Original Article

# Clinical Analysis of Colorectal Cancer Among Sample of Iraqi Patients Between 2018 and 2023

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## Abstract

**Background:** Colorectal cancer (CRC) is the most common type of gastrointestinal cancer and ranks as the fourth-leading cause of cancer-related death worldwide. **Objective:** The aim of this study was to investigate the epidemiology of CRC in Baghdad from 2018 to 2023. **Materials and Methods:** A total of 45 cases of various CRC samples with their clinical information were collected from Medical City Teaching Hospital, Baghdad, and private labs. In addition, 30 cases of colon and rectum with no significant pathology were collected from the Forensic Medicine Department for comparison purposes in this study. **Results:** revealed that the most prevalent histological type of CRC was adenocarcinoma which comprised about 86.7%, the peak age frequency was at the patients over 60 years accounted for 44.4%, and the left side of the colon had a high frequency accounted for 66.7%. In malignant cases, the mean size was (5.02 cm). Females had a 53.3% higher incidence of CRC than males. Stage IIIB was the most common tumor stage accounted for 42.2%, and moderately differentiated was the most common grade at the time of study with a rate of 93.3%. **Conclusion:** Adenocarcinoma is the most frequent type of CRC in Iraq, occurring in patients over the age of 60 that present at the IIIB stage of disease with a moderate tumor grade.

**Keywords:** CRC, epidemiology, lymph node metastasis, moderately differentiated, stage IIIB

## Introduction

Colorectal cancers (CRCs) were provided the third incidental (about 2 million) and second common cause of death (roughly 1 million) of all cancers in 2020.[1] In Iraq, cancer incidence and mortality data are frequently published by the World Health Organization (WHO), the Iraqi Ministry of Health, and the Iraqi Cancer Board. According to these institutions, Bowel cancer is the sixth most prevalent cancer in Iraqi males and the fifth most common cancer in Iraqi females. All malignancies, including CRC, grew significantly in Iraq, particularly following the first and second Gulf Wars.[2]

According to data collected by the Iraqi Cancer registry, CRC is the 7th most common type of cancer among both males and females in Iraq.[3] The incidence rate increased from 2.75/105 in 2002 to 3.26/105 in 2011. Around fifty percent of the cases were diagnosed between the ages of 40 and 59.[4] The prevalence of colon cancer in Iraq is 2.6%, in compression to 6%–13% in developed countries and 17%–51.1% in industrialized nations.[5] Most CRCs are slow-growing lesions that develop from polyps that are adenomatous or sessile serrated lesions. Because of the sluggish growth, there is a window of opportunity to screen for both early cancer and precursor lesions.[6] Different etiological causes increase the person's risk of getting the cancer involving age, presence of polyps, hereditary factors, smoking, dietary factors, physical inactivity, some viruses, diminished selenium, inflammatory bowel diseases, environmental impacts, exogenous hormones, and alcohol.[7]

The etiology of bowel cancers has not been completely explained, and the primary causes are remained unknown, However, several risk factors have been identified over

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Quick Response Code:

Website: https://journals.lww.com/mjby

DOI: 10.4103/MJBL.MJBL_1435_23

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**Submission:** 18-Sep-2023 **Accepted:** 05-Dec-2023 **Published:** 30-Apr-2026



**How to cite this article:** Abd Alkareem FM, Mohamad BJ. Clinical analysis of colorectal cancer among sample of Iraqi patients between 2018 and 2023. Med J Babylon 2026;23:541-6.

years of research. There are no modifiable risk factors for CRC, including inherited variables and age. In addition to lifestyle factors and variable environmental.[8] The patient's age is considered to be the primary cause. Although cancer can occur in young people, the risk increases after the age of 50 years, and 9 out of 10 cancer patients are over the age of 50 years, with the frequency increasing after the age of 70 years.[9] Several risk factors are lifestyle-related. Scientific data suggests a lack of physical activities and a low-residue diet high in fat, calories, and red meat but poor in folic acid and calcium. Additionally, smoking and drinking alcohol are discussed.[9] The aim of the current analysis was to investigate the epidemiology of CRC in Baghdad at the time of the study.

## Materials and Methods

### Preparation and staining

Forty-five cases of colonic biopsies (excisional biopsies and total colectomy) in the form of paraffin-embedded tissue blocks have been gathered from the archive files of the Department of Pathology of teaching laboratories at Baghdad Medical City Teaching Hospital and private labs in Baghdad, Iraq, between 2018 and 2023. Clinical information such as age, tumor site, tumor size, pathological stage, grade, and lymph node involvement were also obtained from the patient's data reports. In addition, 30 specimens of colorectal tissues without significant pathology were also collected and used as a control. A microtome cutter (Leica RM2255, Germany) was used to cut the tissue section at a thickness of 4 μm from each paraffin block. Sections were placed in a water bath (Electrothermal) heated to 40 to 50 °C, Then, sections were placed on glass slides (PathnSitu Cat# PS016-72, USA). Sections were stained with Hematoxylin and Eosin and examined by a specialist pathologist.

### Ethical approval

The College of Science Ethics committee approves the research proposal to be conducted in the presented form. None of the investigators and coinvestigator participating in this study took part in the decision-making and voting procedure for this study.

This Ethics committee is working in accordance with College of Science guidelines on biomedical research. (Including the document number CSEC/0922/0109 and the date September 28, 2022).

## Statistically Analysis

The Statistical Analysis System SPSS-28 (Statistical Packages for Social Sciences—Version 28) was used to determine the effect of various variables on research parameters. The information was given in simple frequency, standard deviation, mean, percentage, and range (minimum and maximum values) measurements. To compare percentages in different groups, the Chi square test ($\chi^2$ test) was used.[10]

## Result

Patients' data are listed in Table 1.

Cases of study were assessed as follow:

### Age

Patients ranged in age from 28 to 85 years. In the malignant group, the mean age was (56.84 ± 14.154). During the time of diagnosis, the category >60 years old had the highest age frequency [Figure 1].

### Gender

Females constituted 53.3% of the total 45 malignant cases versus 46.7% of male cases.

### Tumor diameter

In malignant cases, the mean size was (5.02 ± 2.31 cm).

### Tumor site

Tumors from the left site were the most frequent comprising 66.7% of the total. The findings revealed that the left colon is more prone to develop CRC than the right side.

### Histological type

The most prevalent histological type of CRC was adenocarcinoma which comprised about 86.7% [Figure 2].

### Tumor grade

According to WHO grading, 4.4% of cases were in grade I, 93.3% were in grade II and 2.2% were in grade III [Figure 3].

### Tumor stage

Malignant cases were classified according to AJCC staging system (modified Dukes classification), the largest proportion of cases were within stage IIIB comprising 42.2% of the total, while 37.8% of cases were stage IIA, 6.7% stage IIIA, 11.1% stage IIC, and 2.2% were stage IIIC [Figure 4].

### Lymph node metastasis

Negative lymph node metastasis constituted 57.8% of the total 45 malignant cases versus 42.2% of positive lymph node metastasis cases [Figure 5].

## Discussion

The current study found that the incidence of CRC was greater in the age group above 60 years, with a rate of (44.4%). The same result was detected by Falih Soliman and Jasim Mohamad,[11] who reported a high rate of CRC

**Table 1: Patients Characteristics of study population ($n = 75$)**

| Gender distributions in different groups ($n = 75$) | | | |
|---|---|---|---|
| **Group** | **Descriptive data** | **Number** | **Present (%)** |
| Malignant $N = (45)$ | Male | 21 | 46.7 |
| | Female | 24 | 53.3 |
| Control $N = (30)$ | Male | 18 | 60 |
| | Female | 12 | 40 |
| Malignant case ($n = 45$) | | | |
| Group | Descriptive data | Number | Percent (%) |
| s Age $N = (45)$ | <40 | 5 | 11.1 |
| | 40–49 | 7 | 15.6 |
| | 50–59 | 13 | 28.9 |
| | >60 | 20 | 44.4 |
| Tumor size $N = (45)$ | ≤5 cm | 30 | 66.7 |
| | >5 cm | 15 | 33.3 |
| Tumor site $N = (45)$ | Left | 30 | 66.7 |
| | Right | 15 | 33.3 |
| Histological type $N = (45)$ | Adenocarcinoma | 39 | 86.7 |
| | Mucinous | 4 | 8.9 |
| | Signet ring cell | 2 | 4.4 |
| Lymph node metastasis $N = (45)$ | Positive | 19 | 42.2 |
| | Negative | 26 | 57.8 |
| Histological grade $N = (45)$ | I | 2 | 4.4 |
| | II | 42 | 93.3 |
| | III | 1 | 2.2 |
| Histological stage $N = (45)$ | IIA | 17 | 37.8 |
| | IIIA | 3 | 6.7% |
| | IIIB | 19 | 42.2% |
| | IIC | 5 | 11.1% |
| | IIIC | 1 | 2.2% |

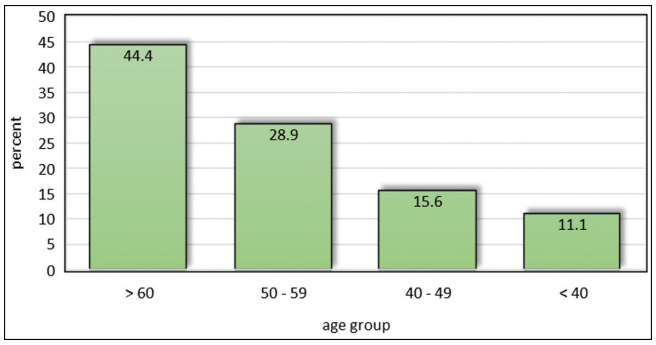


**Figure 1:** The distribution of CRC according to age group

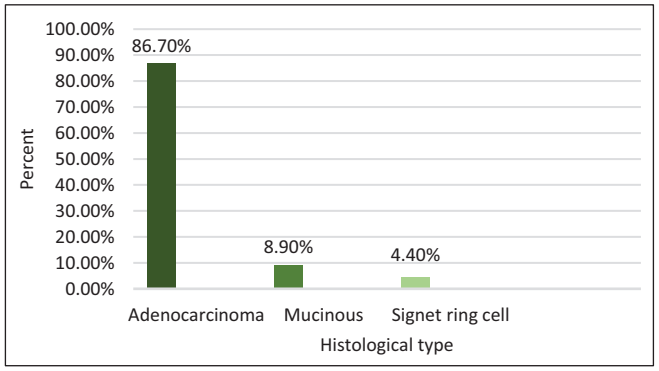


**Figure 2:** The distribution of CRC according to histological type

among individuals aged 60–90 years, with a prevalence of 40.3%. Altoriah *et al*.[2] also showed that CRC incidence was 46.7% in patients over the age of 66. those over the age of 65 have three times increased chance of developing bowel cancer compared to those aged (50–64), and a 30-time increased risk compared to those aged (25–49). The reality that CRC is an age-related disease is most apparent within the developing nations, where the risk of colon and rectal cancer is highest. CRC incidence in these countries corresponds, among other things, with higher life expectancy and, as a result, an increase in the number of elderly persons in the population.[12] The current study's results are also higher than those of other researches worldwide such as Chatila *et al*.[13] from Lebanon who found that 41.6% of people were 60 or younger, and from China the study by Lu *et al*.[14] which showed that (64.8%) were below age 65.

Gender is another important finding in this study, results exposed that females had a higher incidence of CRC (53.3%) than males (46.7%). This result is agreed with Jalal, *et al*.[15] found a higher frequency of cases in females

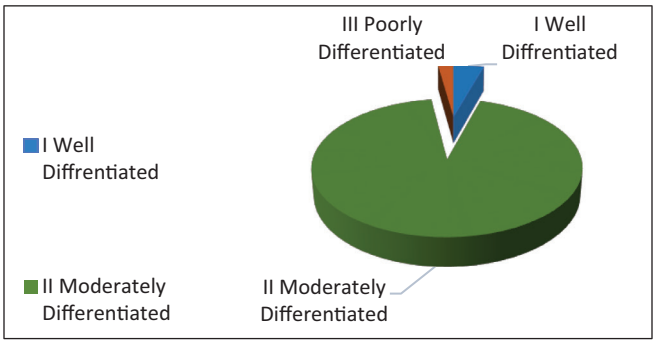


**Figure 3:** The distribution of CRC according to WHO grading

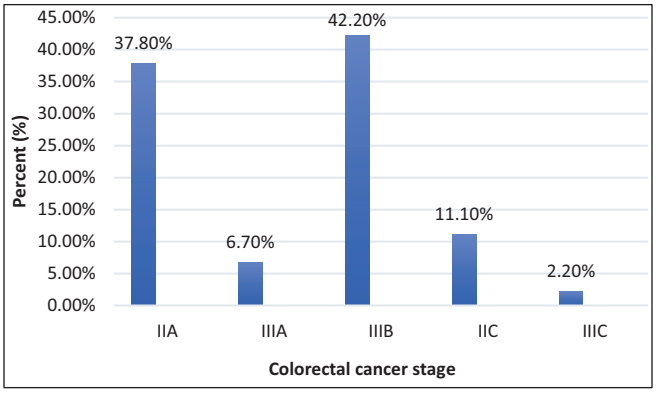


**Figure 4:** The distribution of CRC according to the Histological stage of tumor

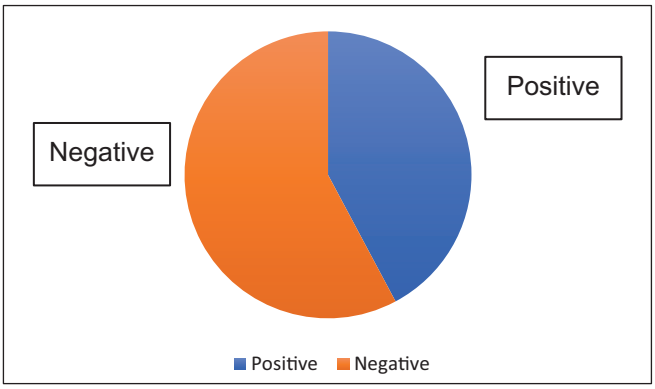


**Figure 5:** The distribution of CRC according to the lymph node metastasis

60% than in males 40%. Dissimilarity, in Saudi Arabia, Al-Hajeili, *et al*.[16] reported that males accounted for 50.24% and females 49.76%. According to Jabbar and Jawad,[17] females have a 45.7% incidence and males have a 54.3% incidence. Although the causes of sex differences are unknown, it has been suggested that they are related to differences in risk factor exposure (e.g., alcohol and cigarettes). Sex hormones, and dietary patterns.[12] The causes of gender disparities This could be attributable to an age-related variation in sex predominance, as male predominance may be age-dependent, as the majority of our patients (61.7%) were above the age of 50. It could also be due to genetic and environmental factors, or just by coincidence.

In terms of tumor size, the current study found that 66.7% of overall cases had tumors less than or equal to 5 cm in size, whereas 33.3% had tumors larger than 5 cm. The current finding agreed with Falih Soliman and Jasim Mohamad[11] since, suggested that in malignant cases, the most common tumor size was 5cm. While, Alrubaiaee and Al-taee[18] noticed that tumor size >5 cm was higher (60%) than those <5 cm (40%).

Another finding of this work was that a higher percentage of cancers were found in the left colon (66.7%) than in the right colon (33.3%). The same result was reported in a previous study done in Iraq by Mohamad *et al*.[19] they reported that 69% were found in the left side of colon. Furthermore, Kibriya *et al*.[20] found that higher incidence of CRC was in the left side colon accounted for 80%. The difference in proportion between the right and left sites can be associated with developmental and anatomical origins, differential carcinogenic agents (such as bacterial population variances on both sides of the colon or exposure to bile acids and various nutrients), or a combination of both.[21] Also, the variance in right colon cancer (RCC) and left colon cancer (LCC) characteristics are assumed to be caused by variances in fecal exposure, detection time, and embryologic origin. Earlier research reported that RCC had a greater recurrence and survival rate than LCC, whereas other studies discovered that early-stage RCC had a better prognosis than LCC.[22]

Other aspect of the current study is that adenocarcinoma represented in 86.7% of the patients while 8.9% being Mucinous Adenocarcinoma, while Signet ring cell carcinoma accounted for 4.4%. This demonstrates that the most common type of CRC is adenocarcinoma in Iraqi patients at the time of study. The results of the present study agreed with the study of Falih Soliman and Jasim Mohamad[11] from Iraq who found 92.3% of cases are Adenocarcinoma in Baghdad city. In their study in Egypt, Hassan *et al*.[23] stated that adenocarcinoma made up 75.0% of cases. Whereas in China, Lu *et al*.[14] found that the greater cases of adenocarcinoma, mucinous, and other type of CRC was 93%, 5.4%, and 1.6%, respectively.

Also in the present study, the malignant cases were graded into three major groups using guidelines from the WHO and staged using the seventh edition of the AJCC tumor-node metastasis (TNM) staging system. Our data stated that 93.3% of CRC cases were moderately differentiated, and 42.2% of CRC cases were in stage IIIB. Like previous studies; Farhad *et al*.[24] who found that 62% was moderately differentiated. According to Al-Maghrabi,[25] 65.8% of cases were moderately differentiated. The grading procedure is comprised of the following factors: (1) the proportion of carcinoma cells that form tubules; (2) the nucleus size difference

between normal and cancer cells; and (3) the incidence of cancerous cell division. Pathologists classify tumors based on these features into three categories, the higher the grade, the greater the difference in histological structures between malignant and healthy tissue.[26] Mostly, a lower-grade number suggests slower-growing cancer that is, less likely to spread and has a better prognosis, whereas a higher-grade number suggests faster-growing cancer that may require immediate or more severe treatment.[27] About the tumor stage; The current results were in accordance with study of Jahil and Zayed[28] which represents that 39.7% was in stage III. Liu *et al*.[29] found that 66.8% were in stage IIIB. Pei *et al*.[30] reported that stage IIIB was the most prevalence stage in his study. While Falih Soliman and Jasim Mohamad[11] in their study represents that 60% of total cases were in stage IIA.

On the other hand, the present study showed that 57.8% of cases had negative lymph node metastasis, while 42.2% was positive. Chen *et al*.[31] who found that 63.5% of cases were negative lymph node metastasis. Also, Newland *et al*.[32] suggested that 58.5% had negative lymph node metastasis and 41.5% was positive. Furthermore, Peacock *et al*.[33] found that the negative LN metastasis accounted for 64.28% and positive LN metastasis about 35.7%. The examination of lymph node metastases is regarded as one of the most significant indicators for prognosis tools to the CRC, requiring careful and extensive examination by an expert pathologist. The American Joint Committee on Cancer (AJCC)'s 7th and 8th editions suggested that at least 12 lymph nodes be examined during CRC surgical resection.[34] The International Union Against Cancer and the AJCC proposed the TNM staging system, which determines primary tumor (T), lymph node metastasis (N), and distant metastasis (M) to predict disease recurrence and survival, are thought to be an essential indicator of overall survival (OS) and disease-free survival in the patients with CRC without distant metastasis. Lymph node status is also a critical factor for determining the use of adjuvant chemotherapy following surgical resection, the status of lymph nodes is also an important consideration when deciding whether to utilize adjuvant chemotherapy following surgical resection.[35]

## Conclusion

This study revealed that CRC was higher in patients older than 60 years in this study, with a higher prevalence in the left side of the colon. The size of a tumor in malignant cases was <5cm. Most malignant cases have been identified within the stage (IIIB) of disease and moderately differentiated grading.

### Financial support and sponsorship

Nil.

### Conflicts of interest

There are no conflicts of interest.

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