Original Article

Clinical and Histopathological Characteristics of Colorectal Cancer in Iraq between 2015-2021

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Abstract

Colorectal cancer (C.R.C.) is the commonest malignancy in the gastrointestinal tract and is the fourth leading reason behind cancer-associated death in the world. It usually begins with the non-cancerous proliferation of mucosal epithelial cells. These growths are polyps and might grow gradually for 10–20 years before becoming cancerous. This study was designed to investigate the epidemiology of the diagnosed cases of colorectal cancer from 2015 to 2021 in Baghdad. A total of 60 cases of different colorectal cancer samples were collected from Medical City Teaching Hospital, Baghdad, and private labs. Clinical information was also collected, including patients' age, tumor size, gender and location, pathological grade, and stage. Results revealed a high incidence of C.R.C. in patients aged 60-90 years for the rate of 40.3%, with a high frequency in the left colon of 59.6%. The dominant tumor size was 5cm in malignant cases, and a high incidence of C.R.C. was seen in the female by 52.0%. While the most frequent tumor stage was stage I.I.A., with a rate of 59.6%, and moderately differentiated was the foremost one with 67.3% ($P \leq 0.05$). The most common type of C.R.C. in Iraq is adenocarcinoma, which occurs in patients older than 60years and presented at the I.I.A. stage of disease with moderate tumor grade. Early disease detection and diagnosis are effective in its control and treatment.

Keywords: Colorectal Tumors, Adenocarcinoma, Risk Factors, Epidemiology

1. Introduction

Colorectal cancer (C.R.C.) is the most common malignancy in the gastrointestinal tract and is the fourth leading reason of cancer-associated death worldwide. The C.R.C. ranked seventh among the ten most common cancers reported in Iraq. The importance of C.R.C. stems from the fact that despite its high prevalence, it is an entirely treatable disease if diagnosed early (1). The C.R.C. usually begins with the non-cancerous proliferation of mucosal epithelial cells. These growths are polyps and might grow gradually for 10–20 years before becoming cancerous (2). Precancerous conditions of the colon or rectum are changes to cells that make them more likely to grow to be cancerous. These conditions do not seem to be yet

cancer. However, if they are not treated, there is an opportunity that these abnormal changes may become colorectal cancer.

The World Health Organization (WHO) pathologic classification of gastrointestinal includes a number of histologic subtypes of colorectal carcinomas, such as Classic adenocarcinomas (A.C.), Mucinous adenocarcinomas (M.A.C.), and Signet ring cell carcinomas (S.R.C.C.) in addition to other rare variants of colorectal carcinomas including squamous cell, neuroendocrine, adenosquamous, spindle cell, and undifferentiated carcinomas (3).

Comparative studies within the Cancer Registry Iraq, during the 30 years (1965-1994), showed an increased incidence of colorectal cancer in Iraq from 25% to

50%. The incidence of colorectal cancer in Iraq is 2.6% compared to 6-13% within the developed countries and 17-51.1% within the industrialized nations (4). C.R.C. ranked as the 6th most common cancer in men and, therefore, the 5th most common cancer in women in Iraq. There has been a transparent increase in all told cancers in Iraq, including C.R.C., especially after the primary and second gulf war (5). The incidence of C.R.C. in women is 9.4% of all cancers, making it the second most common after breast cancer, while it is considered the third most common cancer globally, with 10.0% in men (6). The significant challenge to the management of C.R.C. is early detection worldwide, which makes this treatment option to be administered so late after tumor metastasis. If tumors are detected early, and polyps are surgically resected, they may reduce the incidence and death rate of C.R.C. (7). Several mutations are involved in the development of C.R.C. Rat sarcoma (R.A.S.) mutations are found in up to 50% of sporadic C.R.C.s and 50% of colonic adenomas larger than 1cm; they are rarely seen in smaller adenomas (8). This study investigated the epidemiology of colorectal tumors among a sample of patients in Iraq and its correlation with clinicopathological features (age, gender, tumor site & size, pathological stage, and grade).

2. Materials and Methods

2.1. Patient Sampling and Clinical Information

A total of 60 cases of colonic biopsies (total colectomy and excisional biopsies) in the form of paraffin-embedded tissue blocks were collected from archive files between the years (2015-2021) of the Department of Pathology of teaching laboratories of Baghdad Medical City Teaching Hospital and private labs, Baghdad–Iraq. Clinical information, including age, tumor site, size, pathological grade, and stage, were also collected from the patient's data reports. The College approved this study of Science at the University of Baghdad, Iraq. Tissue samples from patients in Iraq included 52 cases of malignant tumors, 8 cases of benign tumors, and 10 cases of colorectal tissue without significant pathology as a control. One section

from each paraffin-embedded tissue block was cut by a microtome cutter (Leica, RM2255) for thickness between 4-5 μm. The sections were stained with Hematoxylin and Eosin (H&E). Finally, stained sections were examined by a specialist pathologist.

2.2. Statistical Analysis

Data analysis was carried out using the available statistical package of SPSS-26 (Statistical Packages for Social Sciences- version 26); computer software was used for this purpose. Data were presented in simple measures of frequency, percentage, mean, standard deviation, and range (minimum-maximum values). The significance of the difference of different percentages (qualitative data) was tested using the Pearson Chi-square test (χ^2-test), applying Yate's correction or Fisher Exact test whenever applicable. Statistical significance was considered whenever the P value was equal to or less than 0.05 ($P \leq 0.05$).

3. Results

This study included sixty cases of colorectal tumor tissue samples from Iraqi patients. Fifty-two cases of them had colorectal carcinoma (adenocarcinoma and mucinous carcinoma), while eight cases were benign adenomas. Also, this study collected ten cases with no significant pathology for comparison purposes. The results of the study of risk factors were as follows:

3.1. Age

Patients' ages ranged from (18-90) years, with a mean age of (61.13±15.44) in the malignant group. The peak age in the malignant group was in the age category (66-90) at the time of diagnosis (Figure 1).
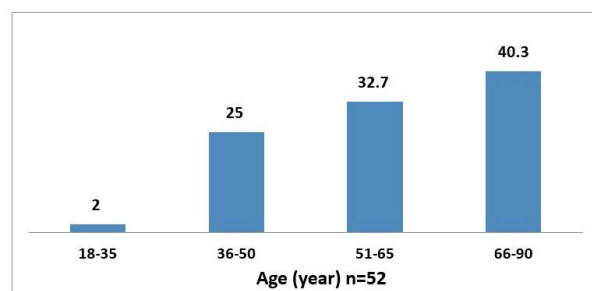

Figure 1. Distribution of malignant cases according to age groups

3.2 Gender

Of the total 52 cases of colorectal cancer, 51.7% (31cases) were males, while 48.3% (29 cases) were females (Figure 2).

3.3. Tumor Size

The mean size in malignant cases was evaluated in three sizes below 5, 5-10, and above 10 cm. The mean size in benign cases was (4.35±2.35)—the highest prevalence in sizes below five, figure 3.

3.4. Tumor Side

The distribution of colorectal tumors site in malignant and benign groups is illustrated in figure 3. Tumors

from the left colon in malignant and benign groups were the most frequent, comprising 59% and 62.5%, respectively (Figure 4).

3.5 Tumor Stage and Grade

The findings of this study showed that 21% of cases were well differentiated, 67% were moderately differentiated, and 12% were poorly differentiated (Figure 5).

According to the A.J.C.C. staging system (modified Dukes classification), 3.8% were stage I, 2% I.A., 2%IB, 60 % I.I.A., 23% I.I.B., and 9% I.I.I.B. (Figure 6).
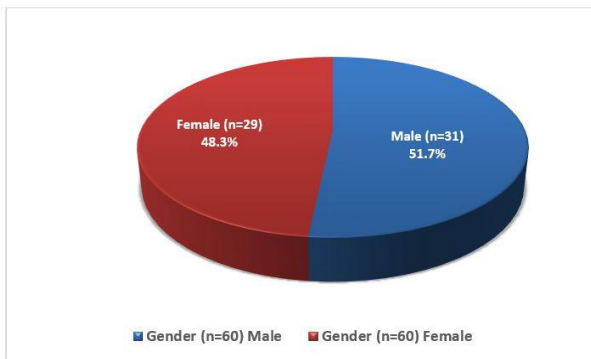
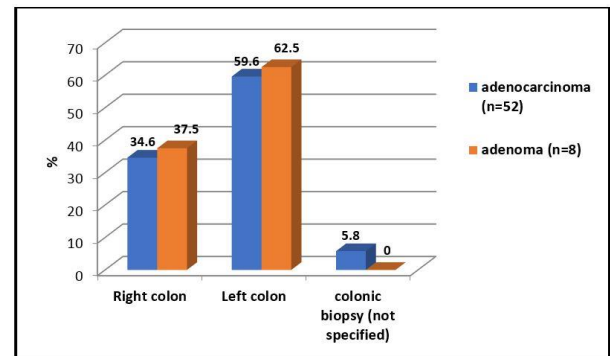**Figure 2.** Distribution of malignant cases according to gender

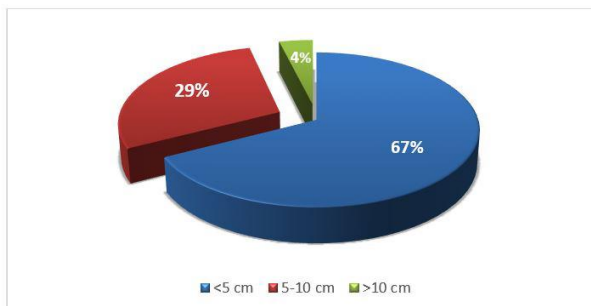**Figure 4.** Distribution of cases according to the side of the tumor

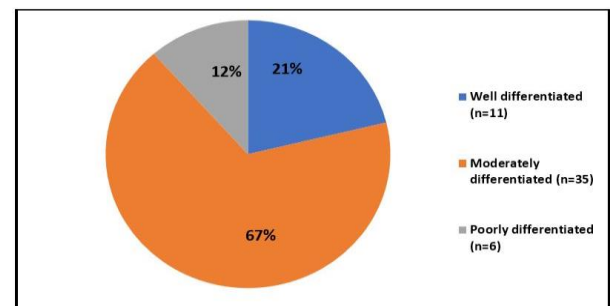**Figure 3.** Distribution of malignant cases according to the size of a tumor

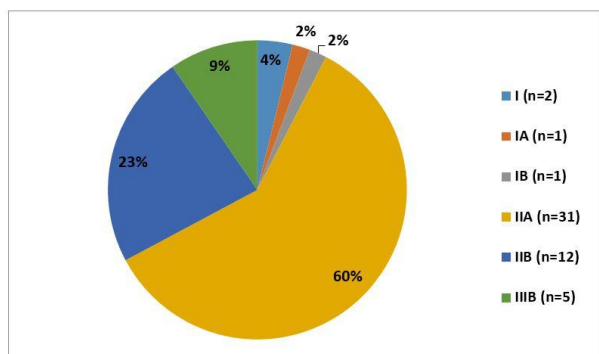**Figure 5.** Distribution of malignant cases according to WHO grading

Figure 6. Distribution of cases according to the Histological stage of the tumor

4. Discussion

According to research, colorectal cancer is common in men and women. Results from this study revealed that the incidence of C.R.C. was higher within the age group older than 66 years, with an incidence of (40.3%), and the mean of age was (61.13±15.44) years in the malignant group. This is close to the finding of Al-Saadi (9), who recorded that C.R.C. patients aged between 41-70 were 68%. Also, Altoriah, Jumaah (5) reported that C.R.C. incidence was 26.7% in patients older than 66 years old, and Alshewered and Al-Naqqash (10) recorded (24.8%) of patients belonged to the age group 61-70 years. Aging is a progressive decline of the immune system (11); innate and adaptive immune systems are affected through transformations of their constituents and functions. The numerous changes contribute to increased susceptibility to carcinogenesis in older people (12).

Another aspect of the current study is gender, which revealed a relatively higher incidence of C.R.C. among males (52.0%) than females (48.0%). These results agreed with Jalal, Othman (13), who found that the incidence of males (54.3%) and females (45.7%), as well as Mohamad and Zghair (14), who mentioned that (72.2%) of C.R.C. cases were males, a study by Anele, Askari (15) reported that the males were (57.2%) and the female (42.8%). The reasons for this difference between males and females are not entirely understood but likely reflect complex interactions between gender-related differences in exposure to hormones and risk factors (16).

Regarding tumor size, in malignant cases of the current study, tumors less than 5cm was observed in (67.4%) of patients, while (28.8%) had a tumor size of 5-10 cm, and only (3.8%) exceeded 10 cm. In the current study, tumor size did not relate and had no significant correlation with any other parameters in this study.

Other findings were regarding the location of tumors in the colon observed in the left colon (59.6%) compared to the right. (34.6%), the same findings were reported in previous studies done in Iraq (13, 14, 17, 18). Yaeger, Chatila (19) found in their study that (45.9%) of patients had left-sided tumors, whereas (29.7%) of them had right-sided tumors. The difference between sites of tumors can be attributed to the anatomical and developmental origin, distinct carcinogenic factors (such as difference in bacterial population on the two sides of the colon or exposure to particular nutrients and bile acids), or a combination of factors. Colonoscopy screening makes it easier to detect left C.R.C. tumors as small adenomas at an early stage. Right-sided C.R.C. tumors are still detectable at an early stage but much more difficult than left C.R.C. tumors because of their flat morphology (20).

Furthermore, adenocarcinoma comprised (92.3%) of cases in this study, of which (67.3%) of them were moderately differentiated. This reveals that adenocarcinoma is the most frequently detected type of colorectal carcinoma and the most common tumor diagnosed in the colon and rectum, and this agrees with Alsafi, Metib (21), who found (82.1%) of adenocarcinomas in the total cases in Karbala city, and Al-Hishma (22) who found in her study that (66%) of cases were adenocarcinoma. Wang, Hirano (23) showed that (93.8%) of cases were adenocarcinoma. Herman, Hawkins (24) recorded that (89.1%) of cases were adenocarcinoma. Conversely, 7.7% (4 out of 52) of all colorectal cancer cases were mucinous carcinoma. This agrees with Hosseini, Bananzadeh (25) reported that mucinous carcinoma was (11.4%) of the total cases in their study. Lan, Chang (26) proved in their study on C.R.C. that mucinous carcinoma

accounts for (4.9%) of all colorectal cancers, as well as (23) found in their study that the mucinous carcinoma of the total cases was (3.82%).

In this study, adenocarcinomas and mucinous carcinoma were graded into 3 major groups according to WHO guidelines while they were staged according to the 7th AJCC TNM staging system. Our findings showed that most cases were moderately differentiated, comprising 67% of cases, and 60% of C.R.C. cases were within stage I.I.A. Like previous studies; Khalil, Al-Hassawi (18) showed that the majority of cases were moderately differentiated adenocarcinoma constituting (85.2%), Khalil, Al-Hassawi (18) stated that the majority of cases were moderately differentiated comprising (85.2%). Al-Maghrabi (27) reported that (65.8%) of cases in his work were Moderately differentiated. Sharkas, Arqoub (28) revealed in their study that (62.6%) of cases were moderately differentiated. Moreover, Abbood and Aziz (29) stated that the most common stage of tumors was I.I.A. (59.6). The current results are in accordance with a study by Mahmood, Abdulghany (30) who found that (45%) of cases were stage II, Almuttairi, Isra'a (31) recorded that (53.3) of cases were II. Shaker, Senousy (32) from Egypt showed that (48.3%) of cases were II. In their study, Yaeger, Chatila (19) reported that (42.6%) of C.R.C. patients were stage II. Mo, Dai (33) found that most cases presented with I.I.A. accounts (77.1%). Moreover, Lee, Yu (34) stated that (30.9%) of cases were I.I.A. The scientific interpretation for that and compared to other stages, stage II of diseases is more heterogeneous, comprising low-, intermediate- and high-risk diseases for metastatic dissemination (35).

In this study, the incidence of C.R.C. was higher within the age group older than 66, with a high incidence in the left colon. The overall tumor diameter was less than 5 cm in malignant cases. Most malignant cases were detected in the (I.I.A.) stage. Moreover, a large proportion of malignant cases were with moderate tumor grade.

Authors' Contribution

Ethics

Conflict of Interest

Acknowledgment

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