

Short Communication**Epidemiology and trend of cancer in Isfahan 2005-2010***

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Abstract

BACKGROUND: Cancer incidence rate is increasing in the world particularly in developing countries. The awareness regarding cancer incidence and distribution helps policy makers and researchers to design comprehensive plan for controlling cancer. The aim of this study was to determine the incidence rate and trend of cancer in Isfahan area, one of the most importance provinces of Iran.

METHODS: Data of Isfahan cancer registry were derived from 2005 to 2010. Direct standardization through world standard population produced by the world health organization was used and adjusted standard rate (ASR) was calculated. The Poisson regression analysis was employed to estimate cancer incidence trend during 5 years.

RESULTS: The new cases of cancer were 24771 patients from 2005 to 2010. Mean age of these patients was 56.1 ± 18.0 years and 54.6% were male. Male patients were approximately 7 years older than females. The most frequent cancer was gastrointestinal in men and breast cancer in women. The rate of cancer increased approximately 4 per 1000 population and incidence rate ratio (IRR) was 1.004 (95%CI: 1.002-1.005).

CONCLUSIONS: The rate of cancer is increasing rapidly in Isfahan province. Cancer control and comprehensive prevention plan for Isfahan is necessary.

KEYWORDS: Cancer, Incidence, Epidemiology.

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Cancer is an important cause of death worldwide and is the third cause of death in Iran.¹ The burden of cancer is increasing in the world, particularly in the developing countries because of population aging and growth as well as an increasingly adoption of cancer associated lifestyle such as smoking, unhealthy diet and low physical activity.² Approximately, 12.7 million cancer new cases and 7.6 million cancer deaths are estimated to have occurred in 2008 around the world. Nearly 60% of them occurred in developing countries.³ It was reported that the incidence rate is 98 to 100 per 100000 population annually in Iran.⁴ The most frequent cancers in

male was gastrointestinal and in female was breast cancer.^{1,2}

Awareness of incidence, trend and distribution of common cancers introduces some elements for policy makers to direct cancer control plans for reducing the cancer burden. Unfortunately, there are a few running cancer control programs in Iran. The primary epidemiological data helps policy makers to run cancer control and prevention plans. The main goal of our study was to describe the distribution of cancer based on demographic factors and present cancer incidence rate and 5-year trends in Isfahan. These findings were based on cancer registry which was approved by Iran

* This was an independent project and a report from cancer registry

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ministry of health. These statistics are published for the first time from Isfahan region.

Method

Isfahan province is one of the biggest and the most important area that is located in center of Iran. Its population is around 4,200,000 people who live in approximately 107027 km² area. The data was obtained from Cancer Registry center of health deputy. It is a population based cancer registry based on Iran Ministry of Health guideline.⁶ Data was collected from all hospitals, pathology lab, physician office, radiography centers, and radiotherapy centers. Trained health professionals collected the data. Data contained demographic characteristics - like age and sex- and histopathologic diagnosis. Histopathologic diagnosis were coded based on International Classification of Diseases for Oncology (ICD-O).⁷ Data entry was performed by special software named CanReg which was designed by cancer department of ministry of health. The history of cancer registry in Iran was described previously by Mohagheghi and Mosavi-Jarrahi.⁸

The population based data of Isfahan cancer registry has been completed since 2005. It was tried to cover all centers in Isfahan University of Medical Sciences district area. For checking sensitivity of data gathering, ten percent of data was rechecked every year by cancer registry office professionals. We decided to enter data from 2005 to 2010 because of confidence in gathering information to prevent sampling bias.

Data were extracted from cancer registry software and transferred to SPSS version 15 software. Analysis was done by SPSS 15 and STATA 10 software. We calculated crude incidence rate and the average annual adjusted specific incidence rate (ASR) per 100000 persons. We used direct standardized method using world standard population. We obtained population of Isfahan province and then adjusted it based on WHO standard population tables. Afterwards, the incidence rates regarding calculated standard populations were calculated.⁹ Trend of yearly cancer incidences and ASRs were compared by Poisson regression

analysis and were presented as incidence rate ratios (IRR) with %95 confidence interval (CI). The Poisson regression model is a method for multiple regression analysis of data with a dichotomous outcome and one or more categorically define predictors. The Poisson regression coefficient is IRR. The ASRs were defined as dependent variable while age sex and years were considered as independent variable and IRR was calculated by STATA 10 software. Significant level was determined as $p < 0.05$.

Result

During 5-year period from 2005 to 2010, 24771 new cases of cancer were registered in Isfahan cancer registry center. Of these, 54.6% of patients were male and 45.4% were female aged 56.1 ± 18.03 years (mean \pm SD). The average of age significantly differed between male and female. Figure 1 shows age differences between male and female. Male patients were approximately 7 years older than females.

Frequency of cancers based on their topography is shown in figure 2. The most prevalent cancers were gastrointestinal system, skin, breast and urinary system neoplasms. The most frequent cancer in men was gastrointestinal but in women it was breast cancer.

After direct standardization, it was demonstrated that the incidence rate of cancer is increasing in Isfahan province. Figure 3 showed the 5-year incidence trend of cancer in Isfahan. Poisson regression analysis determined the rate of cancer increased approximately 4 per 1000 population (IRR = 1.004 95%CI: 1.002-1.005). Table 1 shows the incidence rate ratio (IRR) of cancer in each year adjusted for sex and age.

Discussion

The findings of this study showed that incidence of cancer in Isfahan province has been increasing in recent years (4 per 1000 population). It is important for policy makers and health manager to seriously consider cancer in future plan in this district area -Isfahan.

The gastrointestinal and breast cancers were pioneer in this area. There was a gender

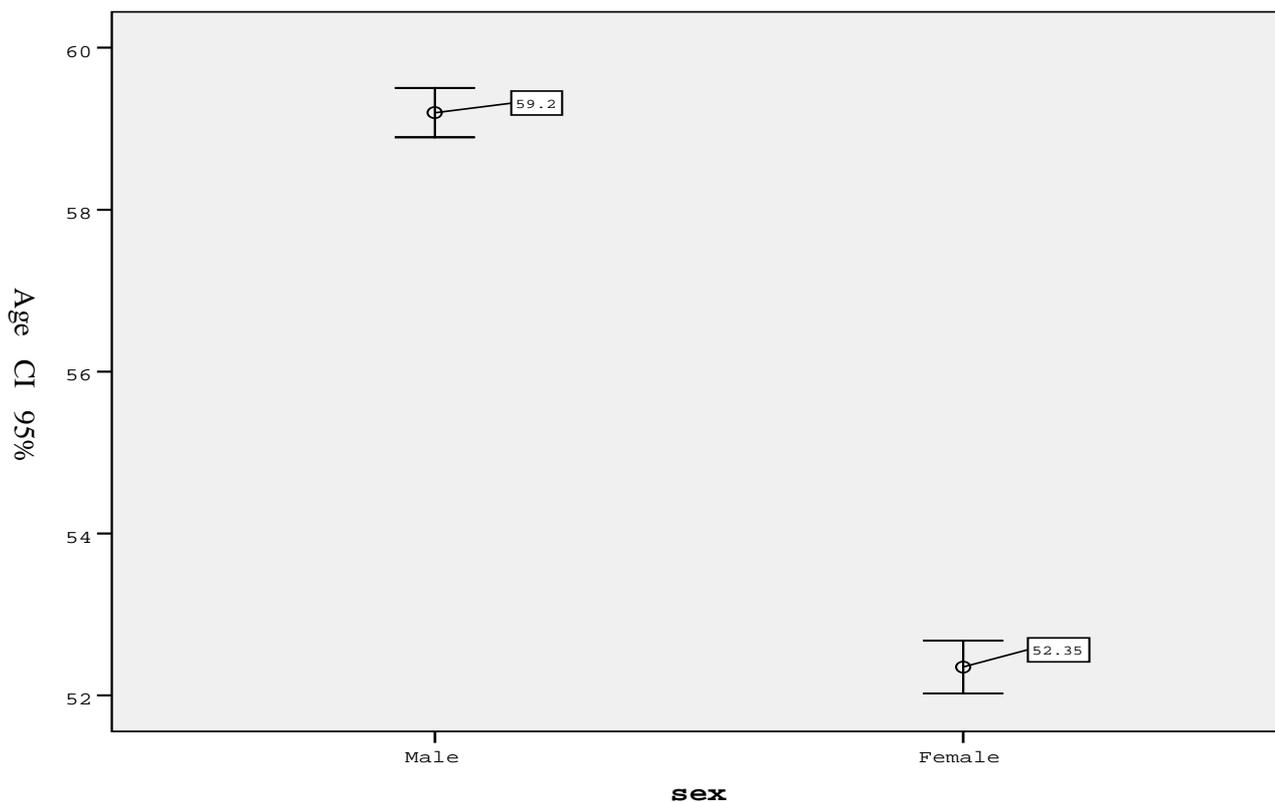


Figure 1. The mean age of cancer patients in men and women

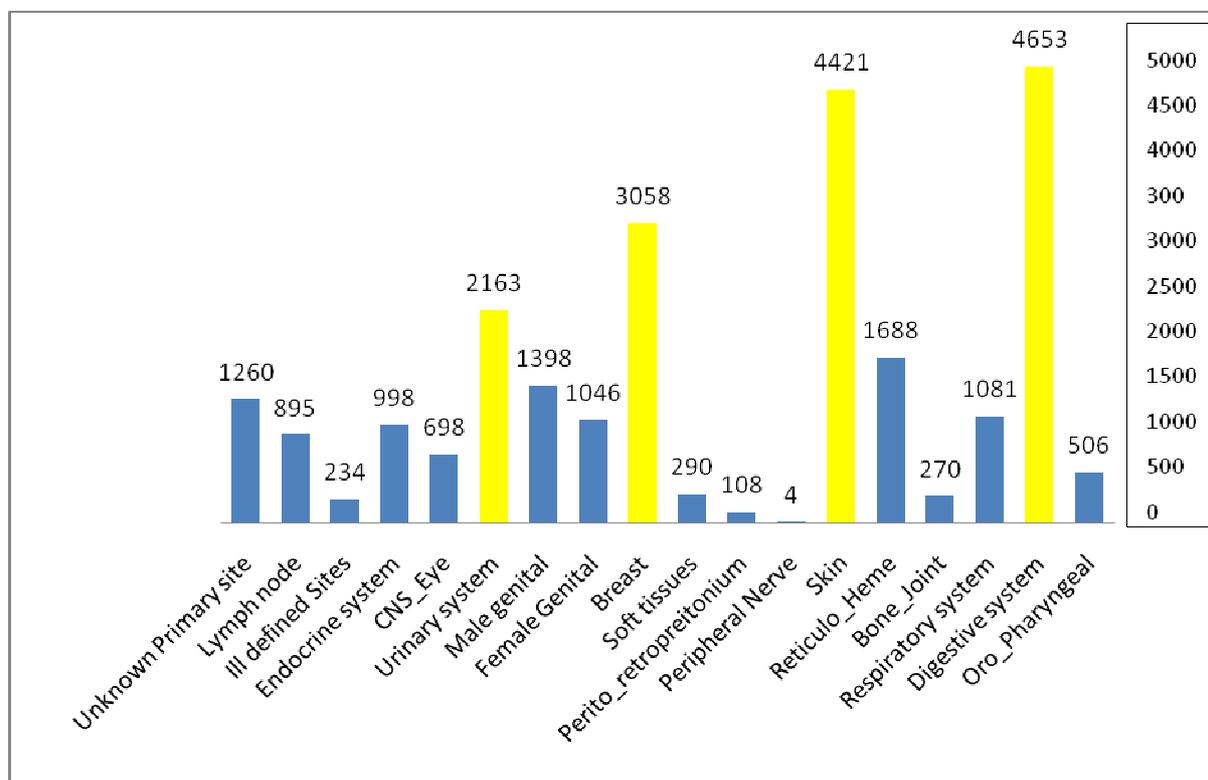
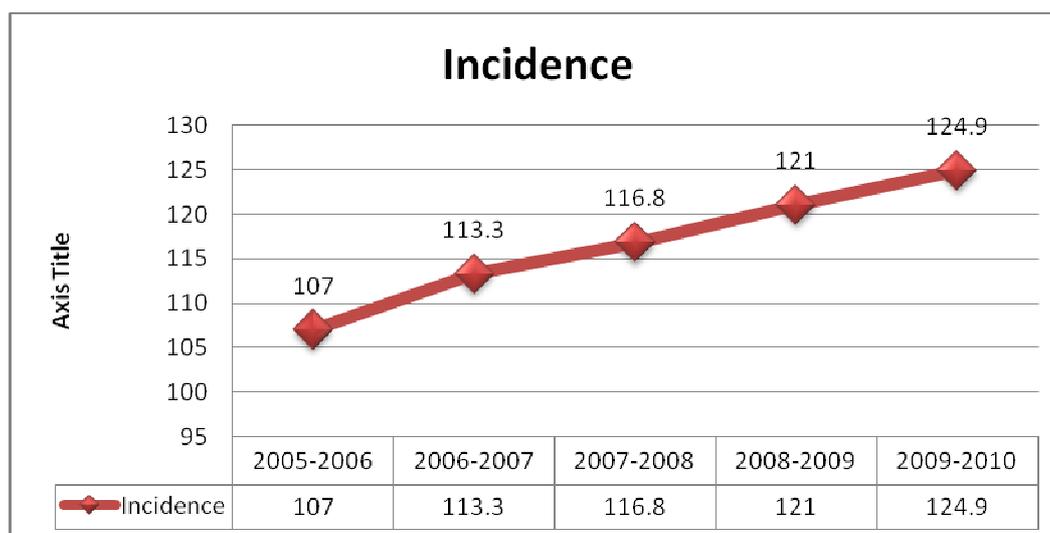


Figure 2. Frequency of cancers by organs



*ASR incidence per 100000 population

Figure 3. Trend of cancer incidence from 2005 to 2010

Table 1. Annual Incidence rate ratio of cancer from 2005 to 2010.

	IRR*	P-value**	95% CI***
2005-2006	1	--	--
2006-2007	1.02	0.52	0.96—1.08
2007-2008	1.017	0.59	0.95—1.08
2008-2009	1.027	0.39	0.97—1.09
2009-2010	1.017	0.59	0.95—1.08

*incidence rate ratio

**P-value derived from Poisson regression

*** Confidence interval

difference in cancer incidence and most people were involved in middle ages with mean age of 56 years. Previous reports from different area of Iran confirm these findings. In Iran, the most prevalent cancer was gastrointestinal and breast cancers in male and female, respectively. The mean age of cancer patients in other reports in Iran was around 56-57 years old.¹⁻⁵ The world population data shows the most frequent cancer in men is respiratory system cancers and GI cancers are after that. The serial studies by Moore and colleagues showed the contribution of cancer in Asia-Pacific area. Our recent data was comparable with incidence rates from different population of the world.¹³⁻²⁰ One of differences in Iran in contrast to other countries was respiratory system cancers. In Iran the frequency of respiratory cancer was low but it is improving. There are some proba-

ble reasons for it. At first, the smoking pattern in Iran differs from other country and it seems to be lower than other countries, although it has been progressing. More important reason was an information defect regarding respiratory cancers in our cancer registry data. Many cases with lung cancer are undiagnosed and some of them did not have any biopsy. They have been diagnosed only by radiographic procedures. Thus, many of them were not registered.

In male gender, the gastrointestinal cancers were the most frequent one. The most prevalent site for cancer in gastrointestinal was colorectal area. Colorectal cancer in our data was the most frequent and after that stomach cancer was in the second order. Report from Tehran showed the same proportion. The incidence of esophageal cancer was low in Isfahan.

However, It is notable that Iran is located in esophageal cancer belt of Asia.¹⁰

In women, breast cancer was on the top of list. The rate of breast cancer is increasing in Iran. Our rates was the same as Asian countries but it was lower than North American and European countries.²¹ Enhancement in breast cancer incidence should be taken into consideration. Existence of early detection programs of breast cancer plays the leading role in reducing mortality and improving the patient's prognosis.

The comparison between our data and countrywide data which published by ministry of health determined the incidence of bladder cancer was high in Isfahan province. Isfahan is industrial area and bladder cancer is job dependent. We have designed some research project to clarify bladder cancer situation in Isfahan.

Our finding showed the incidence of cancer is dramatically increasing in Isfahan. However, there were some limitations in our study. For trend analysis we needed at least 20-year data. We presented 5-year analysis and will try to report ten-year or more in future. We did not

have data from 2 cities of Isfahan province - Kashan and Aran-bidgol- because they are covered by Kashan Medical Sciences University. Additionally, data in our registry were limited to pathology, sex and age. We could not analyze other related variables like job. However, we have been conducting some research project to find cancer risk factors and distribution in the district area. As discussed in aforementioned paragraphs, our cancer registry had defect in lung cancer. We have tried to solve this problem to call on all medical center like oncology, radiology, surgery and respiratory disease centers.

Conclusion

The rate of cancer is rapidly increasing in Isfahan province. Comprehensive cancer control and prevention plan for Isfahan seems to be necessary. Fortunately, this plan is being prepared in Isfahan University of Medical Sciences.

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We appreciate all health professional that helped cancer registry for data collection.

Conflict of Interests

Authors have no conflict of interests.

Authors' Contributions

FM designed and edited manuscript, MAR designed, analyzed and wrote manuscript, KH and MT supported the project and edited manuscript and HT helped in data collection and entry and managed data.

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