Global Advanced Research Journal of Medicine and Medical Sciences (ISSN: 2315-5159) Vol. 5(10) pp. 264-268, October, 2016
Available online http://garj.org/garjmms

Full Length Research Paper

Clinicopathological Pattern of Colorectal Cancer in Tabuk Region, Saudi Arabia

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Accepted 21 October, 2016

Colorectal cancer is a common cancer in Saudi Arabia. This study aims to investigate the clinical and the pathological features of the disease in Tabuk region. Records of all patients diagnosed with colorectal cancer at the three main referral hospitals in Tabuk region; King Fahd Hospital, King Khaled Hospital and King Salman military hospital between 2010 and 2014 were retrieved retrospectively. Seventy-two patients were included. Saudi patients were 67 (94.4%) while four patients were non-Saudi (5.6%). The mean age of the patients is 56.4 ± 15.1 years (21 to 89 years). The male to female ration is 1.7:1. Fifty patients (69.4%) presented as cold cases while the rest presented acutely. The most common presenting symptom was rectal bleeding (83.4%) followed by alteration of bowel habits (39.2%), abdominal pain (37.3%), weight loss (25.5), anemia (17.6%), abdominal mass (13.7%). Left-sided tumors accounted for 73.6% while right-sided tumors comprised 26.4%. The rectum was the most common affected site (36.1%) followed by the sigmoid colon (27.8%). Synchronous tumors were found in 5 patients (6.9%), and moderately differentiated (63.4%) adenocarcinoma (98.6%) were the major pathological features.91.1% of patients presented with advanced stage and 29.9% with metastatic disease. The clinicopathological features of CRC in Tabuk region is similar to other regions in Saudi Arabia. However, a higher percentage of patients tend to present with an advanced stage of the disease.

Keywords: Colorectal, Cancer, advanced stage, Tabuk, Saudi Arabia.

INTRODUCTION

Colorectal cancer (CRC) is a common disease and one of the leading causes of cancer-related deaths worldwide (Al-Ahwal et al., 2013). In Saudi Arabia, the incidence of the disease is rising dramatically and has doubled in the last two decades. Since the publication of the first report of the Saudi cancer registry in 1996, the incidence of CRC has risen from 5.5% to reach as twice as much (11.0%) in 2011 (Saudi Cancer Registry, 2011). Al-Radi et al. (2000) in the Western region of Saudi Arabia, have shown that CRC is the most common gastrointestinal malignancy in contrary to the previous studies which labeled the disease as uncommon in that area (Al-Radi et al., 2000). The disease is ranked the first among males and the second among females in almost a consistent pattern through all provinces and health jurisdictions in the Kingdom (Saudi Cancer Registry, 2011). Investigators from different parts of the country have tried

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to study the clinical and pathological features of the disease and to highlight any differences within the local, regional and international communities. Most of these studies have demonstrated male preponderance and an increasing number of patients developing the tumor at young age (Mansoor et al., 2002; Eltinay et al., 2006). Left-sided tumors were more frequently encountered than right-sided ones; however, Eltinay and Guraya contradict this in their study at King Khalid University Hospital in Riyadh in 2006,where they defined a rightward shift in the pattern of CRC tumors (Guraya et al., 2006) Many studies have consistently indicated adenocarcinoma as the main histological type of the tumor (ranging between 81 and 100%) and that most of the patients present with an advanced stage of the disease (Dude`s C and D between 61.2 and 68%) (Amin et al., 2012; Aljebreen et al., 2007; Ayyub et al., 2002). In contrary, Mansoor et al. (2002) in a study at King Abdul-Aziz University Hospital in Jeddah, have found 61.5% of CRC patients in their series presenting with localized disease Duke`s stage A and B, (Mansoor et al., 2002). Synchronous tumors tend to happen at a higher rate (25%) as concluded by Aljebreen in his 10-year study in Riyadh in 2007 (Aljebreen et al., 2007). Data from Gulf States (Rasul et al., 2001; Basaleem et al., 2004; Al-Shamsi et al., 2003), and other regional countries (Missaoui et al., 2010; Al-Jaberi et al.; 2003; Abdalla et al., 2010) appear to share the same pattern of CRC tumors as in the Kingdom of Saudi Arabia.

According to the last report of the Saudi Cancer Registry (2011), Tabuk province, situated in the north-west part of the Kingdom, comes as the fifth most common region of CRC tumors in the Kingdom in both males and females. However, there is no study done in this area regarding this common disease. This study aims to highlight the clinical and pathological features of CRC in Tabuk region in view of the results of similar studies in the Kingdom and outside, and to serve as a trigger for further research in the field.

METHODS

This is a retrospective hospital-based descriptive study conducted in the three main referral hospitals in Tabuk region namely; King Khalid Hospital, King Fahd Hospital, and King Salman armed forces Hospital. Data of all patients presented with CRC tumors over 5-year period between 2010 and 2014 were retrieved from patients` records at the departments of statistics in the three hospitals. Demographic characteristics of the patients (age, sex and nationality), the clinical mode of presentation, the pathological features and the stage of the tumors, in addition to the treatment modalities applied were investigated. Data were analyzed using the "Statistical Package of Social Sciences" computer software (SPSS) version 16.

RESULTS

The study included 72 patients who were diagnosed with CRC in the three hospitals during the study period. Sixty-seven patients were Saudi (94.4%) while four patients were non-Saudi (5.6%) who were from South East Asia. The mean age was 56.4 ± 15.1 years (range; 21 to 89 years). Male patients were 45 (62.5%) while female patients were 27 (37.5%) (Figure 1). The male to female ration is 1.7:1. Fifty patients (69.4%) were referred as cold cases while the rest presented acutely. Rectal bleeding was the most common mode of presentation in cold cases (84.3%), followed by alteration in bowel habits (39.2%), abdominal pain (37.3%), weight loss (25.5%), anemia (17.6%), abdominal mass (13.7%) and spurious diarrhea (9.8%) as shown in table 1. Table 2 outlines the pathological features of the tumors. Left sided tumors were encountered in 53 patients accounting for 73.6% while right-sided tumors were identified in 19 patients (26.4%). The rectum was the most common site inflicted (36.1%) followed by the sigmoid colon (27.8%). Synchronous tumors were found in five patients giving rise to 6.9%. Histologically, 93% of the tumors were adenocarcinoma, 2.8% were Signet ring cell and mucinous carcinomas each, and there was one case of lymphoma (1.4%). The tumor was moderately-differentiated in 63.4% of the cases followed by well-differentiated (25.4%) and poorly-differentiated in 11.3%

Table 1. Frequency of Symptoms in Patients with Cold Presentation (N=51)*

Symptoms	Frequency	%
Rectal bleeding	43	84.3
Alteration in bowel habits	20	39.2
Abdominal pain	19	37.3
Weight loss	13	25.5
Anemia	9	17.6
Abdominal mass	7	13.7
Spurious diarrhea	5	9.8

*Multiple symptoms may apply in a single patient.

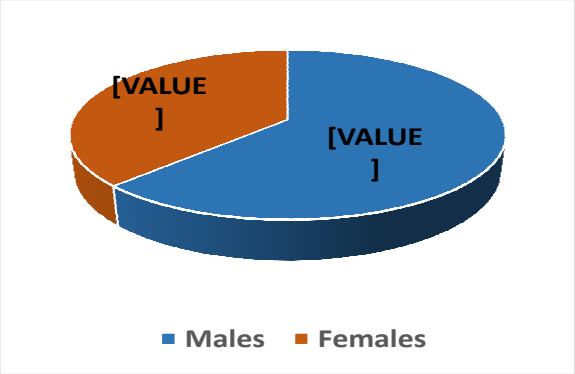

Figure 1. Gender Distribution of Patients with CRC (N=72).

Table 2. Tumor Site, Differentiation and Stage of the Tumor (N=72)

Pathology	Frequency	%
1. Tumor histology		
Adenocarcinoma	67	93
Signet ring cell	2	2.8
Mucinous carcinoma	2	2.8
Lymphoma	1	1.4
Total	72	100
2. Tumor site:		
Left-sided		
Rectum	26	36.1
Sigmoid colon	20	27.8
Splenic flexure	5	6.9
Descending colon	2	2.8
Total	53	73.6
Right-sided		
Cecum	7	9.7
Hepatic flexure	7	9.7
Transverse colon	3	4.2
Ascending colon	2	2.8
Total	19	26.4
3. Tumor stage (Duke`s):		
A	0	0
B	6	9
C1	17	25.4
C2	24	35.8
D	20	29.8
Total	67*	100
4. Differentiation:		
Well	18	25.3
Moderate	45	63.4
Poor	8	11.3
Total	71**	100
5. Metastasis (N=20):		
Liver	8	40
Lung	5	25
Peritoneum	5	25
Multiple sites	2	10
Total	20	100

*Five missing. **One missing.

Table 3. Tumor Site and the Advanced Stage of Presentation among Gender groups.

Gender\ Site-Stage	Gender		Total
	Males (N=45)	Females (N=27)	
Left sided	30 (66.6%)	23 (85.2%)	53
Right-sided	15 (33.3%)	4 (14.8%)	19
Advanced stage (C+D)	37 (90%)	24 (88.9%)	61
Metastatic disease	15 (36.6%)*	5 (19.2%)**	20

§ Percentages are out of males and females. *N=41 (4 missing), **N=26 (0ne missing).

of the cases. Regarding the stage of the tumor, 41 patients presented in stage C (61.2%), 20 patients in stage D (29.9%), 9 patients in stage B (9%) and no patient presented in stage A. Metastasis was to the liver in 8 patients (40%), to the lung in 5 patients (25%), to the peritoneum (ascites) in 5 cases (25%) and in multiple sites in two patients (10%). Sixty-one patients presented with advanced stage (C+D) representing 91.1%. Table 3 shows that left-sided tumors were more commonly encountered in females than in males (85.2% and 66.6% respectively), equal proportions of males and females presented with an advanced stage of the disease (90% and 88.9% respectively), while greater proportion of males presented with metastatic disease (36.6% and 19.2% respectively), however these results are not statistically significant. Table 4 shows the treatment modalities applied to the patients. Curative procedures were done in 46 patients (68.7%) while palliative treatment was applied to 21 patients (31.3%). Fifteen patients (20.8%) developed complication following surgical treatment. The frequency and nature of these complications are shown in table 5. Three patients died during the study period accounting for mortality rate of 4.2%. Eight patients (11.1%) have experienced delayed diagnosis in whom symptoms have been attributed to other conditions and there was time lapse before the diagnosis of CRC is finally established.

Table 4. Frequency of Curative and Palliative Procedures Done (N=71*).

Procedure	Curative	Palliative
APR	5	-
Anterior Resection	5	-
Left hemicolectomy	15	-
Right hemicolectomy	21	-
Total Colectomy	5	-
Palliative colostomy	-	11
Palliative Chemoradiation	-	9
Total	51 (71.8%)	20 (28.2%)

*One missing.

Table 5. Frequency and Nature of Complications of Surgical Procedures Done (N=15)

Complication	Frequency	%
Surgical site infection	4	26.7
Intestinal obstruction (adhesive)	3	20
Colostomy-related	2	13.3
Perineal sepsis	2	13.3
DVT	2	13.3
Anastomotic leak	1	6.7
One-sided hydronephrosis	1	6.7
Total	15	100

DISCUSSION

An increasing incidence of CRC is reported from different regions in Saudi Arabia. Tabuk region, which is situated in the far North West part of the Kingdom, has experienced a double increase in the incidence in the last two decades and is considered among the areas of the highest incidence in Saudi Arabia. Development of CRC has been related in the literature to genetic and environmental factors. The local community of Tabuk has urbanized in the last few decades, which was accompanied by significant changes in lifestyle of the population particularly their diet. The consumption of fast food meals with its high content of fats and proteins has flourished recently and may explain partially the rapid increase in the incidence of the disease. Although few patients have harbored adenomatous polyposis coli, family history of CRC was not identified in most of the patients in our study. Most of the cases of CRC may be sporadic;however,a study of 83 CRC patients in Riyadh in 2014 has declared an increased incidence of KRAS mutation among those patients in Saudi Arabia (Bader et al., 2014). An increased tendency of hereditary CRC among the Saudi population was also suggested by Bavi et al. (2008) and Al-Kuraya et al. (2006) (Bavi et al., 2008; Al-Kuraya et al., 2006). Lack of data regarding the predisposing factors of CRC in the patients` records would necessitate conduction of prospective studies to evaluate the role of genetics and other predisposing factors in initiation of CRC. The improvement in the health facilities and availability of diagnostic equipment may have contributed to the increase in the detection rate and explain the rising incidence of the disease.

The predominance of left-sided tumors in this study is consistent with the published results in other regions of the Kingdom. Guraya and Eltinay (2006) have claimed a rightward shift pattern of CRC tumors in their series (Guraya et al., 2006). However, Abduljabbar (2006) have argued the validity of their result owing to the small number of patients in the study (Abduljabbar et al., 2007). Al-Kuraya et al. (2006) have reported a higher incidence of right-sided tumors in Saudi Arabia (46.6%) in comparison to western countries but this is not supported neither by our study nor by other studies in the Kingdom. Many studies done in different areas in Saudi Arabia (Riyadh, Jeddah, Al Hassa) have shown predilection rates of right and left sides of the colon similar to this study and that seems fairly constant all over the Kingdom (Eltinay et al., 2006; Amin et al., 2012; Aljebreen et al., 2007; Ayyub et al., 2002).

A remarkable finding of this study is the high percentage of patients presenting with an advanced stage of the disease (91.1%). Another interesting finding is that no patients presented in stage A which coincides with the result of Ayyub and his colleagues at King Abdul Aziz Hospital in Jeddah in 2002 (Ayyub et al., 2002). Investigators in other parts of the Kingdom have reported high percentages of advanced stages of CRC tumors; however, the percentage in this study is still much higher. Eltinay and Gyraya (2006) have reported a 67% of advanced presentation (Eltinay et al., 2006). Amin and his colleagues (2012) reported that 62.7% of their patients presented in advanced stage (Amin et al., 2012). For Aljebreen (2007) it was 68% (Aljebreen et al., 2007) and according to ayyub and his colleagues (2002), it was 61.2% (Ayyub et al., 2002). We suggest that the health authorities in Tabuk region should endeavor to increase the awareness of the public about the warning symptoms of CRC through health education initiatives and to design and promote implementation of screening programs for the disease, which would help detect patient at an early stage. According to the patients' records, we identified 8 patients (11.1%) who experienced delayed diagnosis; their symptoms were related initially to other condition and they proved later to have CRC. It is understandable that many factors could have contributed to this result, however raising the awareness of health practitioners regarding the commonality of CRC in this region together with disseminating and encouraging the use of guidelines of CRC diagnosis established by national health systems (Bazarbashi et al., 2014) would count to better outcome of the disease, indeed.

CONCLUSION

The clinical and pathological features of CRC in Tabuk region coincides with the pattern of the disease in other regions in Saudi Arabia. Of special note is the high percentage of patients presenting with an advanced stage of the disease, whichrequire collaboration of efforts to educate the public about the disease and implement suitable screening programs. We recommend future prospective studies to delineate the role of genetics and other predisposing factors that interplay in initiation of CRC in Tabuk region.

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