

Morphology of colorectal carcinoma among Nigerians: A 30-year review

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Abstract

Background: The incidence of colorectal carcinoma has been on the increase in the developing countries, including Nigeria, as a result of change in diet and adoption of western lifestyle.

Objectives: The aim of this review is to highlight the prevalence, age and sex distribution, anatomical location, and morphological characteristics of colorectal carcinomas in Ilorin, Nigeria.

Materials and Methods: This is a retrospective study of all cases of histologically diagnosed colorectal carcinoma in the University of Ilorin Teaching Hospital, Ilorin, Nigeria, over a 30-year period (January 1979–December 2008), using the departmental record and histological slides of the cases.

Result: A total of 241 cases of colorectal carcinoma were reported, 144 cases (60%) in males and 96 cases (40%) in females with a male: female ratio of 1.5:1. The peak age of occurrence for males was between 51 and 60 years, while that of the females was between 41 and 50 years. The malignancy was found in the rectum in 60.2% of the cases, while the least affected site is the descending colon (1.2%). The exophytic occluding masses were found in 82.2% of the cases, and the most common histological type is adenocarcinoma (77.2%) with well-, moderately, and poorly differentiated forms constituting 52.3%, 32.8%, and 14.9% respectively. Of the 241 cases that were seen over the last 30 years, 93 cases (38.6%) were seen in the last 5 years.

Conclusion: Colorectal carcinoma is no longer a rare disease in Nigeria. The surge in the incidence reported in the last 5 years in this center calls for a pragmatic action in its control, with emphasize on colonoscopic screening for those with family history, and possibly making digital rectal examination a mandatory aspect of clinical examination, because most colorectal carcinomas are within the reach of examining finger.

Key words: Carcinoma, colorectum, Ilorin

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Introduction

Colorectal carcinoma is the third most common cancer worldwide and the third most common cause of deaths from cancer in both sexes in industrialized nations.^[1] The incidence varies according to geographical location with the highest rates reported from Australia, New Zealand, and Northern and Western Europe.^[2] Although the highest incidence of colorectal carcinoma in United States is seen among African Americans, colorectal carcinoma is an uncommon malignancy in Africans and most of the other developing countries.^[3,4] Several epidemiological studies

done in different parts of Nigeria, mostly hospital-based, have highlighted the relative incidence, age and sex distribution, and pathological characteristics of colorectal carcinoma.^[5-7] However, it is difficult to ascertain the national incidence and mortality for colorectal carcinoma in Nigeria due to lack of a reliable population statistics and absence of population-based cancer registries.

The development of colorectal carcinoma is a multistep

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process and is influenced by complex interactions between the host and environmental factors.^[8] Almost synonymous with the host factor are genetic influences that include mutations in adenomatous polyposis coli (APC) gene, DNA mismatch repair (MMR) gene, and fast acetylators particularly those with *N*-acetyl transferase 1 alleles (NAT).^[9-11] Others include glutathione *S*-transferase null genotype and homozygosity for the *Msp*I mutant genotype of CYP1A1, a cytochrome P450.^[11,12] In addition to the genetic factors, other important host factor includes hormonal factors such as estrogen and growth factor.

The observed geographical variation in the incidence of colorectal carcinoma has been linked to considerable influence exerted by environmental factors. Excessive intake of red meat, animal fat, beer, and refined carbohydrate increases fecal bowel acids and mutagens implicated in the causation of colorectal carcinoma.^[3,13] A diet rich in fruits, vegetables, and fibers on the other hand exert protective influences through induction of enzymes that neutralizes noxious chemicals within the gastrointestinal tract.^[3,14] Adoption of western lifestyle including diets in spite of previously documented low level of colorectal carcinoma among Nigerians is putatively a major reason for possible increase in the incidence of colorectal carcinoma among other possible factors in the nearest future.

The aim of this review is to analyze all cases of colorectal carcinoma seen in the Department of Pathology, University of Ilorin Teaching Hospital, Ilorin. The incidence, age and sex distribution, anatomical location and pathological characteristics of colorectal carcinoma are documented.

Materials and Methods

This is a retrospective study of all histologically confirmed colorectal carcinomas seen in the Department of Pathology of the University of Ilorin, Ilorin, from January 1979 to December 2008. The department provides histopathological services to the people from the North-Central geopolitical zone of Nigeria, comprising Kwara, Niger, Kogi, and Benue States; and some parts of Osun and Oyo States of Nigeria.

All cases of colorectal biopsies and resections were obtained from the histopathology register in the Department of Pathology. The age, sex of the patients, anatomical location, and gross description of the specimens of all histologically confirmed colorectal carcinomas were obtained from the histopathology request forms and other records in the department.

Hematoxylin and eosin-stained slides of all the cases were retrieved and reviewed with emphasis on histological diagnosis, grade of the tumor, and extent of infiltration of the wall of the colorectum. Periodic acid-Schiff and Alcian blue were done to confirm mucinous adenocarcinoma and signet-

ring carcinoma in some cases. Immunohistochemical facility to differentiate anaplastic carcinomas from malignant mesenchymal tumors and lymphomas was not available in our center.

The colorectal carcinomas were classified histologically using Jass *et al* histological typing of intestinal tumors, adopted by World Health Organization in 1987.^[15] The results are presented in tables and graphs.

Results

Two hundred and forty-one cases of colorectal carcinoma were histologically confirmed during this 30-year period giving an average of eight cases per year. The highest number of cases recorded was in the last 5 years of the study, 93 cases (38.6%) with an average of 19 cases per year as shown in Figure 1.

Of the total cases seen, 144 of 241 (60%) occurred in males, while 96 of 241 (40%) cases were seen in females [Table 1], with male: female ratio of 1.5:1. The age ranges from 18 to 80 years, with a mean of 50.1 ± 16.3 years. The peak incidence was in the 51–60 years age group (24.9%).

The most common site of occurrence was the rectum

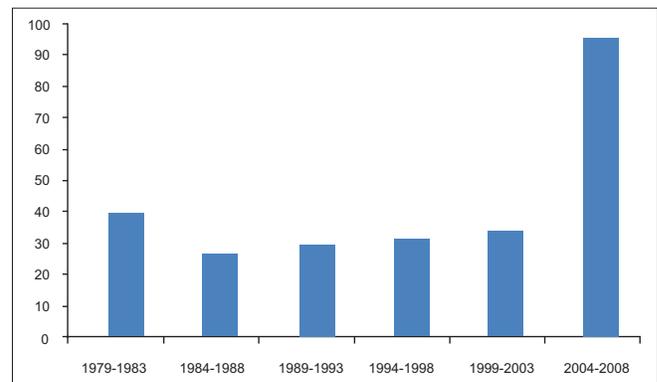


Figure 1: Frequency distribution of colorectal carcinoma in Ilorin over 30 years

Table 1: Age and sex distribution of colorectal carcinoma in Ilorin

Age range	Male	Female	Total (%)
11–20	3	1	4 (1.7)
21–30	19	13	32 (13.3)
31–40	23	14	37 (15.4)
41–50	20	22	42 (17.4)
51–60	41	19	60 (24.9)
61–70	20	16	36 (14.9)
71–80	11	7	18 (7.5)
Age not specified	7	5	12 (5.0)
Total (%)	144 (59.8)	97 (40.2)	241 (100)

(145 cases, 60.2%) followed by the cecum (31 cases, 12.9%) and ascending colon (20 cases, 8.3%), as shown in [Table 2]. Other affected sites include transverse colon (16 cases, 6.6%), sigmoid colon (14 cases, 5.8%), rectosigmoid area (12 cases, 5.0%), and least involved site was the descending colon (3 cases, 1.2%).

Out of 168 of these cases, 82.2% were exophytic occluding tumors, 11.5% were diffusely infiltrating tumors, while 6.7% were ulcerating tumors. One hundred and eighty-six cases (77.2%) were adenocarcinoma with varying degree of differentiation. Well-differentiated, moderately differentiated, and poorly differentiated adenocarcinomas constitute 52.3%, 32.8%, and 14.9%, respectively, of all adenocarcinoma. There were 39 cases (16.2%) of mucinous adenocarcinoma, 13 cases (5.4%) of signet-ring carcinoma, 2 cases (0.8%) of adenosquamous carcinoma, and 1 case (0.4%) of anaplastic carcinoma [Table 3].

Discussion

Colorectal carcinoma although infrequent in developing countries relative to developed nations of world, increasing incidence with high morbidity and mortality among blacks should sound a note of warning in addressing the menace posed by the disease.^[4,16]

The average of eight cases of colorectal carcinoma per year during the 30-year study is lower compared with reported figure of 14.4 by Sule *et al.* in Jos, an area within the same North-Central region of Nigeria.^[6] However, considering the last 5 years (2004–2008) of the study period alone, with 93 cases (38.6%), the annual incidence increased to an average of 19 cases per year. This tends to confirm the assertion that incidence of colorectal carcinoma may be on the increase in Nigeria. Even with this observed increment, these cases fell short of 32.3 and 26.3 cases reported annually in Lagos and Ibadan, respectively.^[7,16] Our finding most probably represent a lower percentage of the true incidence of colorectal carcinoma because quite a large proportion of Nigerians in this region of the country do not have access to healthcare facilities, many seek treatment at alternative medical centers and most deaths remain uninvestigated.

Colorectal carcinomas have been described in all age groups. Sporadic cases occur over the age of 50 years, whereas colorectal carcinomas occurring at a younger age increase the likelihood of a germline genetic abnormality.^[17] The youngest patient in Nigerian literature with rectal carcinoma was a 9-year-old boy with strong family history of colorectal carcinoma.^[18] Only four cases (1.7%) from this study were 20 years and below, and the youngest was 18 years old raising the suspicion of a possible germline mutation in one of the DNA MMR genes implicated in HNPCC.^[10] Although most reported cases of intestinal cancer in the young occurs between 10 and 15 years, the reported case

Table 2: Anatomical sites and distribution of colorectal carcinoma in Ilorin

Anatomic sites	Frequency	Percentage
Cecum	31	12.9
Ascending colon	20	8.3
Transverse colon	16	6.6
Descending colon	3	1.2
Sigmoid colon	14	1.2
Recto sigmoid	12	5.8
Rectum	145	60.2

Table 3: Various histological variants of colorectal carcinoma reported in Ilorin

Histologic types	No.	Percentage
Adenocarcinoma	186	77.2
Mucinous adenocarcinoma	39	16.2
Signet-ring carcinoma	13	5.4
Adenosquamous carcinoma	2	0.8
Anaplastic carcinoma	1	0.4

of a 9-month-old female infant with colorectal carcinoma should make clinicians to be thorough while investigating colorectal masses in young patients.^[19]

The mean age of 50 years in this study is similar to reports from different parts of Nigeria where the figures range from 42.9 to 50.7 years as the mean age.^[7] This observed lower age at presentation in Nigerians and patients from other developing countries when compared with presentation at seventh decade in most developed countries may not be unconnected with the reduced life expectancy in developing countries and possible overrepresentation of HNPCC among the patients.

There is slight male predominance of colorectal carcinoma with a male: female ratio of 1.5:1. This is similar to findings from other studies on colorectal carcinomas in Nigeria and other countries.^[5-7,17,19,20] Even though no agreeable reason has been attributable to this male preponderance worldwide, it may be due to higher frequency of abdominal obesity, cigarette smoking, and alcohol consumption in men.

The rectum was the most common location (60.2%) for colorectal carcinomas in Ilorin, and the least affected location is the descending colon (1.2%). This is similar to the findings from the study conducted by Elesha and Owonikoko in Lagos which found 63% of the colorectal carcinomas in the rectum.^[21] This study like most other authors reported a preponderance of left-sided tumor.^[4-7,22] One of the probable reasons for predominance of sigmoid-rectal carcinomas in this and other studies is the accessibility to digital rectal examination and proctosigmoidoscopy. Histologically, adenocarcinomas of varying degrees of differentiation accounted for 77.2% of all colorectal

carcinomas in this study. This is similar to reports from other studies with overwhelming proportion of the colorectal carcinoma being adenocarcinoma.^[16,19,22]

The second most frequent histological type is the mucinous adenocarcinoma that was seen in 16.2% of the cases. Generally, mucinous adenocarcinoma and signet-ring carcinoma tends to occur with increased frequency in young age group and in low-risk populations for colorectal carcinoma.^[23,24] Unlike adenocarcinomas, both mucinous and signet-ring carcinoma have relatively poor prognosis, and increased frequency with HNPCC has been noted.^[23-25]

In conclusion, this study showed that colorectal carcinoma constitutes a significant health burden in Ilorin and its environs particularly the surge in the incidence reported in the last 5 years of this study. A large number (30.3%) of colorectal carcinoma in Ilorin were seen in people below 40 years of age. Because it is difficult to determine whether these cases were familial or sporadic, the use of flexible colonoscopy in addition to conventional digital rectal examination is advised in patients with suggestive clinical features. Attempts at prevention of colorectal carcinoma or reducing its morbidity and mortality in Nigeria should include among other things, widespread health awareness campaign, improved screening facilities, and early treatment in cases with dysplasia.

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