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Original Research Article

Colorectal cancer in younger adults (<50 years); a retrospective study on its clinicopathological characteristics

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ABSTRACT

Background: Colorectal cancer (CRC) is a common cancer worldwide with significant geographical variation in its incidence. CRC among young adults is not well reported in Indian patients.
Methods: A retrospective study was performed to determine the burden and to analyze the clinicopathological characteristics of newly diagnosed CRC among younger adults (<50 years). Chi-square method was used to analyze the clinicopathological characteristics. P≤0.05 was considered statistically significant.
Results: CRC among younger adults comprised 40.3% of total patients median age of 40 years at diagnosis, was associated with predominantly male patients with male: female ratio of 1.8:1, positive family history, lesser co-morbidities (p=0.000), majority left sided primary tumor with left: right ratio of 4.6:1, more frequent high grade histology compared to older age group (p=0.000), advanced primary tumor and nodal metastasis. Approximately one third patients had distant metastasis at diagnosis compared to in one fourth patients in older patients. Peritoneal metastasis was significantly higher among younger adults compared to older patients (p=0.000). Significantly greater proportion of patients among younger adults initially presented with bowel obstruction (p=0.034), for which upfront emergency surgical procedures was performed in significantly higher proportion of patients compared to the older age group (p=0.007).
Conclusions: Advanced stage and aggressive disease biology of CRC in younger adult warrants inclusion of one decade younger age group into present screening recommendation.

Keywords: Clinicopathology, Colorectal cancer, Metastasis, Younger adults

INTRODUCTION

Globally colorectal cancers (CRC) account for approximately 10% of all cancer incidence, and 9.4% of all cancer mortality. It is the 3rd most common cancer in incidence and 2nd most common in cancer mortality.[1] It is 5th most common cancer in India accounting for 4.9% of all cancer incidence.[2] The highest incidence of CRC in India has been reported to be from south India.[3] Risk factors of CRC are broadly divided into genetic, environmental or life style related factors.[4-7] Due to aggressive screening practices of the population more than 50 years of age the number of colorectal cancers are decreasing in older age group, whereas there is a dramatic increase in incidence among younger adults aged 20 to 49. CRC in young adults are commonly diagnosed in advanced stage.[8,9] In view of paucity of data on CRC among younger adults in Indian patients, we conducted a retrospective study to estimate the burden and to analyze the characteristics of CRC among younger adults.

METHODS

A retrospective analytical study was conducted for newly diagnosed CRC patients treated in the department of Medical oncology, Government Royapettah hospital

attached to Kilpauk Medical College, Chennai. Convenient sampling method was followed to include 305 newly diagnosed CRC patients registered in the centre between January 2016 and December 2020. The study aimed to determine the burden of CRC among younger adults, and to evaluate its clinicopathological characteristics. Patients were divided into two arms, i.e. the younger adults (<50 years) and the older age group (≥50 years).

Data was retrieved from the cancer registry in a predesigned proforma after obtaining permission from institutional ethical committee. Data was collected for clinicopathological variables like age, sex, smoking, alcohol history, co-morbidity, performance status, family history, presenting symptoms, duration of symptoms, histopathology, grade, site, types of lesion, bowel obstruction, emergency surgery, tumor stage, nodal stage, metastasis, site and number of distant metastasis. SPSS statistical software version 23.0 was used for data analysis. Chi square analysis was used to compare different clinicopathological parameters between the two arms. A two tailed p value ≤0.05 was considered statistically significant.

Inclusion criteria

Patients with newly diagnosed biopsy proven colorectal cancer registered in the hospital between January 2016 and December 2020 were included in the study.

Exclusion criteria

Patients with colorectal lesion without biopsy proof or those with recurrent colorectal cancer were excluded from the study.

RESULTS

Out of total 305 newly diagnosed CRC patients, the younger adults constituted 123 (40.3%). The median age at diagnosis was 54 years and 40 years for overall patients and younger adults respectively. Predominantly male patients were observed in the study population with male to female ratio (M: F) of 1.6:1, and 1.8:1 among overall patients and younger adults respectively. Most patients (approximately two third) presented with eastern co-operative oncology group (ECOG) performance status I (Table 1). Family history of colorectal cancer or polyps was present in two patients, both of which belonged to the younger adults group. The most common presenting symptoms were in the following order; bleeding per-rectum> pain abdomen> altered bowel habit> vomiting (Table 1). Most of the primary tumor were left sided, with left to right sided tumor ratio of 4:1, 4.6:1, and 3.8:1, in the overall, younger age, and older age groups respectively. Adenocarcinoma and intermediate grade histology was most commonly seen; whereas significantly higher frequency of higher grade histology was found in younger age group (Table 2). Greater than 90% of patients were diagnosed with advanced T stage (T3/T4) and over 80% patients had lymph nodal metastasis at diagnosis, both findings were similar in the two age groups (Table 2). Distant metastasis was observed in approximately one fourth of total patients, out of which majority (96%) were detected at multiple sites and numbers. Relatively higher number of distant metastasis was observed among younger patients (Table 2). Common sites of distant metastasis were in the following order; liver> peritoneum> lung> bone> brain> others (Table 1). Peritoneal metastasis was found to be significantly more common among younger age patients, whereas no such difference was observed between the two arms for other site metastasis (Table 2).

Table 1: Clinicopathological characteristics of the study population.

Parameters	Number (%)
Age (in years)	
Median	54
Range	20-92
Sex	
Male	189 (62)
Female	116 (38)
Smoking	
Yes	57 (18.7)
No	248 (81.3)
Alcohol	
Yes	59 (19.4)
No	246 (80.6)
ECOG	
I	210 (68.8)
II	87 (28.5)
III	8 (2.7)
IV	-
Co morbidities	
Diabetes	30 (9.8)
Hypertension	32 (10.4)

Continued.

Parameters	Number (%)
Coronary artery disease	25 (8.2)
HIV	1 (0.3)
Hypothyroid	1 (0.3)
Positive family history	2 (0.7)
Symptoms	
Pain abdomen	122 (40)
Bleeding per rectum	178 (58.4)
Altered bowel habit	104 (34.1)
Vomiting	36 (11.8)
Duration of symptoms (in months)	
Median	2
Range	1-60
Site	
Righted sided colon	60 (19.7)
Left sided colon	79 (25.9)
Rectum	166 (54.4)
Type of lesion	
Ulceroproliferative	197 (64.6)
Ulceroinfiltrative	108 (35.4)
Intestinal obstruction	
Yes	198 (64.9)
No	107 (35.1)
Emergency surgery	
Yes	86 (28.2)
No	219 (71.8)
Histopathology	
Adenocarcinoma	291 (95.6)
Neuroendocrine	3 (1)
Lymphoma	2 (0.7)
Melanoma	4 (1.3)
GIST	2 (0.7)
Adeno squamous	1 (0.3)
Grade	
Low	103 (33.9)
Intermediate	151 (49.4)
High	51 (16.7)
Tumor stage	
T1	4 (1.3)
T2	22 (7.2)
T3	210 (68.8)
T4	69 (22.7)
Nodal stage	
Negative	60 (19.7)
Positive	245 (80.3)
Distant metastasis	
Oligometastasis	3 (1)
Multiple metastasis	80 (26.2)
No metastasis	222 (72.8)
Sites of distant metastasis	
Liver	50 (16.4)
Lung	22 (7.2)
Peritoneum	27 (8.9)
Bone	10 (3.3)
Brain	8 (2.6)
Ovary	1 (0.3)
Adrenal	1 (0.3)
Spleen	3 (1)
Abdominal wall	2 (0.6)
Urinary bladder	1 (0.3)

Table 2: Comparison of different clinicopathological parameters between two age groups.

Parameters	<50 years N (%)	≥50 years N (%)	P value
Sex			
Male	71 (57.7)	117 (64.3)	0.339
Female	52 (42.3)	64 (35.2)	
Co-morbidities (DM-2/HTN/CAD/hypothyroid/HIV)	116 (40.6)	170 (59.4)	0.000
Alcohol	26 (21.7)	30 (17.9)	0.421
Smoking	25 (20.3)	32 (17.6)	0.547
Family history	2 (1.8)	-	0.092
Histopathology			
Adenocarcinoma	113 (94.9)	171 (96.6)	0.407
Lymphoma	2 (1.7)	-	
Melanoma	1 (0.8)	3 (1.7)	
Adeno squamous	1 (0.8)	-	
GIST	1 (0.8)	1 (0.6)	
Neuroendocrine	1 (0.8)	1 (0.6)	
Grade			
Low	25 (22.9)	67 (41.4)	0.000
Intermediate	56 (51.4)	78 (48.1)	
High	28 (25.7)	17 (10.5)	
Site of tumor			
Left sided	101 (82.1)	144 (79.1)	0.519
Right sided	22 (17.9)	38 (20.9)	
Bowel obstruction at initial presentation	52 (42.3)	56 (30.8)	0.039
Upfront emergency surgery	45 (36.6)	41 (22.5)	0.007
Tumor stage			
T1	1 (0.8)	4 (1.7)	0.248
T2	5 (4.3)	16 (9.1)	
T3	78 (67.2)	122 (69.3)	
T4	32 (27.6)	34 (19.3)	
Nodal stage			
Positive	102 (82.9)	147 (80.8)	0.633
Negative	21 (17.1)	35 (19.2)	
Distant metastasis			
Oligometastasis	-	3 (1.6)	0.127
Multiple metastasis	38 (30.9)	42 (23.1)	
Sites of distant metastasis			
Liver	19 (15.4)	31 (17)	0.714
Lung	10 (22.7)	12 (24.5)	0.842
Peritoneum	19 (15.4)	8 (4.4)	0.001
Bone	5 (13.5)	5 (12.2)	0.862
Non regional nodes	5 (13.5)	5 (12.2)	0.862
Others	2 (1.6)	6 (3.3)	0.370

DISCUSSION

The present study was conducted to estimate the burden of CRC among younger adults, and to analyze its epidemiology, clinical presentation, stages at the time of diagnosis, the pattern of metastasis. The median age of diagnosis of CRC in the study was 54 years, which was lower than the global data of median age at diagnosis of 66 years.[10] Present study revealed that 40.3% patients were below 50 years of age, which was in concordance with the study finding of Ghodssi-Ghassemabad et al and Sudharsan et al.[11,12] Men were more affected than women (62% versus 38% respectively) in the study, which was in concordance with previous Indian study report by Patil et al.[13] The smoking and diabetes are the important risk factors of colorectal cancers; but in this study small no patients were smokers and diabetes mellitus, which could be probably due to prior undetected diabetes and or information bias.[14,15] About 70% of patients had ECOG

performance status of 1. The most common presenting symptom was lower GI bleeding, followed by abdominal pain which was almost same in both the age groups. This study showed 42.3% of younger patients initially presented with intestinal obstruction which was significantly more in comparison to older patients. Among younger adults, 36.6% had undergone emergency surgery for the same which was also significantly higher compared to older age patients. Previous study have reported that usually 5 to 10% of colorectal cancer patients have familial history, but in the present study, positive family history was found in 1.8% patients; which was similar with study finding of Patil et al, who have reported familial CRC in 1.9% patients.[13,16,17]

The most common site of the lesion was in rectum followed by left colon and right colon in both the age groups, which was similar to that of previous study report.[13] Most common pathologic variant was adenocarcinoma, which was same as that of previous studies. Significantly higher frequency of high grade tumor was found among younger adults compared to the older patients, which was in concordance with previous studies.[18,19]

Nearly one third of patients among younger adults and one fourth patients in the older age group had de-novo metastasis. Liver metastasis was the commonest site of distant metastasis in overall population and also in both the age groups; whereas there was significantly increased rate of peritoneal metastasis among younger adults, these results were similar with other previous studies.[20] Majority of patients had multiple metastasis at diagnosis, whereas all metastatic patients among younger adults had multiple metastasis.

Limitations

It was a single institutional and retrospective study. The difference in survival characteristics between the two age groups was not evaluated in the study.

CONCLUSION

Younger adults comprised 40.3% of total CRC patients. It is associated with predominantly male patients, positive family history, majority left sided primary tumor, more frequently high grade histology compared to older patients, advanced stage at diagnosis. Approximately one third patients had distant metastasis at diagnosis, compared to one fourth in the older age group. Peritoneal metastasis was more common among young adults. Greater proportion of patients among younger adults initially presented with bowel obstruction, for which upfront emergency surgical procedures was performed in significantly higher proportion among younger adults compared to the older age group. In view of high burden of CRC among young adults and its advanced stage at diagnosis, inclusion of these patients in routine screening practice is required for early diagnosis and treatment to improve outcome.

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