Clinico-pathological and Epidemiological Characteristics of Colorectal Cancer Patients - Retrospective Study

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Abstract:

Objective: Our aim of this study was analysis of the clinic epidemiological patterns of colorectal cancer (CRC) in patients presented at clinical oncology department in Assiut university hospitals from 2010 to 2020

Methods: This study included 263 patients with CRC who fulfilled the following criteria: age > 18 years, proven by histopathology, patients with all stages of CRC were included. Data analyses were performed using statistical package for the social science (IBM-SPSS) version 26.0 software. Qualitative data were expressed as frequency and percentage. Mean ± SD was used to express the numerical variables.

Results: The mean age of the enrolled patients was 45.88±15.23 years. The incidence was higher in males, accounting for 141 cases (53.6%). the majority, comprising 151 (57.4%), individuals were diagnosed with cancer rectum 66 (25.1%). The most common presenting symptom was constipation 121 (46.0%). The predominant subtype was adenocarcinoma, observed in 186 (70.7%) patients. As for TNM staging the distribution of "T" stages revealed 133 (50.6%) patients at "T3" followed by 65 (24.7%) patients at "T4". Concerning metastasis, 93 (35.4%) patients were diagnosed with synchronous metastasis "M1", while 170 (64.6%) patients were categorized as "M0" Relapse, either distant or local, occurred in 42 (16.0%) patients. Distant relapse was observed in 33 (12.5%) patients. Local relapse occurred in 17 (6.5%) patients.

Conclusion: CRC mostly presented at advanced stages so analysis of its risk factors needs further studies to understand its behavior and early detection carry hope for improving its survival.

Keywords: colorectal cancer, Epidemiological, Clinico-pathological characteristics.

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Introduction:

In Egypt, colon cancer ranks the 9th most common cancer with an incidence rate of 2.5%, and the 11th most common cause of cancer-related mortality with a mortality rate of 2.1%, according to Globocan 2020. Rectal cancer, on the other hand, is the 18th most common cancer with an incidence rate of 1.1%, and the 16th most common cause of cancer-related mortality with a mortality rate of 0.91% [1]. Additionally, 25% of CRC cases in Egypt occur in individuals under the age of 40 [2].

Mortality due to colorectal cancer (CRC) is largely from metastatic disease. 20-25% of patients present with synchronous metastasis, while another 20-25% will develop metastatic disease after an initial presentation with metachronous metastasis [3]. Despite the high number of cases, the incidence of colon and rectal cancers per 100,000 people has decreased significantly over the years. It was 60.5 in 1976, 46.4 in 2005, and 38.7 in 2016. The mortality rate from CRC has also been decreasing for decades, with a 50% reduction from peak mortality rates. This improvement is attributed to cancer prevention, early diagnosis through screening, and better treatment options. The survival rates for CRC vary depending on the stage of the cancer at diagnosis. In cases where the cancer is localized, meaning it has not spread beyond the colon or rectum, the 5-year relative survival rate is 91%. About 37% of patients are diagnosed at this early stage. If the cancer has spread to surrounding tissues or organs and/or the regional lymph nodes, the 5-year relative survival rate drops to 73%. About 36% of patients are diagnosed at this regional stage. When the cancer has spread to distant parts of the body, the 5-year relative survival rate is just 14%. Unfortunately, about 22% of patients are diagnosed at this late stage [4].

However, there is hope for patients with even advanced-stage CRC. For those who have just oligometastatic disease to the lung or liver surgical removal of these tumors can sometimes eliminate cancer (surgical metastatectomy), which greatly improves the 5-year relative survival rate for those patients.

It's important to note that survival rates can differ between colon cancer and rectal cancer. For colon cancer, the overall 5-year relative survival rate for people is 63%. If the cancer is diagnosed at a localized stage, the survival rate is 91%. If the cancer has spread to surrounding tissues or organs and/or the regional lymph nodes, the 5-year relative survival rate is 72%. When colon cancer becomes metastatic, the 5-year relative survival rate drops to 13 % [4].

Patients and Methods:

This retrospective study conducted at the Clinical Oncology Department of Assiut University Hospital on cases diagnosed with CRC over the past ten years from 2010 to 2020. The study received approval from the Ethics Committee of Assiut University Hospital before data collection with IRB: 17101726 Data were collected from medical records of 263 patients over 18 years of age; and analyzed as regards patients and tumor characteristics, risk factors; and survival.

Primary Endpoint:

Studying the clinico-pathological and epidemiological characteristics of CRC patients.

Statistical Analysis:

Data analysis was performed using statistical package for the social science (IBM-SPSS) version 26.0 software. Qualitative data were expressed as frequency and percentage. All numerical variables were tested before evaluation to determine the normality of data by Shapiro–Wilk test, mean ± SD was used to express them. The level of significance was considered at P value < 0.05.

Results:

The mean age of the enrolled patients was 45.88±15.23 years, ranging from 37 to 70 years. Among these patients, 209 (79.5%) were under the age of 60. The incidence of CRC was higher in males, accounting for 141 cases (53.6%), compared to females, where there were 122 cases (46.4%).

Notably, 80(30.4%) patients were identified as smokers. Furthermore, 45(17.1%) patients were presented with various comorbidities, including diabetes mellitus (DM) in 20 (7.6%) patients, hypertension (HTN) in 26 (9.9%) patients.

In terms of the performance status of the included patients, we observed the following distribution:

- 171(65.0%) patients with performance status (PS) 0
- 51(19.4%) patients with (PS)1
- 27 (10.3%) patients with (PS)2
- 14 (5.3%) patients with (PS)3

Table (1)

Table (1) Characteristics of Studied Patients:

Variables	N=263	%
Age (years)		
< 60	209	79.5%
≥ 60	54	20.5%
Mean ± SD (range)	45.88±15.23 (17.0-96.0)	
Gender		
Female	122	46.4%
Male	141	53.6%
Smoking	80	30.4%
Presence of Comorbidities	45	17.1%
Types of Comorbidities		
HTN	26	9.9%
DM	20	7.6%
PS		
Ps 0	171	65.0%
Ps 1	51	19.4%
Ps 2	27	10.3%
Ps 3	14	5.3%

Clinical Data of Studied Patients (n=263):

In the examination of the site of the tumor among the studied patients, the majority, comprising 151(57.4%), individuals were diagnosed with cancer rectum. 66(25.1%) patients presented with left-sided colon cancer, while 41(15.6%) patients exhibited right-sided colon cancer, the least presented is transverse colon in 5(1.9%) patients fig (1).

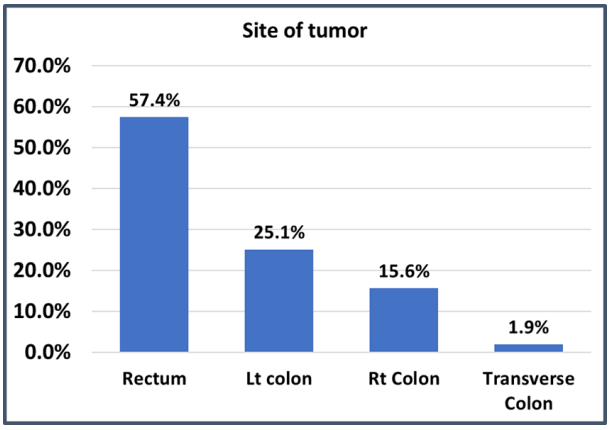

Figure (1): Site of Tumor among Studied Patients

Analysis of the symptoms reported by the patients revealed that 121 (46.0%) individuals experienced constipation, 114 (43.3%) reported abdominal pain, and 95 (36.1%) presented with rectal bleeding. Obstruction was noted in 58 patients (22.1%), and 6 (2.3%) patients presented with perforation fig (2).

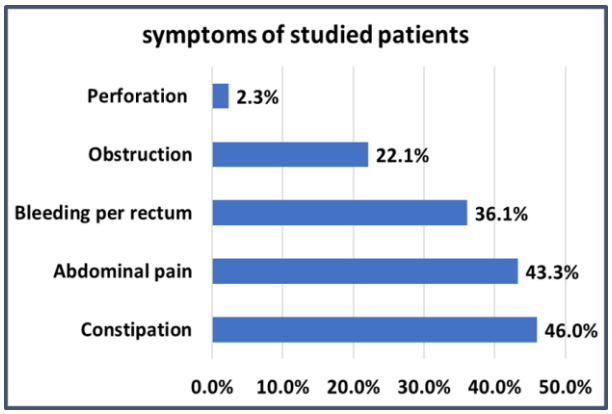

Figure (2): Presenting Symptoms among Studied Patients

Regarding histopathology, the predominant subtype was adenocarcinoma, observed in 186 (70.7%) patients. Mucinous differentiation was identified in 44 (16.7%), patients signet ring carcinoma in 30 (11.4%) patients and squamous cell differentiation in 3 (1.1%) patients fig (3).

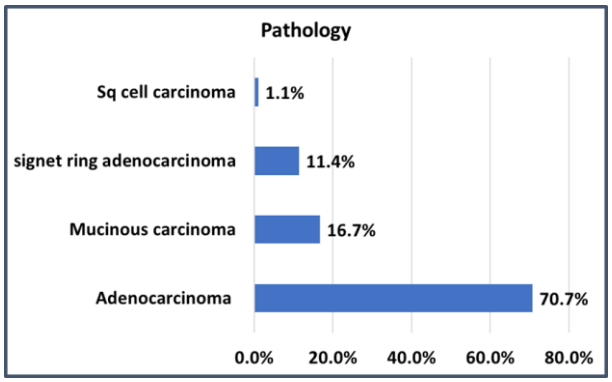

Figure (3): Pathology Results among Studied Patients

As for TNM staging the distribution of "T" stages revealed 133 (50.6%) patients at "T3" followed by 65 (24.7%) patients at "T4," 30 (11.4%) patients at "T2" and 3 (1.1%) patients at "T1." Additionally, 32 (12.2%) patients were classified as "Tx". Lymph node involvement, denoted as "N+" was evident in 199(75.7%) patients. while 64 (24.3%) patients exhibited "N0". Concerning metastasis, 93 (35.4%) patients were diagnosed with de novo metastatic disease "M1", while 170(64.6%) patients were categorized as "M0"

Pathological grading revealed that 192 (73.0%) patients had "Grade 2" tumors, followed by "Grade 3" in 35 (13.3%) patients "Grade 1" in 20 (7.6%) patients, and "Grade 4" in 16 (6.1%) patients as shown in fig (4).

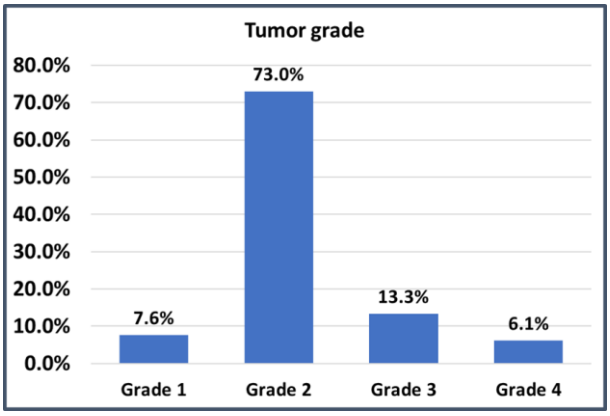

Figure (4): Tumor Grade among Studied Patients

Additional pathological features included lymph vascular emboli, identified in 50 (19.0%), patients and perineural invasion, found in 33 (12.5%) patients Table 2.

Table (2) Clinical Data Of Studied Patients:

Variables	N=263	%
Site of Tumor:		
Rectum	151	57.4%
Lt colon	66	25.1%
Rt colon	41	15.6%
Transverse colon	5	1.9%
Symptoms:		
Constipation	121	46.0%
Abdominal pain	114	43.3%
Bleeding per rectum	95	36.1%
Obstruction	58	22.1%
Perforation	6	2.3%
Pathology:		
Adenocarcinoma	186	70.7%
Mucinous Carcinoma	44	16.7%
Signet Ring Adenocarcinoma	30	11.4%
Sq Cell Carcinoma	3	1.1%
T Stage		
T1	3	1.1%
T2	30	11.4%
T3	133	50.6%
T4	65	24.7%
Tx	32	12.2%
N Stage		
N 0	64	24.3%
N +	199	75.7%
M stage		
M0	170	64.6%
M1	93	35.4%
Grade		
Grade 1	20	7.6%
Grade 2	192	73.0%
Grade 3	35	13.3%
Grade 4	16	6.1%
Presence of LVI	50	19.0%
Presence of Perineural invasion	33	12.5%

Site of metastasis among De Novo metastatic patients (n=93)

As for the site of metastasis in patients who experienced De-novo metastatic (n=93, 35.4%): Liver metastasis was observed in 57 (61.3%). patients, Lymph node (LN) and lung metastasis occurred separately in 19 patients each (20.4%). Peritoneal metastasis was identified in 16 (17.2%) patients. Bone metastasis was noted in 5(5.4%) patients. Ovarian metastasis was incidentally observed in 4 (7.5%) female patients out of 53 female patients presented with M1 stage.

Regarding the incidence of relapse in the overall studied patients (n=263):

Relapse, either distant or local, occurred in 42(16.0%) patients.

Distant relapse was observed in 33(12.5%) patients. Local relapse occurred in 17(6.5%) patients.

Note: Some patients showed both distant and local relapse simultaneously.

Concerning the site of distant relapse (n=33, 12.5%):

Peritoneum (peritoneal deposits) was the most frequent site, occurring in 14 (42.4%) patients of distant relapses, (5.3%) of the total studied patients.

Liver meta-Chronos metastasis was the second most common observed in 10 (30.3%) patients, (3.8%) of the total.

Relapsed lung and bone metastasis occurred in 5(15.1%), patients each (1.9%) of the total separately.

The least frequent distant relapses were noted in the brain 2 (6.0%) patients, (0.8%) of the total, and lymph nodes in 1 (3.0%) patient, (0.4%) of the total

As shown in Table 3 and fig (5).

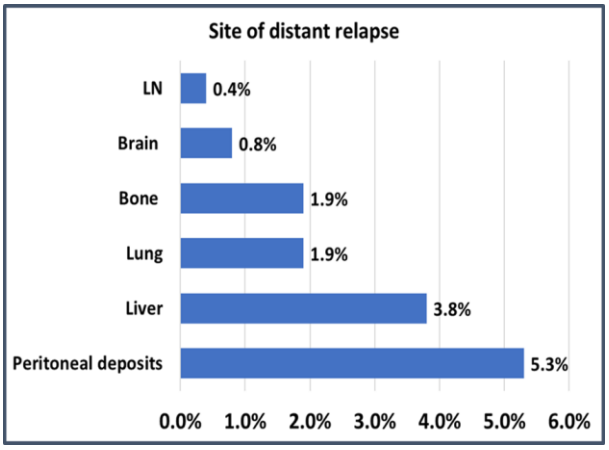

Figure (5): Site of Distant Relapse among Studied Patients

Discussion:

In our study we present compelling findings on the epidemiology of CRC, shedding light on risk factors affecting its incidence and progression. Our research focused on aspects of this prevalent malignancy offering valuable insights help understanding its epidemiological landscape aiming to advance knowledge in the prevention, early detection and management of CRC.

Table (3) Metastasis and Relapse among Studied Patients:

Variables	N=263	%
Metastasis	**93**	**35.4%**
Site of Metastasis		
▪ Liver	57	61.3%
▪ LN	19	20.4%
▪ Lung	19	20.4%
▪ Peritoneal	16	17.2%
▪ Bone	5	5.4%
▪ Ovaries	4	4.3%
Relapse	**42**	**16.0%**
▪ local relapse	17	6.5%
▪ Distant relapse	33	12.5%
✓ **Site of distant relapse**		
▪ Peritoneal deposits/nodules	14	5.3%
▪ Liver	10	3.8%
▪ Lung	5	1.9%
▪ Bone	5	1.9%
▪ Brain	2	0.8%
▪ LN	1	0.4%

The study encompasses a cohort of 263 CRC cases. The mean age of patients in the study is 45.88±15.23 years, with higher incidence in males; which is consistent with that reported by Zaborowski, et al. which found that A total of 3378 patients were included, with a median age of 43 (18–49) and a slight male preponderance (54.3%) [5].

Furthermore, several earlier types of research support the predominance of men as Miranda, et al. which revealed among the cases analyzed, the majority of patients were men (53.23%). Only about one third of the cases were diagnosed at the localized stage [6].

In terms of site of the tumor; In our study the majority comprising (57.4%) were diagnosed with cancer rectum. with significant poor OS with left-sided colon cancer compared with right- sided colon cancer. Azar, et al. showed early onset cancer colon, Left- sided is associated with better OS than right-sided only stage IV by one year. While OS was better with right-sided cancer colon in stage II and the better prognosis of stage II RCC might be due to the high incidence of mismatch repair deficient tumors in this subpopulation. This may be the same reason in our study and need to be evaluated [7].

In our study, 30.4% of patients were smokers; smoking is recognized as a risk factor for developing CRC. For Huang YM, et al. study focused on relationship between smoking and CRC survival including 18,816 patients; (33.3%) were identified as smokers In addition, the mortality rate was significantly higher in the smoking group (30.1% vs. 27.9%, p = 0.0012) [8].

Furthermore, (17.1%) were presented with various comorbidities; the most common (HTN) represents (9.9%) of patients. Also data reported from Qiu H, et al. The most prevalent comorbidities were hypertension (8581/29,610, 29.0%) [9].

Analysis of the symptoms reported by the patients revealed that (46.0%) experienced constipation, (43.3%) reported abdominal pain, and (36.1%) presented with rectal bleeding. Obstruction was noted in (22.1%) of patients while (2.3%) presented with perforation. These symptoms considered as a high risk factor and encourage need for screening as reported from Peter Vibe Rasmussen, et al. which identified 2576 patients with lower GI-bleeding of whom 140 patients were subsequently diagnosed with colorectal cancer within the first year of lower GI-bleeding. In all age groups, we observed high risks of colorectal cancer after lower GI-bleeding. Lower GI-bleeding should not be dismissed and always be examined for a potential underlying malignant cause [10].

In this retrospective study pathologically, the predominant subtype was adenocarcinoma followed by Mucinous differentiation was identified in (16.7%). These data consistent with that reported by Zhu, et al. which showed total patients 818,229 patients with incidence of mucinous carcinoma more than signet ring carcinoma (8.6% - 0.8%) respectively [11].

In our study noted that metastatic patients at time of diagnosis (De Novo metastatic) were (35.4%) and the most common site for distant metastasis was liver followed by Lung or distant LN followed by peritoneal metastasis the least common sites for distant metastasis were bone & ovaries which almost the same with data reported from Qiu, et al. which showed liver metastasis is the most common site for colon and rectal metastasis (13.8% vs 12.3%) specifically common with left-sided cancer colon and lung metastasis common site for rectal metastasis (5.6%) compared with colon metastasis to lung (3.7%). And bone was the least common site of metastasis (0.9%) [12].

Conclusion:

Our study demonstrated a high prevalence of CRC among young patients, most of them presented with advanced stage. Large number presented with metastasis or develop it during the treatment so furthers studies on the risk factors and new drugs needed to improve the prognosis.

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