

Low Incidence of Colorectal Cancer in Kerman Province, Iran

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Abstract

Background: In Iran colorectal cancer (CRC) incidence varies among various places. But we do not have any validate data that deeply explored the difference of CRC in Kerman province by national average. The aim of this study was to evaluate the incidence of colon cancer within a 12-year period in Kerman province and to find whether the incidence of CRC in Kerman compared with the total incidence found in Iran.

Methods: Data on colorectal cancer was collected from all histopathology departments around the Kerman Province during 1991 – 2002 retrospectively. The crude and age-standardized incidence rates per 1 million populations were calculated based on the 1996 census data and the population growth rate.

Results: During this study total number of 551 new cases of colorectal cancer in Kerman province had been diagnosed. Age Standardized Rate of colon cancer in males and females were 50 (95% CI: 44-56) and 53 (95% CI: 46-59) cases per 1,000,000 population per year, respectively. The risk ratio in females relative to males was not significant in any type of colon cancer. We did not find any difference for each year during the entire study period.

Conclusion: The ASR of colorectal cancer in Kerman province was quite lower than the average rate in the whole country. This study showed that, the risk of acquiring colon cancer was constant. We concluded that the risk of colorectal cancer in Kerman province was much lower than the entire country.

Keywords: Neoplasm; Iran; Trend analysis, Epidemiology, Colorectal

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Introduction

CRC is an important public health problem, with nearly one million new cases of CRC diagnosed worldwide and half a million deaths annually [1]. CRC is the third most common cancer in males and females with 663,612 new cases and Age Adjusted Rate (ASR) of 204 per 10⁶ for males and 570,099 new cases with ASR of 146 per 10⁶ for females [2, 3].

CRC incidence varies among countries and has a significant time trend [4]. Moreover, there are striking differences between racial and ethnic groups in both incidence and mortality. Mortality rates for Hispanics, Asians, Pacific Islanders, American Indians, and Alaskan Natives are lower than those for whites or African Americans [5]; thus, CRC is a leading cause of death in the western world [1].

In the age group 45-54 colon cancer incidences are about 200 per 1000,000 annually and thereafter increases at much higher rates (550 per 1000,000 annually for aged 55-64, 1200 for aged 65-74 and 2000 per 1000,000 annually for those older than 75 years of age) [6].

In Iran CRC is the third and fifth common cancer in females and males respectively [7]. According to a recently published pathology-based national Iranian cancer registry, the ASR for CRC in males has increased from 5.5 to 8.2 [8]; however, Iran is still a low-risk country for CRC, particularly in the older population. Although the ASR in the young Iranian and the US population is close, the rates are much lower in older Iranians [9].

In our previous study we showed that oral [10], esophagus and gastric cancer [11] in Kerman province, the largest province in southeast Iran, was lower than the national average; however, hepatic

Table 1. Age distribution of colorectal cancer in Kerman province between 1991 and 2002

Age	Melanoma		Sarcoma		Carcinoma		Total	
	M/F	Both (%)	M/F	Both (%)	M/F	Both (%)	M/F	Both (%)
0-9	0/0	0	2/1	3(0.11)	1/1	2(0.004)	3/2	5(0.01)
10-19	0/0	0	2/3	5(0.19)	1/3	4(0.01)	3/6	9(0.02)
20-29	0/0	0	1/1	2(0.07)	7/8	15(0.03)	8/9	17(0.03)
30-39	1/0	1(0.13)	0/3	3(0.11)	26/20	46(0.09)	27/23	50(0.09)
40-49	0/0	0	1/3	4(0.15)	31/38	69(0.13)	32/41	73(0.13)
50-59	1/1	2(0.25)	1/2	3(0.11)	48/61	109(0.21)	50/64	114(0.21)
60-69	1/2	3(0.38)	2/3	5(0.19)	77/68	145(0.28)	80/73	153(0.28)
70-79	0/1	1(0.13)	0/0	0(0.00)	60/48	108(0.21)	60/49	109(0.20)
80-89	1/0	1(0.13)	2/0	2(0.07)	9/9	18(0.03)	12/9	21(0.04)
Total	4/4	8(0.01)	11/16	27(0.04)	260/256	516(93%)	275/277	551

Table 2. The crude and standardized annual incidence rate (in 1,000,000population) of the four types of colorectal cancer classified by sex and type

Type of Cancer	Sex	Crude Incidence 95% CI	Standardized Incidence 95% CI
Melanoma	Male	2(0.6-4.5)	1(0-2)
	Female	2(0.6-4.7)	1(0-2)
	Total	2(0.9-3.6)	1(0-2)
Sarcoma	Male	3 (2.9-4.1)	4(3-6)
	Female	1(0.5-1.7)	2 (1-3)
	Total	3 (2.3-3.7)	4 (3-5)
Carcinoma	Male	19(16-21)	47(41-53)
	Female	20(17-22)	50(44-57)
	Total	20(18-21)	49(44-53)
Total	Male	21(18-23)	50(44-56)
	Female	22(19-24)	53(46-59)
	Total	21(19-22)	51(47-56)

cancer was significantly greater than the national average. According to the cancer registry in Iran, ASR of CRC in Kerman province during 2004-2006 for both males and females were lower than the total ASR of the country [12]. However, no published data has deeply explored the ASR of CRC in Kerman province, by comparing it to the national average.

The aim of this study was to evaluate the incidence of colon cancer within a 12 year period in Kerman

province and to find out the incidence of CRC in Kerman comparing with the total incidence of the country.

Materials and Methods

Our study was done in Kerman, a province in the southeast of Iran. The population is about 2.6 million.

Considering that there was no comprehensive cancer registry in Kerman province until 2002, the data used in this epidemiologic investigation were

Table3. The effects of sex and age on the risk of colorectal cancer classified by their pathologic types

Type		Risk Ratio (95% CI)	P- value
Melanoma	Sex		
	Male	1	0.78
	Female	0.81(.17 - 3.6)	
	Age		
	>60	1	0.31
	40-60	0.42 (.08-2. 23)	
<40	0.16 (0.01-1.6)		
Sarcoma	Sex		
	Male	1	0.80
	Female	1.1 (0.50- 2.4)	
	Age		
	>60	1	0.03
	40-60	0.31(0.11- 0.91)	
<40	0.14(0.05-0.37)		
Carcinoma	Sex		
	Male	1	0.611
	Female	1.04(0.87-1.2)	
	Age		
	>60	1	0.0001
	40-60	0.27 (0.22 -0.32)	
<40	0.05 (0.039 - 0.067)		
Total	Sex		
	Male	1	0.50
	Female	1.05 (0.89 – 1.25)	
	Age		
	>60	1	0.0001
	40-60	0.28 (0.23-0.34)	
<40	0.02(0.01 -0.030)		

extracted directly from pathology records registered in all public and private pathology centers of Kerman province during the study period. The information of all newly diagnosed cases of colon cancer was collected actively from all of the 18 histopathology departments around Kerman Province. Moreover, these departments have received nearly all of their pathology specimens from private and public hospitals and clinics throughout the province.

In this data we analyzed 551 patients during 1991 to 2002. We estimated the population of Kerman province base on a 1996 census. The crude and age standardized incidence rates of colon cancer were computed, classified by pathologic types the (Melanoma, Sarcoma, Carcinoma), and expressed per 1,000,000 person-years. Using the

direct methods, the incidences were standardized based on the standard world population[13] . The risk ratio and 95% confidence interval (CIs) for sex and age groups were estimated for three groups of colorectal cancer by using Poisson models sex and age groups (univariate analysis) and we used the Stata version 9 for these analyses.

Results

During 1991 to 2002, a total number of 551 new cases of colorectal cancer in Kerman province had been diagnosed. Histologically, colon cancers were classified as Carcinoma (93%), Sarcoma (4%), Melanoma and (1%) unclassified (Table 1). The majority of cancers (97.8%) raised from colon and 2.2% from metastatic tumors. The mean and median age of the patients was 56.4 and 60.0 years

respectively (range: 2 to 89); most cases of colon cancer were seen in the 60-69 age group with 153 cases.

ASR of colon cancer in males and females were 50 (95% CI: 44-56) and 53 (95% CI: 46-59) cases per 1,000,000 population per year, respectively (Table 2).

The risks of all cancers were considerably lower in younger people. The risk in over 60-year-old were RR: 0.02, CI: 0.01-0.030 and in less than 40-year olds, 40-60 year olds groups were and RR: 0.28, CI: 0.23-0.34. Similar trends were observed more or less in all sub-types (Table 3).

Although we expected the incidence of colorectal cancer in females to be less than males, but we did not see this in our study (Table 1). Also, the risk ratio in females relative to males was not significant in any type of colon cancer.

We did not find any significant relationship for the linear effect of year (p-value 0.24 CI: 0.98-1.05), implying an average risk of reported colon cancer. Additionally, we did not find any difference for each year during the entire study period.

Discussion

Kerman is a province located in the salty desert of Iran and according to the census of 2005; it was grouped as a medium population. According to the country's division, Kerman is a young province with 28.3 % of their population under 15-years old.

Based on Globocan 2008, the data showed the least prevalence and mortality of colon cancer in the member states of the Eastern Mediterranean Regional Office EMRO; nevertheless, CC is a prevalent cancer in Iran. According to the cancer registry, colon cancer in Kerman is not a prevalent cancer.

The risks of colon cancer are relatively dispersed in Iran, and we did not find any obvious trend like stomach or esophagus cancers in our country. A recent population-based cancer registry in Kerman province showed that the ASRs of colon cancer in males and females were 3.36 and 5.47 in 100,000 populations respectively. This study showed that during 1991 to 2002, the risk of acquiring colon cancer was constant.

Epidemiologic studies of men consistently demonstrate a positive association between tobacco smoking and risk of colorectal adenomas, precursors of cancer, but have not consistently shown an association between smoking and colorectal cancer[14]. In this province, the consumption of tobacco products and other illegal drugs are high. There are 102 drug addicts per 100,000 people,

indicating that Kerman is the third province for drug abusing in Iran. However, as we previously mentioned, no association between tobacco consumption and colorectal cancer was confirmed.

Although there is obvious evidence of genetic predisposition in colon cancer, much of this variation appears to be related to differences in dietary habits. At present, the data suggest that vegetables are associated with lower risk, and that fiber alone does not account for this association. Further, meat consumption is associated with increased risk, but this too, does not explained solely by its fat content [15], and alcohol is associated, though inconsistently, with increased risk [15].

Moreover, physical activity does not appear to be associated with a lower risk (15); on average 29.1% of men and women in Kerman province exercise at least 10 minutes a day[16].

The population of Kerman is young and it is classified as the seventh youngest province in Iran. Maybe it is because of this fact that colon cancer is not high in this area. The other risk factor of colon cancer is obesity; the BMI in Kerman province population is low. This province is classified as having the third lowest BMI relative to the entire country. Diabetes as another risk factor of colon cancer is low in this area [16].

The limitation in our study is the quality of data because it has been collected retrospectively; additionally, some of the medical centers did not use the International Classification of Disease (ICD) coding system at the time of diagnostic procedures, making it impossible to classify all patients with cancer perfectly.

We expected that the incidence and risk ratio of colon cancer higher in males than females, but in our study we did not find any differences.

In conclusion, we showed that the risk of colon cancer in Kerman province was much lower than the entire country.

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Conflict of Interest

There is no conflict of interest in this article.

Authors' Contribution

AAH and MM analyzed the data and wrote the paper; GH and MRZ designed the study and

supervised data collection; MR and MH designed the study and collected data.

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