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# COLORECTAL CANCER IN SAUDI POPULATION;
## ARE THERE ANY ISSUES RELATED TO GENDER?

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**ABSTRACT... Background:** The aim of study was to investigate differences in clinicopathological (CPC) features of colorectal cancer (CRC) patients between both genders. **Setting and Design:** We did a retrospective chart review of CRC patients confirmed by histopathology. **Materials and Methods:** 414 patients were included in study from King Abdul-Aziz medical city Jeddah. Charts of patients were reviewed; data was analyzed on SPSS version 20. **Results:** Majority of patients were males (58.7%) who were slightly older than females (mean age 57.7 versus 54.6 years) (p value 0.033). The most common age group was fifty to eighty years in both genders (64% patients). Abdominal pain was reported more in females (57% vs. 41.5% p value 0.002) while there was no difference in reporting bleeding per rectum between both genders (50.2% vs. 49.3% p value 0.953). History of diabetes mellitus (DM), smoking and colonic polyps) was more common in males (67 versus 34 patients), (21 versus 3 patients) and (10 versus 1 patient respectively. Patients presenting with acute surgical abdominal complications were less than 20%. Only 33 (19.2%) of females received preoperative chemotherapy vs. 80 (33%) of males (p value 0.001). There was no significant gender differences regarding site, histopathology grade and surgical treatment received. **Conclusions:** There are important gender differences in CPC features of CRC patients in our population. Female patients tend to be slightly younger than males and there is less association with smoking, DM and previous colonic polyps. Abdominal pain was the most common presenting symptom among females. Both genders presented at similar stage of disease. These observations should be taken in consideration in making colorectal screening guidelines and public awareness programs.

**Key words:** Colorectal cancer, polyps, gender differences.

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## INTRODUCTION

Colorectal cancer (CRC) is a common malignancy in both genders. It is associated with high morbidity and mortality, accounting for about 56,000 deaths each year in the USA only[1]. Among many risk factors, age and male gender are important. Age influences incidence of CRC in both genders. The effect of gender is seen more in elderly and the incidence of CRC is lower in females 50 years and older compared to males. Moreover this effect is seen more in left sided cancers[2]. Females have been associated with right colon cancer, are usually younger than male patients, and undergo higher rates of ileostomy[3,4]. Women are reported to have more incidence of peritoneal carcinomatosis especially with right-sided tumors[5].

Contrary to above findings young female patients have been found to have more left-sided CRC compared to young men[6]. Type 2 DM has been associated with CRC among men, but not in women. A prospective study revealed associations between colorectal cancer and type 2 diabetes mellitus or insulin use in men[7]. In some studies female CRC patients are older than male patients, have more proximal and poorly differentiated cancers, and undergo fewer radiotherapy (RT) treatments for rectal cancers [8]. Studies showed that the most common site for

male patients is rectum, which was third highest for women, whereas right colon cancer was found to be highest for women. Male/female ratios for surgeries are highest for distal cancer[9]. Proportion of female patients selected for preoperative RT are significantly lower than that of men[10]. Recent advances in the molecular biology of CRC have led to greater understanding of the effect of estrogen in colorectal carcinogenesis which may have a potentially protective effect against the development of CRC[11]. It has been noticed that women present more urgently and at an older age, and they receive less aggressive medical treatment. Nelson at el in his study of 38,931 cases reported as the age increases, men were more likely to develop distal cancer than women[12].

Previous data showed that there are important differences between both genders regarding epidemiology of colorectal cancer in the West. However there is insufficient information available about gender differences in CRC in Saudi Arabia. Therefore, we conducted the present study to see whether the above mentioned differences exist in our population of patients between both genders.

## MATERIALS AND METHODS

This was a single centered retrospective chart review. It involved all histologically confirmed CRC patients who presented to our hospital from 2004-2009. A total of 414 patients were collected. The study was approved by the ethical institutional review board at King Abdullah international medical research center (KAIMRC). Many of these patients were diagnosed for the first time in our hospital but few of them were diagnosed outside and their slides were reviewed in our histopathology department. Patients with anal carcinoma or non-adenocarcinoma, like lymphoma were excluded from our study. The records of all patients were reviewed and medical and demographic information was collected, analyzed, and interpreted. The study was done in King Abdul-Aziz medical city (King Khalid National Guards hospital and Princess Noorah Oncology Center, Jeddah, Kingdom of Saudi Arabia.

Data was collected from the electronic media, hospital intranet, electronic laboratory system, and files were reviewed in medical records. The data was collected and filled on pre approved data collection form. The information was gathered in excel files and was converted to SPSS files. Categorical variables were analyzed using the Chi-square and Fisher exact tests. Two-sample independent t-test was performed for continuous variables. A P-value of less than 0.05 was considered statistically significant. All statistical calculations were performed using SPSS version 20.

## RESULTS

Among a total of 414 patients, the males were 243 (58.7) % and females were 171 (41.3%). Mean age differed between male patients (57.7, range: 18 to 97 years) and female patients (54.6, range: 15 to 112 years) (P=0.033). Male and female patients in different age groups are shown in Fig 1. Risk factors in both genders are shown in Fig 2. Gender differences and stage of CRC are shown in Table-I. Differences between both genders regarding symptoms are shown in Table-II. Gender differences regarding tumor characteristics are shown in Table-III.

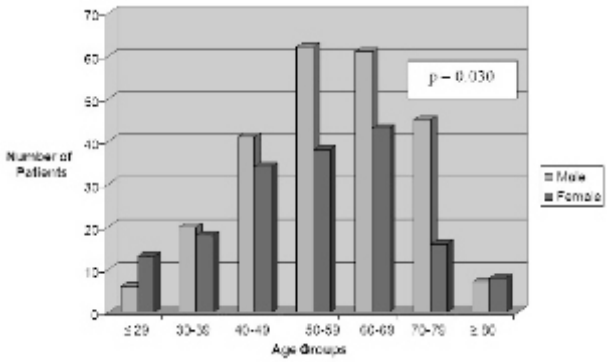


**Fig-1. Male and female patients in different age groups**

## DISCUSSION

The latest Saudi Cancer Registry and Cancer Incidence Report Saudi Arabia published in 2008 showed more males affected (52.9%) than females (47.1%). CRC was ranked first among males and third among females. The percentage of male and female was 58% and 42% respectively

| Symptoms | Gender | | P value (≤0.05 significant) |
|---|---|---|---|
| | Male N=243 | Female N=171 | |
| **Loss of appetite and weight** | **Loss** | | |
| yes | 62 | 39 | 0.481 |
| No | 160 | 121 | |
| **Abdominal pain** | | | |
| yes | 101 | 98 | 0.002 |
| No | 121 | 62 | |
| **Abdominal distension** | | | |
| yes | 38 | 35 | 0.243 |
| No | 184 | 125 | |
| **Diarrhea /loose motion** | | | |
| yes | 19 | 26 | 0.021 |
| No | 203 | 134 | |
| **Constipation** | | | |
| yes | 74 | 46 | 0.341 |
| No | 148 | 114 | |
| **Bleeding per rectum** | | | |
| yes | 120 | 86 | 0.953 |
| No | 102 | 74 | |
| **Symptomatic anemia** | | | |
| yes | 16 | 4 | 0.060 |
| no | 206 | 155 | |
| **Surgical abdomen** | | | |
| No surgical abdomen | 184 | 135 | 0.935 |
| Obstruction | 33 | 20 | |
| Bleeding | 2 | 2 | |
| Perforation | 1 | 1 | |
| **Synchronous** | | | |
| Cancer | 1 | 5 | 0.039 |
| Polyp | 36 | 17 | |
| None | 160 | 120 | |

Table-I. Symptoms in both genders

| Stage of disease | Gender | | P value (≤0.05 significant) |
|---|---|---|---|
| | Male N=243 | Female N=171 | |
| **T** | | | |
| 1 | 2 | 4 | 0.094 |
| 2 | 24 | 10 | |
| 3 | 122 | 92 | |
| 4 | 21 | 25 | |
| **N** | | | |
| 0 | 69 | 53 | 0.918 |
| 1 | 63 | 52 | |
| 2 | 35 | 24 | |
| 3 | 1 | 1 | |
| **M** | | | |
| 0 | 142 | 90 | 0.270 |
| 1 | 81 | 65 | |
| **Dukes** | | | |
| A | 4 | 6 | 0.298 |
| B | 73 | 41 | |
| C | 64 | 46 | |
| D | 71 | 59 | |

Table-II. Stage of disease

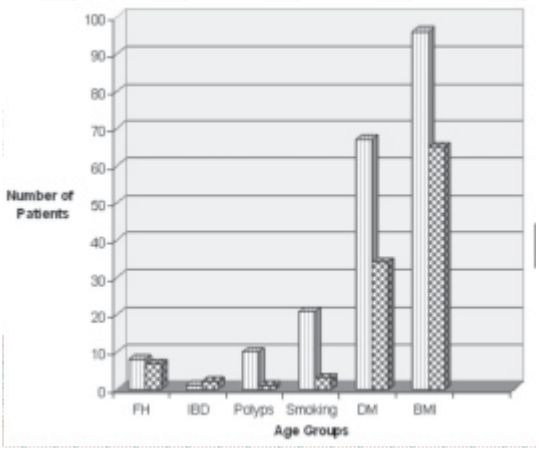


Fig-2. Risk factors in both genders

| CRC Features | Gender | | P value (≤0.05 significant) |
|---|---|---|---|
| | Male N=243 | Female N=171 | |
| **Tumor Site** | | | |
| Cecum & ascending | 33 | 24 | 0.605 |
| Hepatic flexure | 7 | 4 | |
| Transverse colon | 10 | 4 | |
| Splenic flexure colon | 17 | 8 | |
| Descending colon | 17 | 12 | |
| Sigmoid colon | 51 | 49 | |
| Rectum | 108 | 70 | |
| **Tumor subtype: Histopathology** | | | |
| Well differentiated | 41 | 25 | 0.938 |
| Moderately differentiated | 175 | 127 | |
| Poorly differentiated | 15 | 13 | |
| Non adenoca | 1 | 1 | |
| Mucionous adenocarcinoma | 8 | 3 | |
| Signet ring adenocarcinoma | 1 | 1 | |
| Infiltrating adenocarcinoma | 2 | 1 | |
| **Chemotherapy** | | | |
| yes | 180 | 129 | 1.000 |
| no | 39 | 27 | |
| **if yes** | | | |
| Preoperative | 80 | 33 | 0.001 |
| Postoperative | 101 | 96 | |

**Table-III. Site, histology, and treatment**

in Al Jibreen[13] study. This percentage was 57% and 43% respectively in Huzaim[14] study while the males and females were 58% and 42 % respectively in our study. Male patients were more than females especially in 5th, 6th and 7th decade as compared to the study of Tiffany[6] showing 43% males and 57% females.

In our study, male patients with diabetes Mellitus, smoking history and previous polyps were significantly greater than female patients. This finding is consistent with the study of Cambell[7] who found more association of CRC in diabetic patients and smoking in male patients compared to females. We observed that relatively fewer numbers of female patients underwent preoperative chemotherapy as compared to males which was statistically significant, in contrary to Nelson's study.

The mean CEA was 76.2 for females and 122.1 for males (P=0.433) in our study, while in Tiffany6 study males presented with a higher average (CEA) values compared to females. The most common presenting complaint in our study was abdominal pain among females 98/171 (57.3% vs. 41.5% p value 0.002) while there was no differences among both genders in reporting bleeding per rectum (50.2 % vs. 49.3% p value 0.953). In Tiffany[6] study, the most common symptom was rectal bleeding in both genders. A significantly higher incidence of smoking (9.4%) was identified in our male patients than in females (1.8%) similar to Tiffany[6] study (P value 0.002).

The majority had left sided CRC with no gender difference in respect of the site of CRC in our population. Tiffany reports only 35% of young males had left sided cancer while in our study, 81.2% vs. 79.4 %( p value 0.732) females and males respectively had left sided CRC. Moreover, Derwinger [3] and Sijo[5] reported more right sided CRC in females. The percentage of female and male patients who underwent surgical treatment were 173 (71%) and 140 (81.8%) respectively in our study as compared to the study of Carter[15] who reported 43% males and 57% females undergoing surgical treatment. Patients presenting with acute abdomen in their study were 45% females versus 41% males as compared to total 59 patients in our

study in which 36 (14.8%) were males and 23 (13.4%) were females. In our study female patients also presented more commonly in stage II and III disease similar to study of Carter[15] in which women were more likely to present with Stage II or III disease. Only 33(19.2%) female patients received preoperative chemotherapy compared to 80(32.9%) male patients P = 0.001. Both genders received preoperative radiotherapy equally.

The observed differences may be due to cultural and regional causes. Gender comparative studies are sparse in our part of the world and the majority of available data is from western countries. Our study is the first of its type in the region. The gender differences in terms of presenting symptoms and smoking may be due to cultural barriers. Females tend to report lower gastrointestinal symptoms much less than males. Another significant difference was that fewer female patients received preoperative chemotherapy. It would be interesting to see if this has affected their overall outcome.

Although our study has a large volume, it has got limitations of being a retrospective chart review and there is missing data which is not adjusted for in statistical analysis. Other explanations may be confounding factors and social issues like dietary habits (changing to fast foods), consanguinity and increasing obesity and diabetes mellitus. To confirm our observations, we suggest further prospective studies and a regional colon cancer registry to be initiated.

## CONCLUSIONS

We conclude from our study of colon cancer that there are important gender differences in terms of younger female patients and greater association of smoking, DM and previous colonic polyps among males while abdominal pain was reported more often in females. There are no gender differences regarding TNM and Dukes stage of disease (T3 N1 M0) but fewer females received preoperative chemotherapy. Further studies are indicated to confirm these findings. These observations should be taken in consideration in making colorectal screening guidelines and public awareness programs.



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