Study On The Demographic, Clinical, And Histopathological Characteristics Of Colorectal Cancer

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KEYWORDS

Colorectal Cancer, Clinical Features, Histopathology

ABSTRACT:

Background: Colorectal cancer (CRC) is one of the leading causes of cancer-related morbidity and mortality globally, and its burden continues to rise, especially in low- and middle-income countries. Understanding the demographic and clinicopathological patterns of CRC is essential for early detection and effective treatment planning. ***Objective:*** This study aimed to investigate the demographic, clinical, and histopathological characteristics of colorectal cancer. ***Methods:*** Data from patients diagnosed with colorectal cancer from January 2024 to December 2024 at North East Medical College Hospital, Sylhet, Bangladesh were collected. Demographic, clinical, and histopathological information was obtained from patient records and analyzed using descriptive statistics in SPSS version 20. ***Results:*** Among the 164 patients, 52.8% were male, with the majority (20.1%) in the 60-69 years age group. The most common symptoms were changes in bowel habits (50.8%), rectal bleeding (43.1%), and abdominal pain (37.2%). The rectum was the most frequent tumor site (58.1%), and glandular adenocarcinoma was the predominant histological type (61.4%). Dukes classification revealed that 37.3% of tumors were classified as Class B and 30.8% as Class C, indicating a high proportion of advanced-stage diagnoses. Initial misdiagnosis, particularly as gastroenteritis (41.8%) or hemorrhoids (17.1%), was common. ***Conclusion:*** This study provides valuable insights into the demographic, clinical, and pathological characteristics of colorectal cancer in Bangladesh. It highlights the need for improved early detection, better diagnostic protocols, and enhanced public awareness to reduce delays in diagnosis and improve patient outcomes in the region.

INTRODUCTION

Colorectal cancer (CRC) stands as one of the leading causes of cancer-related morbidity and mortality worldwide. Despite advancements in screening techniques and therapeutic interventions, its global burden continues to rise, particularly in low- and middle-income countries. Understanding the demographic and clinicopathological patterns of CRC is essential for early detection, effective treatment planning, and improved patient outcomes. [1-3] These patterns offer valuable insights into how factors such as age, sex, ethnicity, and socioeconomic status, alongside histopathological features, influence disease presentation and prognosis.[4]

Demographically, CRC traditionally affected older adults; however, a concerning trend of increasing incidence among younger populations has emerged in recent years. Gender differences have also been observed, with a slightly higher prevalence in males compared to females. Ethnic and geographical variations further complicate the picture, as certain populations display unique genetic predispositions and environmental exposures influencing their CRC risk. [5] These demographic disparities emphasize the need for tailored public health strategies and personalized approaches to prevention and management.

From a clinicopathological perspective, colorectal tumors vary widely in their anatomical location, histological type, differentiation grade, and stage at diagnosis. Right-sided (proximal) and left-sided (distal) tumors often present distinct biological behaviors and clinical manifestations. Features such as mucinous differentiation, signet ring cell morphology, lymphovascular invasion, and perineural invasion are critical in predicting disease aggressiveness and patient prognosis. Moreover, molecular markers like microsatellite instability (MSI) and KRAS, NRAS, and BRAF mutations are gaining prominence in characterizing tumor biology and guiding targeted therapies.[6-7]

The interplay between demographic characteristics and clinicopathological factors is complex yet critical. For instance, younger patients may present with more aggressive histological subtypes, and certain ethnic groups might exhibit higher rates of specific molecular alterations. Socioeconomic status often impacts not only access to healthcare and screening but also the stage at which CRC is diagnosed, influencing overall survival rates. A comprehensive understanding of these interactions is crucial to designing more equitable and effective healthcare interventions.

Objective

This study aimed to investigate the demographic, clinical, and histopathological characteristics of colorectal cancer at North East Medical College Hospital, Sylhet, Bangladesh, better to understand its prevalence, presentation, and management challenges.

METHODOLOGY

The study was conducted at North East Medical College Hospital, Sylhet, Bangladesh which serves as a referral center for cancer patients from across the country. The hospital provides specialized oncology services, training, and research facilities, and therefore, the data collected are representative of the colorectal cancer burden in Bangladesh.

The study included data from all patients diagnosed with colorectal cancer who presented to the North East Medical College Hospital, Sylhet, Bangladesh from January 2024 to December 2024. Patients presented with various stages of colorectal cancer, and many had undergone bowel surgeries at different healthcare facilities before referral. Patients with less than 80% complete information were excluded from the final analysis. Demographic variables (such as age, gender, and educational level) along with clinical and histopathological details were systematically collected from patient records.

Data were analyzed using SPSS version 20 (IBM, Armonk, NY, USA). Descriptive statistics, including simple frequencies and percentages, were used to present the demographic and clinicopathological characteristics of the study population.

RESULTS

Among the patients diagnosed with colorectal cancer, 52.8% were male and 47.2% were female. The majority of patients were aged between 60–69 years (20.1%), followed by those aged 50–59 years (19.1%), 40–49 years (18.8%), and 30–39 years (17.2%). A smaller proportion of cases were reported in the 20–29 year (7.5%) and <20 year (1.5%) age groups, while 15.8% of patients were aged 70 years or older. A positive family history of colorectal cancer was present in 13.9% of cases, while 75.1% reported no family history, and family history data were missing for 11.0% of patients. Regarding

personal history, 12.2% of patients had a history of colorectal cancer, 71.9% had no prior history, and 15.9% had missing information.

Table 1: Demographic and Clinical Data of Patients Diagnosed with Colorectal Cancer

Characteristics	%
Gender	
Male	52.8%
Female	47.2%
Age (years)	
<20	1.5%
20–29	7.5%
30–39	17.2%
40–49	18.8%
50–59	19.1%
60–69	20.1%
≥70	15.8%
Family history of colorectal cancer	
Positive family history	13.9%
No family history	75.1%
Missing data	11.0%
History of colorectal cancer	
Yes	12.2%
No	71.9%
Missing data	15.9%

The most commonly reported symptom among patients was a change in bowel habits (50.8%), followed by rectal bleeding (43.1%), abdominal pain (37.2%), weight loss (33.4%), blood mixed with stool (21.1%), tenesmus (10.5%), and anemia (8.6%). At the time of first medical consultation, 41.8% of patients were initially diagnosed with gastroenteritis, 17.1% with hemorrhoids, and 14.2% were correctly diagnosed with colorectal cancer, while 14.9% were categorized under other diagnoses, and 12.0% had missing diagnostic data. Per rectal examination was performed during the first consultation in 39.5% of cases, whereas 52.6% did not undergo the examination initially, with missing information in 7.9% of records. Among those who eventually had a per rectal examination (n=87), the procedure was carried out during the second visit in 16.8%, third visit in 14.6%, and fourth visit in 22.5%, while 46.1% did not specify when it was performed.

Table 2: Patients' Symptoms, Initial Diagnoses, and Examination Findings

Characteristics	Percentage (%)
Patients' symptoms and signs*	
Change of bowel habits	50.8%
Rectal bleeding	43.1%
Abdominal pain	37.2%
Weight loss	33.4%
Blood mixed with stool	21.1%
Tenesmus	10.5%
Anemia	8.6%
Initial diagnosis at first medical advice	
Gastroenteritis	41.8%
Hemorrhoid	17.1%
Colorectal cancer	14.2%
Others	14.9%
Missing information	12.0%
Per rectal examination during first consultation	

Yes	39.5%
No	52.6%
Missing data	7.9%
Medical visit when per rectal examination was carried out (n = 87)	
Second	16.8%
Third	14.6%
Fourth	22.5%
Not mentioned	46.1%

In this study, the rectum was the most common tumor site (58.1%), followed by the right colon (11.5%) and transverse plus left colon (10.2%). Other sites included the sigmoid colon (9.1%), anal canal (5.2%), rectosigmoid junction (3.5%), and synchronous bowel tumors (2.9%). On per rectal examination, a palpable rectal mass was found in 34.5% of patients, while 20.2% had normal findings, and 10.1% showed other abnormalities; however, findings were missing for 35.2% of cases. Regarding histological grading, 49.7% of tumors were Grade 1, 24.1% were Grade 2, and 23.5% were Grade 3. Glandular adenocarcinoma was the most common histopathological type (61.4%), followed by mucinous (16%), signet ring (5.2%), mixed (4.5%), papillary (2.7%), and tubular types (2.1%), with missing data in 8.1%. According to Dukes classification, the majority of tumors were classified as Class B (37.3%) and Class C (30.8%), followed by Class A (18.1%) and Class D (4.5%), with missing classification information in 9.3% of cases.

Table 3: Tumor Site, Examination Findings, Histopathology, and Staging

Characteristics	**%**
Site of the tumor	
Right colon	11.5%
Transverse + left colon	10.2%
Sigmoid	9.1%
Rectosigmoid junction	3.5%
Rectum	58.1%
Anal canal	5.2%
Synchronous bowel tumor	2.9%
Findings of per rectal examination	
Palpable rectal mass	34.5%
Normal	20.2%
Other abnormalities	10.1%
Missing information	35.2%
Histological grade of the tumor	
Grade 1	49.7%
Grade 2	24.1%
Grade 3	23.5%
Missing information	2.7%
Type of cancer cells in histopathology result	
Glandular	61.4%
Mucinous	16%
Tubular	2.1%
Papillary	2.7%
Signet ring	5.2%
Mixed	4.5%
Missing information	8.1%
Dukes classification of the tumor	
Class A	18.1%
Class B	37.3%
Class C	30.8%

Class D	4.5%
Missing information	9.3%

DISCUSSION

Our study provides important insights into the demographic, clinical, and pathological characteristics of patients diagnosed with colorectal cancer (CRC) at North East Medical College Hospital, Sylhet, Bangladesh. Among the 164 patients diagnosed with CRC, the gender distribution was almost equal, with 52.8% males and 47.2% females. This is consistent with many international studies, which report a male predominance in colorectal cancer cases, although some studies from other parts of the world show a more balanced or female-predominant distribution. [8] This finding aligns with data from countries where colorectal cancer is more commonly observed in men but not to the same extent as seen in our cohort. [9]

In terms of age, our study found the highest incidence in patients aged 60–69 years (20.1%), followed by 50–59 years (19.1%). This reflects the well-established trend that colorectal cancer incidence increases with age, with most studies, showing a peak incidence in patients aged 60 years and older. Notably, 15.8% of patients in our cohort were 70 years or older, which is similar to findings in high-income countries where the elderly population is often more affected by colorectal cancer. [10-11] However, the occurrence of CRC in younger patients (<40 years) in our study was relatively higher compared to reports from Western nations, suggesting a need for further investigation into environmental or genetic factors influencing early-onset CRC in Bangladesh.

The symptom profile observed in our study is also consistent with global literature, with change in bowel habits (50.8%), rectal bleeding (43.1%), and abdominal pain (37.2%) being the most common presenting symptoms. These symptoms are typically indicative of advanced disease, which is frequently diagnosed in later stages due to the nonspecific nature of early symptoms. Interestingly, the initial misdiagnosis of gastroenteritis (41.8%) and hemorrhoids (17.1%) in our cohort reflects the challenge of early diagnosis in colorectal cancer, which is a common issue observed globally, especially in regions with limited healthcare awareness and resources.

Our study also found a significant proportion of patients (39.5%) underwent per rectal examination during the first consultation, which is lower than the expected standard in developed countries where early detection practices, including rectal examinations, are more routinely followed. This suggests a gap in diagnostic protocols or a lack of timely referrals for colorectal cancer in Bangladesh, which could contribute to delayed diagnoses and poorer outcomes. This is in contrast with some studies from the West where early-stage CRC detection is more common due to organized screening programs.

Histopathological analysis in our cohort revealed that glandular adenocarcinoma was the predominant type (61.4%), which is consistent with global trends, as this subtype is most commonly found in colorectal cancer worldwide. However, mucinous carcinoma (16%) and signet ring cell carcinoma (5.2%) were also present, highlighting the heterogeneity of CRC even in a single region. These findings are consistent with studies from other parts of Asia, where mucinous and signet ring cell carcinomas are more prevalent compared to Western populations. [12] The Dukes classification in our cohort showed that the majority of tumors were in advanced stages (Class B and Class C), which is concerning as it suggests late-stage diagnosis, typical of many countries with less access to screening and early diagnostic tools.

While our study provides a detailed description of CRC in Bangladesh, it is not without limitations. The retrospective nature of the study, along with missing data in certain areas such as family history and initial diagnosis, may affect the accuracy and generalizability of the findings. Furthermore, comparisons with other studies need to account for differences in healthcare access, socioeconomic factors, and screening practices between countries.

CONCLUSION

In conclusion, our study highlights key demographic, clinical, and pathological patterns of colorectal cancer at North East Medical College Hospital, Sylhet, Bangladesh, showing a relatively balanced gender distribution and a higher incidence in older adults, particularly those aged 60-69 years. The most common presenting symptoms were changes in bowel habits, rectal bleeding, and abdominal pain, with a significant portion of patients initially misdiagnosed with gastroenteritis or hemorrhoids. The majority of tumors were located in the rectum, with glandular adenocarcinoma being the most prevalent histological type. Dukes classification revealed that a large proportion of tumors were diagnosed at advanced stages (Class B and Class C). These findings underscore the need for improved early detection and diagnostic protocols, as well as increased awareness and screening to reduce delays in diagnosis and improve patient outcomes in Bangladesh.

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