PATTERN OF PRESENTATION OF COLORECTAL CANCER IN A TERTIARY CARE FACILITY, SOUTHWEST NIGERIA: A TEN-YEAR RETROSPECTIVE REVIEW

Emmanuel Aimebelomo Ikhile [1], Ayorinde Mobolanle Folasire [2]

1- Department of Radiation and Clinical Oncology, University of Benin Teaching Hospital (UBTH), Benin City, Nigeria.
2- Department of Radiation Oncology, University College Hospital, Ibadan (UCH), Nigeria.

Corresponding Author: Emmanuel Aimebelomo Ikhile, Department of Radiation and Clinical Oncology, UBTH, Benin City, Nigeria, emmaikhile22@gmail.com, +2348171240002

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ABSTRACT

Background: Colorectal cancer (CRC) is the third most common malignant neoplasm worldwide and the leading gastrointestinal malignancy globally. In Nigeria, CRC has risen from the tenth to the fourth most common cancer in a single decade, yet organized screening is virtually absent and most patients present with advanced disease.

Objective: To evaluate the patterns of clinical presentation, demographic distribution, and disease stage among colorectal cancer patients managed at the Radiotherapy Department, University College Hospital, Ibadan, over a ten-year period (2002–2011).

Methods: A retrospective review of 300 histologically confirmed CRC cases presenting to the Radiotherapy Department, UCH Ibadan, between January 2002 and December 2011 was conducted. Disease was staged retrospectively using the Modified Astler-Coller (MAC) staging system, based on histopathology reports supplemented by operative findings and available imaging. Data were analyzed with SPSS version 26.0; categorical associations were assessed with the chi-square test, and the ordinal serum CEA-stage relationship with a linear-by-linear (trend) test.

Results: The proportion of CRC among all registered cancers rose from 1.9% in 2002 to 5.1% in 2011. The male-to-female ratio was 1:1. The modal age group was 40–49 years (26.7%) and 51.3% of patients were younger than 50 years. Adenocarcinoma was the dominant histological type (74.7%). MAC Stage D was the most frequent stage at presentation (37.7%). Serum CEA rose significantly with advancing disease stage (linear-by-linear trend $\chi^2(1) = 17.0$, $p < 0.001$).

Conclusion: The proportion of CRC among all cancers registered at UCH Ibadan increased over the study period, and patients presented at markedly younger age than in high-incidence countries, with late-stage disease predominating. These findings support public awareness campaigns and warrant further population-based studies to evaluate whether earlier screening (before age 50) would be beneficial in Nigeria.

Keywords: Colorectal Cancer, Nigeria, Presentation Pattern, Adenocarcinoma, Modified Astler-Coller Staging, Ibadan, Retrospective Review

INTRODUCTION

Colorectal cancer (CRC) remains a major global public health challenge, ranking as the third most common malignant neoplasm in men and the second most common in women worldwide.[1] Globally, it accounts for approximately 1.9 million new cases and over 900,000 deaths annually.[1,2] The geographic distribution of CRC reveals disparities; historically, incidence rates have been highest in high-income regions such as Australia, New Zealand, Europe, and North America—where age-standardized rates frequently exceed 30 per 100,000 person-years—and lowest in sub-Saharan Africa, where rates have traditionally remained below 10 per 100,000.[3,4] While these variations have long been attributed to deeply entrenched differences in regional diets and lifestyles, this historical gap is narrowing rapidly.[5]

Throughout sub-Saharan Africa, the epidemiological landscape is shifting, and the burden of CRC is accelerating. Driven by rapid urbanization, economic development, and nutritional transitions toward a more Westernized lifestyle, populations across West, East, and Southern Africa are experiencing a steady rise in CRC incidence.[6,7] This upward trend is particularly pronounced in Nigeria, which carries the largest absolute burden of disease in the region. Within the span of a few decades, CRC has transitioned from a relatively rare malignancy to one of the most frequently diagnosed cancers nationwide.[8,9] This surge reflects a broader national phenomenon associated with rising rates of physical inactivity, shifting dietary patterns, and increasing metabolic risk factors across both urban and developing rural populations.[10]

Despite this escalating burden, public health infrastructure across the region has not kept pace with the changing disease profile. Structured, population-wide CRC screening programs remain virtually absent in Nigeria, hampered by limited resources, low public awareness, and competing infectious disease priorities. Consequently, the vast majority of patients present with locally advanced or metastatic disease, which severely compromises survival outcomes and strains tertiary healthcare systems. Understanding the contemporary clinical and pathological patterns of CRC is therefore essential for optimizing resource allocation and tailoring regional oncological strategies.

While some historical data have outlined the baseline profile of CRC in Nigeria, there remains a critical need for long-term, comprehensive data analysis of the trends of the past few decades. This study aims to evaluate the patterns of clinical presentation, demographic distribution, and disease stage among CRC patients managed at the Radiotherapy Department of the University College Hospital (UCH), Ibadan, over a ten-year period. By examining these trends, this paper seeks to provide a robust epidemiological framework to inform local management policies, improve early detection strategies, and optimize cancer care delivery in the region.

MATERIALS AND METHODS

Study Area

The study was conducted at the University College Hospital (UCH), Ibadan, located in Ibadan North Local Government Area, Oyo State, south-west Nigeria. UCH serves as the principal oncology referral centre for south-west, south-east, and south-south Nigeria and maintains one of Nigeria's most active cancer registries.

Study Design and Data Collection

This was a hospital-based retrospective descriptive study. Data were extracted from case notes retrieved from the Departments of Radiotherapy and Surgery, supplemented by the Ibadan Cancer Registry, covering January 2002 to December 2011. Variables extracted included age, sex, occupation, domicile, BMI, cigarette smoking history, family history of cancer, presenting complaints, symptom duration, histological type and grade, anatomical tumour site, disease stage, metastatic sites, and serum CEA at presentation.

Study Population and Selection Criteria

All patients with histologically confirmed colorectal carcinoma presenting at UCH Ibadan within the study period were eligible. Cases with absent or inadequate histology and those with an indeterminate primary site were excluded. Of 567 CRC cases identified, 300 met the inclusion criteria and were analysed and 267 were excluded. Because individual demographic and staging data were not systematically retrievable for the excluded records, a formal comparison between included and excluded cases was not possible; the resulting potential for selection bias is acknowledged (see Limitations).

Staging

Disease was staged retrospectively using the Modified Astler-Coller (MAC) system, defined as: Stage A, tumour confined to the mucosa; Stages B1/B2, transmural extension without nodal involvement; Stages C1/C2, regional nodal involvement; and Stage D, distant metastasis. Staging was not based on pathology alone: it was assigned from a combination of histopathology reports, operative and surgical notes, and available radiological imaging (abdominal ultrasonography, computed tomography, and chest radiography). Where these sources were insufficient to assign a stage, the case was recorded as “stage not documented” (30 cases; 10.0%)

Statistical Analysis

Data were analysed using SPSS version 26.0. Continuous variables are expressed as mean (standard deviation) and categorical variables as frequencies and proportions; key proportions are reported with 95% confidence intervals (CIs) calculated by the Wilson method. Missing values were not imputed; the denominator is stated for each analysis, and the extent of missing data is reported for BMI (missing in 26.3%), serum CEA (44.0%), disease stage (10.0%), and histological grade (9.0%). Associations between categorical variables were assessed with the Pearson chi-square test at a 5% significance level ($p < 0.05$), with degrees of freedom reported; where a 2×2 comparison was significant, the effect size is summarised as an odds ratio (OR) with a 95% CI and the phi (φ) coefficient. The overall male-to-female ratio was compared

with unity using an exact binomial test. The change in the proportion of CRC among registered cancers across the ten calendar years was tested with the Cochran-Armitage test for trend. Because both serum CEA category and MAC stage are ordinal, and 8 of the 24 cells (33%) in the CEA-by-stage table had expected counts below 5, the CEA–stage relationship was examined with a linear-by-linear (trend) test and summarised with ordinal effect-size measures (Kendall's τ-b and Cramér's V) rather than with the Pearson chi-square alone. In keeping with the descriptive aim of the study, no adjustment for multiple comparisons and no multivariable modelling were performed.

Ethical Considerations

Ethical approval for this study was sought and obtained from the Institutional Review Board (IRB) / Health Research Ethics Committee (HREC) of the University College Hospital (UCH), Ibadan, Nigeria. Due to the retrospective, non-interventional nature of the study, which utilized anonymized historical medical records from archiving systems, the requirement for individual patient informed consent was waived by the ethics committee. Strict confidentiality rules were maintained, and all data were anonymized during extraction and analysis to ensure patient privacy

RESULTS

Trend in the Proportion of CRC

Of 567 CRC cases registered at UCH Ibadan during the study period, 300 met the inclusion criteria. The proportion of CRC among all registered cancers rose progressively from 1.9% in 2002 to 5.1% in 2011, representing more than a twofold increase over the decade, and the Cochran-Armitage test confirmed a significant upward trend in this proportion across the ten calendar years ($z = 3.70$, $p < 0.001$). A transient trough was observed in 2003 (0.5%), attributable to a hospital workers' industrial action. A mean of 30 CRC cases per year met the inclusion criteria over the period

Table 1: Annual Number and Proportion of Colorectal Cancer Cases Relative to All Cancer Registrations at UCH Ibadan, 2002–2011 (N=300).

Year	CRC Cases (n)	CRC Proportion (%)	Total Cancer Registrations
2002	22	1.9	1,192
2003	6	0.5*	998
2004	25	2.1	1,506
2005	29	2.4	1,544
2006	29	2.4	1,792
2007	26	2.2	1,857
2008	32	2.7	1,997
2009	34	2.9	1,703
2010	36	3.0	1,911
2011	61	5.1	1,811
Total	300	1.8 (average)	16,311

*2003 trough attributable to hospital workers' industrial action. CRC = colorectal cancer. The proportion of CRC among registered cancers rose significantly across the decade (Cochran-Armitage test for trend: $z = 3.70$, $p < 0.001$); overall proportion 1.8% (300/16,311; 95% CI 1.6–2.1).

Demographic Profile

One hundred and fifty-two patients (50.7%; 95% CI 45.0–56.3) were male and 148 (49.3%) were female, giving a male-to-female ratio of 1:1 that did not differ significantly from unity (exact binomial $p = 0.86$). The mean age was 50.8 (SD 2.7) years for males and 49.2 (SD 2.2) years for females. The modal age group was 40–49 years (80 patients; 26.7%) and 154 patients (51.3%; 95% CI 45.7–56.9) were younger than 50 years. Colonic cancer was significantly more frequent in males (95; 62.5%) than in females (64; 43.2%), while rectal cancer was more frequent in females (84; 56.8%) than in males (57; 37.5%); this site-by-sex association was significant ($\chi^2(1) = 11.2$, $p < 0.001$), with males about twice as likely as females to have colonic rather than rectal cancer (OR 2.19, 95% CI 1.38–3.47; $\varphi = 0.19$). Traders constituted the largest occupational group (128; 42.7%). The majority of patients (236; 78.6%) were domiciled in south-west Nigeria.

Risk Factor Profile

Only 29 patients (9.7%) reported cigarette smoking and only 11 (3.7%) had a positive family history of cancer. Critically, 289 patients (96.3%) had never undergone any form of CRC screening. BMI was calculable in 221 patients; 72 (24.0%) had normal weight, 65 (21.7%) were overweight, 60 (20.0%) were underweight, and 24 (8.0%) were obese (Figure 3).

Clinical Features, Histopathology, Stage, and Metastasis

Abdominal pain was the most frequent presenting complaint (153; 51.0%), followed by abdominal mass (117; 39.0%) and gastrointestinal or rectal bleeding (103; 34.3%) (Table 3). The majority of patients (165; 55.0%) first presented between 1 and 4 months after symptom onset (Figure 4B).

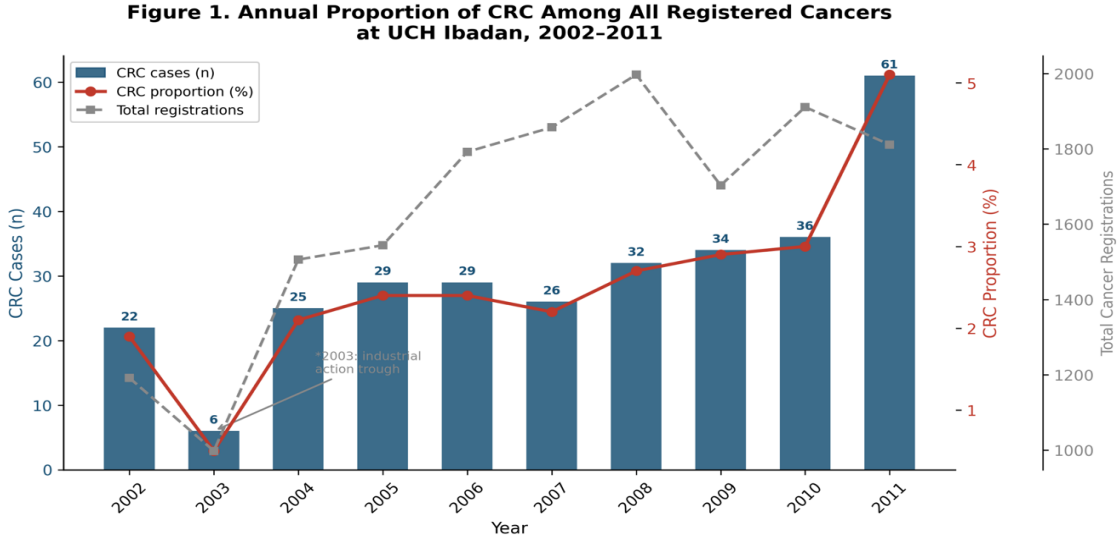

Figure 1: Annual proportion of CRC among registered cancers, 2002–2011.
Bars = CRC case numbers (n); solid line = CRC proportion (%); dashed line = total cancer registrations (right axis).

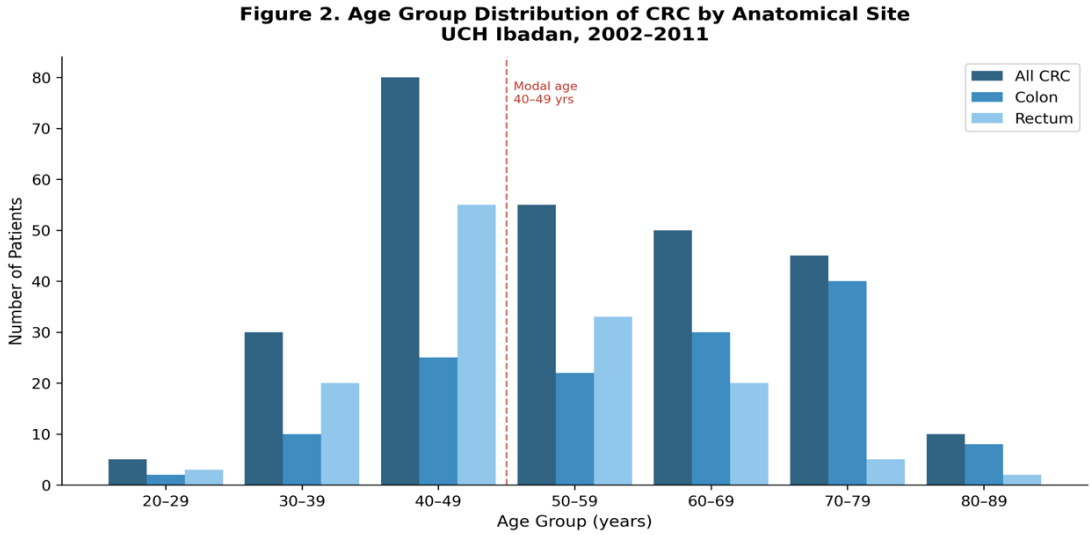

Figure 2: Age group distribution of CRC by anatomical site Modal age group: 40–49 years overall and for rectal cancer, and 70–79 years for colonic cancer; 51.3% of patients were younger than 50 years.

One hundred and fifty-nine patients (53.0%) had colonic cancer and 141 (47.0%) had rectal cancer (Table 3). Within the colon, the caecum was the most frequently affected segment (63; 39.6%; 95% CI 32.4–47.4), and the proximal segments (caecum, ascending colon, and hepatic flexure) together accounted for 58.5% of colonic tumours. Adenocarcinoma was the dominant histological type (224; 74.7%; 95% CI 69.5–79.3), followed by mucinous adenocarcinoma (43; 14.3%) and GIST (24; 8.0%). Histological grade was predominantly well differentiated (168; 56.0%).

MAC Stage D was the most frequent stage at (113; 37.7%; 95% CI 32.4–43.3), followed by Stage C2 (54; 18.0%), C1 (45; 15.0%), B2 (33; 11.0%), B1 (17; 5.7%), and A (8; 2.7%). Liver was the most common metastatic site (54; 47.8%). (Table 4).

Table 2: Demographic Characteristics of Colorectal Cancer Patients at UCH Ibadan

Variable	**n**	**% or Detail**
Sex		
Male	152	50.7 (95% CI 45.0–56.3)
Female	148	49.3 (95% CI 43.7–55.0)
Male:Female ratio	1:1	
Age at Presentation		
Range (years)		22–84
Mean age – males	–	50.8 ± 2.7 years
Mean age – females	–	49.2 ± 2.2 years
Younger than 50 years	154	51.3 (95% CI 45.7–56.9)
50 years and above	146	48.7 (95% CI 43.1–54.3)
Modal age group	80	26.7% (40–49 years)
Site By Sex		
Colon – Male	95	62.5% of males
Colon – Female	64	43.2% of females
Rectum – Male	57	37.5% of males
Rectum – Female	84	56.8% of females
Occupation		
Trader/Business	128	42.7
Retired/Unemployed	44	14.7
Civil servant	40	13.3
Student	32	10.7
Professional	26	8.6
Artisan	24	8.0
Housewife	6	2.0

SD = standard deviation; CI = confidence interval (Wilson). The male-to-female ratio did not differ from 1:1 (exact binomial $p = 0.86$). The site-by-sex association was significant ($\chi^2(1) = 11.2$, $p < 0.001$): males were about twice as likely as females to have colonic rather than rectal cancer (OR 2.19, 95% CI 1.38–3.47; $\varphi = 0.19$)

Figure 3. BMI Distribution and Risk Factor Prevalence
UCH Ibadan, 2002-2011 (N=300)

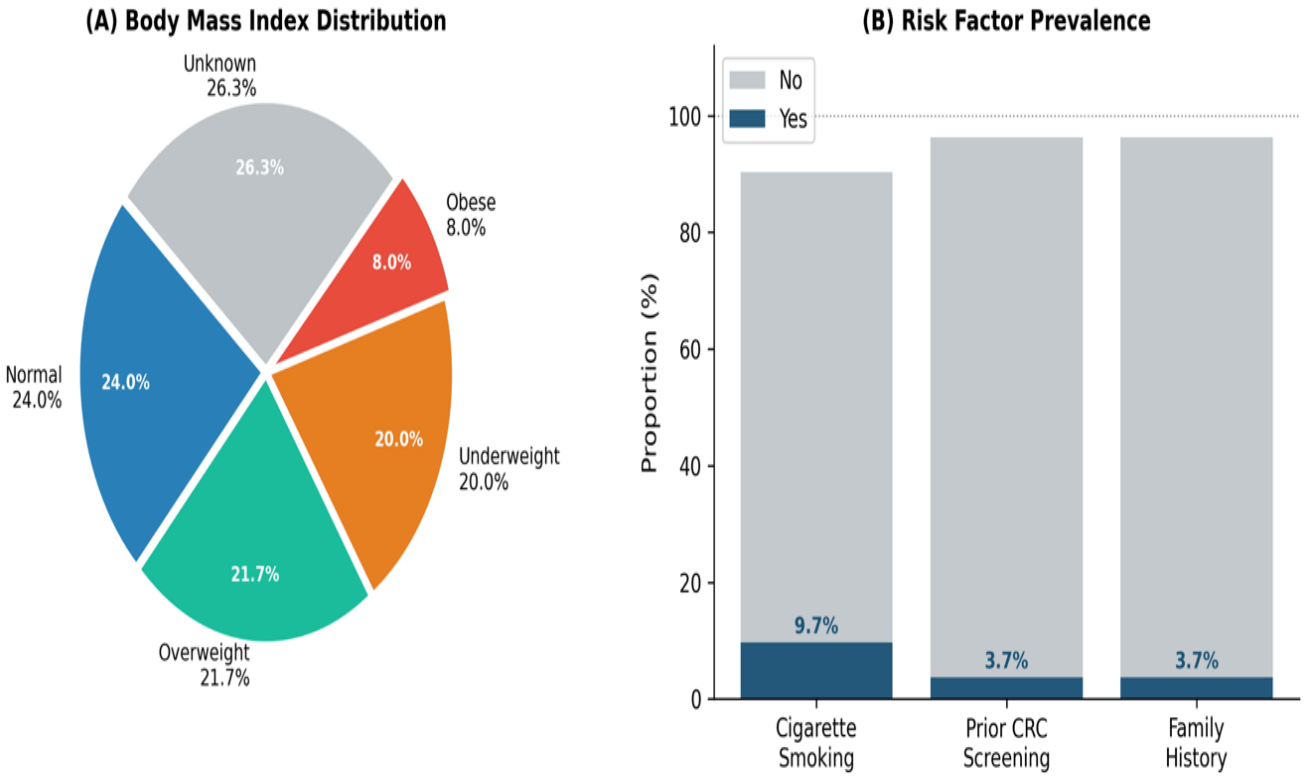

Figure 3: Risk-Factor Profile (A) BMI distribution (N=300; 26.3% undocumented). (B) Prevalence of selected risk factors; 96.3% of patients had never undergone CRC screening.

Table 3: Clinical Features and Histopathological Characteristics of CRC Patients at UCH Ibadan

Characteristic	n (%)	Note
Presenting Complaints		
Abdominal pain	153 (51.0)	Commonest
Abdominal mass	117 (39.0)	
GIT / rectal bleeding	103 (34.3)	
Constipation	64 (21.3)	
Altered bowel habit	47 (15.7)	
Vomiting	35 (11.7)	
Weight loss	29 (9.7)	
Anal pain	15 (5.0)	
Tumour Site		
Colon (overall)	159 (53.0)	M:F 1.5:1
Rectum (overall)	141 (47.0)	M:F 1:1.5
Caecum (colonic)	63 (39.6)	Most common
Sigmoid colon	31 (19.5)	
Descending colon	30 (18.9)	
Ascending colon	20 (12.6)	
Hepatic flexure	10 (6.3)	
Splenic flexure	3 (1.9)	
Transverse colon	2 (1.3)	
Histological Type		
Adenocarcinoma	224 (74.7)	
Mucinous adenocarcinoma	43 (14.3)	
GIST	24 (8.0)	
Carcinoid tumour	8 (2.7)	
Signet ring cell carcinoma	1 (0.3)	
Histological Grade		
Well differentiated	168 (56.0)	
Poorly differentiated	70 (23.3)	
Moderately differentiated	35 (11.7)	
Not documented	27 (9.0)	

Presenting complaint percentages are of all 300 patients; patients may report more than one complaint. Colonic sub-site percentages are of colonic cases (n=159). Colonic sub-site percentages are of colonic cases (n = 159). 95% CIs (Wilson) for principal categories: adenocarcinoma 74.7% (69.5–79.3); colonic tumours 53.0% (47.4–58.6); caecum (of colonic) 39.6% (32.4–47.4). Proximal (right-sided) segments — caecum, ascending colon, and hepatic flexure — accounted for 58.5% of colonic tumours.

Serum Carcinoembryonic Antigen at Presentation

Serum CEA was available for 168 of the 300 patients. Among those tested, 41 (24.4%) had Level A (0–4.0 ng/mL), 28 (16.7%) Level B (4.01–10.0), 45 (26.8%) Level C (10.01–20.0), and 54 (32.1%) Level D (above 20.0). Serum CEA rose significantly with advancing MAC stage. Because 8 of the 24 cells (33.3%) in the CEA-by-stage table had expected counts below 5, the ordinal association was assessed with a linear-by-linear (trend) test: $\chi^2(1) = 17.0$, $p < 0.001$ (Pearson $\chi^2(15) = 30.0$, $p = 0.012$). The strength of this association was moderate (Kendall's τ-b = 0.26, $p < 0.001$; Cramér's V = 0.24). (Table 5, Figure 6)

Table 4: Disease stage and Metastatic Site Distribution, UCH Ibadan, 2002–2011 (N=300).

Stage / Site	n (%)	Notes
DISEASE STAGE (Modified Astler-Coller)		
Stage A	8 (2.7; 95% CI 1.4–5.2)	Mucosa-confined
Stage B1	17 (5.7; 95% CI 3.6–8.9)	Muscularis; N0
Stage B2	33 (11.0; 95% CI 7.9–15.0)	Transmural; N0
Stage C1	45 (15.0; 95% CI 11.4–19.5)	Muscularis; N+
Stage C2	54 (18.0; 95% CI 14.1–22.7)	Transmural; N+
Stage D	113 (37.7; 95% CI 32.4–43.3)	Distant metastasis
Not documented	30 (10.0; 95% CI 7.1–13.9)	
METASTATIC SITES (Stage D, N=113)		
Liver	54 (47.8)	Commonest
Peritoneal	26 (23.1)	
Pulmonary	18 (15.9)	
Bone	14 (12.4)	
Anterior abdominal wall	9 (8.0)	
Cerebral	8 (7.1)	

Metastatic-site percentages are of Stage D patients (N = 113); some patients had more than one site. Stage percentages are of all 300 patients with 95% Wilson confidence intervals; disease stage was not documented in 30 cases (10.0%).

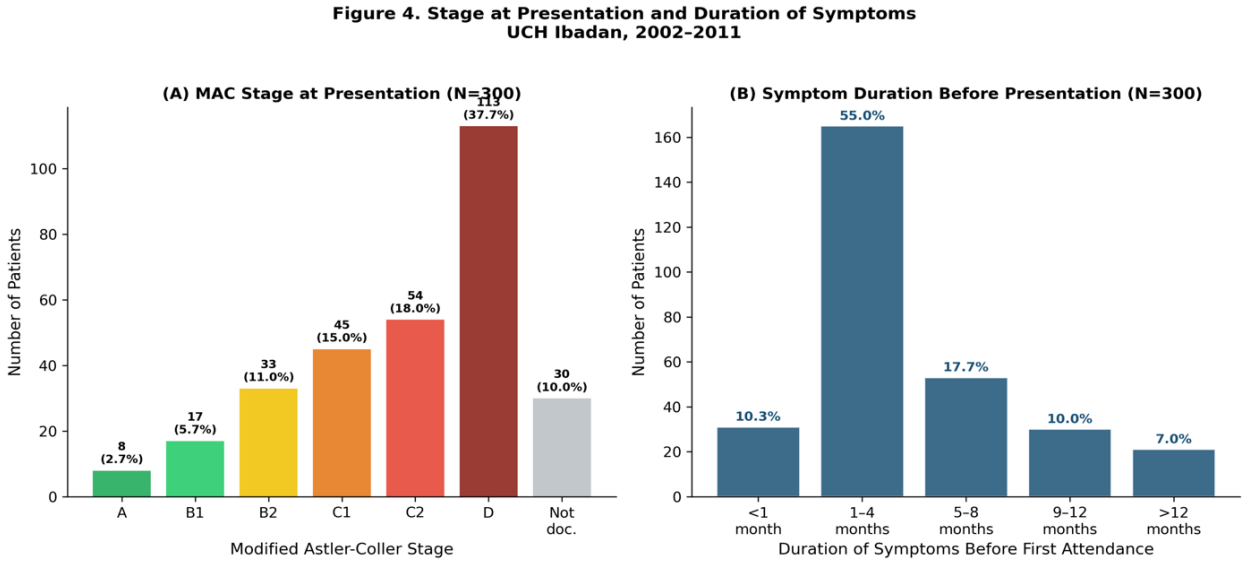

Figure 4: Stage and symptom duration. (A) MAC stage at presentation (N=300); Stage D predominates (37.7%). (B) Symptom duration before first attendance; 55.0% presented 1–4 months after symptom onset.

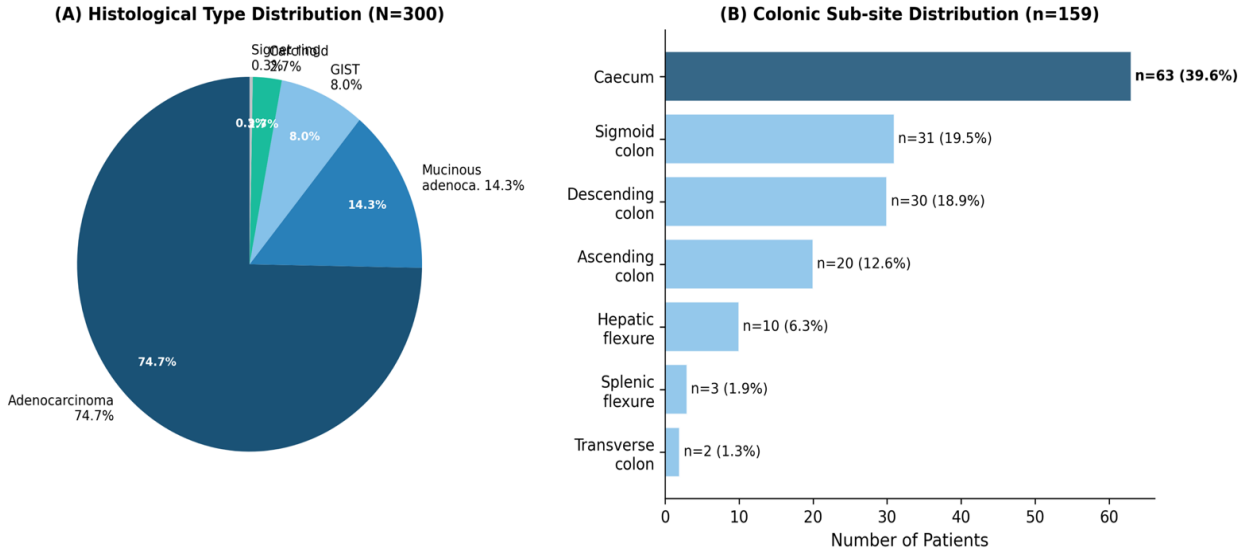

Figure 5: Histology and tumour location. (A) Histological type (N=300); adenocarcinoma predominates (74.7%). (B) Colonic sub-site (n=159); the caecum is most frequently affected, indicating right-sided predominance.

Table 5: Association between serum CEA level and Modified Astler-Coller stage, UCH Ibadan (N=168 with CEA data).

MAC Stage	CEA 0–4.0 (n)	CEA 4–10 (n)	CEA 10–20 (n)	CEA >20 (n)	Chi-square	p
Stage A	7	3	4	3	136.7	**<0.001**
Stage B1	7	3	6	3		
Stage B2	10	4	3	3		
Stage C1	6	7	3	8		
Stage C2	3	5	14	14		
Stage D	8	6	15	23		
Total	41	28	45	54		

Level A = 0–4.0 ng/mL; Level B = 4.01–10.0; Level C = 10.01–20.0; Level D = >20.0 ng/mL. *Linear-by-linear (trend) χ^2, df = 1. Pearson $\chi^2(15) = 30.0$, p = 0.012; 8 of 24 cells (33%) had expected counts < 5. Ordinal association: Kendall's τ-b = 0.26 (p < 0.001); Cramér's V = 0.24.

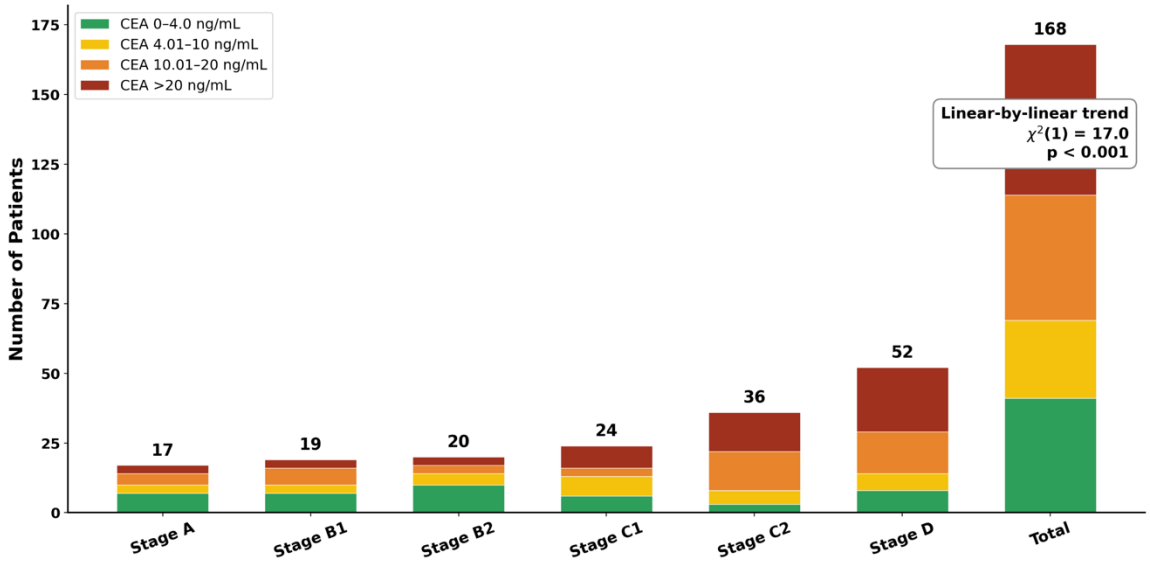

Figure 6: CEA level distribution by MAC stage (N=168). Higher CEA categories become more frequent with advancing stage (linear-by-linear trend $\chi^2(1) = 17.0$, p < 0.001).

DISCUSSION

The proportion of colorectal cancer (CRC) among all malignant neoplasms registered at the University College Hospital (UCH), Ibadan, increased from 1.9% in 2002 to 5.1% in 2011. This upward trajectory is consistent with historical institutional data; a 16-year retrospective analysis by Duduyemi[11] documented an increase from 1.1% to 3.2% at the same center, while a 10-year review by Gbaa et al.[12] in Makurdi showed comparable incremental shifts over preceding decades.

This rising proportion may reflect a true increase in the burden of CRC within the referral population; however, a hospital-based series cannot distinguish a genuine change in incidence from changes in referral patterns, diagnostic access, or registry completeness. The parallel trends of rapid urbanization, dietary change toward processed foods and red meat, and increasing physical inactivity that have been reported elsewhere in the literature offer a plausible context for this shift; the present study, however, collected no individual dietary or lifestyle data and therefore cannot establish any causal relationship. From a public health perspective, the increasing number of CRC cases presenting for care nonetheless underscores the need to move from opportunistic management toward organized, low-cost detection frameworks that identify disease before advanced presentation.

The overall male-to-female ratio of 1:1 observed in this cohort diverges from the global distribution, which demonstrates a male predominance of approximately 1.4:1.[13,14] This near-equal sex distribution may reflect region-specific variations in colonic carcinogenesis, potentially mediated by distinct dietary exposures, metabolic profiles, or localized hormonal interactions that differ from Western cohorts. Clinically, this indicates that public health campaigns and screening initiatives within Nigeria must target men and women equally, rather than assuming the male predominance observed in Western populations.

The demographic profile of the cohort is characterized by a youthful distribution. The modal age group was 40–49 years, with 51.3% of all diagnosed patients younger than 50 years. While Duduyemi[11] previously reported an older modal distribution of 50–59 years at this institution, the current data are similar to findings from Abdulkadir et al.[15] in Kano, Nigeria, in which 57.1% of colorectal cancer cases were in patients under 50 years of age, suggesting a possible demographic shift toward earlier occurrence of cases.

This youthful presentation may point to an altered pathogenic pathway — for example, a higher prevalence of defective DNA mismatch repair akin to hereditary non-polyposis colorectal cancer (HNPCC/Lynch) phenotypes — as suggested by some regional and international studies[16,17], although the present descriptive data cannot confirm this. Because a large proportion of patients presented before age 50, the age thresholds used in high-income screening guidelines may not align with the demographic profile observed here. Rather than recommending a specific national screening age on the basis of a single-centre retrospective series, these findings indicate that well-designed population-based studies are warranted to evaluate whether earlier screening (for example, beginning before age 50) would be beneficial and cost-effective in Nigeria.

The absence of any prior CRC screening in 96.3% of this cohort highlights a reliance on symptom-driven detection. This is reflected in an apparent paradox: although 55.0% of patients reported seeking medical attention within 1 to 4 months of symptom onset, 37.7% already had metastatic Stage D disease at their first oncology consultation. Retrospective presentation data cannot distinguish between the several explanations that may contribute to this finding: the interval between symptom

onset and first contact may be under-reported, referral pathways to the tertiary centre are frequently prolonged, and diagnostic delays are common. A genuinely more aggressive tumour biology is a further possibility but cannot be inferred from these data alone, and this interpretation should therefore be made with caution.

Histologically, adenocarcinoma (including the mucinous subtype) was the dominant variant, with the caecum the most commonly affected sub-site (39.6% of colonic tumours). It should be noted that gastrointestinal stromal tumours (GIST; 8.0%) were captured in this series because they were registered as colorectal-sited malignancies in the source records; GISTs are biologically distinct from colorectal adenocarcinoma, and their inclusion is acknowledged as a limitation when interpreting the histological distribution. The predominance of proximal, right-sided tumours is consistent with historical regional data[18,19] and has practical implications for screening, because flexible sigmoidoscopy examines only the distal colorectum; randomized trials have shown that flexible sigmoidoscopy reduces distal, but not proximal, colorectal cancer incidence and mortality.[20,21] Finally, the significant association between pre-treatment carcinoembryonic antigen (CEA) level and disease stage reinforces the utility of CEA as a marker of tumour burden and supports its routine measurement as a baseline for staging and treatment monitoring.

CONCLUSION

This ten-year review demonstrates a clear and progressive rise in the proportion of CRC among all cancers registered at UCH Ibadan, more than doubling from 1.9% to 5.1%. The disease predominantly affected a younger population than in high-incidence Western countries; over half of patients were younger than 50 years, with a modal presentation in the fourth decade of life. Despite relatively short reported symptom-to-hospital intervals, the majority presented with advanced Stage D disease, underscoring the limitations of symptom-driven detection in the absence of systematic screening. Adenocarcinoma with right-sided colonic predominance characterized the histological and anatomical profile. Taken together, these findings support a shift from a reactive toward a more proactive approach to CRC detection in Nigeria and, in particular, provide a rationale for further population-based research to evaluate whether earlier screening strategies (before the age of 50) would be effective and cost-effective in this setting.

Limitations

This study has several limitations inherent to its retrospective, single-centre design. As a tertiary referral-centre series, the findings may not be representative of the broader Nigerian CRC population, and the rising proportion of CRC among registered cancers cannot be equated with a change in population incidence. Of the 567 CRC cases identified, 267 (47.1%) were excluded for inadequate histology or an indeterminate primary site; comparative demographic and staging data for these excluded cases were not systematically available, so the possibility of selection bias cannot be excluded. Substantial missing data — BMI in 26.3%, serum CEA in 44.0%, disease stage in 10.0%, and histological grade in 9.0% — limited some analyses, and missing

values were not imputed. Gastrointestinal stromal tumours, which are biologically distinct from colorectal adenocarcinoma, were retained in the histological distribution as recorded in the source registry. Retrospective staging may differ from prospective staging at diagnosis. The statistical analyses were descriptive and largely unadjusted; sparse cell counts in the CEA-by-stage table warranted a trend-based test, and the absence of follow-up data precluded stage-specific survival analysis.

Declarations

Funding Statement

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Conflict Of Interest

The Authors declare that there is no financial interest or any other conflict of interest regarding the publication of this paper

Data Availability

All relevant data used in this study are readily available and can be obtained from the corresponding author upon request.

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