

Colorectal carcinoma in a tertiary hospital in North-western Nigeria: a histopathologic retrospective review

Mohammed Ibrahim Imam,¹
Ibrahim Ogere Adogu²

¹Department of Pathology, Bayero University/Aminu Kano Teaching Hospital, Kano-Nigeria; ²Department of Pathology, Abubakar Tafawa Balewa Teaching Hospital, Bauchi-Nigeria.

Abstract

Colorectal Carcinoma (CRC) accounts for about 3.9% of all malignant lesions in human beings with several studies identifying it as the most common gastrointestinal malignancy. It was previously considered to be more common in developed nations of the world but recent studies have reported increasing trends in developing nations. The study was done on all cases of colorectal carcinomas diagnosed between 1st January 2001 and 31st December 2010 in the Department of Histopathology of a tertiary institution. The laboratory request forms and the duplicate copies of histology reports were retrieved for extraction of relevant clinical information like age, sex, anatomical sites of the lesions and clinical presentations. Histological diagnoses and grading were also extracted. Corresponding haematoxylin and eosin-stained slides were retrieved and evaluated. Special stains were carried out where necessary. The lesions were classified according to the World Health Organization (WHO) histological variants and tables and figures were used to illustrate the results. A total of 186 cases of colorectal carcinoma were diagnosed during the period, representing 3.9% of the total malignant tumors and 50.4% of the gastro-intestinal malignancies. One hundred and ten cases (59.1%) and 76 cases (40.9%) were in males and females respectively with a male:female ratio of 1.46:1. The age range was from 17-87 years with a mean of 42.8 years and peaked at 61-70 years. Site distribution showed rectosigmoid lesions accounted for 64.5%, caecum, ascending colon, transverse and descending colons accounted for 9.1%, 3.8% and 2.2% each respectively. Most of the cases were adenocarcinoma (71.0%), followed by mucinous carcinoma (23.7%) and signet-ring cell carcinoma (3.8%).

Colorectal carcinoma is prevalent in our

environment and is the commonest malignant gastro-intestinal tumors. There is a slight male preponderance with adenocarcinoma the commonest lesion and rectosigmoid as the most common site.

Introduction

Tumors of the colorectal region are among the most common human neoplasm which occur worldwide. These tumors could either be benign or malignant. Adenomas are the most common neoplasms of the colorectal area and are the precursor of most primary malignant epithelial tumors of the large intestine.

Early-stage Colorectal Carcinoma (CRC) is typically diagnosed only at the time of screening or other unrelated colonoscopy and does not usually manifest with symptoms, signs, or other laboratory findings. Advanced cancers are more likely to result in clinical symptoms, including a change in bowel habits, constipation, abdominal distention, hematochezia or tenesmus.

Colorectal Carcinoma (CRC) is the third most common cancer in the world and the fourth cause of cancer mortality in the western world including the United States of America.¹ About 655,000 deaths result annually from CRC worldwide.² The highest incidence of CRC is seen in the developed countries of the world.³ Both genetic and environmental factors including diet have been implicated in the high incidence in western nations.⁴ Even though generally, the incidence rate is relatively low in developing countries, recent studies have however raised concern about the gradually increasing incidences of CRC among developing countries of the world.⁵⁻⁷ This may be connected to the improvement of the socioeconomic life of the people and the adoption of the western lifestyle as a result of globalization.

Materials and Methods

The materials for this ten-year retrospective study comprised all cases of colorectal specimens received and diagnosed as colorectal cancer in the Histopathology Department of Aminu Kano Teaching Hospital from 1st January 2001 to 31st December 2010. The laboratory request forms of these cases were retrieved for extraction of relevant clinical information such as age, sex and site of surgical biopsy. Slides that had been produced for the cases were also retrieved and in cases of lost, broken or faded slides, new ones were made

Correspondence: Mohammed Ibrahim Imam, Department of Pathology, Bayero University/Aminu Kano Teaching Hospital, Kano-Nigeria.
E-mail: imamib89@yahoo.com

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from their respective tissue blocks and stained with haematoxylin and eosin stains. Cases for which the slides and the blocks could not be found were excluded from the study. Furthermore, a special mucicarmine stain was also done to confirm some cases of mucinous adenocarcinoma.

The cases were reviewed by the researchers and subsequently classified according to the World Health Organization (WHO, 2016) different histological patterns and grading. The data were collated and analyzed using simple statistical tools. Tables were used to display the results

while photomicrographs of some of the lesions were also used in the illustration.

Results

A total of 4779 malignant tumors from various anatomical sites and of different histological types were diagnosed in the Department of Histopathology, AKTH, Kano over the ten-year period of this study. Three hundred and sixty-nine out of this number, accounting for 7.7% of all the malignant lesions are from Gastrointestinal Tract (GIT). One hundred and eighty-six cases (50.4%) of the total GIT malignancies are CRC, out of which 110 (59.1%) and 76 (40.9%) of these cases of CRC were diagnosed in males and females respectively giving a male-to-female ratio of 1.46:1. These 186 cases represent 3.9% of the total malignant lesions diagnosed in the department during the period with an average of 18.6 cases per annum.

The age distribution of CRC in this study ranges from 17 to 87 years with a mean age of 42.8 years. The peak age of occurrence of CRC in the study was in the 61–70-year age group. Twenty-seven cases representing 14.5% of the cases occurred in those of age 30 years and below, 62 cases (33.3%) were diagnosed among patients of age bracket 40 years and below while 87 cases (46.8%) were found among those above the age of 50 years as shown in Table 1. In terms of the anatomical distribution of CRC in this study, left-sided tumors (124 cases) constituting 66.7% were more common than right-sided tumors (28 cases) which constituted 15.1%. More than half of the cases were located in the rectosigmoid region (120 cases, 64.5%). This was followed by the caecum with 17 cases (9.1%); the ascending colon had 7 cases (3.8%); the descending colon and transverse colon had 4 cases each (2.2%) (Table 2).

Microscopically, one hundred and thirty-two cases (71.0%) were adenocarcinoma (Figure 1), 44 cases (23.7%) were mucinous carcinoma (Figure 2) and 7 cases were signet ring cell carcinoma (Table 3).

Discussion

Colorectal Carcinoma (CRC) is one of the most common health problems and lethal malignancies worldwide. Its development is a multistep process that gives an opportunity for prevention and early detection. The high incidence and mortality rates emphasize the need for prevention and screening. In this study CRC accounted for 3.9% of all the malignant tumors diagnosed. This is in agreement with a value of 4-10% of all malignancies reported worldwide.

Abdulkareem *et al.* in Lagos and Shagamu reported 5.8%.⁸ In their series, Seleye-Fubara and Gbobo reported that 2.5% of all malignancies diagnosed in the University of Port Harcourt Teaching Hospital are from colorectal region.⁹

This study showed that 51.8% of all malignant gastrointestinal lesions are from the colorectal regions. This figure concurs with the results of studies from other centers in the country. In Lagos and Shagamu,⁸ Abdulkareem *et al.* reported 59% of total gastrointestinal malignancy as CRC, and so also Obafunwa reported 28.9% and 24.4% for rectal and colonic carcinomas respectively in Jos, North Central of Nigeria.¹⁰ In Ife, Ojo *et al.* had 80% of all cases of large bowel malignant tumors as colorectal carcinoma.¹¹ According to the America Cancer Society report of 2005, CRC is the commonest gastrointestinal cancer and trail only to lung cancer as the highest cause of cancer death in America.

One hundred and eighty-six cases of CRC were diagnosed over the 10-year period of the study with average annual cases of 18.6. This figure is low when compared to

higher figures from western countries but is higher than 12.5 cases per annum in a previous study carried out in this institution by Edino and colleagues.¹² The increase in cases per annum may have been accounted for by the increasing number of samples in the current study as well as an increase in hospital attendance. Iliyasu *et al.* reported an increase of 81% of cases of CRC over a period of 20 years in Ibadan.⁷ Naeeder *et al.*, in Ghana, reported a three folds increase in the number of patients presenting with CRC compared to what used to be the case a decade earlier.¹³

The male-to-female ratio of 1.46:1

Table 1. Age and sex distribution of patients.

	Frequency (%)
Age (years)	
11-20	8(4.3)
21-30	19(10.2)
31-40	35(18.8)
41-50	37(19.9)
51-60	29(15.6)
61-70	45(24.2)
71-80	11(5.9)
81-90	2(1.1)
Sex	
Male	110(59.1)
Female	76(40.9)
Total	186(100)

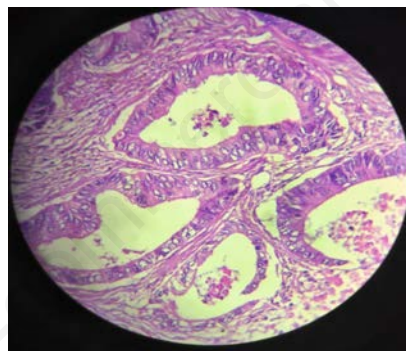


Figure 1. (H&EX40) Section of adenocarcinoma showing infiltrating malignant glands lined by columnar epithelial cells with hyperchromatic pleomorphic nuclei.

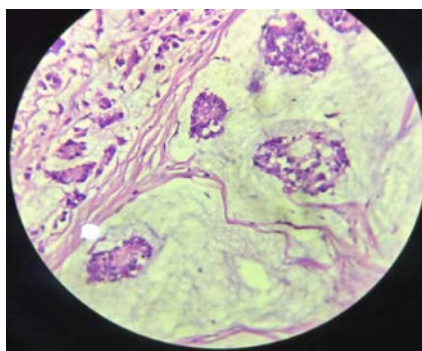


Figure 2. (H&EX10) Section of mucinous carcinoma showing infiltrating malignant glands swimming in mucin pool.

Table 2. The site distribution of Colorectal Carcinoma (CRC).

Site	Frequency (%)
Rectosigmoid	121(65.1)
Ileocaecum	17(9.2)
Ascending colon	7(3.8)
Descending colon	4(2.1)
Transverse colon	4(2.1)
Unspecified	33(17.7)
Total	186 (100)

Table 3. Distribution of Histological variants of Colorectal Carcinoma (CRC).

Histological subtype	Frequency (%)
Adenocarcinoma	132(71.0)
Mucinous carcinoma	44(23.7)
Signet ring cell carcinoma	7(3.8)
Basaloid carcinoma	1(0.5)
Verrucous carcinoma	1(0.5)
Undifferentiated carcinoma	1(0.5)
Total	186(100)

agrees with a slight male preponderance of CRC reported in previous studies and it disagrees with others with overwhelming male preponderance. A study in Iran reported a male-to-female ratio of 52.4% to 47.6% (1.1:1).¹⁴ In South Africa ratio of 1.32:1¹⁵ was reported while Odigie *et al.* in Zaria reported a ratio of 1.42:1.¹⁶ Abdulkareem *et al.* in Lagos and Shagamu reported a ratio of 1.3:1 in a recent study.⁸ These ratios are however at variance with ratios of 3:1 reported in Port Harcourt⁹ and 2.5:1 in a previous study in Kano.¹²

The 42.8 years mean age of presentation in this study confirms the fact that CRC shows younger age of presentation among blacks and also in areas of low incidence. Values of 38.9 years, 41 years and 52.3 years were reported in Zaria,¹⁶ Ibadan⁷ and Iran¹⁴ respectively. A previous study in Kano reported a mean age of 42.9 years. Apart from environmental factors, the role of genetics might be important in this early onset of the ailment and a lot of work will be necessary to unravel the possible genetic cause.

The peak age of occurrence of CRC in this study was 61-70 years which is in keeping with studies done in Lagos and Shagamu⁸ and Ghana¹³ but is higher than the peak age of 41-50 years found in Ife.¹¹ In Caucasians the peak period is between 60 and 79 years and fewer than 50% of the cases occur before 50 years of age except when CRC is a complication of pre-existing ulcerative colitis or one of the polyposis syndromes, conditions which are rare in our environment. About 33.3% of the cases were diagnosed in patients who were at the age of 40 years and below in this study, which conforms to a study done by Cronje *et al.* in Johannesburg where they reported 41% incidence among less than 50-year-old patients.¹⁵ In the same study done in South Africa, the proportion of black patients less than 40 years at presentation were 19% compared to 4% reported in their white counterpart confirming the fact that black patients present with CRC at younger ages.¹⁵ Our study shows distal (left-sided) lesions accounted for 67.2% of the CRC which conforms with studies from Iran,¹⁴ Ghana,¹³ Ife,¹¹ Ibadan⁷ and Lagos-Shagamu⁸ that all reported predominance of distal lesions. A previous study in our center also reported a value of 77.3% for left-sided lesions. In Zaria, left-sided lesions also dominated accounting for 74.3%.¹⁶

Histological analysis of this study

showed 71.0% were adenocarcinoma, 23.7% were mucinous carcinoma and 3.8% signet-ring cell carcinoma. In Lagos-Shagamu studies,⁸ values of 76.4%, 10.7% and 1.2% were reported respectively for adenocarcinoma, mucinous carcinoma and signet ring cell carcinoma. Ojo *et al.* in Ife,¹¹ also reported a similar pattern of carcinoma with 73% adenocarcinoma, 7.3% mucinous carcinoma and 3.7% signet ring cell carcinoma. The high figure of mucinous carcinoma contrasts reports of 11-15% mucinous carcinoma reported worldwide, where most of these reports were from studies among whites and this agrees with some studies that reported high cases of mucinous carcinoma in blacks.^{13,15}

Conclusions

In conclusion, Colorectal carcinoma is prevalent in our environment and is the commonest malignant gastro-intestinal tumors. There is a slight male preponderance with adenocarcinoma the commonest lesion and rectosigmoid as the most common site.

Limitations of the study

Our study is a single-center retrospective study which might have caused the results to be underestimated. In view of this, there is a need to carry out a multicenter prospective study with a larger sample size and multivariate analysis which allows for the enhancement of reproducibility and generalizability.

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