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Original Research Article

Spectrum of Colorectal Adenocarcinomas: A 4 year experience in a tertiary care centre from Western Maharashtra

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ABSTRACT

Background: Colorectal cancer is the third most common cancer in both men and women. Environmental and genetic factors play a role in the development of colorectal carcinoma**.** The majority of colorectal cancers are sporadic, with hereditary cancer syndrome accounting for 10% of cases. Precursor lesions like adenoma that transform into adenocarcinoma cause the majority of colorectal cancers.
Materials and Methods: A total of 72 of colorectal malignancies were studied for histopathological features. The histologic features were studied for site, grade, tumor -infiltrating lymphocytes, Crohn -like lymphocytic reaction, mucinous histology, signet ring cell histology, and medullary growth pattern.
Results: The mean age of the patients was 59.52 ± 11.80 years with M:F 1.76:1. Light microscopy showed TILs in 16 (22.2%) patients, followed by mucinous areas in 5 (6.9%), crohn like lymphocytic reaction in 4 (5.6%) and signet ring morphology in 2 (2.8%) patients.
Conclusion: This study concludes that colorectal carcinomas are more common in 5th and 6th decade of life with slight male preponderance. The most common malignant lesion being moderately differentiated adenocarcinomas. This study highlights age and gender prevalence, as well as histopathological characteristics of colorectal carcinomas in this demographic region .

1. Introduction

Colorectal cancer is the second and third most common cancers in men and women respectively. Colorectal cancer (CRC) is the third most common cancer in both men and women, and second most common cause of cancer death.[1] In 2018, about 576,000 and 521,000 men and women, respectively, are projected to be diagnosed with colon cancer which constitutes 1.51% cumulative risk of colon cancer among men and 1.12% risk among women in the both age group of age 0–74 years. Colorectal cancer is the third most common cancer in both men and women, accounting for 9.7% of all cancers. More than half of the cases occur in the world's more developed regions. Men have a higher age-standardized incidence rate (ASRi) of colorectal cancer (20.6 per 100,000 people) than women (14.3 per 100,000). The majority of sporadic cancer patients are over 50 years old, with 75% of rectal cancer patients and 80% of colon cancer patients are under 60 years old at the time of diagnosis.[2,3]

Environmental and genetic factors play an important role in the development of colorectal carcinoma. The developmental risk of CRC are a sedentary lifestyle, diet with high fat, obesity, consumption of alcohol and tobacco, and a progressive increase in the age of the population.[4]

According to revised Bethesda guidelines, the histologic features associated with high-level MSI (MSI histology) are tumor-infiltrating lymphocytes (TILs), Crohn like

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lymphocytic reaction, mucinous histology, signet ring cell histology, and medullary growth pattern. The presence of TILs is defined as an average of ≥3 lymphocytes between tumor cells per hpf, with counts from 5 consecutive hpf. Crohn-like lymphocytic reaction is defined as at least 3 lymphoid aggregates present at the tumor periphery with at least 1 lymphoid aggregate measuring >1 mm in diameter. The mucinous adenocarcinoma is used if > 50% of the lesion is composed of pools of extracellular mucin that contain malignant epithelium as acinar structures, layers of tumor cells, or individual tumor cells including signet-ring cells. Carcinoma with mucinous areas of < 50% are categorized as having a mucinous component. It is of said that a small amounts of mucin may indicate MSI.[5,6]

Present study analyses the histopathological spectrum of colorectal cancers along with identifying the presene of features of MSI like histology.

2. Materials and Methods

This is a retrospective study of 72 cases (excisional biopsies and major resections) of colorectal carcinomas from 2018 to 2022. Tissue processing was done with automated tissue processor and sections of thickness 2 to 4 microns were taken. Clinical features with lower GI complaints were recorded. The histologic features were studied for site, grade, and MSI histology (tumor infiltrating lymphocytes, Crohn like lymphocytic reaction, mucinous histology, signet ring cell histology, and medullary growth pattern).

3. Observations and Results

A total 72 cases of colorectal carcinoma were studied. The mean age of the patients was 59.52 ± 11.80 years out of 72 with 26 females (36.1%) and 46 males (63.9%) with M:F 1.76:1. The demographic parameters are shown in Table 1.

The most common presentation found was per rectal bleeding (48.6%), followed by abdominal pain (33.3%), vomiting (22.2%), loss of appetite (19.4%), loose stools (18.1%) and weight loss (16.7%) and anemia (13.9%) of patients. As tabulated in Table 2.

The commonest site of CRC was sigmoid colon in 32 (44.44%.) cases, followed by rectum in 15 (20.83). The site of distribution of the CRC is shown in Table 3.

There were 63 cases (88.9%) of moderately differentiated adenocarcinoma followed by 7 (9.7%) cases of well differentiated adenocarcinoma and 1 case (1.4%) of poorly differentiated adenocarcinoma.(Figure 1)

The distribution of patients according to histopathological grade in patients with CRC shown in graph 1.

Light microscopy showed TILs in 16 (22.2%) patients, followed by mucinous areas in 5 (6.9%), crohn like lymphocytic reaction in 4 (5.6%) and signet ring morphology in 2 (2.8%) patients is shown in fig 2 The distribution of patients according to MSI histology is shown in Table 4.

Table 1: Agewise distribution of patients

Age group	No. of patients	Percentage
21-30	01	1.38
31-40	02	2.77
34-40	02	2.77
41-50	06	8.33
51-60	36	50
61-70	18	25
71-80	05	6.94
81-90	02	2.77
Grand Total	72	100.00

Table 2: Clinical findings in patients with colorectal carcinoma

Symtoms	Frequency	Percent
Per rectal bleeding	35	48.6
Abdominal pain	24	33.3
Vomiting	16	22.2
Loss of appetite	14	19.4
Loose stools	13	18.1
Weight loss	12	16.7
Anemia	10	13.9
Constipation	9	12.5
Obstruction	8	11.1
Abdominal distention	4	5.6
Malena	3	4.2

Table 3: Site wise distribution of colorectal tumour

Site	Number of cases	Percent
Ascending colon	11	15.27
Transverse colon	05	6.9
Descending colon	02	2.77
Sigmoid colon	32	44.44
Rectosigmoid junction	07	9.72
Rectum	15	20.83
Total	72	100.0

Table 4: MSI histology

	Frequency	Percent
Crohn like lymphocytic reaction	4	5.6
Tumor infiltrating lymphocytes	16	22.2
Signet ring morphology	2	2.8
Mucinous	5	6.9

4. Discussion

CRC can result from mutations in oncogenes, tumor suppressor genes, and genes involved in DNA repair pathways. CRC are divided into three groups based on the mutation: sporadic, hereditary, and familial.

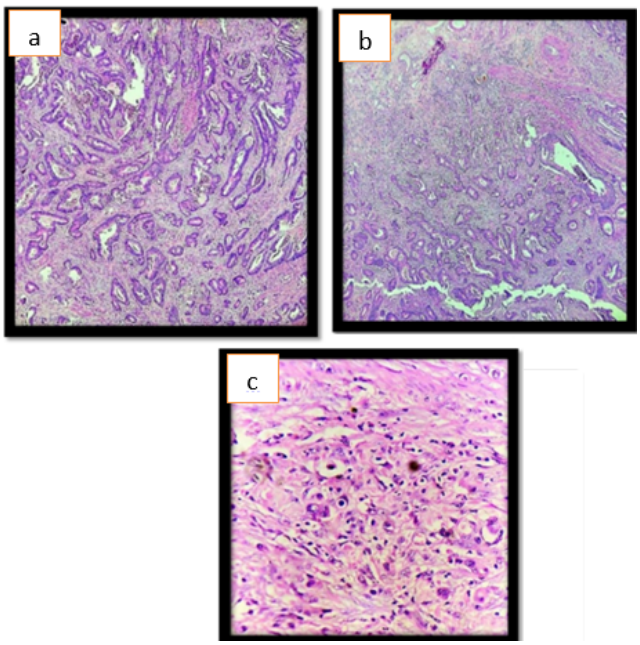

Fig. 1: Photomicrograph showing grade of colon adenocarcinoma; **a**: Well differentiated adenocarcinoma (H&E); **b**: Moderately differentiated adenocarcinoma (H & E 10X); **c**: Poorly differentiated adenocarcinoma (H7E 10X)

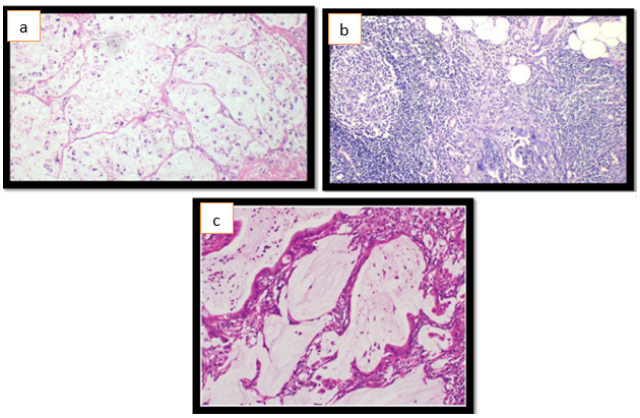

Fig. 2: Photomicrograph showing MSI like histology; **a**: Signet ring cell adenocarcinoma (H&E 40X); **b**: Tumor infiltrating lymphocytes (H&E 40X); **c:** Mucin secreting adenocarcinoma (H&E 40X)

1. Sporadic CRC: this is more common among older adults, comprises nearly 70% of all colorectal cancers, and is typically caused by point mutations. Because multiple genes might be affected by mutations, the molecular etiology of sporadic cancer is varied.[7]
2. Familial CRC: this is more frequently seen in a first-degree relative, and molecular pathogenesis has not been established yet.[8]
3. Inherited CRC: only about 5% of CRC cases are caused by inherited malignancies. Polyposis and non- polyposis types are the two main types. Familial adenomatous polyposis (FAP) is an autosomal dominant disease mainly due to the APC gene mutation and is characterized by the development of several potentially cancerous polyps in the colon.[9]

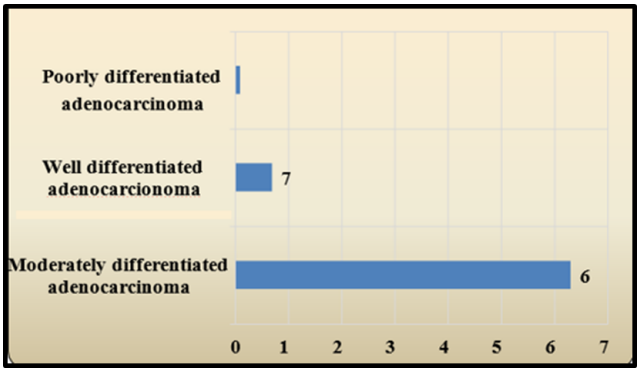

Fig. 3: Grade of colonadenocarcinoma

In contrast, DNA repair pathway mutations are linked to hereditary non-polyposis colorectal cancer (HNPCC). HNPCC is an autosomal dominant disease, also known as Lynch syndrome.(LS).[10,11]

The majority of the patients (61 out of 72) in present study were over the age of 50, and 11 were under the age of 50. This finding correlates with study by Soliman NA[12] in which 50% and 53% were above 50 years .

In the present study, the incidence of colorectal carcinomas was highest (50.00%) between the age group of 50-60 years which was comparable to the study done by Nandish et al which had 37.21% of cases.[13]

A highest proportion of cases were seen in males as compared to females with M:F ratio of 1.76:1 and studies conducted by Rajesh S et al showed M:F ratio of 1.15:1.[14]

The commonest site of CRC was sigmoid colon in 32 (44.44%) cases, followed by rectum in 15 (20.83). Similar results were obtained by Rasool M et al[15] and Sharma P et al.[9]

In the present study, most (88.9%) of the CRC were moderately differentiated adenocarcinomas, followed by well differentiated (9.7%) and poorly differentiated adenocarcinomas (1.4%).

Some morphological features such as young patient age, right-sided location, mucinous and signet ring histology, and tumor infiltrating lymphocytes, careful observation of tumour histology help identifying these tumours.[16]

Present study showed tumor infiltrating lymphocytes in 16 (22.2%) patients, followed by 5 (6.9%) patients with mucinous component, 4 (5.6%) with Crohn's like lymphocytic reaction, and 2 (2.8%) with signet ring morphology. 24.3% of the 83 cases of adenocarcinoma found by Soliman NA[12] et al were mucinous carcinoma, while 3.55% of the cases of signet ring carcinoma which

was comparable to the present study.

The MSI can be identified by means of polymerase chain reaction (PCR) testing, which compares normal and tumour DNA of the same patient. Patients with Lynch syndrome used to be identified by means of clinicopathological criteria.[17,18] MSI is considered a favourable prognostic factor in early stage CRCs, with longer disease free and overall survival.[19,20]

5. Conclusion

This study concludes that colorectal carcinomas are more common in 5th and 6th decade of life with slight male preponderance. The most common malignant lesion being moderately differentiated adenocarcinomas. This study highlights age and gender prevalence, as well as histopathological characteristics of colorectal carcinomas in this demographic region. Immunohistochemistry can further aid to identify its clinicopathological association.

6. Declaration

Manuscript is original and is not published or communicated for publication elsewhere either in part or full.

7. Conflict of Interest

There are no conflicts of interest in this article.

8. Source of Funding

None.

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