

# Research Journal of Pharmaceutical, Biological and Chemical Sciences

## The Epidemiology of Skin Cancer and Its Trend in Isfahan Province, Iran.

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### ABSTRACT

Skin cancer is one of the most common cancers worldwide, including in Iran. Awareness of trend and distribution of skin cancers provide some dimensions for policy makers to handle cancer control plans for decreasing the cancer burden. The main goal of our study was to determine the trend and distribution of skin cancer based on demographic factors and present cancer incidence rate and 4-year trends in Isfahan province. This study was done using existing data, extracted from the National Cancer Registry System and the Disease Management Center of Iranian Ministry of Health between 2003 and 2008. Age Standardized incidence rates (ASIR) were calculated using the world standard population. The crude incidence rate (CIR) were also computed. During 4 years in Isfahan province, a total of 3298 new cases of skin cancers have been registered. Of these, 34.94% (1152 cases) occurred in females and 65.06% (2146 cases) in males, sex ratio (male to female) for this study is 1.86. This cancer is more prevalent in men than women. The data shows that skin cancer incidence gradually increased with age for both sex. The rate of skin cancer is rapidly increasing in Isfahan province. Comprehensive cancer control and prevention plan for Isfahan seems to be necessary.

**Keywords:** Epidemiology, Skin Cancer, Trend, Iran

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## INTRODUCTION

Cancer is the main cause of death in the worldwide [1] and is the third leading cause of death in Iran [2]. Currently, the burden of cancer is increasing in the world, particularly in the developing countries on account of population aging and growth along with an increasingly adoption of cancer related lifestyle such as immobility, stress, obesity, unhealthy diet and smoking [3-6]. It is estimates that the number of new cases of cancer from 10 million per year in 2000 will rise to 15 million in 2020, and approximately 60% occurs in developing countries [7]. One of the most common cancers in humans are Skin cancer [2]. Also, Skin cancer is the most common cancer in Iran so that the its comprise 5.27 to 32.7 percent of cancers (8). According to the cancer registries in Iran, fifteen percent of all malignancies recorded related to skin cancer in 2003 and, according to the cancer registry report, skin cancer with a 9114 case accounted for high percentage of cancer cases in 2008 and also, during the years 2003 to 2007 was the most prevalent cancer in Iran [9].

Skin cancer can be classified into two groups of malignant melanoma and Non-Melanoma Skin Cancer (NMSC [10]. NMSC, which includes Basal Cell Carcinoma (BCC) and Squamous Cell Carcinoma (SCC) is the most common cancers that account for approximately 40 percent of all malignancies [11]. Even though, NMSC don't lead to a high mortality rate, it causes major disabilities [2, 9]. Although the incidence of malignant melanoma do not have much, if not recognized and treated early, it is one of the most lethal malignancies [12]. Frequent exposure to sunlight, positive experiences of radiation to the head and neck, not using sunscreen, and changes in cultural habits in the recent decades may contribute to the increased incidence of skin cancer in Iran [13]. Geographical features and climate also, lead to Iran has become the land for the development of this cancer [14].

Therefore, Awareness of trend and distribution of skin cancers provide some dimensions for policy makers to handle cancer control plans for decreasing the cancer burden. Unluckily, there are a few running cancer control programs in Iran. The primary epidemiological data contributes to the policy makers to run cancer control and prevention plans. The main goal of our study was to determine the trend and distribution of skin cancer based on demographic factors and present cancer incidence rate and 4-year trends in Isfahan province.

## METHODS

This secondary data analysis study was carried out based on longitudinal program the province of Esfahan in Iran that have national registry of cancer (NCR) which is trying to identify all cases of cancer occurring in Iran. Data used in this study were obtained from NCR, and disease control and prevention of ministry of health and medical education in Iran for 2005–2008 (15). More details about cancer registry in Iran were previously published [11, 16]. In this study, data on the incidence of skin cancer were selected according to the International Classification of Diseases-Oncology (ICD10) with the code C44 for age groups and sex [17]. Age Standardized incidence rate (ASIR) were calculated using the world standard population. The crude incidence rate (CIR) were also computed. To describe incidence time trends for 4 years studied.

## RESULTS

Finding obtained from the national registry system of cancer showed that the incidence of skin cancer had increasing trend from 2005 to 2008(table-1). During 4 years from 2005 to 2008, in Isfahan province, a total of 3298 new cases of skin cancers have been registered. Of these, 34.94% (1152 cases) occurred in females and 65.06% (2146 cases) in males. Overall Cancer incidence sex ratio (male to female) for this study is 1.86. Most frequent Cancer cases within this period time were reported in 2008, including 562 males and also in 2005, including 292 females. Sexually, the incidence rate of this cancer in men is more than women (Table 1). ASIR shows an increasing trend for the both sexes during 2005- 2008; so that it has increased from 27.63 to 28.93 in females and from 19.36 to 19.41 in males (Table 1). The data shows that skin cancer incidence gradually increased with age for both sex, with the maximum rate in 80-84 years old, but there was some decline after 85 years old (Table 2).

**Table 1: Frequency, crude, and standardized incidence of skin cancer by sex, during the years 2005-2008**

	Female			Male			Total population		M:F
	Count	CIR*	ASIR**	Count	CIR	ASIR	Count	ASIR	
2005	292	13.04	19.36	488	20.68	27.63	780	23.49	1.67
2006	290	12.95	20.12	541	22.93	30.54	831	25.33	1.86
2007	282	12.59	18.97	555	23.52	30.80	837	24.88	1.96
2008	288		19.41	562		28.93	850	24.17	1.95

\*CIR=Crude incidence rate (per 100,000 persons), \*\*ASIR=Age-standardized incidence rate (per 100,000 persons)

**Table 2: Age- standardized incidence rate (per 100,000 persons) According to Age and sex Groups**

Age Group	2005		2006		2007		2008	
	F	M	F	M	F	M	F	M
0-4	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.03
5-9	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.29
10-14	0.33	0.30	0.00	0.00	0.00	0.00	0.19	0.19
15-19	0.32	0.00	0.32	0.63	0.00	0.32	0.29	0.35
20-24	1.71	1.81	1.71	1.36	1.28	0.45	0.47	0.53
25-29	0.56	3.04	0.00	3.04	2.81	2.02	1.09	1.18
30-34	4.35	3.72	3.11	5.59	4.35	6.83	2.45	2.35
35-39	2.94	7.80	2.21	2.84	5.89	4.97	3.47	3.67
40-44	10.53	8.27	5.67	6.61	7.29	8.27	6.78	6.88
45-49	19.80	26.83	16.50	23.00	16.50	26.83	11.48	13.58
50-54	37.07	91.04	49.43	95.92	45.72	73.16	35.46	33.86
55-59	70.50	102.41	74.21	97.12	77.92	113.01	42.19	63.21
60-64	106.52	99.07	122.73	117.65	97.26	126.94	59.10	89.97
65-69	79.54	112.62	110.33	116.20	92.37	67.93	61.96	97.88
70-74	97.33	171.33	70.79	212.87	73.74	275.17	73.82	125.90
75-79	150.45	164.83	100.30	229.33	105.32	225.75	113.74	157.34
80-84	247.93	485.80	275.48	475.23	247.93	644.21	128.94	255.73
≥85	169.18	184.19	169.18	410.88	153.80	297.53	103.15	199.06

### DISCUSSION

In this study, the sex ratio (male to female) for incidence of cancer was 1.86. The high rate of skin cancer incidence among Iranian males has also been reported for other provinces of Iran. In a study carried out in Sistan and Baluchistan province, the most common cancer in both sexes was skin cancer with the rate of 10.35% and of all skin cancer cases, 58.2% were male and 41.8% female [3]. In a study by Razi et al on epidemiology of skin cancers in 30 provinces, this ratio (male to female) was 1.67 from 2005 to 2008 [11]. The incidence of skin cancer have been in the second degree in Iran at 2006. Studies in different parts of Iran indicate a high incidence of skin cancer in most cities of Iran; this may be related to increased cases of diagnosed or facing with more risk factors [18]. To this regard, it should be noted that in the all mentioned studies, population sex ratio was not equal [3, 11]. The ASIR showed an increasing trend for skin cancers in Isfahan; so that the skin cancer rate in females was 19.36 in 2005 and increased to 19.41 in 2008. Also, this rate increased from 23.49 to 24.17 for males. The study findings of Ghonche et al showed that, the incidence of skin cancer has rising between 2003 and 2008 in southern of Iran [8]. In a study conducted in Yazd, Vakili et al reported that the *cancer* incidence is demonstrating *increasing trends in both sexes* between 2005 to 2009.

In the Vakili's study the ASIR increased from 84.6 to 94.8 and this rate increased from 85.9 to 113.8 for males [19]. Several factors may be affect in increasing trend of skin cancer incidence in Iran. These factors consist of climate changes, promoting awareness, environmental factors, and advances in diagnosis [20, 21]. The most important etiologic agent of all types of skin cancer is ultraviolet radiation [13]. And also, the incidence of skin cancer in people who have had excessive exposure to sunlight than other people was 4.8 times. In most seasons of

the year, the intense radiation of the sun and lack of using suitable protection for outdoor in Iran can probably lead to high incidence of the skin cancer [11]. These *studies show* that skin cancer *incidence rates* are *higher in women than in men*. In most studies BCC has been more common in men than women in the world [8, 22]. Daily activities in outdoor and sunny environments or contact with the carcinogen can be main factors cause to the high rate of the cancer in males [9, 11]. It recommended that in the area that ASIR is higher than the national average, appropriate studies to identify environmental, cultural, biological factors, designed to identify the factors affecting the occurrence of the disease in these areas. Furthermore, in this study, despite the continued increase in the incidence of disease with rising the age, the disease in the age group 85 years, and elders is less than the previous age group, that similar with other study. The possible reason was reduce in physician meeting in this age group for skin problem and reduce skin cancer diagnosis. To reduce burden of cancer, education, preventive and screening programs recommended in Iran[23].

Also, according to the increasing life expectancy and the mean age of population in our country, rising the incidence of skin cancer, especially in the older age, may be justifiable. Other studies, similar our study, showed as age increases, the incidence of cancer will increase [24, 25].

One of the main limitation of this study is the data collected from the Cancer Registry of Ministry of Health which are limited to the sex and age. Another limitation was lack of information related to subjects' lifestyle and their education, occupation and socio-economic status.

### CONCLUSION

The rate of skin cancer is rapidly increasing in Isfahan province. Comprehensive cancer control and prevention plan for Isfahan seems to be necessary.

### ACKNOWLEDGEMENT

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

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