

Frequency and Trends of Colorectal Cancers Among Different Age Groups

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ABSTRACT

Objective	To assess the trends of colorectal cancers across various age groups.
Study design	A cross-sectional observational study.
Place & Duration of study	Department of General surgery, Jinnah Postgraduate Medical Centre (JPMC) Karachi, from June 2024 to March 2025.
Methods	The study included patients diagnosed with colorectal carcinoma by biopsy. The data included the demographics of the patients, family history, presenting symptoms, details of histopathology report and grade of the tumor. Comparison of the carcinoma and grade of the tumor among different age groups was made using the Chi-square test. A p-value <0.05 was considered as significant.
Results	The study included a total of 300 patients consisting of 191 males (63.7%) and 109 females (36.3%). There were 59 (19.7%) patients in the age group of 15-30 years, 136 (45.3%) between 31-45 years, 85 (28.3%) from 46-60 years, and 20 (6.7%) above 60-years of age. Grade 2, 3, and 4 tumors were more common among patients of age less than 45-years of age (p=<0.0001).
Conclusion	The frequency of colorectal cancers (CRC) was high in patients between 31 - 45-years of age. The tumors were more common among male patients. Moreover, the young patients present with advanced stage of the tumor, mostly in grade 2 and 3.
Key words	Colorectal cancer, Grade of tumor, Rectal carcinoma.

INTRODUCTION:

Colorectal cancers are the third most prevalent cancers and the second most common cause of cancer-related mortality. Over 1.9 million newly diagnosed cases and nearly 0.9 million fatalities globally were reported in 2022.¹ The rates of colorectal cancers are higher in men compared to women and tend to rise with advancing age. While

there has been a decline in the incidence rates among individuals eligible for screening (ages 50 to 75-years), and a decrease in risk factors like smoking, however, there are reports of rising incidence in younger individuals under the age of 50-years. The increase is particularly notable among those aged 20 - 39-years, who display the highest annual percentage change in the incidence.^{2,3}

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Data from cancer registries indicate that over the past ten years, the overall incidence of colorectal cancer in Europe has remained relatively unchanged. However, a notable rise of 41% has been observed among younger individuals aged 25 to 49-years.⁴ In contrast, robust screening initiatives have contributed to a decline of up to 6% in colorectal cancer incidence for those between 60 and 75-years of age. Projections suggest that by 2035, the incidence rate of colorectal

cancer may decrease by 11% from its 2014 levels, reaching approximately 74 cases per 100,000 population.⁵

In addition to analyses focused on specific countries, recent studies have examined the occurrence of early-onset colorectal cancer in seven high-income nations, as well as in various European countries and 11 industrialized nations.⁶⁻⁸ However, there is a notable absence of studies on trends of CRC in developing countries. The goal of the current study was to assess the trends of colorectal cancer across various age groups at our institution.

METHODS:

Study design, place and duration: This was an observational cross-sectional study conducted in the Department of General Surgery JPMC Karachi, from June 2024 to March 2025.

Ethical considerations: This study was approved by Hospital Institute review board (letter dated January 2025 F.2-81/2025-GENL/372/JPMC). Informed consent was taken from the study participants.

Inclusion and exclusion criteria: Patients diagnosed on biopsy with colorectal carcinoma above 15-years of age were included. Patients who received any neo adjuvant therapy, diagnosed with any other malignancy in the past, those diagnosed with familial adenomatous polyposis (FAP), patients with synchronous, metachronous or recurrent rectal carcinoma, those with squamous cell carcinoma of anal canal and rectal gastrointestinal stromal cell tumors (GIST) were not enrolled. Patients in whom presence of rectal involvement secondary to prostate, bladder, uterus, cervix and vaginal tumors found, were also excluded.

Sample size estimation: All patients who presented during the study period were included.

Study protocol: The data of the patients were recorded on a pre-designed form which included the patients' demographics, family history, presenting symptoms, the histopathological type of the tumor and its grade. Relevant investigations were done for the determining the extent of the disease. Biopsy was performed in all the patients to find out the type the type of the tumor.

Statistical analysis: Data were analysed using SPSS v25. Comparison of histopathology type and grade of the tumor among different age groups was made using the Chi-square test. A p-value <0.05 as

taken as significant.

RESULTS:

The study included a total of 300 patients. There were 191 (63.7%) males and 109 (36.3%) females. According to the age distribution most of the patients (n=136 - 45.3%) were between 31 – 45-years of age. Only 20 (6.7%) were above 60-years. A large number of the patients (n=195 - 65.0%) belonged to the rural areas. Presenting complaints included rectal bleed in majority (n=255 - (85.0%) of the patients followed by constipation (n=209 - 69.7%). Details are given in table I.

According to the anatomical regions the rectum was involved in 127 (42.3%) patients while colon in 170 (56.7%) cases. Adenocarcinoma was the predominant histopathological diagnosis reported in 296 (98.7%) patients. The grading of CRC showed that majority of the patients (n=115 - 38.3%) were of grade 2 type as given in table II. The association of age with the grade of colorectal cancer is given in table III. Overall, the results indicated a significant relationship between the age and the grade of colorectal cancers.

DISCUSSION:

This study provided a valuable data related to the colorectal cancers that traditionally was considered as a disease predominantly affecting older populations. However, this study and others from Pakistan indicate a rising trend among middle age people.⁹ The reasons for this increase are not yet fully understood, but potential contributing factors include shifts in lifestyle choices, dietary habits, obesity levels, and sedentary behaviors.¹⁰ Additionally, genetic factors are also recognized as important contributors. The inherited mutations such as Lynch syndrome and familial adenomatous polyposis (FAP) substantially increase the risk of developing colon cancer in young age patients.¹¹ In this study we excluded patients with FAP and genetic tests were also not performed. However, these should be considered for obtaining a more holistic data.

The increasing incidence of colon cancer among young people is particularly concerning because of the aggressive nature of the tumor. With the scarcity of early detection strategies outcome is dismal.¹² Often, symptoms in younger patients are not given importance and other less serious conditions like hemorrhoids are considered. This can result in delayed diagnosis at an advanced stages of the disease.¹³ Early-onset colon cancer poses distinct challenges and necessitates customized strategies for successful prevention, screening, and treatment.

Table I: Baseline Characteristics of Study Patients

Variables	Frequency / Percentage (n%)
Gender	
Male	191 (63.7%)
Female	109 (36.3%)
Age groups	
15-30 years	59 (19.7%)
31-45 years	136 (45.3%)
46-60 years	85 (28.3%)
>60 years	20 (6.7%)
Residential area	
Rural	195 (65.0%)
Urban	105 (35.0%)
Occupation	
Farmer	69 (23.0%)
Job Holder	29 (9.7%)
Businessman	19 (6.3%)
Laborer	96 (32.0%)
Non-working	87 (29.0%)
Presenting complaint	
Anorexia	27 (9.0%)
Per rectal bleed	255 (85.0%)
Intestinal obstruction	20 (6.7%)
Weight loss	71 (23.7%)
Change of bowel habits	157 (52.3%)
Abdominal pain	131 (43.7%)
Constipation	209 (69.7%)
Diarrhea	14 (4.7%)

Table II: Characteristics of the Cancers

Variables	Frequency / Percentage (n%)
Primary anatomical location	
Rectum	127 (42.3%)
Colon	170 (56.7%)
Cecum	02 (0.7%)
Appendix	01 (0.3%)
Histopathology type of CRC	
Adenocarcinoma	296 (98.7%)
Myofibroblast tumor	01 (0.3%)
Carcinoid tumor	02 (0.7%)
Gastrointestinal stromal tumor	01 (0.3%)
Grade	
Grade 1	70 (23.3%)
Grade 2	115 (38.4%)
Grade 3	73 (24.3%)
Grade 4	42 (14.0%)

Table III: Association of Age with Grade of CRC

	Grade 1 (n=70)	Grade 2 (n=115)	Grade 3 (n=73)	Grade 4 (n=42)	p-value
15-30 years (n=59)	12 (20.3%)	17 (28.8%)	18 (30.5%)	12 (20.3%)	<0.0001
31-45 years (n=136)	15 (11.0%)	66 (48.5%)	35 (25.7%)	20 (14.7%)	
46-60 years (n=85)	34 (40.0%)	27 (31.7%)	15 (17.6%)	09 (10.6%)	
>60 years (n=20)	09 (45.0%)	05 (25.0%)	05 (25.0%)	01 (5.0%)	

In this study 59 patients were between 15 – 30-years of age and most were in grade 2 of the disease when diagnosis was made.

In Pakistan, there is limited research on the age distribution of colorectal carcinoma. In our study we found that 19.7% patients diagnosed with CRC were below 30-years of age. A study conducted in Pakistan found that 20.8% of cases occurred in individuals under 30-years of age.¹⁴ Another study reported that 52% of colorectal carcinoma cases were diagnosed in patients younger than 30-years of age.¹⁵ These findings suggest a great variability. However, presence of early-onset colorectal cancers within the Pakistani population is reported. In a study from India the incidence of colorectal cancer among individuals under the age of 40-years was 33%.¹⁶

Among the patients diagnosed with CRC, there were 63.7% male patients. Similar trends were reported by Anwar et al. who reported 65.7% male patients diagnosed with CRC.¹² Abro et al. also reported that CRC is more common among male patients.¹⁷

Regarding the association of the grading of the tumor and the age trends, the grade 2 and grade 3 tumors were more common among patients less than 45-years of age. A study reported high prevalence of grade 2 and grade 3 tumors among patients of less than 50years, representing a similar pattern.¹⁷

Limitations of the study: This is the single centre study though a good number of patients were enrolled. Patients with different syndromes that predispose to the CRC were excluded. The risk factor analysis was not done and treatment with follow up were not recorded.

CONCLUSION:

The incidence of CRC was high among patients aged less than 45-years and less in those who were above 50-years of age. CRC were more common among male patients. The young patients presented with a more advanced stage of the tumor in grade 2 and 3.

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