

RESEARCH ARTICLE

Cancer Notification at a Referral Hospital of Kermanshah, Western Iran (2006-2009)

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Abstract

Background: Cancer is a major public health problem and the leading cause of mortality in both males and females in developed and developing countries. The incidence of cancer is gender dependent. Among Iranians, it is the third cause of death. **Materials and Methods:** The information recorded in the files of all patients (7,695 individuals) pathologically diagnosed with cancer in Imam Reza referral hospital of Kermanshah University of Medical Sciences during the four year period of 2006-2009 were reviewed and analyzed using SPSS statistical software package version 16.0. **Results:** Around 61.6% of reported cancer cases were males and 38.4% were females. The most prevalent reported malignant tumors occurred at the age group of 70-79 years in males and in females these tumors were presented in the ages of 60-69 years. The most prevalent cancers among studied patients were gastrointestinal (GI) cancers with a frequency of 22.9% [gastric 10.7%, colorectal 6.9%, and esophageal 6%]. The second, third and fourth prevalent cancers were blood at 16.4%, lung 13.5% and bladder 12.8%, respectively. In males the cancers of GI (25.6%) were the most prevalent followed in order of frequency by bladder (18%), blood (17.6%), lung (17.4%) and prostate (6.8%). In females the most frequent recorded cancer was breast (24.1%) followed in order of frequency by GI (20.5%), blood (14.4%), lung (7.3%), uterus (6.2%) and ovary (5.1%). Breast cancer was the most prevalent cancer (27%) in the age group of 40-49 years. **Conclusions:** The present study provides frequency data for various types of cancers in both males and females from a referral hospital of Kermanshah that are comparable with some reports from other areas of the country.

Keywords: Cancer distribution - GI tract - breast - blood - bladder - lung - Kermanshah, Western Iran

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Introduction

Cancer is a major public health problem and the leading cause of mortality in both males and females in developed and developing countries (Kolahdoozan et al., 2010; Najafi et al., 2011). Cancer is the second leading cause of death in developed countries. Among Iranians, cancer is the third cause of death after coronary heart disease and accidents (Kolahdoozan et al., 2010; Najafi et al., 2011). It is predicted that the number of cancer related deaths will increase until 2020 and 70% of cancer related deaths will occur in developing countries in 2020 (Najafi et al., 2011). The cancers of lung, stomach, colon-rectum, liver and breast are the five cancers with the highest number of cancer related deaths (Najafi et al., 2011). In Iran the five common cancers in both sexes are stomach, esophagus, breast, prostate and colon cancers (Kolahdoozan et al., 2010; Najafi et al., 2011; Alimoghaddam et al., 2014). The incidence of cancer is gender dependent. Among Iranian men, the most prevalent cancers are cancers of stomach,

esophagus, colon-rectum, bladder and leukemia. While in Iranian females, breast cancer is the most prevalent cancer that is followed by esophagus, stomach, colon-rectum and cervix/uteri cancers (Kolahdoozan et al., 2010).

Esophagus cancer (EC) is the eighth most common cancer in the world and ranks sixth among all cancers related mortality (Kolahdoozan et al., 2010). Esophagus cancer is the sixth prevalent cancer in Iran (Najafi et al., 2011; Harirchi et al., 2014).

Stomach cancer is the fourth most prevalent cancer and the second leading cause of cancer mortality in the world (Atrkar-Roushan et al., 2013; Alimoghaddam et al., 2014). Stomach and esophagus cancers are the most prevalent cancers in some areas of Iran, especially Northern provinces. Annually, around 50,000 new cases of cancer occur in the 75 million Iranian populations that 38% of these cancers occur in the gastrointestinal (GI) track (Atrkar-Roushan et al., 2013).

In western countries colorectal cancer is one of the most common malignancies. In developing countries the

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incidence of this cancer is increasing (Najafi et al., 2011).

Breast cancer is the most common malignancy and the leading cause of mortality among women worldwide (Kaviani et al., 2013). Its incidence is increasing in developing countries in a rate of 3-4% (Babu et al., 2011). Breast cancer is considered as one of the common health problems among various populations (Yari et al., 2014).

Around two-thirds of all urinary cancers are bladder cancers. Bladder cancer is the fourth and ninth most prevalent cancer, respectively in males and females (Yavari et al., 2009; Salehi et al., 2011).

Cancer incidence varies in different geographical areas that indicate the role of genetics, environmental factors and life style for the presence of different frequency of cancers among various populations (Talaiezhadeh et al., 2013). Iran is a land of different ethnic groups, which include Farsis, Turks, Kurds, Lurs, Baluches, Arabs, Bakhtiaris, Azari, Taleshes, Turkmans, Ghashghais, and Armenians (Rahimi et al., 2006). So, epidemiological studies of cancer patterns in various areas may help to clarify the etiology of the disease and will be useful for cancer researches, health care planning, screening and diagnosis of the diseases.

The aim of present study was to report the number of different types of cancers according to age and sex during 2006-2009 in a referral Hospital of Imam Reza, Kermanshah, Iran.

Materials and Methods

Information recorded in the file of all patients pathologically diagnosed with cancers in Imam Reza referral hospital of Kermanshah University of Medical sciences during the four years period of 2006-2009 were reviewed. The extracted data from the files of all patients according to the pathologist report entered to a computer database. The cancers were coded and classified according to the international classification of diseases for oncology (ICD-10). The overall frequency of various cancers and their stratification according to sex and age group was calculated. The SPSS (SPSS Inc., Chicago, IL, USA) statistical software package version 16.0 was used for the statistical analysis.

Results

From a total 7695 cancerous diagnosed patients who referred to Imam Reza Hospital of Kermanshah University of Medical Sciences during four years period of the study, 4719 (61.6%) cases were males and 2940 (38.4%) cases were females (Table 1).

The most frequent cancers were the GI track cancers with a frequency of 22.9% [stomach cancer (10.7%), colon-rectum cancer (6.9%), and esophagus cancer (6%)]. As demonstrated in Table 1, stomach cancer comprised around half percent of GI track cancers. The second, third and fourth frequent cancer sites were blood (16.4%), lung (13.5%) and bladder cancers (12.8%), respectively (Table 1). Our results indicated that in males the cancers of GI track (25.6%) were the most frequent cancers followed by bladder (18%), blood (17.6%), lung (17.4%) and prostate

(6.8%) cancers. In females the most frequent recorded cancer sites were breast (24.1%), GI track (20.5%), blood (14.4%), lung (7.3%), uterus (6.2%) and ovary (5.1%) cancers (Table 1).

The male to female ratio for GI track cancers were 1.26, 2.75, and 1.92 for esophagus, stomach and colon-rectum cancers, respectively. The male to female ratio for blood, brain, skin and lung cancers were 1.97, 1.31, 2.39 and 3.8, respectively. For kidney and blood cancers these ratios were 2.88 and 6.4, respectively (Table 1).

Breast cancer was the most frequent cancer in the age group of 40-49 years (27%). Also, the age groups of 50-59 and 60-69 years were the second and third age groups that among them the breast cancer was prevalent (23.8, and 19.1%, respectively). However, the uterus and ovary cancers mostly occurred in the age group of 50-59 years (30.6, and 27.3%, respectively). In males the prostate cancer was frequent in individuals older than 80 years

Table 1. Frequency of cancer Sites and their Distribution According to sex During 2006-2009

Site	n (%)	Male to female ratio
All Sites	7659 (100)	
Male	4719 (61.6)	1.6
Females	2940 (38.4)	
Blood	1253 (16.4)	1.97
Male	831 (17.6)	
Females	422 (14.4)	
Bladder	982 (12.8)	6.4
Male	849 (18)	
Females	133 (4.5)	
Lung	1037 (13.5)	3.8
Male	821 (17.4)	
Females	216 (7.3)	
Stomach	821 (10.7)	2.75
Male	602 (12.8)	
Females	219 (7.4)	
Breast	727 (9.5)	-
Male	19 (0.4)	
Females	708 (24.1)	
Colon-rectum	529 (6.9)	1.92
Male	348 (7.4)	
Females	181 (6.2)	
Esophagus	456 (6)	1.26
Male	254 (5.4)	
Females	202 (6.9)	
Prostate	322 (4.2)	-
Male	322 (6.8)	
Females	0 (0)	
Brain	263 (3.4)	1.31
Male	149 (3.2)	
Females	114 (3.9)	
Uterus	183 (2.4)	-
Male	0 (0)	
Females	183 (6.2)	
Ovary	150 (2)	-
Male	0 (0)	
Females	150 (5.1)	
Skin	143 (1.9)	2.39
Male	98 (2.1)	
Females	41 (1.4)	
Kidney	93 (1.2)	2.88
Male	69 (1.5)	
Females	24 (0.8)	

(44.3%) and in the age group of 70-79 years (29.5%) (Table 2).

As indicated in Table 2, the age groups with the highest frequency of GI cancers were 60-79 years for stomach cancer (49.6%), 50-79 years (64.1%) for colon-rectum cancer and 70-79 years for esophagus cancer (35.3%). In the age group of 70-79 years there was the highest reported bladder cancer (30.7%) (Table 2).

The reported cases with blood cancer in men (66.3%) were higher than those in women (33.7%). The highest frequency of blood cancer was detected in the ages

between 10 to 19 years. The most frequent reported malignant tumors were at the age group of 70-79 years in males. However, in females the malignant tumors were presented in the ages of 60-69 years (not presented in tables).

Table 3 demonstrates the age-standardized incidence rates (ASR) per 100,000 persons-years of cancers in some areas of Iran according to the population-based cancer registry (Babaei et al., 2005; Somi et al., 2008; Alimoghaddam et al., 2009; Roshandel et al., 2012; Fateh and Emamian, 2013; Talaiezhadeh et al., 2013).

Table 2. The Most Prevalent Cancer Sites According to the Age Group

Cancer site/Age group (years)	0-9 n (%)	10-19 n (%)	20-29 n (%)	30-39 n (%)	40-49 n (%)	50-59 n (%)	60-69 n (%)	70-79 n (%)	>80 n (%)
GI track	16 (0.9)	0 (0)	20 (1.1)	53 (2.9)	175 (9.7)	303 (16.8)	378 (20.9)	496 (27.5)	364 (20.2)
Stomach	12 (1.5)	0 (0)	0 (0)	8 (1)	60 (7.3)	107 (13)	182 (22.2)	225 (27.4)	227 (27.6)
Colon-Rectum	4 (0.8)	0 (0)	18 (3.4)	42 (7.9)	84 (15.9)	122 (23.1)	106 (20)	110 (21)	42 (7.9)
Esophagus	0 (0)	0 (0)	2 (0.4)	3 (0.7)	31 (6.8)	74 (16.2)	90 (19.7)	161 (35.3)	95 (20.9)
Blood	281 (22.4)	395 (31.5)	176 (14)	50 (4)	55 (4.4)	91 (7.3)	68 (5.4)	102 (8.1)	35 (2.8)
Breast	0 (0)	9 (1.2)	22 (3)	101 (13.9)	196 (27)	173 (23.8)	139 (19.1)	59 (8.1)	28 (3.9)
Bladder	19 (1.9)	0 (0)	13 (1.3)	19 (1.9)	35 (3.6)	194 (19.8)	204 (20.8)	301 (30.7)	197 (20.1)
Lung	0 (0)	4 (0.4)	8 (0.8)	31 (3)	47 (4.5)	171 (16.5)	199 (19.2)	380 (36.6)	197 (19)
Prostate	0 (0)	0 (0)	0 (0)	3 (0.9)	6 (1.8)	26 (7.8)	52 (15.7)	98 (29.5)	147 (44.3)
Uterus	0 (0)	0 (0)	0 (0)	15 (8.2)	24 (13.1)	56 (30.6)	52 (28.4)	21 (11.5)	15 (8.2)
Ovary	0 (0)	1 (0.7)	30 (20)	13 (8.7)	23 (15.3)	41 (27.3)	19 (12.7)	12 (8)	11 (7.3)

GI: Gastrointestinal

Table 3. The Age-standardized Incidence Rates (ASR) per 100,000 Persons-years of Cancers in Some Areas of Iran According to the Population-based Cancer Registry

Site	Tehran (1998-2001) ASR		Semnan (1998-2002) ASR		Golestan (2004-2008) ASR		East Azerbaijan, (2006-2007) ASR		Khuzestan (2002-2009) ASR		Shahroud (2001-2010) ASR	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Stomach	19.7	10	36.9	14.8	30.7	12.4	25.99	11.6	7.17	4.31	21.24	9.76
Esophagus	6.8	5.3	11.7	8.8	24.3	19.1	12.43	11.65	2.53	2.82	9.96	11.39
Lung	14.9	7.0	9.19	4.57	15.4	5.9	9.58	3.7	5.85	2.86	2.71	1.92
Colon- rectum	11	9.5	11.42	10.52	12.4	9.5	15.6	9.73	6.32	5.72	8.39	8.15
Leukemia	8.4	6.1	4.06	2.86	10.5	7.4	-	-	4.5	3.02	-	-
Blood	-	-	-	-	-	-	10.8	5.72	-	-	2.8	2.85
Skin	11.3	1.3	10.2	7.46	12.6	8.2	24.38	14.71	15.99	13.63	21.02	15.4
Prostate	15.6	-	10.11	-	10.1	-	7.33	-	7.64	-	9.71	-
Ovary	-	6.5	-	-	-	5.7	-	5.28	-	2.5	-	2.27
Lymphoma	9.2	6.0	7.49	6.9	7.6	4.7	-	-	1.97	1.44	-	-
Brain, nervous system	6	4.5	7.0	6.26	7.2	5.3	4.98	5.48	2.07	1.49	3.65	2.79
Bladder	13.3	3.8	7.16	3	8.7	-	15.72	3.68	10.69	4.07	9.39	3.16
Breast	-	31.4	2.29	21.3	-	26.9	-	23.47	1.02	26.36	0.38	16.50
Kidney	3.2	1.7	2.27	0.71	-	-	3.42	1.76	2.26	1.41	0.79	0.3
Bone	2.6	2.1	2.62	2.76	-	-	2.04	1.32	0.63	0.51	-	-
Cervix	-	-	-	1.08	-	-	-	1.87	-	2.56	-	1.8
Uterus	-	-	-	-	-	-	-	2.18	-	2.75	-	1.2
Cervix/uteri	-	4.8	-	-	-	-	-	-	-	-	-	-
Gallbladder	1.1	1.6	0.36	2.13	-	-	1.16	1.68	0.63	1.06	0.46	0.89
Larynx	5.3	0.9	3.03	1.09	-	-	2.12	0.26	2.13	0.44	3.77	0.58
Liver	3.8	3.2	5.83	3.53	-	-	2.23	2.03	0.07	0.05	1.58	1.15
Multiple Myeloma	1.7	1.3	0.78	1.13	-	-	-	-	1.49	1.11	-	-
Oral cavity	2.6	2.4	1.95	3.43	-	-	3.58	2.78	0.02	0.02	-	-
Pancreas	3.3	2.6	1.58	2.83	-	-	1.9	1.3	0.44	0.44	1.12	1.49
Pharynx	1.7	0.9	-	-	-	-	1.75	0.95	0.92	0.53	-	-
Small bowel	-	-	3.2	-	-	-	-	-	0.26	0.29	-	-
Male genitals, testis	1.8	-	0.58	-	-	-	2.04	-	1.11	-	2.18	-
Thyroid gland	1	2.8	2.22	4.47	-	-	1.44	4.9	0.9	2.84	0.86	1.38

Discussion

Findings of present study demonstrate that the overall frequency of cancers reported in Imam Reza hospital of Kermanshah University of Medical sciences is more higher in men (61.6%) than women (38.4%). In the present study the maximum number of cancer notification in men was in the age group of 70-79 and in women was in the age group of 60-69 years. The number of cancer cases reported after 70 years in men were approximately three times more than women.

The most frequent cancers in our studied patients were GI track cancers that among them, stomach cancer accounted for half of these cancers. Such findings are in line with reports from cancer registries of other provinces in Iran (Table 3). The proportion of stomach cancer was 10.7% followed by colorectal (6.9%), and esophagus cancers (6%). Stomach cancer is the most common GI track cancer accounting for 50% of all GI cancers in Iran and its incidence is very high compared with western countries (Atrkar-Roushan et al., 2013). The highest incidence of stomach cancer among Iranians occurs in Northern and Northwestern Iran. Ardabil in Northwestern Iran has the highest incidence of gastric cancer among Iranian provinces with an age-standardized incidence rates (ASR) of 49.1 in men and 25.4 in women (Kolahdoozan et al., 2010). However, Kerman province in Southern Iran has the lowest incidence of this cancer (Najafi et al., 2011). Further, in a study conducted in Sistan-Balouchestan province, the esophagus cancer was the most prevalent GI track cancer and stomach cancer was the second prevalent GI track cancer in this area (Mashhadi et al., 2009).

It has been reported that esophageal carcinoma consists 9% of all cancers and 27% of gastrointestinal cancers in Iran (Kolahdoozan et al., 2010). There is an obvious difference in esophagus cancer incidence between men and women. For men, the incidence is several times higher than that for women (Atrkar-Roushan et al., 2013). Among Iranians the highest incidence of esophagus cancer has been reported in northern region and in Golestan province (Najafi et al., 2011).

Esophagus and stomach cancers are multi-factorial diseases and genetic factors (race and ethnicity), male gender, lifestyle, nutrition, alcohol consumption, and smoking are involved in the pathogenesis of both cancers. These cancers occur at advanced stage of the disease in the majority of Iranian patients (Alimoghaddam et al., 2014).

Among Iranians colorectal cancer incidence in males has increased from ASR 5.5 to 8.2. However, particularly in old Iranian population the risk of the cancer is low (Atrkar-Roushan et al., 2013). It has been reported that in the Kermanshah Province of Iran during 1993-2007 the incidence of colorectal cancer has increased (Najafi et al., 2011).

In the present study the colorectal cancer comprised 6.9% of reported cancers that was highly frequent in men than women with a male to female ratio of 1.92 and was mostly detected in the age group of 50-79 years.

Breast cancer is the most prevalent cancer among Iranian women with a crude incidence rate of 24.4% and ASR of 17.1 per 100000 of all malignancies (Kolahdoozan

et al., 2010). In our recorded files, breast cancer with a frequency of 24.1% was the most frequent cancer among women that mostly diagnosed in the age group of 40-49 years. In fact, most of findings of present study regarding the breast cancer is in line with reports from other provinces (Table 3).

In developing countries including Iran breast cancer is appeared around one decade earlier than that in developed countries. In Iran breast cancer predominantly affects younger women in their fourth decade of life with more aggressive course and poorer prognosis (Babu et al., 2011). Early detection of breast cancer reduces the mortality rates and improves patient prognosis (Babu et al., 2011). Also, early-onset and aggressive estrogen receptor-negative breast cancers are common among Iranian women. Lifestyle could be one of the reasons for high prevalence of breast cancer (Babu et al., 2011).

The results of this study indicate that cancer in hematopoietic system in Kermanshah province is more frequent compared to other parts of the country (Tahmasbyet al., 2013) and in males (66.3%) is more common compared to females (33.7%). It seems, the higher incidence of hematopoietic system cancer in our population compared to other parts of Iran might be associated with several factors including the side effects of 8-year war in this province bordered by Iraq.

The incidence of bladder cancer has increased during recent decades that might be attributed to the exposure to tobacco, non-occupational and industrial carcinogens and population aging (Salehi et al., 2011). In Iranian males the bladder cancer is the third most common cancer while in Iranian females this cancer is the ninth prevalent cancer and there is a trend toward increased risk of bladder cancer in the elderly (Salehi et al., 2011). In the present study the bladder cancer was the second prevalent reported cancer in males after GI track cancers.

In our study the frequency of lung cancer was 17.4% in males and 7.3% in females. Moreover, the highest number of lung cancer was observed in the age group of 70 to 79 years that in men was more frequent than women. According to the many studies from other parts of the country, the prevalence of cancers is higher in males than that in females (Roshandel et al., 2012).

The main factors that increase the risk of cancer are aging, the lifestyles alterations, reduce the incidence of infectious diseases and appropriate diagnosis and treatment of communicable and non-communicable diseases (Najafi et al., 2011).

In summary, the present study revealed that the GI track cancer is the most frequent cancer in men while breast cancer is the most one in females from Kermanshah. The number of reported cancers was higher in men than women. The maximum number of cancer in men was in the age group of 70-79 and in women was in the age group of 60-69 years. The findings of present study are comparable with some reports from other areas of the country (Table 3).

The present study has its own limitations. First, Imam Reza hospital is a referral hospital in Western Iran and notification of cases are not representing the incidence of cancer in Kermanshah as there are some referral from

other provinces near to Kermanshah. Second, even in Kermanshah province, some cases are not referring to Imam Reza but to other hospital in Kermanshah city meaning that even the number presented in this study is not representing of all notifications in Kermanshah. Third, some cancers such as skin cancer may have fewer chance of hospital admission and therefore under presentation of such cancer does not mean the low incidence of the cancer.

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