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Early Age Group Presentation of Colorectal Carcinoma: Changing the Age Incidence

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Abstract **Original Research Article**

Background: Colorectal cancer (CRC) is the second most common malignancy in the Western world, with rising incidence and mortality globally. While traditionally a disease of older adults, recent trends suggest an increasing prevalence among younger populations, warranting further investigation. ***Objective:*** To assess the early-age presentation of colorectal cancer and changing age-based incidence patterns in a tertiary care setting. ***Methods:*** This descriptive cross-sectional study was conducted in the Department of Surgery, Mymensingh Medical College Hospital, over one year (January–December 2010). Seventy consecutively enrolled, non-randomized CRC patients were analyzed. Data were processed using MS Office and SPSS 23.0. ***Results:*** Mean age of participants was 48.6±15.59 years; 32.86% were ≤40. Tumors were located in the proximal colon (32.86%), distal colon (24.29%), and rectum (42.86%). Most were moderately differentiated (44.29%), while 18.57% were poorly differentiated. Advanced stages predominated (stage III: 41.43%; IV: 20%). Younger patients (≤40) had more rectal tumors (47.83%) and aggressive histology (73.91% moderate/poor differentiation), but comparable staging (p=0.974) and risk factors (p>0.05) to older patients. Surgical approach has differed marginally (p=0.225). ***Conclusion:*** While CRC remains more prevalent in older individuals (predominantly males with lower socioeconomic status), a substantial proportion (32.86%) of cases occurred in patients ≤40, often with aggressive features. These findings highlight shifting epidemiological trends, emphasizing the need for early screening and awareness in younger populations.

Keywords: Colorectal cancer, Early-age onset, Histopathology, Risk factors, Tumor staging.

INTRODUCTION

Colorectal carcinoma (CRC) represents a significant global health burden, ranking as the second most common malignancy in Western countries. In the United Kingdom alone, approximately 18,000 patients succumb to this disease annually [1], while in the United States, about 150,000 new cases are diagnosed each year with 57,000 attributable deaths [2]. The worldwide distribution of CRC demonstrates a clear association with industrialization and socioeconomic development, exhibiting high incidence rates in developed regions including Western Europe, Scandinavia, and North America. In contrast, developing nations in sub-Saharan Africa, Asia, and South America report lower incidence rates, though this observation requires cautious interpretation due to potential underreporting and less reliable cancer registries in these regions [3]. A notable epidemiological feature of CRC is its inverse socioeconomic gradient within high-incidence countries. Unlike breast cancer, which shows higher prevalence among affluent populations, colorectal carcinoma demonstrates greater frequency in lower socioeconomic groups [3]. Gender differences in tumor location are also well-established, with women more frequently developing proximal colon cancers while men show predilection for rectal carcinomas [4]. Longitudinal studies reveal evolving patterns in CRC incidence. Among women, rates for rectal and distal colon cancers have gradually declined since 1984, while proximal colon cancer rates remained stable. Male populations

demonstrated more stable incidence patterns overall, with only modest declines in distal colon cancer rates over the past 15 years [5]. Age remains the strongest risk factor, with incidence becoming appreciable after age 50 and peaking between 70-79 years [6]. The annual incidence escalates dramatically from 0.39 per 1000 at age 50 to 4.5 per 1000 at age 80 [6]. Emerging data highlight important ethnic variations in CRC presentation. South Asian populations (including Bangladeshi, Pakistani, and Indian individuals) in the UK exhibit lower overall CRC incidence and mortality compared to non-South Asians, with particularly favorable outcomes observed in Bangladeshi patients [7]. However, this population demonstrates a striking pattern of early-onset disease. A study at Royal London Hospital (1998-2002) identified 5% of CRC cases (18/363) in Bangladeshi patients, with a median age of 40 years (range: 26-73) compared to 69.5 years (range: 33-98) in non-Bangladeshi patients. Remarkably, 61% of Bangladeshi CRC patients were under 40 years old, none of whom reported a family history of the disease [8]. These findings underscore the complex interplay of geographic, socioeconomic, and ethnic factors in CRC epidemiology. The disproportionately high rate of early-onset cases in certain ethnic groups, particularly without traditional risk factors, suggests potential genetic predispositions or unique environmental exposures warranting further investigation.

METHODOLOGY

This descriptive cross-sectional study was conducted at the Department of Surgery, Mymensingh Medical College Hospital, from January to December 2010. We enrolled 70 consecutive patients with histologically confirmed colorectal cancer through non-randomized purposive sampling. All admitted surgery ward patients meeting the inclusion criteria - histopathological diagnosis of primary colorectal malignancy - were included, while recurrent cancers and cases without pathological confirmation were excluded. Using TNM classification, we staged cancers from I to IV to analyze presentation patterns. Participants were categorized by gender and socioeconomic status (poor, middle class, rich) to examine demographic associations. The study received ethical approval from the hospital's review committee. Data analysis was performed using MS Office and SPSS version 23.0 to compare cancer stages at presentation, evaluate gender distribution, and assess socioeconomic influences on disease characteristics. This methodological approach allowed systematic evaluation of colorectal cancer presentation patterns in our clinical setting while maintaining diagnostic rigor through histopathological verification and standardized staging protocols. The consecutive enrollment of eligible patients over the study period helped minimize selection bias in this hospital-based assessment of colorectal cancer epidemiology and clinical features.

RESULT

This study analyzed 70 colorectal cancer (CRC) patients aged 16–90 years (mean: 48.6 ± 15.59). Notably, 10% were under 30, 22.9% aged 31–40, and 25.7% each in the 41–50 and ≥61 age groups. Tumor distribution revealed 32.86% in the proximal colon, 24.29% in the distal colon, and 42.86% in the rectum. Histologically, 37.14% had well-differentiated, 44.29% moderately differentiated, and 18.57% poorly differentiated tumors. Advanced-stage disease predominated, with 41.43% stage III and 20% stage IV, while only 8.6% presented at stage I. Comparing ≤40-year-olds (32.86%) and >40-year-olds (67.14%), no significant differences emerged in risk factors like smoking (34.78% vs. 40.42%, p=0.809) or vegetable intake (p=0.350). Rectal tumors were most common in both groups (47.83% young vs. 40.43% older), though proximal colon involvement was slightly higher in younger patients (34.79% vs. 31.91%, p=0.129). Younger patients had more histologically aggressive tumors (73.91% moderately/poorly differentiated vs. 57.45% in older patients, p=0.408). Stage distribution was similar (p=0.974), with marginally higher stage IV in younger patients (21.74% vs. 19.14%). Surgical approaches varied slightly: right hemicolectomy and APR were more frequent in younger patients, while left hemicolectomy and anterior resection predominated in older patients (p=0.225).

Table 1: Distribution of patients by age (N= 70)

Age (in years)	n	%
≤ 30 Yrs.	7	10.0%
31-40 Yrs.	16	22.9%
41-50 Yrs.	18	25.7%
51-60 Yrs.	11	15.7%
≥61 Yrs.	18	25.7%

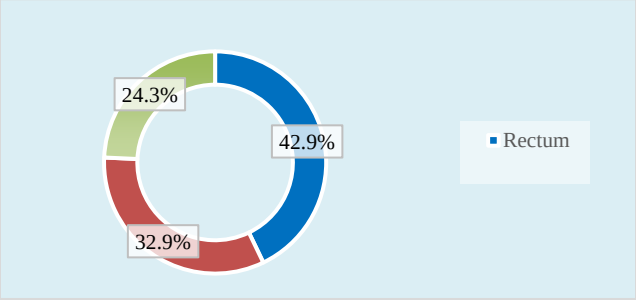

Figure 1: Ring chart showed distribution of patients by tumor location (N= 70)

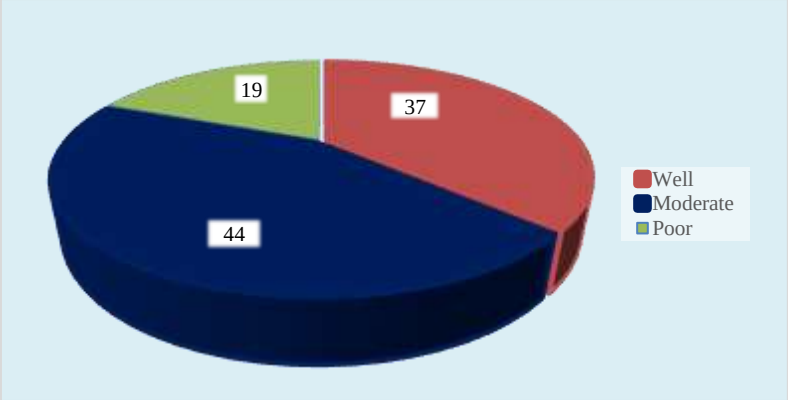

Figure II: Pie chart showed distribution of patients by grading of tumor (N= 70)

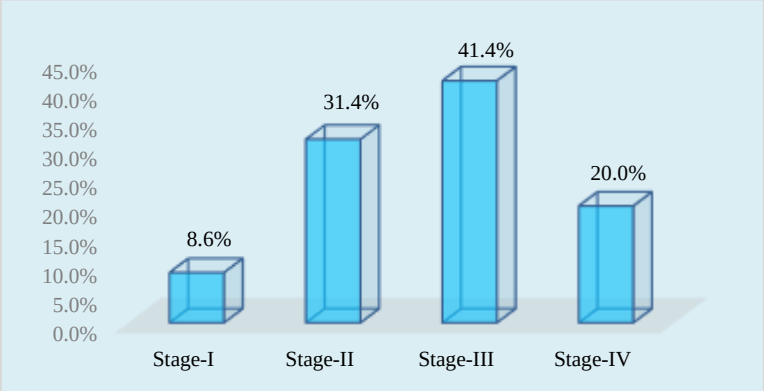

Figure III: Column chart showed distribution of patients by tumor staging (N= 70)

Table 2: Comparison of the study population according to age (N= 70)

Age (years)	n	%	p-value
≤ 40	23	32.9%	0.004
> 40	47	67.1%	

Table 3: Comparison of the presence of risk factors in the patients (N= 70)

Risk factors	Group		p-value
	Young (≤40) (n = 23)	Old (>40) (n = 47)	
Smoker	08(34.8)	19 (40.4)	0.809
IBS	01 (04.3)	01(02.1)	
F/H of CC	00(00)	01 (02.1)	
Intake of vegetables			
Adequate	02(08.7)	8(17.02)	
Less	21(91.3)	39(82.9)	

Table 4: Comparison of tumor locations (N= 70)

Location	Group		p-value
	Young (n =23)	Old (n =47)	
Rectum	11(47.8)	19(40.4)	0.129
Proximal colon	8(34.8)	15(31.9)	
Distal colon	4(17.4)	13(27.7)	

Table 5: Comparison of tumor grading (N= 70)

Differentiated	Group		p-value
	Young (n = 23)	Old (n = 47)	
Well	6(26.09)	20(42.55)	0.408
Moderate	12(52.17)	19(40.43)	
Poor	5(21.74)	8(17.02)	

Table 6: Comparison of tumor staging (N= 70)

Stage	Group		p-value
	Young (≤40) (n = 23)	Old (>40) (n = 47)	
Stage-I	2 (8.69)	3 (6.38)	0.974
Stage-II	7 (30.43)	15 (31.91)	
Stage-II	9 (39.13)	20 (42.55)	
Stage-IV	5 (21.74)	9 (19.14)	

Table 7: Comparison of young and old patients undergoing surgery (N= 70)

Surgery	Group		p-value
	Young (n = 23)	Old (n = 47)	
Right H	8 (34.8)	12 (25.5)	0.225
Left H	2 (8.7)	13 (27.6)	
AR	7 (30.4)	10 (21.3)	
Anterior resection	0 (00)	5 (10.6)	
Simple colostomy	6 (26.1)	7 (14.9)	

DISCUSSION

The findings of this study highlight significant patterns in colorectal cancer (CRC) presentation, particularly regarding age distribution and disease characteristics. Our results demonstrate that 32.86% of CRC cases occurred in patients aged ≤40 years, with a mean age of 48.6±15.59 years. This aligns with emerging global evidence suggesting a rising incidence of early-onset CRC [9,10]. While traditionally considered a disease of older adults (typically >50 years) [11], our data reinforce recent reports from Western countries documenting increasing CRC rates among younger populations [12,13]. The predominance of rectal tumors (42.86%) in our cohort, particularly among younger patients (47.83%), contrasts with Western data showing proximal colon predominance in older adults [14]. This discrepancy may reflect ethnic variations in CRC pathogenesis or differences in risk factor exposure. Notably, younger patients exhibited more aggressive histopathological features, with 73.91% having moderately/poorly differentiated tumors compared to 57.45% in older patients. This finding corroborates studies reporting advanced histology in early-onset CRC [15,16], potentially explaining the higher proportion of stage III/IV disease (61.17% overall) in our study. The lack of significant differences in traditional risk factors (smoking, diet) between age groups suggests that alternative mechanisms may drive early-onset CRC in our population. This observation supports recent hypotheses about distinct molecular pathways in young-onset CRC [17,18]. Interestingly, only 2.13% of older patients reported family history, contrasting with Western data where 20-30% of young CRC patients have hereditary syndromes [19]. This discrepancy may reflect limited genetic testing availability or unique environmental contributors in our setting. Our finding that 67.14% of cases occurred in patients >40 years maintains consistency with global age distribution patterns [20]. However, the substantial proportion of young patients underscores the need for heightened clinical suspicion in younger individuals presenting with colorectal symptoms, particularly in low-resource settings where screening programs are limited [21]. The advanced stage at presentation (61.43% stage III/IV) across all age groups highlights diagnostic delays, possibly due to low awareness and limited screening access [22]. This contrasts with data from countries with established screening programs, where localized disease predominates [23]. The similar stage distribution between age groups (p=0.974) suggests systemic barriers to early diagnosis affect all populations equally in our setting. Surgical approach variations, though statistically insignificant (p=0.225), may reflect tumor location differences between age groups. The higher rate of right hemicolectomies in younger patients corresponds with their greater proximal colon involvement (34.79% vs 31.91% in older patients). This anatomical distribution warrants further investigation regarding potential ethnic-specific carcinogenic pathways [24].

LIMITATIONS OF THE STUDY

The single-center design and modest sample size limit generalizability. Lack of molecular profiling prevents exploration of potential biological differences

between age groups. Recall bias may affect risk factor reporting, particularly family history.

CONCLUSION

This study reveals a significant burden of early-onset colorectal cancer in Bangladesh, with 32.86% of cases occurring in patients ≤40 years. Younger patients showed more aggressive tumor biology and advanced-stage presentation, despite lacking traditional risk factors. These findings highlight the need for increased clinical vigilance in younger populations and tailored screening strategies in low-resource settings. Further research should explore unique etiological factors driving early-onset CRC in this population.

RECOMMENDATIONS

To address the rising burden of early-onset colorectal cancer, we recommend implementing targeted awareness programs for healthcare providers, establishing cost-effective screening protocols for high-risk groups, and conducting multicenter studies to investigate unique risk factors in our population. These measures should be supported by developing specialized clinical guidelines for managing young CRC patients.

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