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Colorectal Cancer: Prevalence and Sociodemographic and Pathological Profile of an Endoscopic Series in Bobo-Dioulasso

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ABSTRACT

Introduction: *Colorectal cancer is a major global public health issue, both in terms of its prevalence and its rising incidence. Our study aimed to investigate the prevalence, sociodemographic profile, and pathological characteristics of patients diagnosed with colorectal cancer via endoscopy in the city of Bobo-Dioulasso.*

Methods: *This was a descriptive cross-sectional study involving retrospective data collection over a ten-year period from January 1, 2015, to December 31, 2024 in the gastrointestinal endoscopy units of the HepatoGastroenterolgy Department at Sourô Sanou University Hospital Center and six private facilities. All patients in whom colon and/or rectal cancer was confirmed following endoscopy and histopathological examination were included. Variables studied included sociodemographic data, indications for examination, endoscopic and histological findings. Data were entered into a data entry form created using Kobotoolbox software and analyzed on a computer using R and SPSS® version 25. Descriptive statistics were used to determine the means and standard deviations of quantitative variables as well as the proportions of the various conditions.*

Results: *During the study period, on 1,979 lower gastrointestinal endoscopies, 87 patients (4.4%) had colorectal cancers. There was a predominance of males, with 52 men (59.8%). The mean age was 51.8 ± 16.02 years. The main indications were hematochezia (40.2%) and the prescribing physician's suspicion of a colorectal tumor (20.7%). The tumors most commonly had an ulcerative-budding appearance (63.5%), a hemorrhagic appearance (32.3%), or an exophytic appearance (26%). On histological examination, the most common types were Lieberkühnian adenocarcinoma and mucinous adenocarcinoma, accounting for 68 (78.2%) and 14 (16.1%) cases, respectively. Regarding differentiation, 42 (48.3%) were well-differentiated tumors.*

Conclusion: *Nearly half of patients affected by colorectal cancer are men under 50 years of age and presenting with hematochezia. Tumor are detected at a late stage, appear as ulcerative-budding lesions on endoscopy, and well-differentiated type on histological analysis.*

Keywords

Colorectal cancer, Prevalence, Endoscopy, Adenocarcinoma, Burkina Faso.

Introduction

Colorectal cancer (CRC) is a major global public health issue, both in terms of its prevalence and its rising incidence [1,2]. According to the Global Burden of Disease Study 2021 and other international studies, it is the third most common cancer, following lung and breast cancer. It is also the second leading cause of cancer mortality [2]. The global burden of CRC is projected to increase by 60% by 2030, reaching more than 2.2 million new cases and 1.1 million deaths [1-4]. The incidence of early-onset CRC, occurring in individuals under 50 years of age, accounts for 9.66% of new cases, with a projected increase of 5.56% by 2036, particularly among men [1-6]

CRC is very common in the Western world. In France, the disease is more common in men, with a median age at diagnosis of 71 years for men and 73 years for women. Five-year net survival was estimated at 57% according to a 2018 study [4,7]. In Africa, CRC is believed to be underdiagnosed [2,8] Reported prevalence rates, although potentially underestimated, vary: 1.4% in Cotonou [9], while in Ouagadougou, Kaboré [10] reported 2.1% rectal tumors and 7.1% colonic tumors, and Sawadogo et al. [11] identified 13.1% of confirmed cancers in a series of suspected cases. Unlike Western data, where the median age is high, African patients appear to be younger, with a mean age at diagnosis often under 60 years, and a predominance of rectal locations [9,12,13]. Furthermore, in the absence of organized screening programs [14-17], patients are predominantly diagnosed at a late stage, based on suggestive clinical signs such as hematochezia [18-20]. The predominant histological type remains adenocarcinoma [11,13,21].

Our work is situated within this context of fragmented and conflicting knowledge. While the studies by Kaboré [10] in Ouagadougou and by Koura et al. [12] in Bobo-Dioulasso have provided valuable data, some of them are outdated, and others have focused on specific aspects. There is therefore a current and more comprehensive need to accurately describe the epidemiology of colorectal cancer in the city of Bobo-Dioulasso, the country's second-largest city. In light of the rising global incidence of these tumors, their high mortality rate—particularly among young adults—and the lack of recent, comprehensive data on the sociodemographic and pathological characteristics of patients in our setting, this study was initiated. The objective of our study was to investigate the prevalence, sociodemographic profile, and pathological characteristics of patients diagnosed with colorectal cancer via endoscopy in the city of Bobo-Dioulasso.

Methods

Study settings

Our study was conducted in the gastrointestinal endoscopy units of the Hepatogastroenterology (HGE) Department at the Sourô Sanou University Hospital and at six private facilities (Clinique Saint Léopold, Clinique Nadish, Centre Médical Eurêka, La Grâce Medical Center, Clinique Universelle du Houet, and Clinique de l'Avenir) in the city of Bobo-Dioulasso.

Study type and period

This was a descriptive cross-sectional study involving retrospective data collection over a ten-year period from January 1, 2015, to December 31, 2024.

Study population

The target population consisted of patients who underwent lower gastrointestinal endoscopy in the gastrointestinal endoscopy units of the HGE department at Sourô Sanou University Hospital Center and the six private facilities mentioned above during the study period.

The source population consisted of patients who had a dysmitotic lesion on colonoscopy, rectosigmoidoscopy, or anorectoscopy performed in the gastrointestinal endoscopy units of the aforementioned facilities during the study period, and who underwent a histopathological examination of the biopsies

Inclusion criteria

All patients in whom colon and/or rectal cancer was confirmed following endoscopy and histopathological examination were included.

Sampling and sample size

We conducted a comprehensive survey of cases of rectal and colonic tumors for which lower gastrointestinal endoscopy reports and histopathological examination reports were available during the study period.

The sample size was calculated using Schwartz's formula: $n = z^2 \times p\,(1 - p) / m^2$

n = represents the minimum required sample size;
z = 1.96 is a factor to achieve a 95% confidence level;
p = 0.49 represents the estimated proportion of colorectal cancers in the study population [12];
m = the margin of error set at 5%.

Application of this formula yielded a minimum sample size of 384 patients. After adding a 10% margin to account for any incomplete or unusable records, the minimum required sample size was 422 patients.

Description of variables

The various variables studied included sociodemographic characteristics (sex, age, occupation), indications, endoscopic findings (tumor location and macroscopic appearance), and pathological findings (histological type, degree of tumor differentiation).

Operational definitions

Lower gastrointestinal endoscopy: we included anorectoscopies, rectosigmoidoscopies, and colonoscopies.

Dysplasia referred to any neoplasm suspected of malignancy observed during endoscopy.

Inflammatory lesions: In our study, intestinal inflammatory lesions were defined as all inflammatory lesions of the rectum, colon, and/or anorectal region. The following were included: anitis (inflammation of the anal canal), proctitis (inflammation of the rectum), colitis (inflammation of the colon), sigmoiditis (inflammation of the sigmoid colon), and rectosigmoiditis (concurrent involvement of the rectum and sigmoid colon).

Collection equipment

Anorectoscopies were performed in the knee-chest position using a coloscope or an anoscope, following an enema with tap water or an osmotic laxative. Colonoscopy was performed using a flexible colonoscope 5 to 14 mm in diameter and 40 to 170 cm in length, equipped with either a fiber optic scope or a mini-

video camera connected to a monitor. This scope had a working channel for biopsy and allowed for the insertion of guide wires, probes, or polypectomy snares. To ensure reliable examinations, bowel preparation included evacuation enemas for limited rectosigmoidoscopies, or polyethylene glycol-based solutions (FORTRANS®) for total colonoscopies, ensuring optimal bowel evacuation. Total colonoscopies were performed after obtaining verbal informed consent, with or without sedation. Examinations were conducted with the patient in the left lateral decubitus position, with lubrication of the anal canal, careful advancement of the instrument to avoid kinking, using rotational maneuvers, and, when necessary, repositioning the patient [22,23].

Data Collection

Information was collected using a structured form based on data from anorectoscopy, rectosigmoidoscopy, and colonoscopy reports, as well as from the pathology department.

Data Analysis

The data were entered into a data entry form created using the Kobotoolbox software and analyzed on a computer using R and SPSS® version 25. Descriptive statistics were used to determine the means and standard deviations of quantitative variables as well as the proportions of the various conditions. Graphs were created using Excel 2016.

Ethical considerations

Prior to any data collection, the study protocol was submitted for approval to representatives of the Sourô Sanou University Hospital Center Institutional Ethics Committee and to the heads of the various private facilities involved. The data collected were used exclusively for this study, and no information allowing for patient identification was included.

Results

A total of 1,979 patients underwent a lower gastrointestinal endoscopy with a usable report. There were 759 colonoscopies (38.3%) and 1,220 anorectoscopies (61.7%). On endoscopy, a dysmitosis pattern was observed in 96 patients (4.9%), of which histological confirmation was obtained in 87 cases, representing a prevalence of 4.4% and an annual frequency of 8.7 cases.

Sociodemographic Characteristics

There was a predominance of males, with 52 men (59.8%), resulting in a *sex ratio* of 1.5. The mean age of the patients was 51.8 ± 16.02 years, ranging from 20 to 91 years. Among them, 39 (44.8%) were under 50 years of age. The distribution of cases by age and sex shows a male predominance in most age groups.

The patients were predominantly homemakers (32.2%), informal sector workers (18.4%), and farmers/ranchers (16.1%). Table 1 provides details of the sociodemographic profile of the patients.

Indications

The main indications were hematochezia (40.2%) and the prescribing physician's suspicion of a colorectal tumor (20.7%), of which 12.6% were based on imaging findings and 8.1% on the detection of a mass during a digital rectal examination. Table 2 provides a breakdown of the patients' indications.

Table 1: Distribution of patients by sociodemographic characteristics (N = 87).

Variables	Frequency	Percentage
Sex		
Male	52	**59.8**
Female	35	40.2
Age groups (years)		
[20-30]	10	11.5
[30-40]	9	10.4
[40-50]	**20**	**23.0**
[50-60]	**18**	**20.7**
[60-70]	**17**	**19.5**
[70-80]	9	10.4
[80-90]	3	3.4
[90-100]	1	1.1
Occupation		
Housewives	**28**	**32.2**
Informal sector	**16**	**18.4**
Farmers/ranchers	**14**	**16.1**
Employees	11	12.6
Retirees	8	9.2
Merchants	6	6.9
Pupils/Students	4	4.6

Table 2: Indications for lower endoscopy in patients with colorectal cancer (N=87).

Indications	Frequency	Percentage
Hematochezia	**35**	**40.2**
Suspected colorectal tumor	**18**	**20.7**
Rectal syndrome	9	10.4
Rectal pain	8	9.2
Anal mass	7	8.1
Constipation	6	6.9
Abdominal pain	5	5.7
Chronic diarrhea	4	4.6
Anal discharge	2	2.3
Anal incontinence	1	1.1
Deterioration in general health	1	1.1
Hemorrhoidal prolapse	1	1.1
Anemia	1	1.1
Polyp evaluation	1	1.1
Functional bowel disorders	1	1.1

Note: Some patients had more than one indication.

Endoscopic findings

Among the 87 patients, the most common location was the lower rectum (40.2%) and the anorectal junction (29.9%). The tumors most commonly had an ulcerative-budding appearance (63.5%), a hemorrhagic appearance (32.3%), or an exophytic appearance (26%). Table 3 illustrates the distribution of malignant tumors based on their endoscopic appearance.

Table 3: Endoscopic characteristics of malignant tumors in the 87 patients.

Variables	Frequency	Percentage
Topography		
Lower rectum	35	40.2
Anorectal Junction	26	29.9
Middle rectum	11	**12.6**
Upper rectum	5	5.7
Right colon	8	9.2
Left colon	7	8.1
Rectosigmoid junction	3	3.4
Sigmoid colon	3	3.4
Cecum	3	3.4
Transverse colon	1	1.1
Macroscopic appearance		
Ulcerative with nodules	54	62.1
Hemorragic	26	29.9
Nodular	24	27.6
Ulcerated	8	9.2
Necrotic	4	4.6

Note: Some patients had tumors exhibiting multiple histological features.

Histological features

On histological examination, the most common types were Lieberkühnian adenocarcinoma and mucinous adenocarcinoma, accounting for 68 (78.2%) and 14 (16.1%) cases, respectively. Regarding differentiation, 42 (48.3%) were well-differentiated tumors and 37 (42.5%) were moderately differentiated tumors. (Table 4) shows the distribution of malignant tumors by type and histological differentiation.

Table 4: Histological description of malignant tumors (N = 87).

Variables	Frequency	Percentage
Type histologique		
Lieberkühn adenocarcinoma	68	78.2
Mucinous adenocarcinoma	14	16.1
Squamous cell carcinoma	2	2.3
Signet ring cell adenocarcinoma	1	1.1
Cat's-eye cell adenocarcinoma	1	1.1
Colonic meloma	1	1.1
Degree of differentiation		
Well-differentiated	**42**	**48.3**
Moderately-differentiated	**37**	**42.5**
undifferentiated	4	4.6
Poorly differentiated	4	4.6

Associated conditions

The associated conditions were hemorrhoidal disease in 7 patients (30.4%), inflammatory lesions in 4 (17.4%), and rectocolonic polyps in 3 cases (13%).

Discussion

Sociodemographic Characteristics

In this endoscopic series, malignant anorectal tumors were found in 87 patients, representing an endoscopic prevalence of 4.4%. This rate is as low as those reported by other authors in Africa. Overall, Azangue Zapdji [24] and Kpossou [9] reported CRC prevalences of 6.98% and 1.4%, respectively. More specifically, Koura [12] and Kaboré [10] reported rectal cancer rates of 4.2% and 2.1%, respectively. Colonic cancers accounted for 7.1% of patients in the same study by Kaboré [10]. These prevalence rates, based on clinical or endoscopic series, remain lower than those in European data, where CRC prevalence reaches 10 to 15% [7,25], though with a gradual decline in incidence. This difference could result from underdiagnosis in our context, linked to limited access to both care and diagnostic procedures such as endoscopy and histopathological examination, which in most cases are the responsibility of patients and their families. It could also be attributed to the absence of a national policy for systematic CRC screening starting at age 50 using a guaiac fecal occult blood test, a fecal immunochemical test, or a multi-target fecal DNA immunochemical test, followed—if positive—by a CT colonography, sigmoidoscopy, or colonoscopy [4,25].

A male predominance was observed among CCR cases (61.5%), corresponding to a sex ratio of 1.6. This distribution is similar to the findings reported by Kpossou [9] and Sourokou [26] in sub-Saharan Africa. Although other authors have reported a slight female predominance (50.76%) in the Maghreb [27], or a balance between men and women [25], male sex is reported in the literature as a risk factor associated with this cancer [4,7]. This male predominance may reflect men's greater exposure to certain risk factors (tobacco, alcohol, a diet high in fat, calories, and red meat and low in fiber) and better access to hospital facilities facilitated by their greater purchasing power.

The mean age of patients with colorectal tumors was 51.8 ± 16.02 years, and 44.8% were under 50 years of age. These data are similar to those reported by African authors, where the mean age ranged from 40.6 to 53 years [28,29], whereas in the West, the mean age at diagnosis is generally over 70 years [4,7]. These results reflect the local demographic structure, characterized by a young adult population [30] and the youthfulness of African populations. This population, affected by CRC at an early age, requires further investigation. In the West, too, the issue of the rising incidence of CRC among those under 50 is beginning to emerge; this group is not targeted by routine screening and exhibits certain risk factors linked to globalization (obesity, sedentary lifestyle, high-calorie diet) [7].

In terms of occupation, housewives (32.2%), workers in the informal sector (16.1%), and farmers/herders (18.4%) made up the majority. Sourokou [26] also reported 32.9% of housewives, and Kpossou [9] reported 27.8% of civil servants and 77.7% of patients without health coverage or insurance. Patients belong to diverse socio-professional categories, likely with even more varied risk factors. However, in the African context, many with low or middle socioeconomic status, in a system without third-party payment, delay seeking medical care by opting for self-medication at home or traditional treatments, contributing to late diagnosis.

Indications

The most common indication in our series was hematochezia (40.2%), consistent with reports from other authors in Burkina Faso [11,26,31], Sub-Saharan Africa [19,20,32], and Southern Africa [18,29]. Hematochesia is a red flag for the prescribing physician and a cause for concern for the patient, thus prompting the prescription of endoscopy and the patient's decision to undergo the procedure. Suspicion of colorectal cancer (12.6%) and the detection of a mass during digital rectal examination (8.1%) were the other most common indications. These are all signs of late-stage detection. This differs from findings in Western countries, where a positive fecal occult blood test is the most common indication [4,8,33] or family-based screening programs, which enable early diagnosis and curative treatment.

Endoscopic findings

Topographically, the lower rectum (34.3%) was the most common site. These findings are consistent with those reported by Sourokou [26] and Azangue Zapdji [24], who reported prevalences of 54.4% and 31.5%, respectively. Djapa [28] reported a predominance in the right colon (60%). The sigmoid colon is the predominant site reported in GLOBOCAN by Bray [25] in Europe and Kpossou in Benin [9]. In our context, the predominance of tumors in the lower rectum could be explained by several factors: chronic rectal inflammation caused by repeated microtrauma due to frequent laxative use, earlier consultation for rectal symptoms compared to more asymptomatic colonic tumors, and/or the greater use of anorectoscopies, which are less expensive than colonoscopies.

The ulcerative-budding macroscopic appearance was the most common (47%), which is consistent with data from the African literature [24,26,28]. These findings indicate that the cancers were detected at advanced stages. In the West, many cancers are detected at early stages and treated endoscopically through polypectomies and mucosectomies. In Africa, however, access to endoscopy and the capabilities of endoscopists need to be improved and strengthened through additional infrastructure and qualified personnel.

Histological Findings

Histologically, Lieberkühn's adenocarcinoma (78.2%) was the most common type, followed by mucinous carcinoma (16.1%), consistent with data from the literature [9,12,26,33]. Nearly half of the cancers were well-differentiated (48.3%) and moderately differentiated (42.5%). These findings indicate diagnosis at an intermediate or advanced stage.

Limitations and constraints of the study

This study had limitations related to its retrospective nature and the coding of certain pathological findings without direct patient identification. This made it difficult to match them with endoscopic reports, resulting in missing data. The high cost of the pathological examination, borne by the patients, was also a limiting factor for its implementation and a potential source of underestimation of malignant tumor cases.

Conclusion

In a retrospective analysis of patients with CCR, we found that this is a cancer affecting young adult men, presenting with hematochezia. The tumor, detected at a late stage, appears as an ulcerative-nodular lesion on endoscopy, and histological analysis reveals a well-differentiated type. Nearly half of our patients were under 50 years of age. Future studies will allow for the analysis of associated risk factors in our context. This includes genetic testing in these young patients, in order to implement effective primary prevention strategies through improved communication aimed at behavioral and social change. Furthermore, advocating for systematic screening using fecal immunochemical tests in patients aged 45–50, as well as strengthening the technical capabilities of laboratories to perform immunohistochemistry in the pathology department, would enable early diagnosis and curative treatments.

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