

# Epidemiology and clinical findings of colorectal carcinoma in two tertiary care hospitals in Benghazi, Libya

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## ABSTRACT

**Aim:** The aim is to determine the pattern of patients with colorectal cancer (CRC) seen in two tertiary hospitals in Benghazi, Libya. **Materials and methods:** The cohort includes all patients of CRC who were presented between January 2007 and December 2009 to the Oncology Department, Aljomhoria Hospital and 7<sup>th</sup> October Hospital, Benghazi. Patient's age, gender, clinical presentation, location of cancer involvement, and histopathologic diagnosis were reviewed. Tumor staging was carried out according to Astler Collier modification of Duke's system, dividing it into stage A to C depending upon the extent of local involvement and regional node spread. Stage D was added to account for distant metastasis in accordance with Turnbull modification. **Results:** A total of 152 patients with CRC were included, 84 males (55%) and 68 females (45%) with a male to female ratio of 1.2:1.0. The mean age was  $57.4 \pm 12.92$  years (range 21–87 years). 18 (11.8%) patients were below 40 years of age. The most common presenting symptoms were rectal bleeding and abdominal pain and were together present in 71% of the patients. The majority (67.8%) of tumors arise from rectum and sigmoid colon. More than one-third of the patients had poorly differentiated adenocarcinoma. Sixty patients (39.5%) presented in stage D, whereas 30.9% (47/152) and 29.6% (45/152) of patients were in stage B and stage C, respectively. None of the patients had stage A at presentation. The radiological evaluation showed presence of liver metastasis in 14 patients (9.2%) and pulmonary metastasis in two patients (1.3%). Anemia was found in 56 patients (36.8%). It was more common in females ( $P = 0.01$ ) and in the right sided tumors (66.7%) than left sided tumors (29.5%) ( $P = 0.001$ ). **Conclusion:** The majority of CRC patients in Benghazi were diagnosed in locally advanced or metastatic stage. In order to achieve early detection of CRC, a comprehensive cancer education program and screening of high risk population for CRC should be considered in this part of Libya.

**Key words:** Colon cancer, colorectal carcinoma, epidemiology, Libya

## INTRODUCTION

The epidemiology of colorectal cancer (CRC) varies remarkably from one country to another depending upon various genetic and environmental factors.<sup>[1,2]</sup> Globally, nearly 800,000 new CRC cases are believed to occur each year, which account for approximately 10% of all incident cancers, and mortality from CRC is estimated at nearly 450,000/year.<sup>[1]</sup> It is one of the most commonly diagnosed cancer related morbidity and mortality

in North America, Western Europe and Australia, with a high mortality rate among males and females.<sup>[3-5]</sup> Based on the reports of the World Health Organization, approximately 87,500 new cases are diagnosed annually.<sup>[6]</sup> The incidence of the disease is higher in the elderly, with >90% of cases are older than 55 years of age.<sup>[7]</sup>

In Libya, CRC is the most prevalent gastrointestinal tract (GIT) malignancy in both males and females.<sup>[8,9]</sup> Since

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the information regarding CRC is very limited in Libya we decided to analyze the pattern of patients with CRC seen in two tertiary hospitals, Benghazi, Libya from January 2007 through to December 2009 with a view to determine various epidemiological and clinicopathological features of this disease.

## MATERIALS AND METHODS

All cases of CRC who were presented to the Oncology Department, Aljomhoria Hospital and 7<sup>th</sup> October Hospital, Benghazi, Libya between the period January 2007 and December 2009 were retrospectively reviewed. CRC patients were identified through hospitals discharge diagnostic codes. Data were analyzed for age, gender, symptoms at the time of diagnosis (early symptoms), sub-site distribution in the colon, and histopathologic diagnosis. Tumor staging of CRC was carried according to Astler Coller modification of Duke's system,<sup>[10]</sup> dividing it into stage A to C depending upon the extent of local involvement and regional node spread. Stage D was added to account for distant metastasis in accordance with Turnbull modification.<sup>[11]</sup>

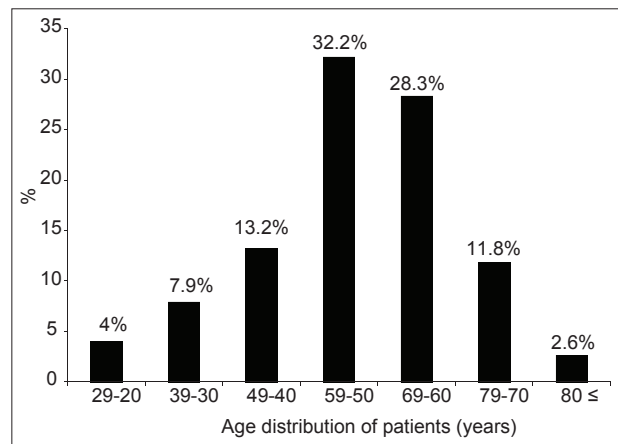
The collected data were analyzed in SPSS statistical software version 19.0 (Armonk, NY: IBM Corp.). Descriptive statistics in the form of mean, standard deviations and frequency with percentages were calculated for interval and categorical variables, respectively. Chi-square test between categorical variables and Student's *t*-test for interval variables was used as appropriate. Results were considered to be statistically significant if *P* value (two-tailed) was <0.05. Ethical approval was obtained from the research ethical committee of Al-Arab Medical University, Benghazi, Libya.

## RESULTS

A total of 152 patients with CRC were included in the present study; 84 were males (55%) and 68 were females (45%) with a male to female ratio of 1.2:1.0 (*P* > 0.05). Their ages at diagnosis ranged from 21 to 87 years with a mean age of 57.4 ± 12.92 years. Eighteen (11.8%) patients were below 40 years of age. The majority of cases (92 patients, 60.5%) were between 50 and 70 years of age. Figure 1 shows the distribution of patients in various age groups. The overall age standardized ratio (ASR) in the 2 years period was 15.24 per 100,000 and was higher for men (16.14 per 100,000) compared to women (13.89 per 100,000) [Table 1]. Furthermore, ASR was estimated 2.26 per 100,000 for individuals aged <40 years. The incidence rate of CRC increased with age and highest rates were observed in the oldest age groups. The most

difference in rates by sex was among individuals above age of 50 years [Table 2].

The presenting symptoms and signs are summarized in Table 2. The most common presenting symptoms were rectal bleeding and abdominal pain and were present in 108 patients (71%). The most common sign on physical examination was palpable abdominal mass found in 20 patients (13.2%), followed by intestinal obstruction in 10 patients (6.6%). Six patients (3.9%) had a documented history of polyps diagnosed previously and only two patients (1.3%) had past long history of ulcerative colitis. No patient had history of Crohn's disease. Data regarding anatomic distribution, histologic type and tumor staging of CRC are shown in Table 3, with majority (103 patients, 67.8%) of tumors arising from rectum and sigmoid colon. Tumors originating from transverse colon, ascending colon and cecum accounted for 20.4% of cases (31 patients). More than one-third (38.8%) of the patients had poorly differentiated adenocarcinoma. The majority of CRC patients were diagnosed in locally advanced or metastatic stage (29.6% [45/152] in stage C and 39.5% [60/152] in stage D), whereas 30.9% (47/152) of the patients were in stage B. None of the patients had stage A at presentation. The radiological evaluation showed presence of liver metastasis



**Figure 1:** Distribution of age at diagnosis of 152 patients with colorectal cancer diagnosed

**Table 1: ASR of colorectal cancer according to sex in the 2 years study period/100,000 population**

Age	Females		Males		Total	
	n (%)	ASR	n (%)	ASR	n (%)	ASR
<40	8/391,212	2.04	10/405,072	2.46	18/796,284	2.26
40-49	9/45,063	19.97	11/47,463	23.17	20/92,526	21.61
50-59	22/24,226	90.81	27/23,728	113.78	49/47,954	102.18
60-69	19/15,253	124.56	24/17,746	135.24	43/32,999	130.30
>70	10/13,459	74.29	12/13,758	87.22	22/27,217	80.83
Overall	68/489,213	13.89	84/507,767	16.14	152/996,980	15.24

ASR: Age standardized rate

in 14 patients (9.2%) and pulmonary metastasis in two patients (1.3%). As shown in Table 3, there was no statistical significant difference between males and females in the mean age, anatomic distribution, histologic type and tumor staging of CRC ( $P > 0.05$  for all comparisons).

Anemia (hemoglobin of  $<12$  g/dl) was found in 56 patients (36.8%) [Table 3]. It was more common in females than males (33 females [48.5%] vs. 23 males [27.2%],  $P = 0.01$ ) and in the right sided tumors than left sided tumors (20 patients [66.7%] vs. 36 patients [29.5%] respectively,  $P = 0.001$ ).

**Table 2: Symptoms and signs at presentation of patients with colorectal cancer**

Clinical features*	Number (%)
Bleeding per rectum	64 (42)
Abdominal pain	44 (29)
Changes in bowel habits	40 (26.3)
Weight loss	34 (22.3)
Abdominal mass	20 (13.2)
Intestinal obstruction	10 (6.5)
Unknown	2 (1.3)

\*More than one feature could present in one patient

**Table 3: Basic data of CRC according to the gender of patients**

	Total	Females	Males	P value*
Number (%)	152	68 (45)	84 (55)	NS
Age, years (range)	57.40 (21-87)	58.13 (21-87)	56.73 (28-78)	NS
Location of CRC				
Rectum	64 (42.1)	29 (42.6)	35 (41.7)	NS
Sigmoid colon	39 (25.6)	18 (26.5)	21 (25.0)	NS
left colon	6 (3.9)	3 (4.4)	3 (3.6)	NS
Descending colon	10 (6.6)	4 (5.9)	6 (7.1)	NS
Splenic flexure	3 (2.0)	1 (1.5)	2 (2.4)	NS
Transverse colon	10 (6.6)	4 (5.9)	6 (7.1)	NS
Hepatic flexure	1 (0.7)	1 (1.5)	0	NS
Right colon	12 (7.9)	5 (7.3)	7 (8.3)	NS
Cecum	7 (4.6)	3 (4.4)	4 (4.8)	NS
Tumor differentiation of AC				
Well differentiated AC	26 (17.1)	12 (17.7)	14 (16.7)	NS
Moderately differentiated AC	52 (34.2)	23 (33.8)	29 (34.5)	NS
Poorly differentiated AC	65 (42.8)	29 (42.6)	36 (42.9)	NS
Undifferentiated carcinoma	9 (5.9)	4 (5.9)	5 (5.9)	NS
Duke's stage at diagnosis at presentation				
A: Mucosal/submucosal	0	0	0	-
B1: Extension to muscularis	10 (6.6)	5 (7.4)	5 (5.9)	NS
B2: Extension to serosa, negative nodes	37 (24.3)	16 (23.5)	21 (25.0)	NS
C: Extension to serosa, positive nodes	45 (29.6)	21 (30.9)	24 (28.6)	NS
D1: Direct invasion of organs	44 (29.0)	19 (27.9)	25 (29.8)	NS
D2: Metastasis to liver or distant organs	16 (10.5)	7 (10.3)	9 (10.7)	NS
Anemia (Hemoglobin $<12.0$ g/dl)	56 (36.8)	33 (48.5)	23 (27.2)	0.01

\*Statistical comparison between males and females. CRC: Colorectal cancer, AC: Adeno-carcinoma, NS: Not significant

## DISCUSSION

The present study represents the pattern of CRC seen in two tertiary hospitals in eastern Libya. In fact both Aljomhoria and 7<sup>th</sup> October Hospitals are university hospitals affiliated to Al-Arab Medical University, Benghazi, Libya. During the study period, Aljomhoria Hospital acts through the Oncology Department, as the central cancer referral center involved in the medical management of all diagnosed cancers, including CRC, from the eastern part of the country. 7<sup>th</sup> October Hospital, on the other hand, was the major hospital where all elective GIT surgeries were performed during the study period. It is noteworthy to mention that both these two hospitals have diagnostic codes for every disease including CRC.

Even though, both hospitals have an important roles in management of newly diagnosed cancers and are a major referral centers, this study has some limitations, mainly due to its retrospective type, including generalization, lacking data and the accuracy of the data in patients' records. Regarding the current medical practice in Libya, CRC screening is not done neither in general nor in selected high risk patients, and cases are considered individually mainly based on the symptoms and/or signs of suspected CRC. This fact as well as lack of awareness in Libyan population of the importance of screening could explain why the majority of CRC cases in this study were diagnosed at the end stage of the disease. In some areas of Libya, particularly in the large cities, people have more access to specialized centers and may be screened by their own physicians but it is not always the case.

The pattern of male to female ratio observed in the present study was comparable to those identified in a previous study from Libya.<sup>[8]</sup> In contrast to Western data,<sup>[12]</sup> wherein there is a significant preponderance of male distribution (male vs. female 2:1), we found no significant difference between gender and CRC. Age impacts CRC incidence more than any other demographic factor. Previous studies show that the incidence of sporadic CRC increases dramatically above the age of 50 years for all groups.<sup>[13,14]</sup> The data in the present cohort suggested an older age distribution of CRC; this is in agreement with western reports, which emphasized that  $>80\%$  of CRCs occurs above 50 years of age.<sup>[13,15]</sup> In the present study, we found the peak age at diagnosis to be between 5<sup>th</sup> and 7<sup>th</sup> decades, suggesting that CRC is primarily a disease of the middle and old age groups in eastern Libya. However, the fact of the late presentation of majority of the CRC cases as well as presence of a substantial number of young adults (11.8%) with CRC in this study should be bearing in mind when physicians see young patients with large bowel symptoms.

Based on the available data on CRC in Libya,<sup>[8,9,16]</sup> a stricter adaption of screening program for early detection of CRC is likely necessary. Cost-effectiveness is a main reason behind this concept, especially if it is correlated to national mortality data, the available screening methods, resource availability, and population preference. Both potentially invasive (i.e. colonoscopy) and noninvasive methods (i.e. fecal occult blood testing and stool DNA detection methods) used for CRC screening. Currently, there is no sufficient epidemiological data in Libya to support starting of screening at a lower age group.<sup>[16]</sup> However, proper identification of cases of familial causes of CRC high risk groups such as ulcerative colitis and Lynch syndrome and other familial causes of CRC is necessary, as these groups should be managed differently.

Classically, colon cancer was believed to be a disease of the left or distal colon.<sup>[15,17]</sup> However, the incidence of right-sided or proximal colon cancer has been increasing in North America and Europe.<sup>[18-21]</sup> Similar trends have been observed in Asian countries.<sup>[15,22]</sup> In the present study, only small number (19.7%) of the patients had right-sided or proximal colon cancer. This might be due to the genetic factors that may preferentially involve the chromosomal instability pathway, which might be predominant in left-sided colon and rectal cancers.

In general, cancer incidence and mortality rates have been higher in economically advantaged countries.<sup>[17]</sup> This may be related to consumption of high-fat dairy products and high-red-meat diet, and physical inactivity with resulting obesity.<sup>[23,24]</sup> Yet, if dietary and lifestyle factors in lower income groups start to mirror those in higher income groups in the years to come, the differences in CRC incidence and mortality rates may start to be further converge.

In contrast to other reports,<sup>[15]</sup> anemia was common in our population and it should be considered as a possible screening test in at risk or symptomatic patients for early detection of CRC particularly in patients within and above the 5<sup>th</sup> decade of age.

## CONCLUSION

We have had very few reports on the epidemiology of CRC in Libya.<sup>[8,9,16]</sup> We found no significant difference between gender and location or types of CRC. Distal CRC was more prevalent. Furthermore, the present study clearly demonstrated that the majority of CRC patients in Benghazi were diagnosed at late stage of the disease either in locally advanced or metastatic stage. In order to achieve

early detection of CRC, a comprehensive cancer education program and a stricter adaption of screening program for early detection of CRC as well as screening of high risk population for CRC should be considered in this part of Libya.

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