RESEARCH COMMUNICATION

Cancer Occurrence in Old Age: Results of a Population-Based Cancer Registry in Semnan, Iran

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Abstract

   <u>Introduction</u>: The proportion of elderly persons has increased in most countries during the last few decades, and will increase further in the coming years. A population-based study was here carried out to clarify the site-specific cancer-incidence rates in old age in Iran. <u>Aims and Methods</u>: A comprehensive search was undertaken to survey and register all new cancer cases during a 5-year (1998-2002) period among the indigenous population of Semnan Province aged 65 years or over. Diagnosis of cancer was based on histopathology, clinical or radiological findings, and death certificates. <u>Results</u>: A total of 791 patients were registered with cancers. Of these, 492 (62.1%) were males. Crude rates were 1,310 and 962 per 100,000 persons per year for males and females respectively, and age-standardized ratios (ASRs) were 1350 and 973. Gastric cancer was the most common tumor with incidence rates of 340 and 153 per 100,000 persons per year for elderly males and females respectively. In women breast cancer was the second most common cancer (ASR= 108). In men prostate cancer was the second most common cancer with ASR= 150. <u>Conclusions</u>: Based on the present standardized rates, cancer is almost 9 times and 7 times more frequent among the elderly compared with younger men and women (30-64). The highest incidence of cancers was in group 75-79 years in both sex and then decrease was noted with increasing age.

Key Words: Cancer incidence - Semnan province - Iran - elderly people

Introduction

   In Europe and the U.S., over 60% of new cancer cases and over 70% of cancer mortalities occur in elderly people (often defined for regulatory purposes as those aged 65 years or older) (Aapro et al., 2005). For most forms of cancers there tends to be an exponential increasing relationship between age and cancer incidence or mortality (Hansen, 1998). Thus, age is the most important determinant for risk of cancer. After cardiovascular diseases, and car accidents, cancer is the most common cause of death in many countries (Naghavi, 2000; Smith, 1997). However, in contrast to the declining incidence of coronary heart diseases, the incidence of most cancers is increasing (Muir and Nectoux, 1996). Some advances in cancer treatment for certain cancers have occurred during the last decades. However, this seems only to have improved cancer mortality among children, young and middle-aged persons (Hoel et al., 1992). The proportion of persons over 65 years has increased from around 5 to over 20% in some west European countries during the last few decades, (Coebergh, 1996) and it is estimated that in the next century around 25% of the population in many countries will be older than 65 years (Butler, 1997).

   Establishment of population-based cancer registries is desired to assess risk factors of cancer development for primary prevention of cancer. Data concerning incidence and prevalence of cancer in the Iran have traditionally not been provided on a basis that facilitated comparison with data from countries in other parts of the world especially in old age.

   The aim of this investigation was to assess the cancer epidemiology of persons aged 65 years and older (the elderly) with a focus on the incidence of common cancers and to present the site-specific cancer-incidence rates in Semnan province in the period 1997–2001.

Subjects and Methods

Geographic location and demography

   Semnan province in located in the center of Iran, south of Elburz Mountains and north of the Great Salt Desert (Dasht-e-Kavir). Its area is about 80000 km^2 (about 5% of total Iran width). North of Semnan is hilly with the altitude of 2000 – 3500m above sea level. Its center and south part have an altitude of 800 – 1000m above sea level and most of its cities and population are located near mountains.

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From northern border it is neighbor of Golestan province with the highest incidence of esophageal cancer in the world. Approximately 90% of the population is of Aryan Caucasoid ancestry. The population in the area of Semnan University of Medical Sciences is about 322,000 according to the census of 2001. The physician-to-patient ratio is 1/830; there are 8 hospitals with 750 beds, 22 clinical diagnostic laboratories, 3 pathology laboratories and a total of 14 diagnostic radiology clinics.

Data Collection

The central office of the Semnan Cancer Registry is located in the internal medicine research center and operates under the approval of the ethics committee of Semnan University of Medical Sciences. The data are collected from hospital records, radiology and pathology clinics, laboratories, central death registry office of Semnan, vice chancellor for health and rural health centers. Also data are gathered from the mortality-morbidity registry center and in rural areas from the behvarzes (auxiliary health-care workers in health houses who are responsible for public health care and the health census of each village). Copies of patients documents are obtained and histological verification is carried out for approximately 94.0% of cases.

Some patients may refer to other medical centers out of the province such as Tehran. We try to collect the information about these cases from private offices.

Presentation of data: Questionnaire

The 5-year data (from 1997–2001) was gathered in central office and coded using the International Classification of Disease, version 10 (ICD-10) (Fritz et al., 2000). The information about individual characteristic and demography, death cause, cancer type and residential place in recent 10 years was completed in a questionnaire and arranged alphabetically. The repeated cases were omitted. All data were assessed by two groups in two sessions. Cases were divided in 5 years age groups.

Statistical analysis

The data entered the computer using SPSS (version 11.5, Chicago, IL) software. Crude incidence rate of cancers were calculated in various age groups and both sexes in 100.000 populations. Age-standardized rate (ASR) per 100.000 person- years was calculated using the direct method of standardization to the world population (Jensen et al., 1991).

Results

In a 5–year period from 1998–2002, 825 cases were registered in Semnan province. Complete and exact information was present in 791 cases (95.8%) that were registered as new cases of cancer in area of the Semnan University of Medical Sciences. Of the registered cases 492 (62.1%) were males and 299 (37.9%) were females.

Table 1. Age-specific, Average Annual Crude and ASR Incidence Rates per 100,000 Males

Sites	65-69	70-74	75-79	80-84	≥85	Crude	ASR	%
Stomach	172	259	850	637	349	327	**340**	25.0
Prostate	51	138	447	187	180	147	**150**	11.2
Bronchus, lung	63	107	335	263	98	127	**132**	9.7
Esophagus	70	69	246	225	127	106	**109**	8.1
Bladder	76	88	134	120	0	85	**86**	6.5
Colon, Rectum	82	48	89	150	158	85	**83**	6.5
Skin	31	37	221	75	63	90	**76**	6.9
Pancreas	6	34	111	187	95	47	**48**	3.6
Non-Hodgkin Lymphoma	19	34	67	105	66	40	**40**	3.1
Nervous system	32	52	33	35	0	37	**37**	2.8
Liver	7	23	67	75	64	29	**29**	2.2
Kidney	20	33	67	0	0	27	**28**	2.1
Small intestine	6	8	67	118	0	21	**23**	1.6
Hodgkin's disease	19	0	89	0	33	21	**23**	1.6
Leukemia chronic	12	15	22	74	0	19	**18**	1.5
Bone	0	24	22	0	0	10	**10**	0.8
Multiple myeloma	0	0	22	74	0	8	**9**	0.6
Lip, tongue, salivary, gland mouth	6	0	44	0	0	8	**9**	0.6
Gallbladder	0	0	45	0	0	5	**7**	0.4
Breast	0	8	0	0	30	5	**5**	0.4
Thyroid	0	0	0	36	32	5	**5**	0.4
Leukemia acute	6	7	0	0	3	2	**2**	0.2
Testis	0	0	0	30	0	3	**2**	0.2
Others	29	104	112	385	69	56	**81**	4.3
All sites	707	1,088	3,087	2,776	1,367	1,310	**1,350**	100

Table 2. Age-specific, Average Annual Crude and ASR Incidence Rates per 100,000 for Females

Sites	65-69	70-74	75-79	80-84	≥85	Crude	ASR	%
Stomach	89	123	382	252	111	157	**153**	16.3
Breast	59	123	229	115	100	106	**108**	11.0
Esophagus	60	98	127	76	0	74	**77**	7.7
Colon, Rectum	82	51	152	75	0	74	**76**	7.7
Skin	52	77	127	112	0	67	**70**	7.0
Bronchus, lung	22	51	152	117	90	61	**60**	6.3
Nervous system	31	75	76	70	33	51	**53**	5.3
Pancreas	29	12	101	112	30	41	**40**	4.3
Liver	30	50	0	115	89	44	**42**	4.6
Corpus uteri Ovary	45	24	25	75	33	38	**37**	4.0
Bladder	30	49	50	37	0	35	**37**	3.6
Lip, tongue, salivary gland, mouth	36	37	25	75	0	35	**36**	3.6
Leukemia chronic	0	27	26	150	0	25	**22**	2.6
Gallbladder	15	25	50	36	0	22	**23**	2.3
Thyroid	19	0	26	0	32	16	**14**	1.7
Non-Hodgkins Lymphoma	0	16	77	0	31	16	**18**	1.7
Small intestine	15	25	0	36	0	16	**18**	1.7
Bone	7	25	26	36	0	16	**17**	1.7
Hodgkin's disease	6	24	0	76	0	16	**15**	1.7
Multiple myeloma	7	0	24	60	0	13	**11**	1.4
Kidney etc.	3	0	99	0	0	12	**15**	1.2
Leukemia acute	7	13	0	0	0	6	**7**	0.6
Others	14	1	60	66	87	23	**24**	2.4
All sites	658	923	1,834	1,691	635	962	**973**	100

Table 1 and 2 show the principle cancer sites, 5-year age specific incidence rates, mean annual incidence, crude rate of cancers and ASR for men and women. Among the elderly men the crude incidence rate was 1310 and the ASR was 1350 per 100,000 persons per year. The corresponding rates for elderly women were, 962 and 973 per 100,000 persons per year respectively.

Discussion

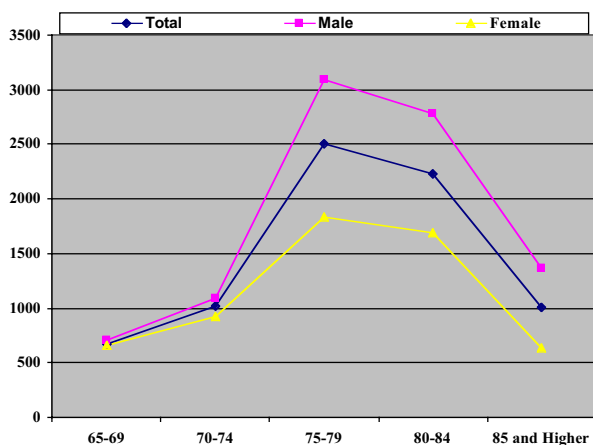Overall ASR of cancer in this study was 1,350 in men

Figure 1. Occurrence of Cancers in Males, Females, and Both According to ASR per 100,000 Persons per Year in Each Age-group

and 973 in women, based on the standardized rates, cancer being almost 9 times and 7 times more frequent among the elderly compared with younger men and women (30 to 64 years old)(Babaei et al., 2005). The calculated ASR for all cancers combined are only 1 to 3% higher than crude rates, indicating that the included populations have an age distribution among the elderly, which is close to the world standard population.

This study also showed that cancers were higher in males than in females. Gastric cancer is the most frequent cancer among elderly men and women accounts for around 25% and 16% of all cancers in both groups. The highest incidence of cancers was in group 75-79 years in both sex and then with increasing in age incidence of cancers was decreased (Figure 1). High incidence of gastric cancer may be due to high prevalence of helicobacter pylori in Iran, dietary, environmental and genetic factors. In this study breast cancer was the second most common cancer after gastric cancer in women, but breast cancer is the most frequent cancer among both elderly and younger women. This major female cancer constitutes around 1 in 5 diagnosed Cancers among the elderly in other parts of the world (Parkin et al., 1993). Annual age-standardized cancer incidence rates per 100,000 elderly persons were calculated based on data from cancer registries in 51 countries in 5 continents kept by the International Agency for Research on Cancer (IARC) and International Association of Cancer Registries (IACR). The proportions of all cancers among elderly men and women were 61% and 56% respectively. All cancers combined (except nonmelanoma skin cancer) were, based on the

standardized rates, almost 7-fold more frequent among elderly men (2,158 per 100,000 person-years), and around 4-fold more frequent among elderly women (1,192 per 100,000 person-years) than among younger persons (30 to 64 years old). However, large variations exist between different cancer sites (Parkin et al., 1997). For comparison the age-adjusted rates of cancer incidence were 751 and 429 per 100,000 in Japanese males and females, respectively in age above 40 years (Mori et al., 2005)

A special problem among elderly cancer patients is that a relatively high proportion also experience comorbid diseases which must be addressed especially in relation to care, diagnosis, and treatment.

Large geographical differences exist in the incidences for most cancers, indicating that lifestyle may play a major role. However, the specific causes for some major tumors (stomach, prostate, breast and colon) remain almost unknown; thus research is particularly needed for these major diseases among the elderly. The number of elderly persons in most countries will further increase during the coming decades. Consequently, it is already very important to emphasize the need for improved prevention, early detection and treatment of cancer in this population.

Acknowledgment

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