



Epidemiology of common cancers in Dezful county, southwest of Iran

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Abstract

Introduction: Cancers is considered as the third reason of death after cardiovascular disease and accidents. These types of disease are one of the most critical issues in health and treatment in Iran and the world.

Objectives: The aim of this study was to conduct an epidemiologic investigation on types of cancers in Dezful.

Patients and Methods: In this epidemiologic study, recorded data of cancers during 2006-2011 was considered. The data were gathered from all of health centers, pathobiology laboratories, and all public and private hospitals in the city of Dezful. Additionally the data of oncology and radiotherapy departments were considered. The incidence rate in every 100000 people had been calculated in subgroups of gender and age groups.

Results: Of 2202 registered cases of cancers during 6 years in Dezful, 42.38% were female and 57.61% were male. Cancer incidence during 6 years reached to 525 (incidence of 111.68 per 100000) in 2011 to 223 (incidence 55.4 per 100000) in 2006. During this period, skin cancers (16.47 per 100000) and stomach (10.88 per 100000) had the highest incidence. The most common cancers in males and females were skin and breast cancers, respectively. Breast cancer in females had two peaks from ages 50-54 years and more than 85 years old.

Conclusion: Regarding ascending order of cancer incidence in the region and also the high incidence of skin and stomach cancers, preventive modalities including individuals' personal protection of sunlight and dietary patterns modification are suggested. Additionally, individual's screening and self-examining are suggested too.

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Introduction

During recent years pattern of some diseases have changed in the world. The reduction of communicable diseases and increasing the incidence rate and prevalence of non-communicable diseases is detectable. In spite of successful modalities in the field of controlling and preventing of epidemic diseases, the rate of chronic diseases is increasing significantly (1,2). In some regions, cancer is considered as the second cause of death after cardiovascular diseases (3). In Iran cancer was the third cause of

Key point

The prevalence of cancer, especially the skin cancer, in Dezful has a high prevalence and needs more attention and care, such as preventing sunlight direct exposure to the skin.

death after cardiovascular diseases and accidents (4) and is considered as one of the important health problems in many advanced and developing countries (5, 6). Regarding molecular and cellular biology,

cancer is referred to molecular defects in cellular activity which causes changes in various genes (7). Cancers are one of the main and critical issues for public health and treatment in Iran and all over the world (8). Cancer in future decades will be one of the main reasons of diseases burden in the world. It is also expected the cases of cancers will increase to 15 million in 2020 that 60 percent, while most of them will happen in less developed countries (9). At the present time, around 7 million deaths occurred in the world due to cancers (equal to 13% of all deaths) (10). Risk factors consisting of age, gender and genetic structure are unchangeable. Other factors comprise environmental factors like smoking, ionizing rays, chemical and toxic materials (11).

Objectives

The aim of this study was to determine cancer epidemiologic pattern in Dezful during 2006-2011 to establish a base for etiological surveys and control programs on types of cancers.

Patients and Methods

Patients

The study is a cross-sectional. Patients' records cases of cancers were collected from all health centers, pathobiology laboratories, hospitals and oncology and radiology departments during 2006 to 2011. Data were included age, gender, death reason, cancer type, anatomic location and involved organs.

Diagnosis of cancer type was done by international code ICD-O (International Classification of Diseases for Oncology). In this cross-sectional study, epidemiologic state of cancer types was investigated in Dezful.

Ethical issues

The research followed the tenets of the Declaration of Helsinki. Before the study, written informed consent was obtained from all patients who participated in the study. All information about individuals was coded and kept confidential. This study was approved by the Ethics Committee of Dezful University of Medical Sciences with code DUR125. Questioners and researchers of the current

project have done their commitments about confining demographic information.

Data collection

Statistical analysis of information was done using SPSS 21 software. The incidence rate of cancers in different urban regions was calculated based on ICD, gender and age groups. The proportion of cancer cases in a year was determined (according to involved area, gender and age groups) or estimated crowd in a year. Death was calculated according to a number of new cases (based on involved area, gender and age groups).

Results

In this study, of 2202 patients with cancer, 1270 patients (57.67%) were male and 932 were (42.32%) female. The most incidence rate of cancers (128.01 per 100 000) was in men and (93.13 per 100 000) were related to the year of 2011 (Figure 1).

As shown in Figure 2, the most incidence rate of cancers during these years generally was related to skin and stomach cancers.

The most incidence rate of cancers in males was skin cancer with 16.47 per 100 000, followed by stomach cancer with 10.7 per 100 000. The most incidence rate in women was related to breast cancer with 24.13 per 100 000 and skin cancer with 7.5 per 100 000 (Table 1).

The most incidence of skin cancer was in age group of 60 years in men and stomach cancer in the age group of 65 to 80 years (Table 2). The most incidence of breast cancer was in the age group of 40 to 55 in women and also age group more than (≥ 80) and kin cancer in age group more than (≥ 70) (Tables 2 and 3).

Generally, 9 cases (2.8%) of whole cases of breast cancer were detected in men while 305 cases (97.2%) were in women. We found, breast cancer in women has two peaks in the age group of 50-54 and more than 85 years with the incidence rate of 132.2 and 166.3 per 100 000 respectively. Also, the most incidence rate of breast cancer was in the age group of 70-74 years and with the incidence rate of 14.96 per 100 000 in men.

Total cases of prostate cancer in men were 93 cases in the



Figure 1. Trend of cancer incidence in Dezful by gender in 2006-2011.

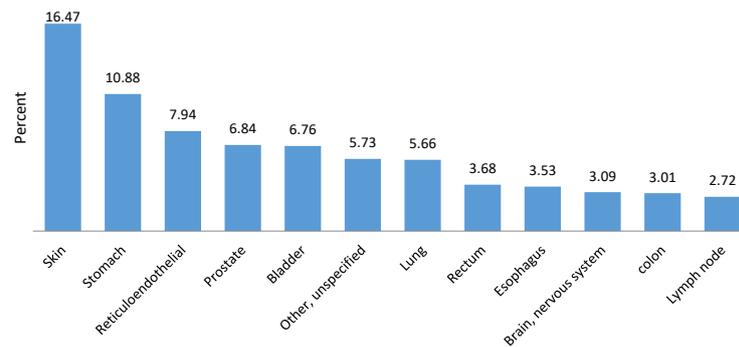


Figure 2. Common cancers in Dezful in 2006-2011.

Table 1. Cancers incidence in 2006-2011

Topology	Incidence in 100000	
	Male	Female
Skin	16.47	7.60
Stomach	10.88	3.29
Hematopoietic and reticuloendothelial system	7.94	3.92
Prostate gland	6.84	--
Bladder	6.76	1.41
Other, unspecified	5.73	4.54
Bronchus and lung	5.66	2.19
Rectum	3.68	1.88
Esophagus	3.53	2.19
Brain, nervous system	3.09	1.10
Colon	3.01	2.74
Lymph node	2.72	1.57
Liver and intrahepatic bile ducts	2.21	1.41
Larynx	1.84	0.24
Kidney	1.76	1.96
Pancreas	1.40	0.71
Bones, joints and articular cartilage	1.10	0.55
Testis	1.03	--
Connective, subcutaneous and other soft tissues	0.88	1.33
Small intestine	0.88	.039
Breast	0.66	24.13
Heart, mediastinum and pleura	0.66	0.31
Tongue	0.59	0.24
Anus and anal canal	0.51	0.24
Retroperitoneum and peritoneum	0.37	0.24
Salivary gland	0.37	0.31
Thyroid gland	0.37	1.25
Mouth	0.22	0.31
Nasopharynx	0.22	0.08
Adrenal gland	0.15	0.08
Gallbladder	0.15	0.47
Hypopharynx	0.15	--
Ovary	--	2.04
Thymus	0.15	0.08
Corpus uteri	--	1.33
Nose and sinuses	0.07	0.16
Cervix and uterine	--	1.25
Uterus unspecified	--	0.63
Vulva, vagina, unspecified female genital areas	--	0.55

age group of 80-84 years and had the highest incidence rate of 228.228 during 6 years. Total cases of skin cancer in men and women were 224 and 98 from 2006 to 2011, respectively. Skin cancer in women in age group of 76-80 years had the incidence of 189.3 per 100000. In men in the age group of more or equal to 85 years we had the incidence rate of 333.3 per 100000 which was the highest incidence during 6 years. Total cases of stomach cancer in men and women were 146 and 42 per 100000, respectively. Stomach cancer in women in the age group of 70-74 years with the incidence of 64.55 per 100000 and in men in the age group of 75-79 years with the incidence rate of 123.64 per 100000 had the highest incidence during 6 years. Total cases of colon cancer in men and women from 2006 to 2011 were 41 and 35 per 100000, respectively. Above cancer in women and men in age group of more than 85 with the incidence of 55.4 and 55.6 per 100000, respectively, had the highest incidence during 6 years. Total cases of bladder cancer in men and women were 92 and 18 respectively which had the highest incidence during 6 years in women in the age group of 75-79 years with the incidence of 37.19 per 100000 and in men in the age group of 80-84 years with the incidence rate of 156.16 per 100000 (Figures 3 and 4).

The results show that most percentage of death due to cancer (70.47%) was related to 2010 and least percentage (37.33%) was related to 2011 (Figure 5).

Discussion

The goal of the study was to investigate the diagram of Dezful malignant and distribute its division in terms of epidemiologic data and compare it with existing information of other canters of Iran. In this study, the incidence rate pattern of cancers was investigated in Dezful. From 2202 cancer cases of obtained cancer record data, 2199 cases were determined true record during 6 years which 42.38% were observed in women and 57.61% in men.

Cancer incidence during 6 years from 2006 to 2011 had ascending order and from 223 cases (55.4 per 100000) in 2006 reached to 525 cases (111.68 per 100000) in 2011. The study results showed that during 6 years, skin (16.47 per

Table 2. Male cancer incidence per 100000 according to topology and age groups in 2006-2011

Topology	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75-	80-	≥85	All
Skin	0.6	4.8	8.2	5.4	12.9	33.7	26.8	59.6	95.9	114.5	139.6	178.6	228.2	333.3	16.5
Stomach	0.6	2.1	0.0	1.1	10.3	24.9	13.4	56.6	61.1	105.3	114.7	123.6	108.1	83.3	10.7
Hematopoietic and reticuloendothelial systems	2.3	6.2	3.7	3.2	6.4	4.4	13.4	29.8	48.0	32.0	24.9	27.5	96.1	27.8	7.9
Prostate gland	0.0	0.0	0.0	0.0	0.0	4.4	1.9	8.9	39.2	36.6	109.7	116.8	288.3	138.9	6.8
Bladder	0.6	0.7	0.0	0.0	1.3	4.4	17.3	26.8	48.0	59.5	84.8	68.7	156.2	55.6	6.7
Bronchus and lung	0.0	0.7	0.0	0.0	7.7	1.5	11.5	8.9	17.4	41.2	54.9	151.1	84.1	166.7	5.7
Other, unspecified	1.2	4.8	2.7	4.3	1.3	13.2	13.4	14.9	21.8	32.0	49.9	54.9	24.0	55.6	5.6
Rectum	0.0	2.1	0.9	2.2	7.7	1.5	17.3	14.9	4.4	41.2	24.9	27.5	36.0	0.0	3.7
Esophagus	0.0	0.0	1.8	1.1	0.0	5.9	7.7	14.9	21.8	27.5	34.9	48.1	84.1	0.0	3.5
Brain, nervous system	1.2	0.7	5.5	2.2	6.4	2.9	11.5	6.0	4.4	18.3	5.0	20.6	12.0	0.0	3.1
Colon	0.6	0.7	0.9	0.0	1.3	1.5	17.3	14.9	21.8	22.9	19.9	20.6	36.0	55.6	3.0
Lymph node	1.7	4.8	2.7	6.5	3.9	4.4	0.0	3.0	4.4	4.6	10.0	0.0	12.0	0.0	2.7
Liver and intrahepatic bile ducts	0.0	0.0	0.0	0.0	0.0	0.0	7.7	17.9	8.7	13.7	24.9	20.6	60.1	55.6	2.2
Larynx	0.0	0.0	1.8	2.2	0.0	2.9	11.5	8.9	26.2	4.6	0.0	0.0	0.0	83.3	1.8
Kidney	0.0	0.7	0.0	1.1	1.3	5.9	1.9	23.8	4.4	4.6	5.0	13.7	0.0	0.0	1.8

Table 3. Female cancer incidence per 100000 according to topology and age groups in 2006-2011

Topology	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75-	80-	≥85	All
Breast	2.3	5.0	20.7	39.0	70.9	80.9	132.3	89.3	48.7	73.1	57.4	46.5	63.1	166.3	23.9
Skin	1.2	0.7	5.9	7.1	12.5	3.2	25.2	31.9	48.7	26.1	71.7	37.2	189.3	55.4	7.5
Other, unspecified	0.6	2.9	1.0	1.2	2.8	6.5	10.5	31.9	26.6	20.9	50.2	27.9	78.9	0.0	4.5
Hematopoietic and reticuloendothelial systems	1.8	2.1	0.0	2.4	2.8	13.0	6.3	6.4	8.9	10.4	35.9	18.6	0.0	27.7	3.9
Stomach	1.2	0.0	0.0	1.2	1.4	8.1	10.5	9.6	17.7	15.7	64.6	46.5	47.3	27.7	3.3
Colon	0.6	1.4	2.0	1.2	1.4	4.9	6.3	15.9	22.1	15.7	28.7	18.6	15.8	55.4	2.7
Bronchus and lung	0.0	0.7	0.0	0.0	2.8	3.2	8.4	9.6	17.7	15.7	21.5	27.9	47.3	0.0	2.2
Esophagus	0.0	0.0	1.0	3.5	7.0	3.2	4.2	19.1	4.4	10.4	7.2	18.6	31.5	27.7	2.2
Ovary	0.0	2.9	1.0	1.2	2.8	4.9	0.0	6.4	22.1	5.2	28.7	18.6	0.0	0.0	2.0
Kidney	0.0	0.7	2.0	0.0	0.0	4.9	0.0	6.4	17.7	15.7	35.9	9.3	0.0	0.0	2.0
Rectum	0.0	0.0	3.0	2.4	2.8	0.0	2.1	22.3	8.9	20.9	7.2	0.0	15.8	0.0	1.9

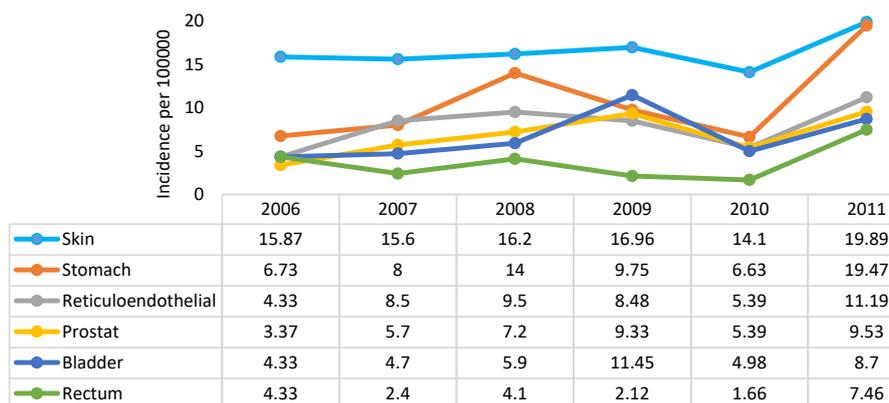


Figure 3. Male cancers Incidence per 100000 according topology of 2006-2011.

100 000) and stomach cancers (10.88 per 100 000) had most incidence rate. Additionally, the most common cancer in men and women was skin and breast cancer, respectively. The results showed that breast cancer in women had two peaks in the age group of 50-54 years and more than ≥80. Prostate cancer in men had the highest incidence rate in

age group of 80-84 years. The most incidence rate of death due to cancer (54.18) was observed in 2008. In the study of Esmaili Nasab et al in Kurdistan, the total incidence of cancers in 2003 and 2004 was 60 and 66.9 per 100 000 people. Around, 62% of cases and 38% of cases of cancer have been reported in men and women,



Figure 4. Female cancers Incidence per 100000 according topology of 2006-2011.

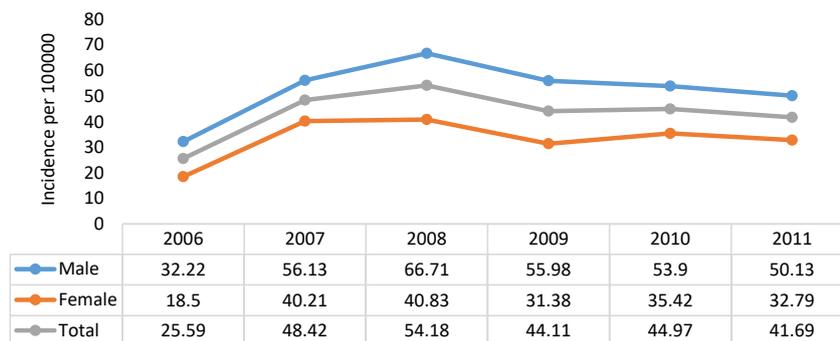


Figure 5. Death rate from cancers in Dezful 2006-2011.

respectively (12). Cancer incidence in Dezful in 2006 (55.4 per 100 000) was similar to the report and 57.61% of cancer cases were in men. The studies showed that total incidence rate of skin cancer in Iran was 10.13 per 100 000 (13). The results of this study showed that skin cancer had the highest rate of incidence with 16.5 per 100 000 during 2006-2011 and was identified as the most common cancer in men.

The incidence of cancer in Dezful is higher than other regions that can be referred to intense radiation from the sun and warm weather. In the study of Marjani and Kabir, age incidence rate of skin cancer were reported in 13.23 men of Golestan city and 13.28 per 100 000 of Mazandaran city per 100 000 (14). In the study of Kavoussi et al, skin cancer was also identified as common cancer in men (15). It is estimated more than 90% of malignant melanoma and other skin cancers globally are due to excessive ultraviolet radiation (16). Constant contact with sunlight is the main reason for cancer (17).

In other studies, it has been proved that ultraviolet ray is the most important reason for skin cancer (15). The study of Afzali et al showed that long-term radiation of UVB and UVC also can lead to risk of cancer (18). Sun radiation is significant in Khozestan and Dezful, because of proximity to equator compared to other provinces. The total measured rate of ultraviolet in Ahvaz is higher than the light rate in coastal countries (19). Also, the rate of total light in Ahvaz is more than other provinces (20,21). In the study conducted in this province, skin cancer has

been most common cancer in Khozestan (22). Exposure to sunlight has an important role in future cancer emersion in childhood and teenagerhood. Therefore, protective behaviors toward sunlight to prevent cancer are effective when it is done truly and started at low ages (24). Stomach cancer is the second common cancer in the world though the incidence of the disease is decreasing in industrial countries but is the second reason of death due to cancer in the world (25). The study results showed that stomach cancer after skin cancer had the highest incidence rate in men during the years and had increasing order. The studies showed that economic level and dietary habits are related to stomach cancer incidence (26,27).

In the study of Kosha et al, stomach cancer had first rank among cancers in East Azerbaijan in the year 2007 (28). The stomach cancer has been observed in those who have low life standard and dietary habits with high salt consumption and low protein consumption (26). Therefore, the study is about inhibiting factors including dietary habits and drug use, the prevalence of *Helicobacter pylori* infection and environmental pollution.

The basic preventive strategy of stomach cancer including modification of dietary habits, quit or decrease of smoke use and screening and extirpation of *H. pylori* using antibiotic is in clinical trials (29). Region changes in stomach cancer distribution show a difference in dietary habits, food preservation and also the prevalence of *Helicobacter* infection (30). The study results showed that breast cancer had highest incidence rate in women that

can be because of reaching to mammography screening program, so the highest incidence rate of breast cancer in 2011 can be referred to screening of this cancer. The results were in line with the results of study conducted by Asgarian et al (31).

In the study of Babaei et al, also breast cancer had the first rank in women cancers (32). Finally, breast cancer almost has steady dispersion in all regions of Iran and has the first rank of common cancer among women in all provinces (33). Breast cancer in women has the most prevalence in two peaks in the age group of 50-54 or higher than or equal 85 years. Reasons are not completely specified but probably reflect changing fertility patterns, increasing fatness, decreasing physical activities and screening program of breast cancer (34). Maintaining body weight and minimizing alcohol use is the best and the most available strategy to decrease risk of breast cancer (35).

As a result of growth and getting old of crowd and increasing prevalence of risk factors, incidence order of cancer like developed countries is increasing (36,37). Important pollution resources in this region include hanging particles in shape of dust, sooty dust, sulfate particles, metals and mineral salts, that these contaminant particles can be carcinogenic potentially. Hence, it can be noted that environmental encounters have the main role of increasing cancer's incidence.

Conclusion

Regarding the location of the city, people are exposed to significant sun light most of the days. Preventive researches and controlling cancer about epidemic investigation of breast, skin and stomach cancer in future should be done regarding their high incidence in the region.

This study is the first study in Dezful during 2006 -2011 which has investigated incidence rate of cancer during the years. Quality of collecting data is important factor to true estimation of decreasing or increasing cancer incidence. Hence, fast increase of the disease in recent years can be referred to change of cancer record system and real record of cancer. In fact, it can be said that during recent years because using cancer record system based on crowd, estimation of incidence rate has been approached to real rate.

Limitations of the study

We had little access to data on cancer staging at the time of diagnosis, which limited our ability to conduct a more detailed investigation.

Acknowledgments

We would like to thank all people who helped us in conducting of study.

Authors' contribution

In this study, RB was correspondibg author. SK, RN, LD, MSV and AS performed the data collection. HAA and BC analyzed the results and interpreted the data. ZK, MH, MK, FN and MD collected the data. All authors assisted in drafting and approving of the manuscript.

Conflicts of interest

The authors declare no conflict of interest.

Ethical considerations

Ethical issues (including plagiarism, data fabrication, double publication) have been completely observed by the authors.

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