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Original Research Article

Colorectal carcinoma in India: A study from a tertiary care centre

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ABSTRACT

Introduction: Colorectal cancer (CRC), which comprises colon and/or rectum cancer, is a significant health problem and the world's second most fatal cancer. Colorectal adenocarcinoma (CRA), can be divided into 4 grades according to Broder's criteria, i.e., well differentiated (I), moderately differentiated (II), poorly differentiated (III), and undifferentiated (IV). Currently, the TNM classification is considered the gold standard for the establishment of prognosis as well as deciding the type of treatment.
Aim: The aim of our study was to assess the incidence, gender preponderance, site, histological grading and staging of colorectal carcinoma in our hospital.
Materials and Methods: This is a retrospective study of 75 patients who were diagnosed as colorectal carcinoma from July 2022 to January 2024. The specimen of the cases were sent to our Department of Pathology, Acharya Shri Chandra college of medical sciences and hospital, Jammu for histopathological examination after resection.
Results: In our study we found out that the cases of colorectal carcinoma had a male preponderance with most cases ranging from age group 46 to 60. The most common site of occurrence was rectum and the most common histological grade diagnosed as per microscopy was grade , that is moderately differentiated adenocarcinoma. The highest number of cases were at Stage II, followed by Stage III.
Conclusion: There is an urgent need to look upon the alarming rate of colorectal carcinoma and understand its incidence, grading and staging for a better prognosis.

1. Introduction

Colorectal cancer (CRC), comprises colon and/or rectum cancer, is a significant health problem and is the world's second most fatal cancer.[1]

Histologically, if we look into the types, more than 90% of colorectal carcinomas are adenocarcinomas, especially, adenocarcinoma not otherwise specified (NOS) is the most common histological subtype.[2]

Sometimes asymptomatic and other times symptoms are associated with it, the principal ones are rectal bleeding, diarrhoea, or constipation — collectively sometimes named 'change in bowel habit', cachexia, abdominal pain, and anaemia.[3]

Colorectal cancer is a genetically diverse type of cancer; but, it can develop through various unique mechanisms, It is believed to have one of the most incredible mutational loads of any malignancy. Depending on the number of somoclonal mutations, CRC can be categorized as hypermutated (more than 12 mutations per 10^6 bases) or non-hypermutated

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(fewer than 8.24 mutations per 10^6 bases).[4]

The occurrence of colorectal cancer has its association with non-modifiable risk factors, which include age and hereditary factors, as well as modifiable factors which are related to environment and lifestyle.[5]

Harmful lifestyle activities like low physical activity, a low-residue diet rich in fat, high in calories, rich in red meat, but also low in calcium or folic acid increase the risk of colon cancer. Besides, alcohol consumption and smoking are also significantly related, which in the US are associated with 1/5 of intestinal cancers.[6] Strong scientific evidence shows that being obese has a greater risk of developing colorectal cancer. Elderly people with BMI>30 have a 5–100% higher risk of developing CRC in comparision to people with BMI<23.[7]

The risk of developing the disease increases upto 20 times in case of ulcerative colitis and 3 times in patients with Crohn's disease.[8]

Most colorectal malignancies occur over 50 years. When diagnosed with colon cancer, the average age of men is 68 years and the average age of women is 72 years.[9] Increasing age is one of the non-modifiable risk factors associated with CRC.[10]

Based on sites of onset, rectal cancer accounts for 49.66% of CRC and colon cancer accounts for 49.09%. Among colon cancers, the most common sites are the sigmoid colon, followed by the ascending colon, transverse colon, descending colon, cecum, and crossing site (2.1%).

Colorectal adenocarcinoma (CRA), can be divided into grades I to IV according to Broder's criteria, i.e., well differentiated (I), moderately differentiated (II), poorly differentiated (III), and undifferentiated (IV), based on the degree of glandular differentiation in histopathological images of colorectal cancer.[11] The World Health Organization (WHO) pathologic classification of gastrointestinal has listed a number of histologic subtypes of colorectal carcinomas, such as classic adenocarcinomas (AC), mucinous adenocarcinomas (MAC), signet ring cell carcinomas (SRCC) and other rare variants of colorectal carcinomas which would include squamous cell, neuroendocrine, adenosquamous, spindle cell, and undifferentiated carcinomas.[12] Histological classification of CRC may influence the clinical features and outcome, thus, to clarify the effect of the varied histological subtypes will help clinicians choose the appropriate treatment strategy.[13]

The TNM classification is at the time, the most used and prevalent classification system for the staging of colorectal carcinoma. It is known to effectively describe the prognostic factors and also incorporate the other classification systems.[14] The TNM classification is currently considered the gold standard for the establishment of prognosis as well as deciding the type and mode of treatment.[15]

1.1. AJCC staging of colorectal carcinoma

1.1.1. Primary Tumor (pT)

1. pT1: Tumor invades the submucosa (through the muscularis mucosa but not into the muscularis propria)
2. pT2: Tumor invades the muscularis propria
3. pT3: Tumor invades through the muscularis propria into pericolorectal tissues ___
4. pT4: Tumor invades the visceral peritoneum or invades or adheres to adjacent organ or structure .

1.1.2. Regional Lymph Nodes (pN) ___

1. pN0: No regional lymph node metastasis
2. pN1: One to three regional lymph nodes are positive (tumor in lymph nodes measuring ≥0.2 mm), or any number of tumor deposits are present and all identifiable lymph nodes are negative
3. pN1a: One regional lymph node is positive.
4. pN1b: Two or three regional lymph nodes are positive
5. pN1c: No regional lymph nodes are positive, but there are tumor deposits in the subserosa, mesentery, or nonperitonealized pericolic, or perirectal/mesorectal tissues.
6. pN2: Four or more regional lymph nodes are positive.
7. pN2a: Four to six regional lymph nodes are positive.
8. pN2b: Seven or more regional lymph nodes are positive.

1.1.3. Distant Metastasis (pM) (required only if confirmed pathologically in this case).

1. pM1: Metastasis to one or more distant sites or organs or peritoneal metastasis is identified.
2. pM1a: Metastasis to one site or organ is identified without peritoneal metastasis.
3. pM1b: Metastasis to two or more sites or organs is identified without peritoneal metastasis.
4. pM1c: Metastasis to the peritoneal surface is identified alone or with other site or organ metastases

2. Aim

The aim of our study was to assess the incidence, gender preponderance, site, histological grading and staging of colorectal carcinoma in our hospital.

3. Materials and Methods

This is a retrospective study of 75 patients who were diagnosed as colorectal carcinoma from July 2022 to January 2024. The specimen of the cases were sent to our Department of Pathology, Acharya Shri Chandra college of medical sciences and hospital, Jammu for histopathological examination after resection.

The specimen received were adequately fixed in 10% neutral buffered formalin for 24 to 48 hours and

representative sections were taken after proper fixation. The sections were routinely processed with paraffin embedding and 4 to 5 micrometre thickness tissue sections were prepared and stained with haematoxylin and eosin stain for histopathological examination.

4. Result

Total of 75 cases were studied from July 2022 to January 2024.

Detailed history of the patients, along with gross and microscopy of specimen were noted for further analysis.

Firstly, we found out that 54 out of 75 patients were male, that is 72% of the cases. Therefore, we found out that colorectal carcinoma showed male predominance in our study. The tabular form of the data is given below:Table 1

Table 1: Showing colorectal carcinoma distribution in patients, both males and females.

Gender	Number of cases of colorectal carcinoma	Percentage
Male	54	72%
Female	21	28%
Total	75	100%

Next, we found out that the age group of the cases ranged from 30 to 93 years. The highest cases were seen between age group 46 to 60. The second highest cases were between the age group 61 to 75 years. The tabular form of the data is given below:Table 2

Table 2: Showing age distribution of colorectal carcinoma patients.

Age in years	Number of cases of colorectal carcinoma	Percentage
30-45	11	14.7%
46-60	39	52%
61-75	18	24%
76-93	07	9.3%
Total	75	100%

Thirdly, we studied the presenting complaints of the patients diagnosed with colorectal carcinoma. The patients presented with bleeding per rectum, changes in bowel habit i.e diarrhoea or constipation, abdominal pain, cachexia and anemia. The most common presenting complaint was bleeding per rectum which was noted in 60% of the cases. The tabular form of the data is given below:Table 3

We then studied the common sites for development of colorectal carcinoma. We found out that rectum was known to be the tumor site in 50.75 of the cases. Also in 10 out 75 cases, that is 20% (which is the second highest) of the cases, the tumor site was hepatic flexure and part of ascending colon. The tabular form of the data is given below:Table 4

Next, we checked the histopathological grading given to each case. (ie. Well differentiated, moderately differentiated and poorly differentiated)

Table 3: Displaying the distribution of colorectal patients according to clinical features.

Symptoms	Number of colorectal cases	Percentage
Rectal bleeding	45	60%
Change in bowel habit	32	42.6%
Persistent abdominal pain	22	29.3%
Anemia	25	33.3%
Unexplained weight loss	30	40%

Table 4: Showing distribution of anatomic location of tumor in colorectal carcinoma specimens.

Tumor site	Number of cases	Percentage
Caecum	07	9.3%
Ascending colon & hepatic flexure	15	20%
Transverse colon & spleenic flexure	01	1.3%
Descending colon	04	5.3%
Sigmoid colon	10	13.4%
Rectum	38	50.7%
Total	75	100%

We found out that 13 (17.33%) cases were diagnosed as well differentiated adenocarcinoma (Grade 1), a majority of 48(64%) cases were diagnosed as moderately differentiated (grade 2), and 14(18.665) of cases were diagnosed as poorly differentiated (Grade 3).Figure 1

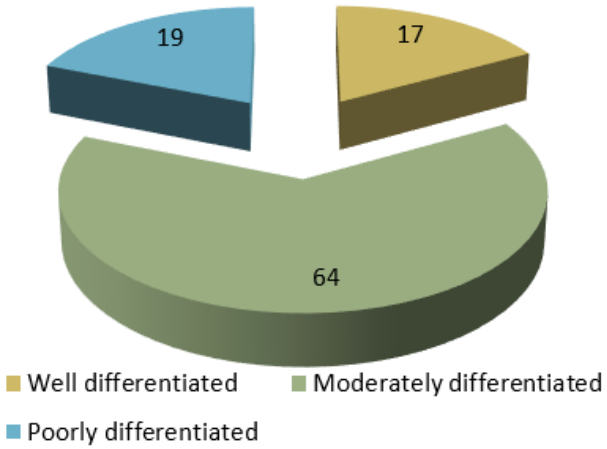

Figure 1: Histological grading

Finally, we assessed the AJCC staging of the cases.

We found out that out of 75 cases diagnosed, 6 cases were Stage I, 42 cases were Stage II, Stage III comprised 19 cases

while 8 cases were included in Stage IV.

The pie chart of the data is given below:Figure 2

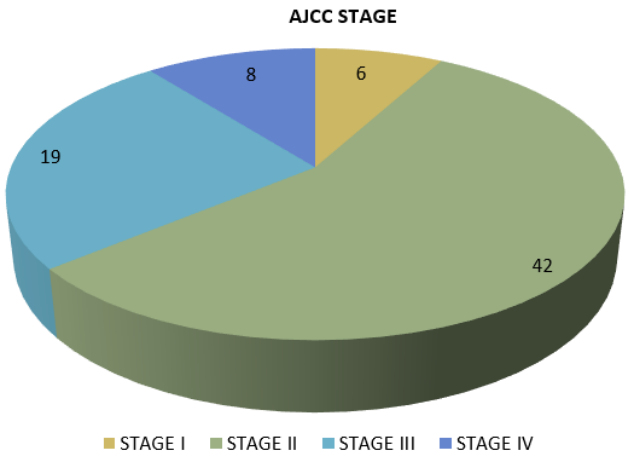

Figure 2: AJCC stage

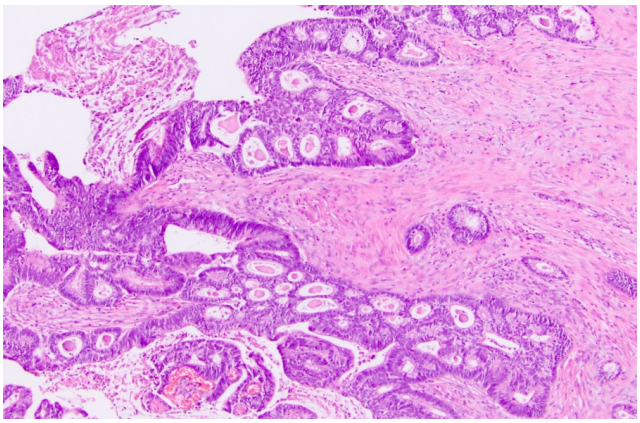

Figure 3: Well differentiated adenocarcinoma colorectum

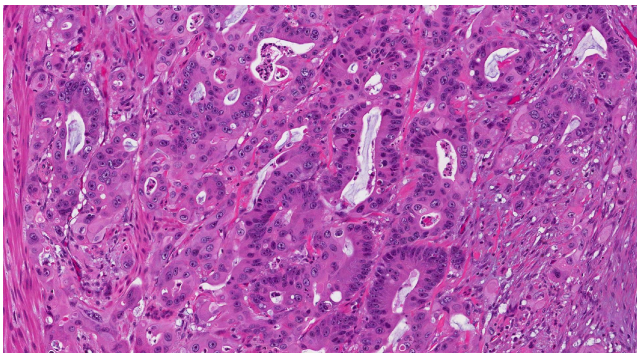

Figure 4: Moderately differentiated adenocarcinoma colorectum

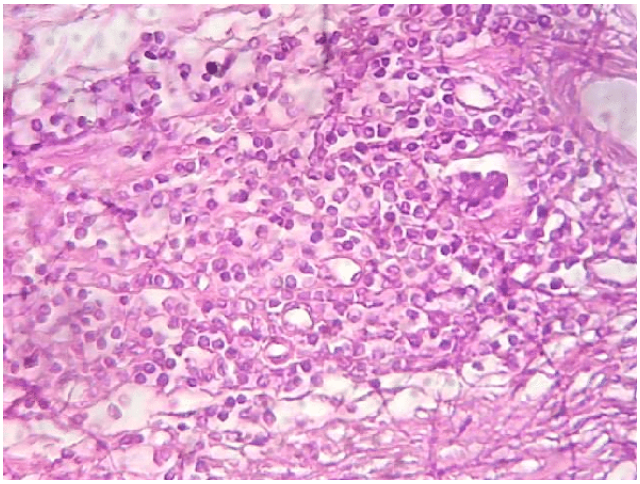

Figure 5: Poorly differentiated adenocarcinoma colorectum

5. Discussion

Colorectal cancer (CRC), defined as cancer of the colon or rectum, has become an increasing problem in developed countries, where it is one of the leading neoplastic locations.[16] The lifetime risk of developing colorectal adenoma in the US, is almost 19%, which looks quite significant.[17]

In 2020, according to GLOBOCAN, colorectal cancer ranked third in the number of new cancer cases reported worldwide, with 1,931,590 cases (10%), and second in the number of fatalities associated with malignancies, with 935,173 deaths (9.4%). A total of 54.2% of colorectal cancer fatalities occurred in Asia, 26.2% in Europe, 7.4% in Latin America and the Caribbean, 6.8% in North America, and 4.8% in Africa.[18]

It is also known that the, 5-year survival rate of patients with colorectal cancer is approximately 60%. The International Agency for Research on Cancer (IARC) has estimated that the number of new cases of colorectal cancer will increase significantly by 63 percent,,at the same time, the mortality rate will increase by 73 percent, to 1.6 million per year.[19]

Hence, there is an urgent need to tackle the alarming rate of CRC effectively. Therefore, we need to know in great depths about the colorectal carcinomas in order to figure out a better was to reduce mortality from CRC and lead the patient towards a better prognosis.

In our study we found out that the 75 cases of colorectal carcinoma had a male preponderance with the most cases ranging from age group 46 to 60. The most site of occurrence of colorectal carcinoma was rectum.

According to this study the most common histological grade diagnosed as per microscopy was grade , that is moderately differentiated adenocarcinoma.

In our study, we observed out that out of 75 cases diagnosed, 6 (8%)cases were Stage I, 42(56%)cases were

Stage II, Stage III comprised 19(25.33) cases while 8(10.66%) cases were included in Stage IV. The highest number of cases were at Stage II, followed by Stage III. The east number of cases were diagnosed at Stage I.

6. Conclusion

There is an urgent need to tackle the alarming rate of CRC effectively. It will take coordinated efforts to eliminate modifiable risk factors, and promote population-wide and targeted screening to achieve the most significant possible reduction in CRC incidence and mortality.

7. Source of Finding

None.

8. Conflict of Interest

None.

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