

Distribution of Risk Factors in Patients with Colorectal Cancer in Saudi Arabia

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Abstract:

Objective: To identify the risk factors for Colorectal Cancer (CRC) at King Abdulaziz University Hospital (KAUH) in the western region of Saudi Arabia.

Methods: Clinical, pathological and risk factors data of all patients with CRC managed at KAUH, over a 10 years period (1993-2002) were collected and analyzed retrospectively. Risk factors, were then correlated with sex and race (Saudis vs Non-Saudis).

Results: Out of 90 patients evaluated, 5 were excluded because of incomplete data. Out of 85 patients, 45 (52.9%) patients were males, 40 (47.1%) females, 33 (38.8) Saudis and 52 (61.2%) were Non-Saudis. The Majority were Asians; 81 out of 85 patients (95.3%) and 4 African (4.7%). Comparisons between males and females revealed no difference for all the following risk factors; familial causes, polyps, Inflammatory bowel disease (IBD), High fat low fiber diet, Non steroidal anti inflammatory drugs (NSAIDS) use and Obesity. Comparisons between Saudis and Non-Saudis revealed no difference in all mentioned risk factors except for familial causes which was found higher among Saudis versus Non-Saudis (15.2% vs 1.9%, $P = 0.031$).

Conclusions: Risk factors for CRC are present in this study population especially dietary habits and obesity. Familial risk factors were higher among Saudis than Non Saudis. The relative high frequency of some risk factors calls for family screening and surveillance.

Key words: Colorectal Cancer, Risk factors, Saudi Arabia

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Introduction:

Colorectal cancer is the second most common cancer in Europe. The estimated number of cases diagnosed in 2004 was 376,400, which is 13% of all incident cases⁽¹⁾. Between January 1999 and December 2000 there were 753 cases of CRC accounting for 6.6% of all 11,330 newly diagnosed cases in the kingdom of Saudi Arabia according to the latest cancer incidence report from the national cancer registry⁽²⁾. The overall Age Standardized Rate (ASR) was 4.9/100,000. The ASR was 5.0/100,000 in males and 4.7/100,000 in females. This cancer ranked fourth in both males and females with a Male: Female ratio of 107: 100⁽²⁾.

A risk factor is a trait that increases a persons chance of developing a disease or makes a person more likely to get to a certain condition such as cancer. Although the exact cause of CRC is not known, there are some factors that increase a persons risk of developing the disease. The most common and known risk factors are; Old age, gender (women have a higher risk for colon cancer while men are more likely to develop rectal cancer), high fat low fiber diet, polyps, positive family history of CRC, past history of ovarian, uterine or breast cancer and finally life style factors such as smoking, not getting enough exercise, drinking alcohol especially high consumption and not the type of alcohol used or being over weight^(3,4). There are so many differences between western and eastern communities, especially life style and dietary habits which may lead to differences in cancer causation. Risk factors for CRC in Saudi and Non Saudi population living in Saudi Arabia were, not evaluated or studied previously. The purpose of this study was to review the pattern of clinical presentation of CRC patients at KAUH, western region of Saudi Arabia as well as their risk factors and the relation to sex and race of either Saudis or Non-Saudis, which are mainly Asians. This will give us an idea about risk factors in our society which will have an impact in identifying persons at high risk of developing CRC and hence more support in screening, early detection and prevention.

Materials and Methods:

This is a retrospective hospital based study of all patients diagnosed to have CRC at KAUH, western region of Saudi

Arabia over a 10 years period from 1993-2002. Data, were collected from the medical records at KAUH. Characteristics of these patients; Age, Sex, Race (Saudis vs Non-Saudis), Stage using TNM staging system, Carcinoembryonic antigen (CEA) level, as well as all known risk factors for CRC (*Table 1*) were analyzed. Regarding age, patients were divided in to two groups; group-I less than 50 years of age and group-II of more than 50 years. Regarding race, they were, divided in to Saudis and Non Saudis. Carcinoembryonic antigen was considered high when level is more than 5 ng/ml. Data of all risk factors were collected as yes if present and no if absent. Almost 90 percent of Non Saudis of our study population have lived for 10 years or more in Saudi Arabia. Familial risk factors using the Amsterdam Criteria were used, to identify potential candidates for Hereditary Nonpolyposis Colorectal cancer (HNPCC) and the presence of any positive family history of hereditary cause like Familial adenomatous polyposis syndrome. Regarding diet, all patients with high fat intake, low fiber diet or both were, considered positive but other patients or unknown were considered negative. Obesity was, considered positive as a risk factor by using body mass index (BMI) which is weight in kilogram/square of height in meters. Subjects were considered obese if their BMI was 30 or above. All risk factors were, correlated with sex (Males vs Females) and race (Saudis vs Non Saudis). Statistical analysis using SPSS program for correlation between different groups were, determined by using Chi-square and Fishers exact tests. A p-value of < 0.05 was, considered significant.

Results:

Ninety patients were, diagnosed as having CRC over 10 years, period. Five patients were, excluded because of incomplete data especially for risk factors. Eighty-five patient's descriptive data were, tabulated according to their frequency distribution. Forty-two patients (49.4%) were < 50 years of age and 43 (50.6%) above 50 years. Colon cancer was higher in patients >50 years of age; 28 (59.6%) compared to 19 patients (40.4%) < 50 years of age while rectal cancer was higher in patients < 50 years of age than above 50 years; 23 (60.5%) versus 15 (39.5%) with a p-value of 0.083. Males were 45 (52.9%) where as females 40 (47.1%) with a male: female ratio of 1.13:1. Thirty three patients were Saudis (38.8%) and 52 (61.2%) were Non Saudis. The majority were Asian in origin; 81 patients (95.3%) and only 4 (4.7%) from Africa. Colon cancer was, found in 47 patients (55.3%) while rectal cancer was, found in 38 patients (44.7%). Colon and rectal cancers were both found higher among males than females; 25 (53.2%) vs 22 (46.8%), 20 (52.6%) vs 18 (47.4%) respectively. Regarding stage, 30 patients presented with localized disease (35.3%), 12 patients with loco-regional disease (14.1%), 23 patients (27.1%) with distant metastasis and 20 patients (23.5%) were unknown. All risk factors are, summarized in *Table 1*. Hyperlipidemia was found in

seven patients (8.2%) by chance during data collection. Comparison of all risk factors between males and females are, summarized in *Table 2*. Comparison of all risk factors between Saudis and Non Saudis are, summarized in *Table 3*. Familial causes was the only risk factor which was found significantly higher among Saudis vs Non Saudis (15.2% vs 1.9%) with a p-value of =0.031. Three out of five Saudis with familial risk factors had positive family history for CRC, one with ovarian and uterine cancers and the fifth patient with familial adenomatous polyposis syndrome while, the Non Saudi patient had strong positive family history of CRC.

Table 1: Characteristics of the study population (Colorectal Cancer Patients) and the frequency distribution of their risk factors.

Character	Number	%	
Age	< 50 Y	42	49.4
	> 50 Y	43	50.6
Sex	Male	45	52.9
	Female	40	47.1
Race	Saudi	33	38.8
	Non-Saudi	52	61.2
Diagnosis	Colon Cancer	47	55.3
	Rectal Cancer	38	44.7
Stage (TNM)	t (is) n0m0	1	1.2
	t1-2 n0m0	9	10.6
	t3-4 n0m0	20	23.5
	any (t) n1-2 m0	12	14.1
	any (t) any (n) m1	23	27.1
unknown	20	23.5	
CEA Level	High	37	43.5
	Normal	48	56.5
Risk Factors:			
- Familial	Yes	6	7.1
	No	79	92.9
- Polyps	Yes	8	9.4
	No	77	90.6
- I.B.D.	Yes	5	5.9
	No	80	94.1
- High Fat Intake	Yes	60	70.6
	No	25	29.4
- NSAID'S Use	Yes	5	5.9
	No	80	94.1
- Obesity	Yes	18	21.2
	No	67	78.8

IBD = Inflammatory Bowel Disease

NSAIDs = Non Steroidal Anti-inflammatory Drugs

Table 2: Relation between sex and risk factors for Colorectal cancer in our study population.

Risk Factors	Males		Females		P= Value
	No.	%	No.	%	
Familial (Y)	4	8.9	2	5	0.679
Polyps (Y)	4	8.9	4	10	1.00
I.B.D. (Y)	3	6.7	2	5	1.00
High Fat Intake (Y)	31	68.9	29	72.5	0.813
NSAIDs Use (N)	44	97.8	36	90	0.183
Obesity (Y)	7	15.6	11	27.5	0.196

IBD = Inflammatory Bowel Disease; Y = Yes; N = No
NSAIDs = Non Steroidal Anti-inflammatory Drugs

Table 3: Relation between race and risk factors for Colorectal cancer in our study population.

Risk Factors	Saudis		Non-Saudis		P= Value
	No.	%	No.	%	
Familial (Y)	5	15.2	1	1.9	0.031
Polyps (Y)	4	12.1	4	7.7	0.705
I.B.D. (Y)	2	6.1	3	5.8	1.000
High Fat Intake (Y)	24	72.7	36	69.2	0.810
NSAIDs Use (N)	31	93.9	49	94.2	1.000
Obesity (Y)	10	30.3	8	15.4	0.112

IBD = Inflammatory Bowel Disease; Y = Yes; N = No
NSAIDs = Non Steroidal Anti-inflammatory Drugs

Discussion:

Colorectal cancer is the fourth most common malignancy in Saudi Arabia in both males and females⁽²⁾. Many risk factors are, known in the literature to cause CRC⁽³⁾. Risk factors for CRC patients in the Saudi population are unknown. Review of all risk factors in this study will give us an idea about present risk factors in our study population, which may give us some ideas about risk factors in our society.

Less than 10% of CRC cases in the western communities occur in patients younger than 50 years. In this study, 49.4% of CRC patients were below 50 years of age. Colorectal cancer patients younger than 40 years of age constituted 20.2% in Jordanian population⁽⁵⁾, where as in high risk, western communi-

ties it accounts for 2-6%^(6,7). A higher figure (35.6%) was, reported in Egypt^(8,9) and in Saudi Arabia (23%)⁽¹⁰⁾. Presence of high number of young patients with CRC at low risk communities necessitates for family screening and surveillance in the presence of any risk factors.

Regarding gender, Males were 45 (52.9%) where as females 40 (47.1%) with a male: female ratio of 1.13:1. Thirty-three patients were Saudis (38.8%) and 52 (61.2%) were Non Saudis. Other characteristics, were summarized in (Table 1).

Familial causes like positive family history of CRC, familial colorectal cancer syndromes were, found in six patients (7.1%) of our study population. There were no significant difference between males and females (8.9% vs 5%, p=0.679) but significantly higher among Saudis than Non Saudis (15.2% vs 1.9%, p=0.031). The presence of high frequency familial causes among Saudis with CRC, may be explained by high consanguineous marriages in our society. Polyps or adenomas and IBD as predisposing factors, were uncommon with no difference in relation to sex or race (Table 2, 3).

Dietary habits like high fat intake, low fiber diet was high in this study population (70.6%) with no significant difference between males and females or between Saudis and Non Saudis (Table 2, 3). This may be explained by most of our study population are Asian and having minor differences in life style habits. Poor dietary habits, high calorie intake and low exercise leads to obesity. Obesity by itself is a known risk factor for CRC. Several mechanisms have been, proposed to explain the relationships of obesity and inactivity to colon cancer risk, including alterations in prostaglandin activity and insulin sensitivity, changes in growth factor profiles and an increase in stool transit time through the colon⁽¹¹⁾. Obesity was present in 21.2% of our patients. It was more in females than males (27.5% vs 15.6%) which was not statistically significant (p=0.196). It was also found higher among Saudis versus Non Saudis (30.3% vs 15.4%, p=0.112). Smokers are 30% to 40% more likely than nonsmokers to die from CRC. Smoking may be responsible for causing about 12% of fatal CRC⁽³⁾. Tobacco use also causes about 2.5 - fold increased risk of adenomas⁽⁴⁾. An American Cancer Society study reported 40% lower mortality in regular aspirin users, and similar reduction were, seen in prolonged NSAIDs use in patients with rheumatological disorders. The new cyclooxygenase-2 (COX-2) inhibitor celecoxib was, recently approved by the US Food and Drug Administration (FDA) for adjunctive treatment of patients with familial adenomatous polyposis⁽⁷⁾. Majority of our patients 94.1% were not using any form of NSAIDs. There was no significant difference in relation to sex or race (Table 2, 3).

Our conclusions from this study is the need to conduct more epidemiologic studies to identify causes and predisposing factors in Asian and Arab countries. Measures to reduce prevent-

able risk factors like dietary habits and obesity are highly needed. Screening programs and guidelines are important, given its clear cost-effectiveness^(12,13). Such programs should be encouraged

through education and awareness of our patients and their families. This will help in early detection of new cases and hence earlier stages and higher chance of cure.

References:

1. Boyle P, Ferlay J. Cancer incidence and mortality in Europe, 2004. *Annals of Oncology*, 2005; 16 (3): 481-488.
2. Cancer Incidence Report, Saudi Arabia, 1999-2000. Riyadh, May 2004.
3. What are the Risk factors for Colorectal Cancer? American Cancer Society (ACS), Inc. 2004.
4. Kim GP, Takimoto CH, Allegra CJ. Colorectal Cancer. In: Abraham J, Allegra CJ, eds. *Bethesda Hand Book of Clinical Oncology*. 1st ed. Lippincott Williams & Wilkins, 2001: 95-106.
5. Al Jaberi TM, Yaghan RJ, El-Heis HA. Colorectal Cancer in young patients under 40 years of age: Comparison with old patients in a well defined Jordanian population. *Saudi Med J*, 2003; 24: 871-874.
6. Heys SD, O' Hanrahan TJ, Brittenden J, Eremin O. Colorectal Cancer in young patients: A review of the literature. *Eur J Surgical Oncol*, 1994; 20: 225-231.
7. Mitry E, Benhamiche A, Jouve J, Clinard F, Finn-Fairre C, Fairre J. Colorectal Adenocarcinoma in patients under 45 years of age: Comparison with older patients in a well-defined French population. *Dis Colon Rectum*, 2001; 44: 380-387.
8. Soliman AS, Bondy ML, Levin B, Hamza MR, Ismail K, Ismail S et al. Colorectal Cancer in Egyptian patients under 40 years of age. *Int J Cancer*, 1997; 71: 26-30.
9. Abu Zaid AA, Khfagy W, Marzoul OM, et al. Colorectal Cancer in Egypt. *Dis Colon Rectum* 2002; 45: 1255-1260.
10. Isbister WH. Colorectal Cancer below age 40 in the Kingdom of Saudi Arabia. *Aust N Z J Surg*, 1992; 62: 468-472.
11. International Agency for Research on Cancer. Weight control and physical activity. Lyon, France, IARC Press, 2002.
12. Macrae FA. Screening for colorectal cancer: Virtually there. *MJA*, 2005; 182 (2): 52-53.
13. Winawer SJ, Fletcher RH, Miller L, et al. Colorectal Cancer screening: Clinical guidelines and rationale. *Gastroenterology* 1997; 112: 594-642.

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