association between the variables was made using the chi-square test with a value of 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

## Results

A total of 466 flexible lower GI endoscopies were reported during the study period: 434 colonoscopies; 32 sigmoidoscopies. The age ranges were from 4 years to 79 years. The leading primary indication for the lower GI endoscopy was gastrointestinal bleeding in 236 (50.6%)-Figure 2.



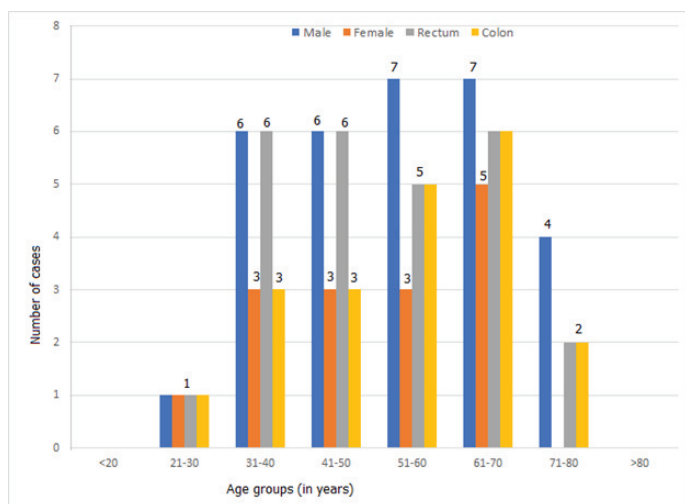
**Figure 1:** Map of Nigeria showing Rivers and Bayelsa States.



**Figure 2:** Primary indication for lower GI endoscopies.

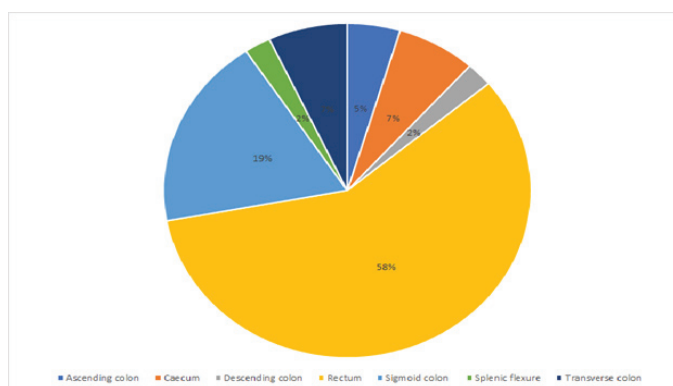
Polyps were detected in 90 cases (polyp detection rate PDR of 19.3%) and 10 cases of adenoma recorded (adenoma detection rate ADR of 2.1%). There were 2 cases of ulcerative colitis recorded but no case of Crohn's disease.

A total of 45 cases had biopsy-confirmed colorectal cancer. The least age was 28 years and the oldest was 79 years (Figure 3). The mean age of CRC patients was  $52.3 \pm 13.7$  years; mode 65 years and median age as 53 years. Eleven cases (24.4%) of CRC cases were below 40 years in age. There were 30 males and 15 females with a male to female ratio of 2:1. The male sex was predominantly affected across the various age groups irrespective of colon or rectal origin.



**Figure 3:** Age and sex distribution of colorectal cancer cases.

The site distribution of colorectal cancer cases is as shown in Figure 4. The predominant site being the rectum with 25 (55.6%) cases recorded.



**Figure 4:** Site distribution of colorectal cancer cases.

Adenocarcinoma was the histologic diagnosis in all cases of colorectal cancer but for one case of non-Hodgkin lymphoma recorded.

## Discussions

Cancer of the colon including the rectum is a leading cause of morbidity and mortality. [1] There is strong evidence that the removal of polyps and adenomas by colonoscopy lowers colorectal cancer (CRC) incidence and mortality. [5] However, comprehensive studies in epidemiology of cancer are limited in developing countries by the dearth of tools for disease control and cancer surveillance. [11] In this flexible lower gastro-intestinal endoscopy based study, a detection rate of 7.5% per annum over a 6-year period (2013-2018) was recorded. This is an increase from a prevalence of 3.75% reported over a 12-year period (1990-2001) from a tertiary hospital record in Port Harcourt, Rivers State, Nigeria. [12] Reports from other regions of Nigeria equally report a rising prevalence of colorectal cancer. [13] The reasons attributed to this trend are westernization of diet especially in cosmopolitan population, increased awareness and availability of diagnostic facilities (laboratory, endoscopy and radiology).

No early stage colorectal cancer (malignant polyp) was recorded. This is relevant as over 90% of CRC cases arise from an adenoma and take about 10 years for polyp greater than 1 cm in size to become an invasive malignancy. [14] The detection of pre-malignant or early malignant stage is crucial to survival rate as the 5-year survival rate for patients with early disease (limited to the muscularis mucosa without involvement of adjacent organs, lymph nodes or distant sites) is 90%. For regional disease with lymph node involvement this drops to 70%, and that for metastatic disease is only 10%. [15,16] The polyp and adenoma detection rates from this study were 19.3% and 2.1% respectively. A multi-centre

colonoscopy study in South-West Nigeria revealed a lower polyp detection rate of 6.8%. [17] In all, these rates are low in comparison to Western developed countries with higher prevalence of CRC. The possible reasons for this low rate of adenoma detection range from low incidence, quality of bowel preparation and inter-observer variability.

A low acceptance level of screening colonoscopy by family members of colorectal cancer patients detected below 40 years of age was noted. This may be due to financial constraints or fear of the examination and results. There were only 2 cases of ulcerative colitis recorded and no case of Crohn's disease. In comparison to a North African population, ulcerative colitis has been reported as a common colonoscopy finding. [18] As reported, the relative risk of colorectal cancer in patients with inflammatory bowel disease is estimated at between 4-to 20-fold. [7]

A serrated pathway is an alternative pathway in which serrated polyps replace the traditional adenoma as precursor lesions to CRC. [19] This results from an extensive methylation at the CpG island promoter site, which may demonstrate microsatellite instability. There was a sole case of serrated adenoma recorded in this study. Newer imaging technologies, such as narrow band imaging, auto-fluorescence and confocal endomicroscopic methods, may lead to higher diagnostic yield of premalignant lesions. [20] As white light endoscopy was used by the endoscopists in this study, it is highly probable that these newer more expensive imaging techniques will increase the yield of smaller adenomatous lesions in this population. The cost and traditional report of a low incidence of CRC discourage their ready availability. However, a withdrawal time for careful inspection of at least eight minutes on navigating white light endoscope to caecum is associated with a high diagnostic yield of colonoscopy as reported by one of the authors. [21]

The routine screening for CRC is associated with reduction of mortality. [22] Evidence from literature is in favour of colonoscopy as the most effective screening tool when compared to flexible sigmoidoscopy and air-contrast barium studies. [23] The guideline for screening by American College of Gastroenterologists recommends colonoscopy be offered first to all asymptomatic individuals aged 50 years or older with no personal history of CRC, adenomas nor chronic inflammatory bowel disease and no family history of CRC or genetic syndrome. [24] This is the average-risk group. From this multi-centre study that shows a mean age of diagnosis of CRC patients at 52 years, a lower screening age of 45 years for medium risk patients is recommended in this population. The reason being

the over 10-year transition period of adenomas and the consideration of an alternate pathway in the geographic variation of disease pattern.

There were limitations to this prevalence study of colorectal cancer from flexible GI endoscopy services. Some factors known to affect polyp/adenoma detection including quality of bowel preparation, caecal intubation rate and withdrawal time were not available for analysis. Another limitation was that endoscopy services are in the urban areas but there is significant rural population and a poor patient referral system. Hence, study findings may not truly reflect the prevalence of colorectal cancer. The cost of colonoscopy service which is about US \$222 (N80, 000 at N360 per \$1 USD), though cheap when compared to the cost in Western countries yet is unaffordable to a large population who are mostly out-of-pocket paying clients. Lastly, a vast pool of asymptomatic patients was not incorporated into this study as the practice of screening colonoscopy or any coordinated screening program was not in place.

## Conclusion

Colorectal cancer is not uncommon in this Nigerian population with a male predominance across all ages and sites of presentation. A targeted screening policy in asymptomatic individuals commencing from 45 years and further molecular studies on microsatellite instability status of colorectal cancer in Nigeria are hereby recommended.

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