ORIGINAL ARTICLE

Spectrum of Colorectal Carcinoma in Karachi

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Abstract

Background: Worldwide, colorectal carcinoma is the third most common malignancy affecting both males and females. Although being considered an old-age disease, a higher incidence of colorectal carcinoma (CRC) has been reported in younger individuals in developing countries.

Objectives: The study aimed to determine the clinicopathological characteristics of previously diagnosed colorectal cancer cases, including demographic factors such as age, gender, ethnicity, as well as tumour location, grading, staging, and mode of treatment, in diagnosed cases of colorectal cancer at a tertiary care hospital in Karachi, Pakistan.

Methods: A cross-sectional study was conducted over three years, from September 2020 to August 2023, following IRB approval. All cases of colorectal carcinoma presenting at the Department of Oncology, Jinnah Postgraduate Medical Centre, Karachi, were included in the study. The data were analysed using SPSS version 22.0.

Results: Of 193 patients, 116(60.1%) were males and 77(39.8%) were females. The overall mean age was 40 ±15.023 years. Per rectal bleeding was the most common (49.03 %) presenting symptom, and the predominant tumour site was the rectum, 88(45.6%). Most of the tumours were at TNM stage III, followed by stage IV. The most common site for distant metastasis was the liver, 46 (23.8%).

Conclusion: The Majority of cases were males aged under 50 years. The majority of the patients had no family history of any cancer. Adenocarcinoma was the most common type. The majority of the patients had advanced disease at the time of diagnosis.

Keywords: *Colorectal cancer, lower gastrointestinal tract, inflammatory bowel disease, smoking, adenocarcinoma.*

INTRODUCTION

The third most prevalent type of cancer and the fourth leading cause of cancer-related deaths globally is colorectal carcinoma (CRC), also known as adenocarcinoma [1, 2]. It affects both males and females, but the frequency of cases involving male individuals is higher than in females [3]. Although being considered an old-age disease, a higher incidence of CRC has been reported in younger individuals in developing countries [4] as well as in some developed countries such as Canada [5].

The highest age-standardised incidence was reported in developed countries, including Denmark, Norway and the Netherlands, due to the advanced age of the population, obesity, sedentary lifestyle, environmental and dietary factors. However, in contrast to this, the highest mortality-to-incidence ratio was reported in developing regions, including South Asia and Africa, mainly due to a lack of knowledge among the population, late presentation, advanced disease at the time of presentation, limited screening programs, and delays in the initiation of treatment [6].

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Colorectal carcinoma is the fifth common malignancy in Pakistan, with an incidence ranging from 4-6.8% in different areas of the country [7, 8]. The government is undergoing rapid urbanisation and lifestyle changes that are parallel to those seen in countries currently experiencing an increased prevalence of the disease. Despite this, there is neither a national cancer screening program nor a national cancer registry for colorectal carcinoma. Local epidemiological data are limited, which serves as a significant barrier to developing effective prevention and treatment strategies [9].

The current study was designed to determine the clinicopathological characteristics of previously diagnosed colorectal cancer cases, including demographic factors, such as age, gender, ethnicity, as well as tumour grading, staging, and treatment modalities in diagnosed cases of CRC at the largest public sector hospital in Karachi, Pakistan.

MATERIALS AND METHODS

This was a descriptive cross-sectional study that included patients with colorectal cancer who presented at the Department of Oncology, Jinnah Postgraduate Medical Centre, Karachi, within three years from September 2020 to August 2023. The study was conducted after obtaining IRB approval with reference

number JSMU/IRB/2020/-300. Patients were recruited into the study with their written informed consent.

The sampling technique was non probability consecutive sampling. The sample size was determined using OpenEPI software, with a 95% confidence interval (z score = 1.96), a prevalence of 7.9% for colorectal cancer in males from a previous study [10], and a margin of error is 5%. The obtained sample size is 175. Since our research spanned a three-year duration, we attempted to include as many cases as were registered with the oncology department, resulting in an actual sample size of 193.

All patients diagnosed with colorectal carcinoma were taken into consideration. However, diagnosed cases with Familial adenomatous polyposis, squamous cell carcinoma of the anal canal and rectal gastrointestinal stromal cell tumours (GIST), metastatic tumours or rectal involvement due to secondary from prostate cancer, bladder, uterus, cervix, and vaginal tumour were kept in exclusion. A structured proforma was designed to collect the data. The proforma included questions regarding demographic features, including age, gender, ethnicity, staging, and grading, as well as the duration of symptoms and the mode of treatment provided to the patients. Data was collected from medical records and pathology reports. All cases had histopathological confirmation of colorectal carcinoma, supporting the validity of the data.

SPSS version 22.0 was used for data entry and data analysis. Frequencies and percentages were computed for categorical variables. Numerical variables were presented as mean ± standard deviation. Data was presented in meaningful tables and charts.

RESULTS

Of the 193 patients, 116 (60.1%) were male and 77 (39.8%) were female. The overall mean age was 40 ± 15.023 years, with an age range of 12-74 years **(Table 1).** The most common age group at presentation for male patients was 31-40 years, whereas most female patients were aged between 21-30 years **(Fig. 1).** The Urdu-speaking ethnic group, comprising 75 (38.8%) patients, was most commonly affected by CRC, followed by the Sindhi-speaking population, comprising 63 (32.6%) patients. Of the patients, only 19 (9.8%) had a positive family history of colorectal cancer. The most commonly affected site for carcinoma was the rectum, 88(45.6%), followed by the recto-sigmoid junction, 44 (22.7%), and the sigmoid colon, 24 (12.4**%**) **(Table 2).**

Rectal bleeding (49.03 %), abdominal pain (51, 33.1%), and altered bowel habits (40, 24.2%) were the most common presenting symptoms for carcinomas located

Table 1: Socio-demographic characteristics of the studied sample.

Variables	Frequency (%)
Gender	
Male	116(60.1)
Female	77(39.8)
Age in years	
≤50	140(72.5)
≥50	53(27.4)
Marital status	
Married	163(84.4)
Unmarried	30(15.5)
Ethnic group	
Urdu	75(38.8)
Sindhi	63(32.6)
Punjabi	13(6.7)
Pashto	29(15.0)
Baloch	13(6.7)
Province	
Sindh	154(79.7)
Punjab	10(5.1)
Balochistan	17(8.8)
Khyber Pakhtunkhwa	12(6.2)

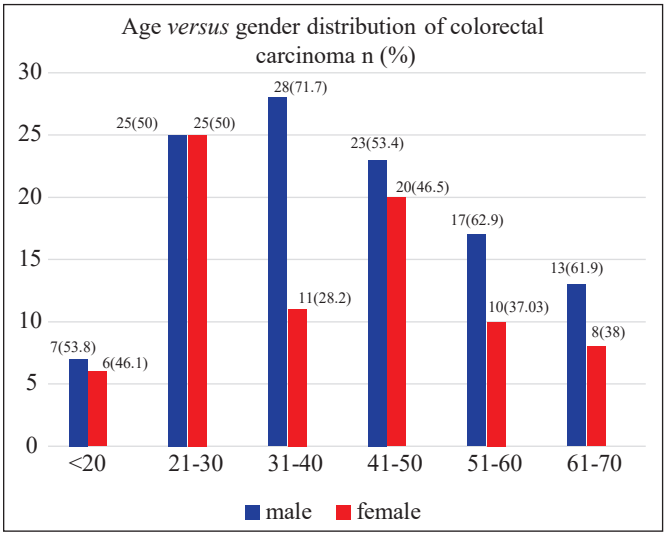

Fig. (1): Graph shows the age and gender distribution of colorectal carcinoma.

in the rectum, colon, and recto-sigmoid junction, respectively **(Fig. 2).** All 193 (100%) of the tumours were Adenocarcinomas. No other histologic pattern was observed. The most common histologic grade was grade 2, *i.e.*, moderately differentiated **(Table 2).** Tumours presenting with grade 2 and 3 histology were more likely to be at advanced TNM stage as compared to grade 1 tumours (**Fig. 3).**

Most of the tumours were at TNM stage III, followed by stage IV in both males and females. **(Fig. 4)** Liver

Table 2: Clinical characteristics of the studied sample.

Variables	Frequency (%)
Histological Degree	
Well differentiated	24(12.4)
Moderately differentiated	92(47.6)
Poorly differentiated	77(39.8)
Histological Type	
Adenocarcinoma	193(100)
Anatomic Location	
Rectum	88(45.6)
Transverse colon	8(4.1)
Cecum	6(3.1)
Recto sigmoid junction	44(22.7)
Sigmoid colon	24(12.4)
Ascending colon	12(6.2)
Descending colon	11(5.7)
Tumour Invasion	
T1	5(2.6)
T2	11(5.7)
T3	130(67.4)
T4	47(24.4)
Lymph Node Involvement	
N0	18(9.3)
N1	126(65.3)
N2	43(22.3)
N3	6(3.1)
Sites of Distant Metastasis	
Liver	46(23.8)
Lungs	5(2.6)
Peritoneum	29(15.02)
Ovaries	2(1.03)
Brain	1(0.5)
Adrenal gland	1(0.5)
Bladder and prostate	1(0.5)

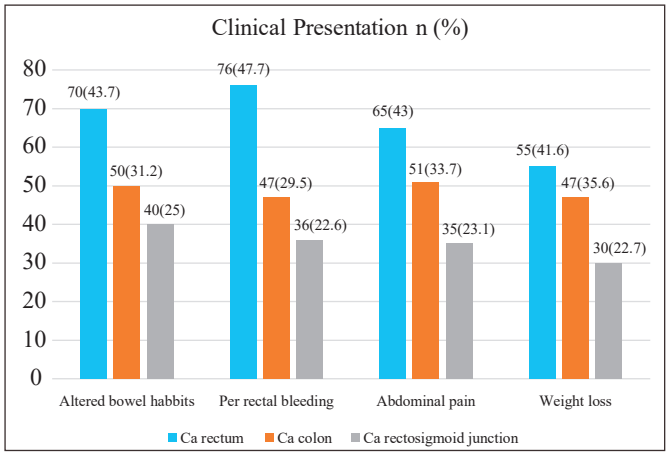

Fig. (2): Graph shows the frequency of various clinical findings among patients.

Table 3: Treatment delivered to the patients.

Variables	Frequency (%)
Surgery	
Radical surgery	102(52.8)
Palliative surgery	91(47.2)
Oncological Treatment	
Neo-adjuvant chemotherapy/radiotherapy	57(29.5)
Adjuvant chemotherapy/radiotherapy	28(14.5)
Concurrent chemo radiation	49(25.4)
Palliative chemotherapy/radiotherapy	59(30.6)
Resection	
Low anterior resection	4(2.1)
Right hemicolectomy	68(35.2)
Left hemicolectomy	66(34.1)
Sigmoidectomy	15(7.8)
Abdominoperitoneal resection	32(16.6)
Transverse colectomy	2(1.0)
Ileocecal resection	5(2.6)
Total colectomy	1(0.5)
Ostomy	
Loop ileostomy	57(29.5)
Colostomy	136(70.5)

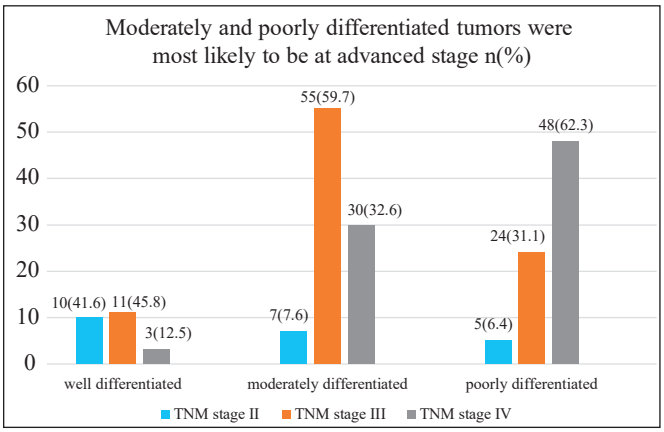

Fig. (3): Graph shows the association of various grades of colorectal carcinoma with the stage of the tumour.

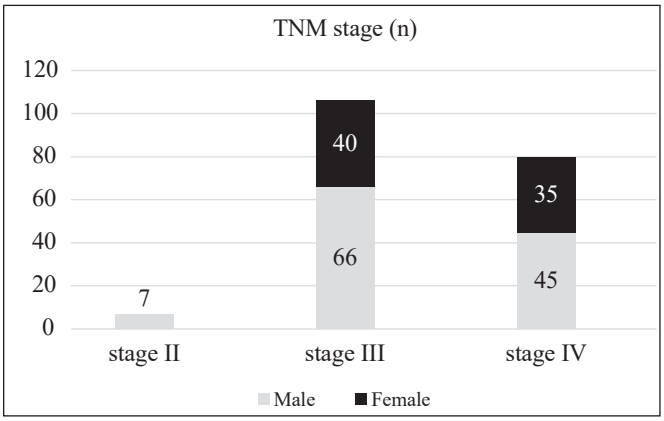

Fig. (4): Graph shows the frequency of various stages of colorectal carcinoma according to TNM staging.

46 (23.8%) was the most often affected site for distant metastases, followed by the peritoneum 29 (15.05%) **(Table 2)**. Different operative techniques (resection/ ostomy) and oncological treatments are shown in Table **3**.

DISCUSSION

In our study, CRC was prominent among younger age groups. Men and women of various racial and cultural backgrounds are affected by colorectal cancer (CRC), which is the third most frequent cancer globally [11]. The majority of the cases were reported in developed countries during the fifth decade of life. However, in developing countries like Pakistan, its incidence is increasing rapidly among younger age groups. Chromosomal instability, hypermethylation of the MLH1 gene promoter, and alterations in various other genes have been identified as contributing to the pathogenesis of CRC through different research studies [12, 13]. This calls for more robust research studies based on molecular profiling of these patients.

In our study, the majority of CRC cases were reported among individuals under the age of 50. The incidence in the elderly population, *i.e.* above 50 years, is comparatively less. These findings were supported by a review article of Batool *et al*. [14]. One reason may be an inherited familial gene or syndrome. However, family history of CRC or any other type of cancer in our study was positive in only 19(9.8%) cases. So this questions the applicability of family history as a reason for the prevalence of this cancer at a younger age. Distinguishing the sporadic from the hereditary form of colorectal cancer is the main challenge among the younger population. Genetic testing should be done for CRC diagnosed at a young age due to its more aggressive course and poor prognosis [15, 16]. Moreover, the frequency of cases is high among males as compared to females. Hence, the ratio of males to females is 1.5:1.

Cases of CRC reported among the Sindhi and Urdu-speaking populations in our study were approximately 63 (32.6%) and 75 (38.8%), respectively. However, comparatively fewer cases were reported among the Punjabi and Baloch populations. The tertiary care hospital's location in Karachi, Sindh, where the majority of the Urdu-speaking population resides, may be a contributing factor.

According to our research, the most prevalent presenting symptom among patients was per rectal bleeding, followed by altered bowel habit. Similar presenting complaints were reported by another study conducted by Hadiza *et al*. [17]. Nevertheless, tenesmus was not a presenting symptom in any of the individuals when compared with published literature, where it was one of the most frequent complaints in patients with CRC along with abdominal pain [18].

One of the most critical indicators of probable local invasion is the histological grade of the tumour, which is a key determinant of clinical evaluation and management of patients with CRC [19]. In our study, around 116 (60%) adenocarcinomas were either well or moderately differentiated. However, poorly differentiated adenocarcinoma was found in 77 cases (39.8%).

Cancers generally have a better outcome if diagnosed and intervened upon early [20]. However, in our study, overall, 177 (91.7%) of the patients had stage T3/T4 tumours, while 126 (65.3%) had N1 disease and 85 (44.0%) had already developed metastasis when they presented to us. Moreover, lack of family history, increasing incidence at a younger age, progressive disease even after surgery and chemo/radio therapy emphasise the need for revising, designing and executing new national guidelines for these patients' early detection and care so that we can have a better outcome of the disease. Our study emphasises the need for a lower age threshold for screening, given the cases under 50 years of age. Clinicians should be aware of common tumour locations and presentations. There is a need to implement national CRC screening programs. Public awareness campaigns focusing on CRC symptoms and risk factors should be carried out. Moreover, maintaining cancer registries is crucial for monitoring disease trends and improving patient outcomes in Pakistan.

LIMITATIONS

This study was conducted at a single centre, so the findings cannot be generalised. Moreover, no genetic testing was performed on the patients. Most of the time, patients didn't come for follow-up, so we are not sure about the outcome of the disease after treatment for every individual.

CONCLUSION

Colorectal cancer was found to be more common in males, particularly those aged less than 50 years. Adenocarcinoma was identified as the only histologic type of malignancy. The majority of the patients had advanced disease at the time of presentation. Future studies should focus on a multicentre design. A large sample size is needed to generalise the findings. Additionally, molecular and genetic studies should be done to identify specific gene mutations, which will guide treatment strategies.

RECOMMENDATIONS

Early screening facilities should be made available in all tertiary care hospitals, and patient awareness programs should be promoted to reduce the frequency of late

presentation of cases. Trained healthcare workers should lead community-based education campaigns to educate the general population about the symptoms of colorectal carcinoma. Easy-to-understand pamphlets should be distributed in local languages at primary health centres explaining risk factors and when to consult a doctor. Introduce modules on healthy lifestyle choices and cancer prevention in schools, colleges and universities. Launch nationwide social media campaigns encouraging early consultation with a doctor.

ETHICAL APPROVAL

Ethical approval was obtained from the Institutional Review Board of Jinnah Sindh Medical University, Karachi (REF letter No. JSMU/IRB/2020/-300 Dated: 24th August, 2020). All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and the principles outlined in the Helsinki Declaration.

CONSENT FOR PUBLICATION

Written informed consent was taken from the participants.

AVAILABILITY OF DATA

The data set may be acquired from the corresponding author upon a reasonable request.

FUNDING

None.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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Declared none.

AUTHORS' CONTRIBUTION

NJ conceived the idea and did the manuscript writing. AK wrote the manuscript, and RB handled the statistics. GH performed a critical review. KJ did the data collection and literature review. TS conducted the literature review and edited the document.

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