Clinicopathological pattern of colorectal cancer in the United Arab Emirates

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ABSTRACT

Objective: The aim of this study is to define the epidemiology of the colorectal cancer in the United Arab Emirates and compare it with the other Gulf States and developed countries.

Methods: This study is a retrospective descriptive study that includes 114 patients who underwent surgeries for colorectal carcinoma at Al-Ain and Tawam Hospitals in the United Arab Emirates during the period 1985 through to 1998. These patients were under medical follow up for a mean period of 24 months (range 6-120 months) Both univariate and multivariate analyses were performed to assess predictors of recurrence and survival. The survival curves were computed by using Kaplan-Meier method.

Results: Mean annual incidence was 12 patients/year. There were 77 males (67.5%) and 37 females (32.5%). The mean age at the time of diagnosis was 46.6 ± 11.8 years with the median

age of 47 years. The mean overall survival time was 63.7 ± 7.7 months. The survival time was shorter for younger patients, those with palliative resection, lymph node metastasis and peritoneal nodules. In multivariate Cox proportional hazards analysis the hazard ratio for positive lymph nodes was 2.30 (95% confidence intervals (CI) 1.22-4.50) as compared to negative nodes and a hazard ratio of 0.52 (95% CI 0.32-0.89) for Dukes stages A and B as compared to Stage C.

Conclusion: Colorectal carcinoma is not a common disease in the United Arab Emirates. In general, the incidence pattern is similar to that of neighboring Gulf and Arab countries. The main reasons of low incidence of colorectal cancer in these countries could be due to the dietary factors, which is intake of more fruit and vegetables.

During the last 3 decades, the United Arab Emirates has experienced a rapid development in many aspects of life and all this had affected the prevalence pattern of cancer. Colorectal cancer is one of the most common human malignancies, and has been well documented.[1] Carcinoma of the colon and rectum accounts for more than 150,000 deaths annually worldwide. It is considered the second most frequent causes of death in most of the Western Countries after cancer of the lung in men and breast and lung cancer in women.[2] Colon cancer is common in women and rectal

cancer in men.[3,4] Furthermore, some study showed that colorectal cancer is the leading type of cancer in Western countries. Over the last decades, its trends have been generally more favorable for women than men.[5] New studies in molecular biology and genetics of colorectal cancer have provided clues to its etiology, and the high risk populations who are most likely to benefit from preventive measures can be identified.[4]

However, since colorectal cancer is highly influenced by environmental changes and including life style factors[6,7] it is obvious that in the coming years colorectal

cancer will be one of the major types of cancer to be tackled in the Emirates. The aim of this study is to define the epidemiology of the colorectal cancer in the United Arab Emirates and compare it with other Gulf and developed countries.

Methods. This study is based on the data of 114 patients who underwent surgeries for colorectal carcinoma at Al-Ain and Tawam Hospitals, Al-Ain, United Arab Emirates during the period 1985 to 1998. Tawam Hospital is recognized as a tertiary treatment center for cancer cases in the United Arab Emirates. There were 77 males and 37 females with a male/female ratio of 2:1. Their ages ranged from 13-85 years with a mean and standard deviation of 46.6 ± 11.8. The dates of cancer specific death and local or distant recurrence were recorded. The patients' files in the Surgery Department were reviewed to obtain the following operative data: tumor subsite, type of operation (whether emergency or elective), type of resection (whether radical or palliative), lymph node involvement, intraperitoneal tumor spread and presence of liver metastasis. The clinicopathologic parameters studied for prognostic value were age, gender, resection procedure, tumor size, depth invasion, nodal involvement, and differentiation grade. These patients were under medical follow-up for a mean period of 24 months (range 6-12 months).

The statistical package for social science computer program[8] was used to calculate Fisher exact and Chi-square tests to ascertain the association between 2 or more categorical variables. Student-t test was used to ascertain the significance of differences between mean values of 2 continuous variables. Analyses of survival curves were determined by the Kaplan-Meier Method, and differences in survival compared by the log rank test. Multivariate analysis by Cox model of proportional hazard was used to incorporate all the explanatory variables. Forward stepwise procedures and likelihood ratios test were used to select independent variables with the greatest prognostic value.

Results. During the last 13-years, a total of 114 patients with colorectal cancer were diagnosed and referred to Tawam and Al-Ain Hospitals in the United Arab Emirates. Mean annual incidence was 12 patients/year. There were 77 males (67.5%) and 37 females (32.5%), with a male/female ratio of 2:1. The total of national and Omani patients was 44 (38.6%) and non-UAE nationals were 70 (61.4%). The mean age at the time of diagnosis is 46.6 ± 11.8 years with the median age of 47 years. The age of highest occurrence was between 41-50 years and accounted to 34.2%, while the lowest accounted to 7.9% of the patients were below the age of 30 years. The mean overall survival time was 63.7 ± 7.7 Months with a range of 6 and 120 months. The socio-demographic and clinicopathologic characteristics of studied patients are shown in **Table 1**.

Table 2 gives the relationship between mean survival time and clinicopathologic findings. The mean survival time was significantly shorter for patients aged 40-years or less (p<0.001). Patients treated by palliative resection had a highly significant shorter survival than patients who underwent potentially curative surgery (p<0.001). The mean survival time was significantly related to the lymph node status, peritoneal spread, liver metastasis and Dukes' staging (p<0.001) for each factor. The mean survival time was also significantly shorter for patients with poorly differentiated tumors than those with well-differentiated tumors (p<0.01). Although, the patients involved with proximal, distal and/or lateral surgical margins showed a shorter mean survival time (p<0.01). **Figure 1** shows the Kaplan-Meier survival curves for lymph node status. The predictor was significant as shown by the log rank test (p<0.001 for lymph node positivity. In the Cox proportional hazards analysis presence of lymph nodes and Duke staging only were significant as shown by the hazard ratios. The hazard ratio for positive lymph nodes was 2.30 (95% Confidence interval (CI) 1.22-4.50) as compared to negative nodes and a hazard ratio of 0.52 (95% CI 0.32-0.89) for Dukes stages A and B as compared to Stage C.

Discussion. Cancer of colon and rectum was the third most frequent type of cancer world-wide in males and females.[1] The most recent results showed that the most common cancers in terms of new cases ranked lung cancer first (1.2 million), breast cancer second (1.05 million) and followed by colorectal cancer (945,000).[1] In European Countries,[9] the most common primary sites were lungs (22% of all cancers), followed by colon and rectum (12%) in men and in females breast cancer ranked first (26%) then colon and rectum (14%). The present study aimed to find the pattern of patients with colorectal cancer seen at both Tawam and Al-Ain Teaching Hospitals over a period of 13-years retrospectively with a view to determine the epidemiological and clinicopathological characteristics of this malignancy. The age standardized incidence rate for colorectal cancer in United Arab Emirates was 6.8/ 100,000 person per year. There must be important protective factors, possibly dietary, that can contribute to lowering this risk. Therefore, this would be an important area of research for future studies. Some epidemiological studies demonstrated the importance of genetic and environmental factors that play an important role in the pathogenesis of carcinoma of the colon and rectum.[3,10-13] Worldwide, the incidence of colorectal cancer varies widely; it varies from 1.7 cases per 100,000 person per year in some Western African countries to 51.7 cases per 100,000 person per year in North America.[1] The incidence rate of colorectal cancer in Arabian and Gulf Countries showed that 3.8/100,000 in Jordan,[14] 7.5/1000,000 in Qatar,[15] and 4.5/100,000 in Kingdom of Saudi Arabia, (KSA).[17] These rates are in

Table 1 - The clinicopathological characteristics of patients studied (N=114).

Variable	Frequency	(%)
Sex		
Male	77	(68)
Female	37	(32)
Age		
<40	12	(11)
≥40	102	(89)
Tumor site		
Right colon	38	(33)
Left colon	35	(31)
Rectum	41	(36)
Type of operation		
Elective	82	(72)
Emergency	18	(16)
Type of resection		
Curative	101	(89)
Palliative	13	(11)
Lymph node		
Negative	42	(37)
Positive	72	(63)
Peritoneal nodules		
Negative	87	(76)
Postive	27	(24)
Liver metastasis		
Negative	91	(80)
Positive	23	(20)
Tumor type		
Adenocarcinoma	103	(90)
Mucoid carcinoma	11	(10)
Tumor grade	53	(46)
1	51	(45)
2	10	(9)
3		
Duke's stage		
A	8	(7)
B	34	(30)
C	72	(63)
Proximal and distal margins		
Negative	88	(77)
Positive	26	(23)
Lateral margins		
Negative	87	(76)
Positive	27	(24)

Table 2 - The relationship between mean survival time and clinicopathological findings - univariate analysis.

Variable	Frequency	(%)	p-value significance
Sex			
Male	41	(63.1)	
Female	24	(36.9)	NS
Age			
<40	7	(10.8)	
≥40	58	(89.2)	$p < 0.05$
Tumor site			
Right colon	27	(41.5)	
Left colon	20	(30.8)	NS
Rectum	18	(27.7)	
Type of operation			
Elective	47	(72.3)	
Emergency	18	(27.7)	$p < 0.001$
Type of resection			
Curative	58	(89.2)	
Palliative	7	(10.8)	$p < 0.001$
Lymph node			
Negative	61	(95)	
Positive	4	(5)	$p < 0.001$
Peritoneal nodules			
Negative	55	(85)	
Postive	10	(15)	NS
Liver metastasis			
Negative	62	(4.6)	
Positive	3	(95.4)	$p < 0.001$
Tumor type			
Adenocarcinoma	60	(92.3)	
Mucoid carcinoma	5	(7.7)	NS
Tumor grade			
1	26	(40)	
2	35	(50)	NS
3	4	(6.7)	
Duke's stage			
A + B	49	(75.3)	
C	16	(24.7)	$p < 0.001$
Proximal and distal margins			
Negative	50	(76.9)	
Positive	15	(23.1)	$p < 0.05$
Lateral margins			
Negative	52	(80)	
Positive	13	(20)	$p < 0.01$

interventions.[1] Most of the researchers have found that there is a direct correlation between the fat intake in the diet and the incidence of colon cancer.[11] The low incidence of colorectal carcinoma in most developing countries have been attributed to the fiber-rich diet consumed in these countries.[10] It has been suggested that fiber-rich diet gives protection against colonic carcinogenesis.[19] A set of tumor and surgery-related factors such as patient age, type of surgery whether elective or emergency, type of resection whether curative or palliative, tumor types whether mucoid or not, degree of tumor differentiation, stage of tumor infiltration (according to Dukes), resection margins including proximal, distal and lateral margins, lymph node status, liver metastasis, and peritoneal spread can successfully predict the outcome of patients with colorectal cancer. These factors would help in selecting patients at higher risk of cancer recurrence and shorter survival in whom adjuvant therapy (chemotherapy or radiotherapy), or both may be helpful.

In conclusion, colorectal carcinoma is not a common disease in this developing country. In general, the incidence rate is similar to that reported from other neighboring Arabian and Gulf Countries like Jordan,[14] KSA[3,10,17,18] and Qatar.[15] The main reasons of low incidence of colorectal cancer in these countries could be due to the dietary factors, which is intake of fruits and vegetables. However, colorectal cancer in these countries tends to affect the young age group in a higher percentage than the other parts of the world. It could be due to the high percentage of young population or some other factors like environmental and genetics. Therefore, a comprehensive cancer health education and screening program should be well planned and implement it for an early detection and prevention of this disease. We hope that future prospective studies will help us to identify genetics and environmental factors associated with the changing epidemiological pattern of colorectal cancer in the United Arab Emirates.

Country	Male	Female
Eastern Africa	2.4	1.9
Australia	46.3	46.2
Northern America	51.7	51.7
Western Asia	5.6	5.6
Pakistan	5.1	5.2
Qatar	8.7	6.3
Kingdom of Saudi Arabia	4.6	4.4
United Arab Emirates	6.9	6.3 (from the present study)

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