

A Descriptive Study on Skin Cancer in Zanjan, Northwest of Iran, 2005-2010: A Hospital-Based Survey

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Abstract: Cutaneous melanoma and non-melanoma skin tumors are now the most common types of cancers in white population. Both of them show an increasing incidence rate worldwide. In this cross-sectional epidemiological study, researchers used data from the histological diagnoses given >5 years period extending from 2005-2010 in the Department of Dermatology of Valiasr Hospital in Zanjan, Iran. All patients suffering from plaque-like lesions suspicious to be tumoral were selected for biopsy. Pathological reports were reviewed and the relevant information such as age, sex, histological diagnosis of tumor and its anatomical site was abstracted. From a total of 5341 biopsied patients, 325 malignant tumors were diagnosed. BCC (65.2%) was the most common tumor. While melanoma was more prevalent in women, men had higher risks of BCC and SCC ($p = 0.014$, $cc = 0.212$). SCC was a cancer of the elderly whereas melanoma occurred on average at younger ages. The most common anatomic site of BCCs and SCCs both were head and neck. Melanoma, solar keratosis and skin lymphoma only involved the head and neck but Kaposi's sarcoma involved only the extremities. Skin cancers are considered to be a public health problem in Northwest of Iran as is the case in other parts of the world. Therefore, providing the high risk population with health information about causative agents and timely referring is highly recommended.

Key words: Epidemiology, melanoma, nonmelanoma skin cancer, skin lymphoma, risk, Iran

INTRODUCTION

Cutaneous melanoma and non-melanoma skin tumors represent more than one-third of all malignant tumors and thereby constitute the most frequent types of tumors (Diepgen and Mahler, 2002). In this respect, Non-melanoma Skin Cancer (NMSC) including Squamous Cell Carcinoma (SCC) and Basal Cell Carcinoma (BCC) are 18-20 times more frequent than melanoma (Holme *et al.*, 2000; Levi *et al.*, 2001; Harris *et al.*, 2001). For both, melanoma and non-melanoma tumors, a significant increase in incidence have been observed worldwide (Holme *et al.*, 2000, 2001; Levi *et al.*, 2001; Harris *et al.*, 2001; Jemal *et al.*, 2001; Mansson-Brahme *et al.*, 2002; Stang *et al.*, 2001; Nola *et al.*, 2002; Ocana-Riola *et al.*, 2001).

In recent years, studies have shown a relatively high prevalence and incidence of skin tumors in several areas of Iran (Mapar *et al.*, 2000; Barzegari, 2006; Tousi *et al.*, 2004; Amouzgar *et al.*, 2006; Iraj *et al.*, 2007; Nourbala, 2007). The aim of this study was to estimate the sex and

age-specific prevalence and anatomic distribution of melanoma, non-melanoma skin cancer and other skin-involving tumors in Zanjan, Northwest of Iran between 2005 and 2010.

MATERIALS AND METHODS

This cross-sectional epidemiological study used data from the histological diagnoses given >5 years period extending from 2005-2010 in the Department of Dermatology of Valiasr Hospital in Zanjan, Iran. This hospital is the only referral center in Zanjan. All patients suffering from plaque-like lesions suspicious to be tumoral were selected for biopsy.

Tumoral lesions had been diagnosed by a pathologist using standard criteria, according to International Classification of Diseases for Oncology (ICD-O) Version 3 (2000). Carcinoma *in situ* was also included and tumoral lesions without definite diagnosis were excluded. All the pathological reports were reviewed and the relevant information such as age, sex, histological diagnosis of

tumor and its anatomical site was abstracted. The sex and age-specific frequency of tumors were computed and the association of tumors type with sex, age and anatomical distribution of lesions were assessed (for sex by Chi-square test and the Cramer's V correlation coefficient [cc] and for age by one-way analysis of variances and the Tukey post hoc test). All statistical analyses were performed using SPSS Version 17.0 for Windows (SPSS Inc., Chicago, Illinois, USA). All calculated p-values were 2-sided and $p < 0.05$ was considered statistically significant.

RESULTS AND DISCUSSION

From a total of 5341 biopsied patients, 325 were diagnosed to have malignant tumors. BCC with a frequency of 212 cases (65.2%) was the most common tumor. SCC and melanoma with 77 (23.7) and 11 (3.4%) cases were in the next places, respectively (Table 1).

Table 2 shows the sex and age specific frequencies of cutaneous skin cancers and the three most frequent other skin-involving tumors. While melanoma was more prevalent in women, men had higher risks of BCC and SCC ($p = 0.014$, $cc = 0.212$). The differences between prevalence of tumors in different age groups were also significant ($p < 0.001$, $cc = 0.231$). Age distribution of BCC and SCC regarding sexes are shown in Fig. 1 and 2, respectively. Figure 3 shows the age means for the six more prevalent tumors. The age means were significantly different in different types of tumors ($F = 4.183$, $p = 0.001$). This difference was between melanoma and Kaposi's sarcoma (Tukey's $p = 0.005$) and between melanoma and SCC (Tukey's $p = 0.008$). SCC was a cancer of the elderly whereas melanoma occurred on average at younger ages. The association between anatomic site of tumor and the

tumor type was also significant ($p < 0.001$, $cc = 0.665$). The most common anatomic site of BCCs and SCCs both were head and neck (98.1 and 92.2%, respectively). Melanoma, solar keratosis and skin lymphoma only involved the head and neck but Kaposi's sarcoma involved only the

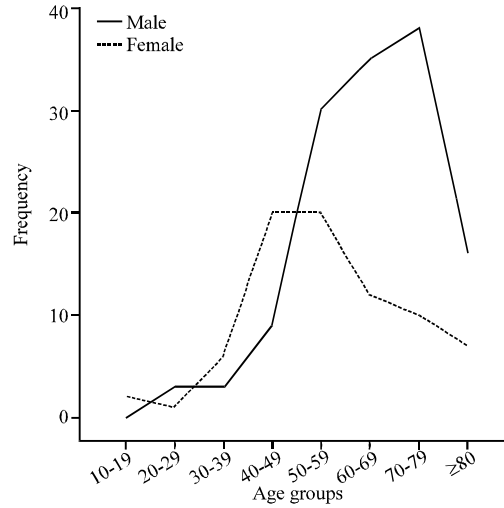


Fig. 1: Age distribution of BCC among male and female patients

Table 1: Frequency of tumors (N = 325)

Tumor types	Frequency (%)
Basal cell carcinoma	212 (65.2)
Squamous cell carcinoma	77 (23.7)
Melanoma	11 (3.4)
Solar keratosis	8 (2.5)
Kaposi's sarcoma	6 (1.9)
Skin lymphoma	5 (1.5)
Fibrosarcoma	2 (0.6)
Keratoacanthoma	2 (0.6)
Granulositic sarcoma	1 (0.3)
Paget's disease	1 (0.3)

Table 2: Sex and age specific frequency of skin cancers and the three most common other skin involving tumors (N = 315)

Sex	Age groups	Tumor types (%)						Total (%)
		BCC	SCC	Melanoma	Solar keratosis	Kaposi's sarcoma	Skin lymphoma	
Male	10-19	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
	20-29	3 (2.2)	1 (1.6)	0 (0)	0 (0)	0 (0)	0 (0)	4 (1.9)
	30-39	3 (2.2)	0 (0)	1 (2.5)	0 (0)	0 (0)	0 (0)	4 (1.9)
	40-49	9 (6.8)	6 (9.8)	0 (0)	0 (0)	0 (0)	1 (33.3)	16 (7.6)
	50-59	30 (22.4)	7 (11.5)	1 (2.5)	1 (20)	1 (16.7)	2 (66.7)	40 (19)
	60-69	35 (26.1)	15 (24.6)	0 (0)	0 (0)	1 (16.7)	0 (0)	51 (24.2)
	70-79	38 (28.4)	20 (32.8)	0 (0)	3 (60)	1 (16.7)	0 (0)	62 (29.4)
	≥80	16 (11.9)	12 (19.7)	2 (50)	1 (20)	3 (50)	0 (0)	34 (16.1)
Total		134 (100)	61 (100)	4 (100)	5 (100)	6 (100)	3 (100)	211 (100)
Female	10-19	2 (2.6)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	2 (1.9)
	20-29	1 (1.3)	2 (12.5)	1 (14.3)	0 (0)	0 (0)	0 (0)	4 (3.8)
	30-39	6 (7.7)	3 (18.8)	5 (71.4)	1 (33.3)	0 (0)	0 (0)	14 (13.5)
	40-49	20 (25.6)	2 (12.5)	0 (0)	0 (0)	0 (0)	1 (50)	23 (22.1)
	50-59	20 (25.6)	3 (18.8)	0 (0)	1 (33.3)	0 (0)	1 (50)	25 (24)
	60-69	12 (15.4)	1 (6.3)	1 (14.3)	0 (0)	0 (0)	0 (0)	13 (12.5)
	70-79	10 (12.8)	4 (25)	0 (0)	1 (33.3)	0 (0)	0 (0)	15 (14.4)
	≥80	7 (9)	1 (6.3)	0 (0)	0 (0)	0 (0)	0 (0)	8 (7.7)
Total		78 (100)	16 (100)	7 (100)	3 (100)	0 (0)	2 (100)	104 (100)

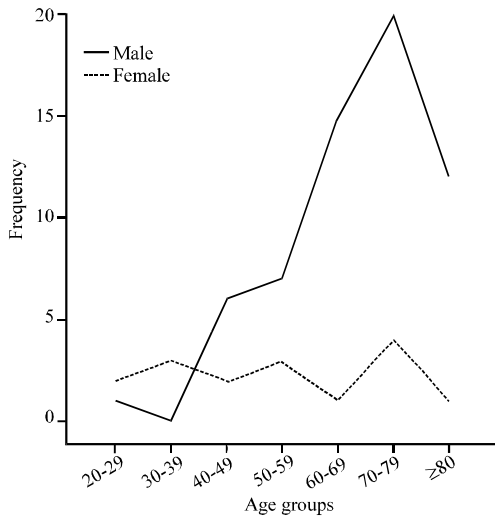


Fig. 2: Age distribution of SCC among male and female patients

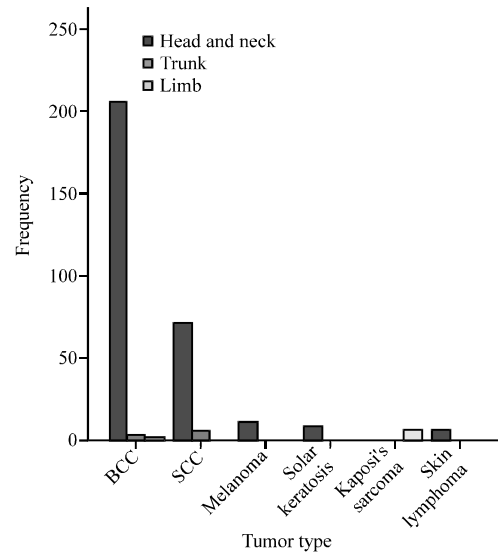


Fig. 4: Anatomical distribution of six most common skin cancers.

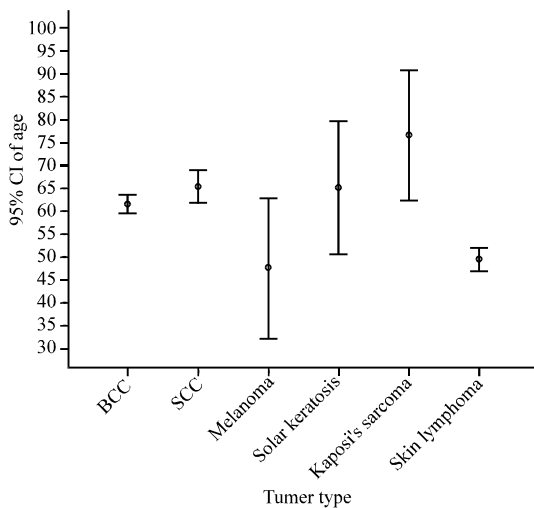


Fig. 3: Comparison between mean ages of the six most common tumors

extremities (Fig. 4). Besides skin phenotypes, geographic factors are also important in increasing the risk of Non-melanoma Skin Cancer (NMSC), the incidence of which increases in areas nearer to the equator (Tsao, 2001). As in caucasians, an increase was observed in the incidence of premalignant and malignant skin lesions in Asians and Blacks.

Destruction of the ozone layer which absorbs part of the sun rays is also a contributing factor (Ishioka *et al.*, 2009). BCC is the most common malignant disease throughout the world and SCC is the second common form of cancer in white subjects (Gloster and Brodland, 1996). This was the same as in the study, BCC (65.2%) and SCC (23.7%). The ratio of BCC to SCC in white persons in

the USA, Australia, England and Belgium was about 4:1 (Pierard-Franchimont *et al.*, 1999) where as in Hamedan, Iran, this ratio was found to be 2.5:1 (Zamanian *et al.*, 2006) and in this study, it was 2.7:1. As a result, BCC in the West countries is more common and this difference may be due to skin phenotype and take more sun as a more important causative factor. Previous studies have shown a higher causative factor. Previous studies have shown a higher prevalence and incidence of NMSC in men than in women (Gray *et al.*, 1997; Chuang *et al.*, 1990b) which was confirmed by this study as well. Nevertheless, the male to female ratio of SCC was 3.8:1 in this study but was much lower in USA (3:1) and Australia (2:1) (Marks, 1997; Martinez and Otley, 2001).

The higher ratio in the region can be attributed to some factors: skin cancers, for example are more common in rural area than urban and most of the patients are farmers and outdoor activities like farming are more frequent in men than women.

The head and neck were the most frequent sites reported for BCC (98%), SCC (92%) and melanoma (100%) similar to the finding of previous studies in Australia (Lathlean, 1999) and Jordan (Omari *et al.*, 2006). But some other studies do not show this, Chuang *et al.* (1990a) reported that only 60% of NMSCs are found on this location and a survey in Catalonia in which more than half of BCCs occurred on the trunk suggests that other factors besides the sunlight contribute to skin cancers (Estrada, 2005). Melanoma is less common than non-melanoma skin cancers. However, it is much more dangerous and causes the majority (75%) of death related to skin cancers

(Jerant *et al.*, 2000). It has the highest incidence in Queensland, Australia and is the 5th most common diagnosed cancer in the United States (Jemal *et al.*, 2009). It is a rare disease in the non-caucasian population and Asians (Cormier *et al.*, 2006; Makredes *et al.*, 2010). In this study, only 3.4% of the patients had melanoma and it was more common in female. Based on age ranges, it was seen in younger age that was as the same as findings of the study conducted by Baccard *et al.* (1997). Merrill (2011) showed that the incidence of melanoma was equal in both sexes in younger ages but was more common in men in older ages. As a limitation to hospital-based studies, a group of patients consulting dermatologists and pathologists practicing in private offices were missed in this and similar studies.

CONCLUSION

Skin cancers are considered to be a public health problem in the Northwest of Iran as is the case in other parts of the world. Therefore, providing the high risk population with health information about causative agents and timely referring is highly recommended.

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