Research Article

CHANGING TRENDS AMONGST PATIENTS WITH COLORECTAL CARCINOMA PRESENTING AT MEDICAL ONCOLOGY DEPARTMENT, JPMC

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ABSTRACT

Colorectal cancer (CRC) is the second leading cause of death This cross sectional study was conducted including biopsy proved adenocarcinoma of colon and rectum patients at outpatient unit of oncology department at Jinnah Post Graduate Medical College (JPMC), Karachi, Pakistan. The mean age of the patients was 40 years (IQR ± 16 years). Majority were males patients accounting for 66%. Majority reported to have frequent vegetable intake (89.8%) and comparably lower processed food intake (69.9%). 92% patients reported to have sedentary lifestyle, 58% were smokers, and 8% were alcohol abusers. Majority of patients (96.6%) had no family history of colorectal cancer. Rectal adenocarcinoma is identified in majority of patient between age 18-40 years (n 70; 65.4%, p=0.004) and this age group often present with Grade III (n=45; 83%,p<0.001) and Stage III of cancer (n 58; 66.7%, p= <0.001). More patients of the age group of 18-40 years had poorly differentiated cancer (n 48; 44%, p<0.001). Few patients in this age group were smokers (n=47; 46%, p 0.005) and had history of alcoholic intake (n 5; 35%, p = 0.038). In our study population the age group 18 years to 40 years had considerably higher rate of colorectal cancer as compared to older age groups. People younger than 40 years are being diagnosed with relatively more advanced and aggressive disease. This study also identified smoking as a potential risk factor in younger adults.

Key words: Colorectal cancer, adenocarcinoma, neoplasms, rectum, oncology, epidemiology

INTRODUCTION

Colorectal cancer (CRC) is recognized as second leading cause of death, causing 8 million deaths in 2018 and third most common cancer worldwide with incidence rate of approximately 2 million cases yearly. The epidemiological trends CRC varies according to region, ethnicity, genetic makeup and risk factors(1). Due to advancement in colonoscopy and timely screening and removal of pre- cancerous polyps the mortality has been declined up to 50% since last 2 decades (2,3). The decline in mortality is also attributed to the use of aspirin for cardiovascular diseases and cessation of smoking awareness (4,5). The pathophysiology of adenocarcinoma comprises of various pathways including microsatellite instability pathway, chromosomal instability pathway and sessile serrated pathway (6).
Meanwhile there is an overall decline in mortality and incidence of CRC, a high incidence rate of CRC was identified in young adults termed as Early onset CRC. Early onset CRC is attributed to advanced stage at diagnosis, poor cell differentiation, prevalent signet ring histology and often located in left sided colon (7). However, differentiation of molecular patterning and immunologic characteristics of early onset CRC from old age CRC remains questionable till date (8,9). Recently a study reported on CRC including all age groups for molecular characterization, showed that there are at least four distinct molecular classes of colorectal cancer, where Ki67, CDK2 and p53 were significant partitioning markers. The study also showed that the younger age at the time of diagnosis was a poor prognostic factor (10). There is still dearth of literature available on CRC in our population therefore this study was conducted including patients presented to our oncology department and reviewed recent trends and advances in treatment and screening.

METHODS

The cross sectional survey was conducted at outpatient department of oncology in Jinnah Post Graduate Medical Centre (JPMC) Karachi. The patients with biopsy proven cancer in colon and rectum were identified were interviewed. The study was conducted September 2023 till February 2024. The Ethical approval was provided by the Institutional Review Board of JPMC (No.F.2-81/2023-GENL/148/JPMC).

The participants were selected through non probability convenient sampling. The patients were either given a preformed questionnaire to fill or interviewed directly after their consent for participation. The patients were interviewed regarding socio-economic status, body mass Index, presenting complains and family history of cancer. The information regarding histopathology, cancer stage and grade, location at the time of presentation and metastasis were retrieved from hospital records.

Statistical Methods

The data was analyzed using Statistical Package for Social Sciences (SPSS version 24.0). Mean and frequencies were calculated for continuous variables while comparisons between groups were done by using chi square, ANOVA and Fischer exact test. A p-value <0.05 was considered significant.

RESULTS

A total of 176 patients were identified with biopsy proven adenocarcinoma of colon and rectum including anal canal. The mean age of the patients was 40 years (IQR ± 16 years). most of the patients were Males (66%) while majority of the participants had education beyond optimum level of illiteracy (63.6%). Higher proportion of patients were employed (56.3%). The majority of patients reported to have vegetable component in their regular diet (89.8%) while 69.9% of patients reported to used processed food intake more than often.

Great majority of patients reported to sedentary lifestyle (92%). A higher proportion of patients were smokers (58%) or beetle nut users (74.4%) while only 8% of cancer patients have history of alcohol use. Majority of patients reported to have no family history of colorectal cancer 96.6%. Higher proportion of patients were underweight (73.9%) and only 26.1% patients had normal BMI. History of Hypertension was found in 27.8% and diabetes in 2.3%. A summary of data is presented in Table 1.

Most patients presented with complain of painful defecation (n=135, 76%), lower abdominal pain (n =147, 83%) and bleeding per rectum (n= 119; 67%). Rectum was identified as the most common site of cancer (n=107; 60.8%). Higher proportion of patients has grade II (n= 114; 64%) and grade III cancer (n= 87; 49%). However significant proportion has metastatic disease (n=73; 41.5%), where 27% had metastasis in liver (n= 49) and 26.7% had in bones (n=27), these both were found as the most common sites of metastasis. A summary of the data is presented in Table 2.

Rectal adenocarcinoma is identified in majority of patient between age 18-40 years (n= 70; 65.4%, p=0.004) and this age group often present with Grade III (n=45; 83%,p<0.001) and Stage III of cancer (n= 58; 66.7%, p <0.001). The higher proportion of the patients of the age group of 18-40 years had poorly differentiated cancer (n=48; 44, p<0.001). Few patients in this age group were smokers (n=47; 46%, p= 0.005). Summary of the data is presented in Table 3.

DISCUSSION

A varying pattern of colorectal cancer kept great importance past decades. Newer data has identified incidence of new CRC cases comprised of more than 50% young adults younger than 40 years of age. . Moreover, a higher incidence rate occurred in males in comparison to females producing ratio of 1.7 of male to female incidence rate of CRC. Few other studies also reported higher incidence of male and young adults (11, 12). We found statistically significant differences in the disease presentation at the time of diagnosis with respect to different age groups. The most common location of disease or cancer for the patients in youngest age group i.e.18-40 years was Rectum and Ano-Rectum with significantly higher proportion of such cases in comparison to older age groups. This finding is in line with previous studies from young colorectal patients or similar age groups (13-16).

The study found a significant proportion of patients with Grade-2 and Grad-3 cancer as compared to older age groups. Similarly, the majority of the patients age group 40 years or younger were diagnosed at Stage-III and Stage-IV with significantly higher proportion as compared to older age groups. These findings indicate that patients in the younger age group i.e. 18-40 years were presenting with considerably advanced disease and these findings are

also supported by previous evidence. Previous studies targeting younger age groups or adults of age 40 or younger have also reported that young people with colorectal carcinoma are commonly diagnosed with more advanced and aggressive disease (17-19).

Table: 1 Socio-demographic characteristics of the patients presenting with colorectal cancer in Oncology Department at JPMC, Karachi (n=176)

Variable	Frequency n (%)	Variable	Frequency n (%)
Mean Age:40 years (IQR; 16 years)			
Age (in completed years)			
18- 40years	97 (55.1)	**Lifestyle**	
41-55years	48 (27.3)	Sedentary	162 (92.0)
56 years and above	31 (17.6)	Physically active	14 (8.0)
Sex		**Substance abuse***	
Male	111 (63.1)	Smoking	102 (58.0)
Female	65 (36.9)	Alcohol	14 (8.0)
		Betel Nut	131(74.4)
		Chewable tobacco	51 (29.0)
Education		**Family history of colorectal cancer**	
Literate	64 (36.4)	Yes	06 (3.4)
Illiterate	112 (63.6)	No	170 (96.6)
Employed		**Body Mass Index(BMI)**	
Yes	99 (56.3)	Underweight	130 (73.9)
No	77 (43.8)	Normal	46 (26.1)
		Overweight	0
		Obese	0
Ethnicity		**Hypertension**	
Urdu	93 (52.8)	Yes	49 (27.8)
Sindhi	35 (19.9)	No	127 (72.2)
Pashto	25 (14.2)		
Punjabi	16 (9.1)		
Balochi	07 (4.0)		
Diet History*		**Diabetes Mellitus**	
Fruits	66 (37.5)	Yes	04 (2.3)
Vegetables	158 (89.8)	No	172 (97.7)
Processed Food	123 (69.9)		

This study also reported considerably high incidence of substance abuse in the form of tobacco smoking, alcohol, betelnut and in the form of chewable tobacco popularly known as "Mawa". However, the significantly higher burden of smoking was observed among the younger age group, i.e. 18-40 years as compared to older age groups. This finding is in line with previous evidence identifying smoking as an important risk factor for colorectal cancer among young people (20). This high burden of tobacco smoking in young adults also explains considerably high proportion of colorectal cases in this particular age group. However, in this study none of the study participants was obese and a high proportion of cases were underweighted. This can be explained by the fact that we measured BMI at the time of study and disease might have affected the patient`s BMI. Moreover, this study didn't find any differences in the burden of colorectal cancer among different age groups on the basis of ethnicity and family history which is contrary to findings from other Asian countries (21).

This indicates that there is possibly a little or no role of genetics in the increasing burden of colorectal cancer in our population. However, large scale multi-center studies are required to conclude the exact role of family history and ethnicity in our population. These findings also support the hypothesis regarding the role of environmental factors in the changing epidemiology of colorectal cancers including early onset of the disease as reported previously (22).

This study has one limitation as it was conducted at only one public hospital, hence generalizability of the findings is not possible.

Table 2. Disease related characteristics of the patients presenting with colorectal cancer in Oncology Department at JPMC, Karachi (n=176)

Variable	Frequency n (%)	Variable	Frequency n (%)
Presenting symptoms*		**Cancer Grade at diagnosis**	
Painful defecation	135 (76.7)	Grade-I	05 (2.8)
Blood in stool	133 (75.9)	Grade-II	114 (64.8)
Lower abdominal pain	147 (83.5)	Grade-III	54 (30.7)
Constipation	95 (54.0)	Grade-IV	03 (1.7)
Altered bowel habits	79 (44.9)		
Per-Rectal bleeding	119 (67.6)		
Disease location		**Stage of Cancer at diagnosis**	
Sigmoid Colon	13 (7.4)		01 (0.6)
Colon	52 (29.5)	Stage-I	15 (8.5)
Caecum	02 (1.1)	Stage-II	87 (49.4)
Rectum	107 (60.8)	Stage-III	73 (41.5)
Ano-Rectal Junction	02 (1.1)	Stage-IV	
Metastasis		**Site of Metastasis * (n=73)**	
Yes	73 (41.5)	Liver	49 (27.8)
No	103 (58.5)	Lung	18 (10.2)
		Bone	47 (26.7)
		Brain	03 (1.7)
		Peritoneum	27 (15.3)
Definitive Diagnosis**			
Adenocarcinoma of Sigmoid Colon-PD		02 (1.1)	
Adenocarcinoma of Sigmoid Colon -MD		10 (5.7)	
Adenocarcinoma of Sigmoid Colon -WD		01 (0.6)	
Adenocarcinoma of Colon-PD		12 (6.8)	
Adenocarcinoma of Colon -MD		33 (18.8)	
Adenocarcinoma of Colon –WD		02 (1.1)	
Mucinous Adenocarcinoma of Colon-PD		03 (1.7)	
Mucinous Adenocarcinoma of Colon-MD		02 (1.1)	
Adenocarcinoma of Caecum-MD		02 (1.1)	
Adenocarcinoma of Rectum-PD		41 (23.3)	
Adenocarcinoma of Rectum-MD		62 (35.2)	
Adenocarcinoma of Rectum-WD		04 (2.3)	
Adenocarcinoma of Ano-Rectal Junction -PD		02 (1.1)	

***PD= Poorly differentiated, MD= Moderately differentiated, WD= Well differentiated*

This study also collected information regarding substance abuse including tobacco smoking, alcohol, betel nut and chewable tobacco as well as use of vegetables, fruits and processed food. Nevertheless, this study is a highly valuable addition to the local evidence regarding the change in epidemiology of colorectal cancer. Findings from this study are consistent with previous studies from India, America and Japan. This study suggests dire need to conduct multi-center studies with the objective to measure exposure for potential risk factors or carcinogens in the environment and also for the genetic risk factors. In addition, in current clinical practice colorectal carcinoma should be considered as a potential diagnosis in young adults of 18-40 years with signs and symptoms of bowel illness irrespective of the existing screening guidelines (23).

Variable	18-40 years	41-55 years	56 years or above	p-value
	Frequency (%)			
Disease location				
Sigmoid Colon	05(38.5)	04(30.8)	04(30.8)	
Colon	20(38.5)	17(32.7)	15 (28.8)	0.004
Caecum	0	02(100.0)	0	
Rectum	70(65.4)	25(23.4)	12(11.2)	
Ano-Rectum	02(100.0)	0	0	
Cancer Grade				
Grade-I	0	04(80.0)	01(20.0)	
Grade-II	50(43.9)	38(33.3)	26(22.8)	<0.001
Grade-III	45(83.3)	06(11.1)	03(5.6)	
Grade-IV	02(66.7)	0	01(33.3)	
Stage at diagnosis				
Stage-I	0	0	1(100.0)	
Stage-II	02(13.3)	07(46.7)	06(40.0)	<0.001
Stage-III	58(66.7)	23(26.4)	06(6.9)	
Stage-IV	37(50.7)	18(24.7)	18(24.7)	
Sub-Classification of disease				
Poorly Differentiated	48(44.0)	36(33.0)	25(22.9)	
Moderately Differentiated	49(81.7)	08(13.3)	03(5.0)	<0.001
Well-Differentiated	0	04(57.1)	03(42.9)	
Metastasis				
Yes	37(50.7)	18(24.7)	18(24.7)	0.129
No	60(58.3)	30(29.1)	13(12.6)	
Smoking				
Yes	47(46.1)	30(29.4)	25(24.5	0.005
No	50(67.6)	18(24.3)	06(8.1)	
Alcohol				
Yes	05(35.7)	08(57.1)	01(7.1)	0.038
No	92(56.8)	40(24.7)	30(18.5)	
Betel nut				
Yes	73(55.7)	32(24.4)	23(19.8)	0.229
No	24(53.3)	16(35.6)	05(11.1)	
Chewable tobacco				
Yes	26(51.0)	15(29.4)	10(19.6)	0.807
No	71(56.8)	3(26.4)	21(16.8)	
Body Mass Index(BMI)				
Underweight	68(52.3)	38(29.2)	24(18.5)	0.477
Normal	29(63.0)	10(21.7)	07(15.2)	

Table 3. Comparison of disease related characteristics and potential risk factors among colorectal cancer patients with different age groups (n=176)

CONCLUSION

Currently the age group 18 years to 40 years have considerably higher rate of colorectal cancer as compared to older age groups. People younger than 40 years are being diagnosed with relatively more advanced and aggressive disease. This study also identifies smoking as a potential risk factor in young adults.

Conflict of interest:

The authors declare no conflict of interest

Ethical consideration:

The study was approved by local research ethics committee. \

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