e-ISSN: 0975-1556, p-ISSN:2820-2643

Available online on www.ijpcr.com

International Journal of Pharmaceutical and Clinical Research 2024; 16(4); 1-7

Original Research Article

Clinical Presentation, Histopathological Characteristics and Outcome of Surgery in Young Age Rectum Cancer Patients: A North Indian Study

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Received: 25-01-2024 / Revised: 23-02-2024 / Accepted: 25-03-2024

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Conflict of interest: Nil

Abstract:

The earlier observation and belief that rectal cancer is a disease of elderly population does not hold true today. Over the recent years there is a rising trend in rectal cancer not only in older population but also in young population across the world including India. Literature is scanty on its clinicopathological features and prognosis in these patients. The present study has been carried to understand the clinicopathological characteristics and treatment outcome in these young age rectal cancer patients at a tertiary care teaching hospital in north India.

Material and Methods: This was a retrospective analysis of prospectively maintained data of rectal cancer patients who were surgically treated between 1990 to 2020. For the study purpose patients were categorised in two groups- those less or equal to 30 year (Group I, young age rectal cancer patients) and those more than 50 years (Group II, old age rectal cancer patients). Patients between age 30- 50 year were excluded from the sturdy. Clinicopathological characteristics, treatment offered and outcomes were compared between the groups. Categorical variable was compared with Chi Square test and continuous variables with t-test. P value < 0.05 was considered statistically significant. Survival analysis was done with Kaplan Meier Curves and groups compared with Log Rank test.

Results: A total 586 patients of rectal cancer were treated over a period of three decades. 21.16% of the patients were in the group I (young age) and 39.24% were in the old group (group II). Young group patients were found to have more low-lying lesion (Lower rectal cancer, 64%), T3/4 tumors (70%), mucin secreting characteristics (42%) as compared to elderly group patients. There was no significant difference in survival between two groups.

Conclusions: Young age onset rectal cancer patients usually present at advanced stage, have low lying lesion and poor histological characteristics but without any significant difference in survival as compared to elderly group.

Keywords: Carcinoma Rectum, Young Age, Pathology, Clinical Features Outcome, India.

Introduction

Carcinoma rectum is eighth most common cancer and is one of the important cause of cancer related death in the world [1]. Though incidence of rectal cancer is low (age standardized rate 7.2 per 1,00,000 among men) in India compared to other parts of the world, the rising trend of increasing in its incidence particularly in young age is a matter of concern [2,3]. The earlier observation and concept that it's a disease of older population (>60 years), is changing as there are reports from many parts of the world with increasing incidence in young age population including Asia [4]. Over the recent years there is a rising trend in rectal cancer not only in older population but also in young population in India [5]. Despite its increasing incidence in younger patients, the literature is scanty on its clinicopathological feature and prognosis in these patients [6]. The present study has been carried to understand the clinicopathological characteristics and treatment outcome in these young age rectal cancer patients as compared to elderly patients in a tertiary care teaching hospital in north India.

Materials and Methods

This a retrospective analysis of prospectively maintained data of rectal cancer patients who were surgically treated over a period of three decades (from 1990 to 2020). The information of all patients with rectal carcinoma were retrieved from a prospectively maintained database on the hospital informatic system. The information retrieved for patient were-clinical presentation, blood and imaging, neoadjuvant treatment, surgical procedures, histology and outcome. There was varying definition of 'young age' patients in the literature. Majority defined <40 as young, although upper limit of 35years, 30 years, 50 years also described [4]. In the present study young age patients were those as less or equal to 30 year (Group I) and old age more than 50 year (Group II). Middle

age patients, age >30 years and <50 years were excluded from analysis to avoid the effect of middle age patients. Site of lesion was defined as lower rectal when it was within 5cm from anal verge, mid rectum when it was between 5-10cm and upper rectum when it was beyond the 10 cm from the anal verge. Operative procedure was labelled as anterior resection (AR) when anastomosis was done above the peritoneal reflection and Low anterior resection (LAR) when the anastomosis was done below the level of peritoneal reflection or ultra-low when it was the level of pelvic floor or at dentate line. Follow up information was retrieved from OPD, telephonic interview or personal interview. Follow up was available in 44 (33.3%) patients in group I and 108 (46.95%) in group II patients. Statistical analysis was done using SPSS 25 version. Categorical variable were compared with Chi Square test and continuous variables with t-test. P value ≤ 0.05 was considered statistically significant. Survival analysis was done with Kaplan Meier Curves and groups compared with Log Rank test.

Results

A total 586 patients (68.6% male and 31.4% females) of rectal cancer were treated over a period of three decade (mean 45.8year, range 12-93 year). Among them 21.16 % were in the young age group (n=124, Group I) and 39.24 % were in the elderly group (n=163, Group II). There was a steady increase in the number of patients both in the total number also in young group rectal cancer patients, with maximum number in the second decade (table1).

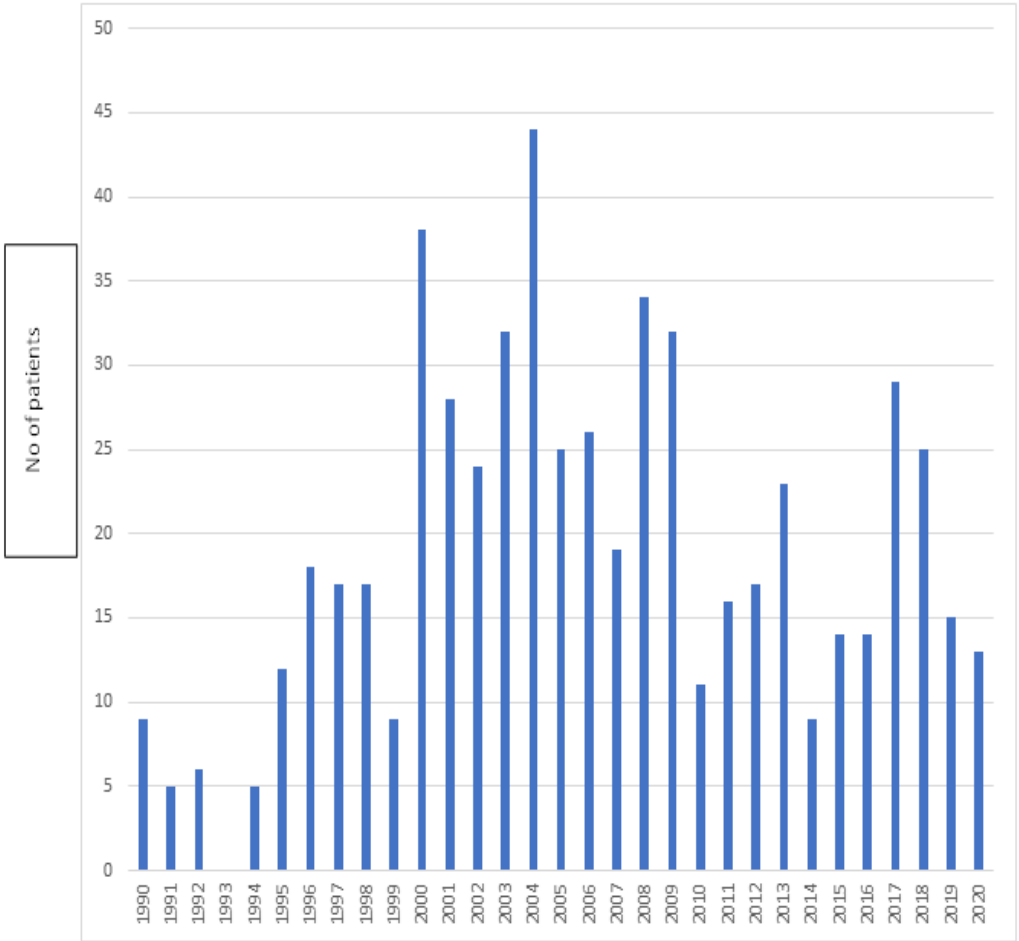

Table 1: Year wise distribution of patients of rectal cancer treated over the year (Year wise distribution)

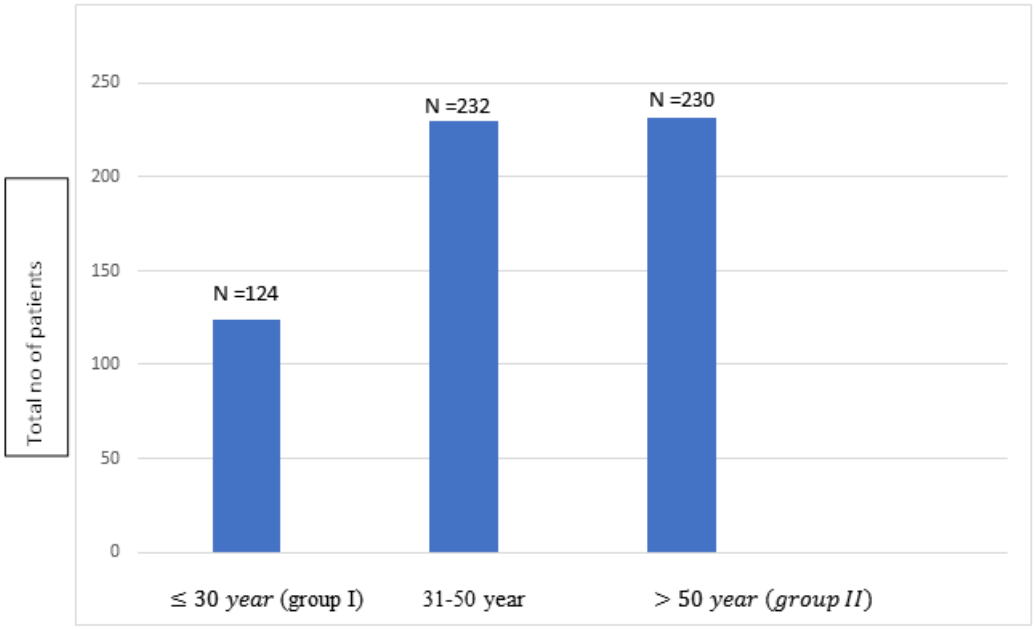

Table 2: Age group wise distribution of patients

In group I, 84 patients were male (67.7 %) and 40 were female (32.2%). Group II comprised of 70.8% males and 29.1% of female patients. (Table 3)

Overall lower rectum was the most common site of involvement among all patients (n=180, 30.7 %). Sub group analysis revealed young patients have more of lower rectal cancer (p<0.0006) while elderly group had more upper rectal cancer(p<0.0001) (Table 1). Over the last three decades lower rectum remained as predominant site of malignancy. There was no significant difference between procedure performed between two groups (Table3).

During surgery young group patients were found to have more involvement of the surrounding structures as compared to the elderly group (29.83% vs 9.52%), which was statistically significant (p =0.00001) (table 3).

On histopathology 66.9% of patients at the young age group had T3/T4 disease while it was little lower in group II (54.3 %). Further analysis revealed group I patients had significant number of T4 disease (odds ratio 1.86 and P = 0.03) (table 3), but there was no significant difference between lymph node positivity between groups (table 3).

43.54% of group patients had WADC and group II had 74.34%, which was significantly different (Odds ratio 4.1864 and P <0.0001). 41.9% of the patients in Group I had Mucinous adenocarcinoma (MUC ADC) as opposed to 15.65% in group II. (Odds ration 3.5926 and P=<0.0001) (table 3).

Table 3: Demography and clinicopathological characteristics of two groups of patients

Parameters	**Group I (≤ 30 yr) N=124 (21.16%)**	**Group II (>50 yr) N= 230 (39.24%)**	**P value**
Sex			
Male	84(67.7)	163 (70.8)	
Female	40 (32.2)	67 (29.1)	
Location of growth			
Upper rectum	10 (8.0%)	60(26.1%)	<0.0001
Middle rectum	35(28.2%)	69(30%)	0.82
Lower rectum	79(63.7%)	101(43.9%)	<0.0006
Type of surgery			
AR	8(6.4)	12(5.2)	0.8
LAR	37(29.8)	68(29.6)	0.9
ULAR	8(6.4)	16(6.9)	0.8
APR	35(28.2)	84(36.5)	0.1
Pelvic exenteration	6(4.8)	1(0.4)	
Adjacent organ involvement			
Bladder	8(6.4)	5(2.1)	

Prostate	10(8.1)	9(3.9)	
Pelvis	6(4.8)	8(3.4)	
Uterus /Vagina	13(10.5)		
Total	37(29.8)	22(9.5)	0.0001
Received NACTRT	45(36.3)	48(20.8)	0.0006
Upfront surgery	54(43.5)	145(63.1)	
pTNM			
T1	0	1(0.4)	0.7
T2	27(21.7)	54(23.5)	
T3	37(29.8)	71(30.8)	0.03
T4	46(37.1)	54(23.5)	
N1	29(23.4)	68(29.5)	0.21
N2	25(20.2)	21(9.1)	
HPE			
WELL DIFF ADC	64(51.6)	191(83.04)	<0.0001
MOD DIFF ADC	6(4.8)	15(6.5)	
POORLY DIFF ADC	54(43.5)	24(10.4)	
SIGNET RING	6(4.8)	2(0.8)	
MUCINOUS	52(41.9)	36(15.6)	<0.0001

AR=Anterior Resection , LAR = Low Anterior Resection, ULAR= Ultra low anterior resection, APR= Abdominoperineal resection

Table 4: Published series on colorectal Cancer in young age patients.*

Publication (Number of young patients)	Cut off for young age	HPE Characteristics	Survival	Disease Stage at presentation in young patients
Shrikhande et, al. [21] (n=57)	40	Poorly differentiated higher in young (24 %vs 14%)	Overall survival poor in young (P<0.05)	More node positive patients(p=0.003)
Dozois et. al.[5] (n=1025)	50	Higher rate of mucinous histology	NR	Advanced stage at presentation
Stanford et. al. (n=239)[22]	55	NR	NR	Higher stage at presentation
Gupta et. al.,[3] (n=119)	35	Higher incidence of mucinous and signet ring cell	Survival same as adult	
Orsini et al., [23] (n=1,102)	40	NR	Survival same as adult	
Present study 2021 (n=124)	30	Higher incidence of poorly differentiated tumor and presence of mucinous and signet ring cell	Survival same as adult	Advanced stage at presentation

All published data are based on study on both colon and rectal cancer except present study

None our patients received neoadjuvant therapy during first decade. Use of neoadjuvant came in to practice since early 2000. Since the introduction of neoadjuvant therapy, 36.3% patients in young group and 20.8% of older patients received neoadjuvant therapy (p=0.0006) (table 3). From the available follow up of 44 (33.3%) patients in group I and 108 (46.95%) in group II patients median survival in group II was19.5 month and in group I is 14.5 month. Though survival was poor in young patients compared to adult but the difference was not significant (p=0.45) (Fig 1).

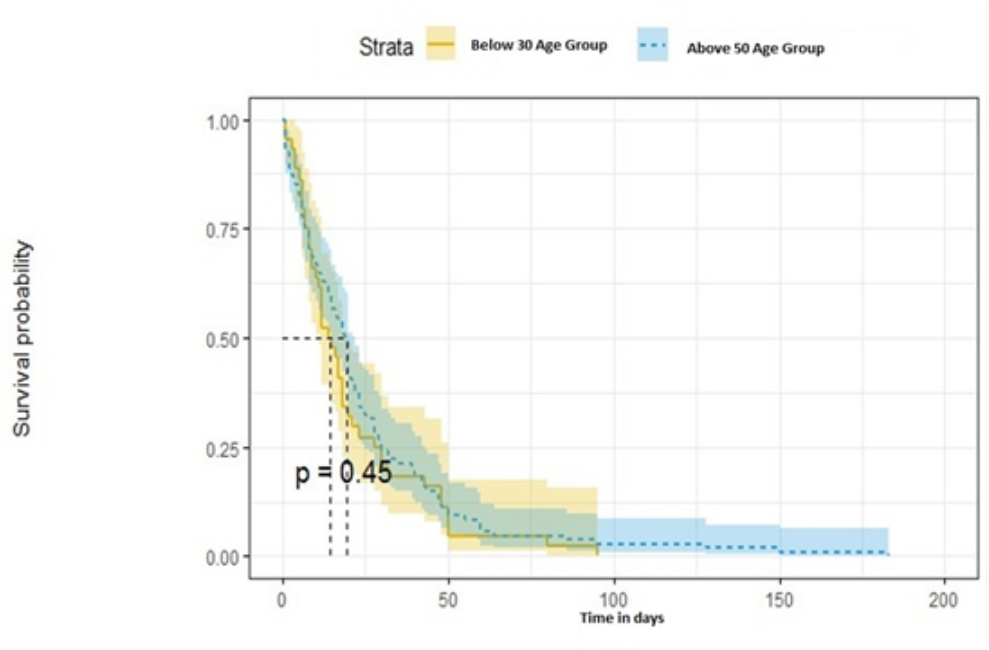

Figure 1: survival graph between two groups

Discussion

Colorectal carcinoma is the second most common cause of cancer death in developed countries, while similar data from developing nations is lacking. In India rectal cancer ranks 9th most common cancer in men [7]. literature from Europian study reveals there is 2.6 % to 7.4 % increase in incidence in colorectal cancer in last 25 years both in men and women [8]. Incidence of colorectal cancer in young patients is reported to be 1.6 to 7% in North America and Australia and some Asian countries [9].

Only a few reports are there in English literature, reporting the incidence of carcinoma rectum in young patients (3.9-35.5%) [10] .Various cut off point have been used to define the young age. Most groups had taken less than 40 years as young age, whereas other had taken <30 and some had taken even <50 years as young age [11]. In our study 21.16% of carcinoma rectum patients were 30 years of age or less. In another report from southern part of India, 35.5 % of patients were 40 or younger at presentation. In another Indian study 39% of their patients were of age less than 40 years[3]. Relatively high incidence of young patient could be because of the fast-increasing young population in our country, better health care and diagnostic facility or it could be environmental effect genetic. However exact reasons are not clear.

Some studies reported increased male preponderance in young colorectal patients as compared to standard age group whereas other had reported female dominance [12,13]. In our study rectal carcinoma was twice as more common in male as compared to females in young age group and 2.5 times in older age group.

In our study we found significant. difference in location of cancer between two groups as young age patients had more lower rectal cancer while older patients had upper rectal cancer, which also has been reflected in the type of surgery performed , and the need of neoadjuvant therapy. This findings can be extrapolated as most of young onset rectal cancer will eventually require neoadjuvant therapy and APR or ultralow LAR as surgical procedure. [14]

In most series cancer directed surgical resection rates are reported to be same in young and elderly patients (63-85%) [15].

In our study, more number of young age onset patients were significantly had T3/T4 disease (66.9%) much higher than the reported studies (35-60%). Adjacent organ involvement (29.8%) was also higher .Similar to our findings Nath et al. from India reported patients under 40 years having advanced T-stage [T0-2: 18.9%, T3: 62.3%, T4: 19.7% vs 34.5%, 56.0%, 9.5% (P = 0.027)] [16].

We found that young age onset rectal cancer had more of mucinous or aggressive histology while older patients had more of well differentiated tumour. Many earlier series have also reported poor histological features of colorectal carcinoma in young patients [18]. Karsten et al reported 39% mucin positive tumour in young patients as compared to 19% in elderly patients [15]. Similarly Chiang et al from Taiwan have reported mucin positive tumour in 36.1% of < 30 years age group patients as compare to 9.6% in > 30 age group [17].

There is a big debate on survival rates in young and standard age group colorectal carcinoma patients. Some studies have predicted a poor survival in young patients [19]. Others have reported similar survival rate in young and elderly patients [13]. O' Conell et al reported one of the highest resection rates in both Young and elderly population (85.4 and 85.5%). Five year survival rates of 63.2% in young age group vs 62.1% in elderly patients [20] . Karsten et al reported 3 year survival rate of 64% in young patients as compared to 56% in elderly [15]. Similarly Chung et al reported five year survival rate of about 55% in both the age groups. In our study, Disease free five year survival, even after curative resection in young patient (25%) was lower than the older patients (50%), which can be explained by relatively advance stage and poor histology in these patients [20].

In our series among 354 patients under analysis we had follow up data of 162 patients (45.76%).Survival analysis revealed younger patient had mean survival of 14.5 months and elderly patients had survival of 19.5 months, though young patients have poor survival but this difference is not statistically significant. The other reason could be an incomplete follow up data. [21]

We had also compared survival difference between different stages as well as different location of tumor though found no significant difference. [22,23]

Conclusion

Age-specific data and tumour characteristics of young rectal cancer patients in our study shows that, young age onset rectal cancer are usually of higher stage compared to older population with poor histological characteristics and commonly presents with obstructive symptoms contrary to their adult counterpart. Though there was difference in the survival between this two age group in the past, over the decades the survival in young population has improved with no significant difference in survival between two groups, may be because of timely detection and improved modality of cancer treatments over the years still a need for a high index of suspicion for the disease in young Indian adults is of utmost importance to identify and treat these patients in timely fashion. Contrary to common belief that rectal cancer is a disease of old age, increasing incidence of rectal cancer in young population mandates further research in this area to develop screening programme to identify these aggressive disease in earlier stage.

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