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The most common skin cancers and the risk factors in geriatric patients: A hospital based-controlled study

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ABSTRACT

Our aim was to detect the distribution of all malign skin tumors in geriatric patients, and evaluate risk factors comparing with health volunters. Two hundred patients with malignant skin tumors over 65 years old and 75 healty volunters were enrolled into the study. Sociodemographic characteristics, hair colour, eye colour, Fitzpatrick's skin type, the degree of photoaging by using Glogau's Photodamage Classification Scale, sunbathing habits, the use of sun protective clothings, sunscreen cream usage, working outdoor, vitamine intake habit, smoking, and alcohol consumption, family history of skin tumor, accompanying systemic diseases, exposition to chemicals and tumors localization were recorded. Tumors' localizations were detected. A total of 109 (54.5%) of patients were male, 91 were (45.5%) female and the mean age of patients was 72.97±6.73 in the study group. A total of 209 skin tumors identified in 200 patients. Basal cell carcinoma (BCC) was the most common skin tumor (n=153, 72.85%) and followed by squamous cell carcinoma (SCC) (n=36, 17.28%) and malignant melanoma (n=10, 4.7%). The most common localization of tumors was the face (n=159, 75.71%). There were significant differences regarding sun protective clothing habits between BCC and SCC patients when compared to the control group ($p<0.05$). Glagou's Photodamage Classification Scale scores in BCC and SCC groups were higher than the control group ($p<0,05$). UV radiation and sun exposure seemed to be the main risk factors of skin tumors in geriatric patients.

1. Introduction

In recent years, the elderly population is rapidly increasing (Khaled et al., 2008). Aging is a risk factor for most of cancers. In general, two different mechanisms have been suggested to explain the increase of cancer risk with aging. The first explanation is the exposure to occupational carcinogens. The second mechanism is the physical aging. Vulnerability to cancer with multiple effects of age such as disturbance of hormonal balance, an increase of chronic proliferation and the decline in immune surveillance with age (Ukraintseva and Yashin, 2003).

Skin cancer is the most common cancer all over the world. In fact, the incidence of skin cancers is rising each year along with the increase of aging population. The longer life expectancy is considered among main risk factors as well as the increased sun exposure and the ozone layer depletion

(Freedman et al., 2003; Andrew, 2012; Malaguarnera et al., 2013; National Council on Skin Cancer Prevention, 2013). Exposure to some chemicals such as solvents, polycyclic aromatic hydrocarbons (PAHs), arsenics were suggested as risk factors for skin cancer (Bancone et al., 2012; Hsu et al., 2015). Nonetheless retinol and vitamin A derivates play role in cell development and differentiation therefore most cancers such as skin, lung, prostate, breast and overian demostrated to be suppressed by retinoic acids (Chen et al., 2014).

Cancers arising from the skin may be categorized into two main groups: melanoma skin cancer and non-melanoma skin cancer which include primarily basal cell carcinoma (BCC) and squamous cell carcinoma (SCC). Other cancer types of the skin are less commonly confronted by the clinicans.

We firstly aimed to detect the distribution of all malignant skin tumors in geriatric patients and to evaluate some sociodemographic and risk factors regarding the skin cancer in the cohort group including their socio-demographic characteristics. In the second step, we aimed to compare these patients with healthy counterparts and thus to see whether there is any difference regarding aforementioned factors between the two groups.

2. Material and methods

A retrospective and comparative study was planned. Two-hundred patients with malignant skin tumors including epidermal, dermal and adnexal tumors (who were diagnosed histopathologically) and over the age of 65, who applied Dermatology and Plastic Reconstructive and Aesthetic Surgery outpatient clinics were enrolled into the study. All datas were collected archives of hospital. Seventy-five healthy volunteers matched regarding sex and age were admitted the study as a control group, Sociodemographic characteristics including the age, gender, marital status, education level as well as hair colour, eye colour and Fitzpatrick's skin type, the degree of photoaging by using Glogau's Photodamage Classification Scale were recorded. Additionally, sunbathing habits, the use of sun protective clothings, sunscreen cream usage, working outdoor, vitamine intake habit, risk factors such as smoking, and alcohol consumption, family history, accompanying systemic diseases, exposition to chemicals such as PAHs, solvents and arsenic were recorded. All the patients and control groups were asked if vitamin suplement contains retinoid acids. Tumors diagnosed by dermatological and histopathological examinations and their localizations were detected in the study group. Statistical analysis of all data was performed using SPSS version 20.0 programme using Kruskal-Wallis, Chi-square test, Fisher test and $p<0.05$ was accepted to be statistically significant.

3. Results

A total of 109 (54.5%) of patients were male, 91 were (45.5%) female and the mean age of patients was 72.97±6.73 in the study group. 36 (48%) of patients were male, 39 (52%) were female in the control grup. A total of 209 skin tumors identified in 200 patients. BCC was the most common skin tumor (n=153, 72.85%) and followed by SCC (n=36, 17.28%), malignant melanoma (n=10, 4.7%), mycosis fungoides (n=5, 2.35%), Kaposi Sarcoma (n=3, 1.41%), eccrine porocarcinoma (n=2, 0.94%) and sebaceous carcinoma (n=1, 0.47%) respectively. The most common anatomical localization of tumors was the face (n=159, 75.71%). When considering overall body parts, the scalp (n=16, 7.68%), the upper limb (n=13, 6.27%), the trunk (n=10, 4.7%), the lower limb (n=6, 2.82%), the neck (n=4, 1.88%), and the genital area (n=2, 0.94%) followed the face other most common localizations. Tumors and tumor localizations were shown on Table 1.

Table 1. Tumors and anatomical localizations

Tumors	Localization	
Basal cell carcinoma	Face: 159	Forehead: 23
		Nose: 66
		Zygomatic prominence: 15
		Cheek: 4
		Mandibular region: 5
		Upper eyelid: 3
		Lower eyelid: 6
		Inner eye canthus: 1
		Upper lip: 2
		Lower lip: 1
		Ear: 5
	Scalp: 11	
	Neck: 4	
	Trunk: 6	
	Upper limb: 1	
Squamous cell carcinoma	Face: 24	Forehead: 3
		Nose: 2
		Zygomatic prominence: 9
		Cheek: 2
		Mandibula: 2
		Lower eyelid: 1
		Lower lip: 5
	Scalp: 4	
	Upper limb: 6	
	Genital area: 2	
Malignant melanoma	Face: 3	Mandibula: 3
		Lower eyelid: 1
		Lower lip: 1
	Scalp:1	
	Upper limb: 3	
	Lower limb: 3	
Mycosis fungoides	Trunk: 4	
	Upper limb: 1	
Kaposi sarcoma	Lower limb: 3	
Eccrine porocarcinoma	Upper limb: 2	
Sebaceous carcinoma	Face: 1	Forehead: 1

A few number of patients had some other tumors, beside BCC and SCC, thus we excluded those tumors when compared with the control group for statistical evaluation. Patients were similiar in terms of age, gender, education level, in the BCC patients, SCC patients and the control group and the statistically significant difference was not found between the three groups ($p>0.05$). Single patients were more frequent in BCC group and SCC group than control group ($p<0.05$). BCC group and SCC group were similiar regarding marital status ($p>0.05$) (Table 2).

Smoking and alcohol using habits, vitamine intake, family history of skin tumor, accompanying systemic diseases were similar in three of the groups and there was no statistically significant differerence between them ($p>0.05$) (Table 3).

Working outdoors experience, exposition to chemicals,

Table 2. Distribution of gender, education level, marital status. Kruskal-Wallis/Chi-square test/*p<0.05 difference between control group.

	BCC patient	SCC patients	Control group	p	
Age (mean)	72.8±6.5	75.0±7.2	72.2±6.0	0.116	
Gender	Female	75 (52.1%)	25 (69.4%)	39 (52.0%)	0.152
	Male	69 (47.9%)	11 (30.6%)	36 (48%)	
Education level	None	43 (29.9%)	8 (22.2%)	21 (28%)	
	Elementary school	60 (41.7%)	20 (55.6%)	35 (46.7%)	
	Secondary school	19 (13.2%)	5 (13.9%)	2 (2.7%)	0.172
	High school	10 (6.9%)	2 (5.6%)	7 (9.3%)	
	University	12 (8.3%)	1 (2.8%)	10 (13.3%)	
Marital status	Single	35 (24.3%)*	13 (36.1%)*	1 (1.3%)	0.000
	Married	109 (75.7%)	23 (63.9%)	74 (98.7%)	

BCC: Basal cell carcinoma; **SCC:** Squamous cell carcinoma

sunbathing habits were similar in the three of the groups and there was no statistically significant difference (p>0.05). A few number of patients who had sun protective clothing habits in BCC and SCC patients and there was statistically significant difference between BCC, SCC and the control group (p<0.05). Sun protective clothing habits were lower in BCC and SCC patients when compared to the control group. There were significant differences regarding sun protective clothing habits between BCC and SCC patients when compared to the control group (p<0.05). When BCC patients are compared to the control group, we detected that more patients had sunbathing habits in BCC group (p<0.05). Sunbathing habits were similar in SCC patients and in the control group (Table 4).

When hair and eye color, skin type and photo damage factors were considered, variable results were obtained. Hair and eye color were statistically evaluated in 2 main subgroups as dark (black, brown hair/black, brown, hazel eye color) and light (blond hair/ green and blue eye colors) colors. There was a significant statistical difference between BCC/SCC groups and the control group. Regarding both factors. However, BCC and SCC groups did not show any statistical difference among each other.

As for Fitzpatrick's skin types, it was similar in all three of the groups and there was no statistically significant difference between the three group (p>0.05) (Table 5).

However, as we could not perform statistical tests for each group from 1 to 6, the skin types were considered as two main subgroups, light and dark (1-3 as fair, 4-6 as dark). On the other hand, Glagou's Photodamage Classification Scale scores in BCC and SCC groups were higher more than the control group (p<0.05) while BCC and SCC groups did not show any statistical difference.

Table 3. Distributions of smoking, alcohol consumption habit, vitamine intake, family history of skin tumor, accompanying systemic and dermatological diseases in all three groups. Chi-square test (Fischer Test)/p<0.05 difference between control group.

	BCC group	SCC group	Control group	p	
Cigarette smoking	Absent	93 (64.6%)	22 (61.1%)	58 (77.3%)	
	Present	26 (18.1%)	7 (19.4%)	3 (4%)	
	(duration) >20 years	13	4	2	
	≤20 years	13	3	1	
	(amount) >1 packet/day	12	3	1	
	≤1 packet/	14	4	2	0.054
	Ex smoker	25 (17.4%)	7 (19.4%)	14 (18.7)	
	(duration) >20 years	13	4	7	
	≤20 years	12	3	7	
	(amount) >1 packet/day	11	3	8	
	≤1 packet	14	4	6	
Alcohol consumption	Absent	119 (82.6%)	32 (88.9%)	67 (89.3%)	
	Present	13 (9%)	1 (2.8%)	7 (9.3%)	
	(duration) >20 years	7	1	4	
	≤20 years	6	0	3	
	(amount) >1 glass/week	5	1	4	
	≤1 glass/	8	0	3	0.201
	Ex user	12 (8.3%)	3 (8.3%)	1 (1.3%)	
	(duration) >20 years	6	2	1	
	≤20 years	6	1	0	
	(amount) >1 glass/week	6	1	0	
	≤1 glass/	6	2	1	
Vitamine intake	Present	21 (14.6 %)	6 (16.7 %)	17 (22.7%)	
	(duration) >5 years	11	3	8	0.322
	≤5 years	10	3	9	
Family history of skin tumor	Absent	123 (85.4%)	30 (83.3%)	58 (77.3%)	
	Present	9 (6.3 %)	0 (0%)	4 (5.3 %)	p>0.05
	Abcent	135 (93.8%)	36 (100%)	71 (94.7%)	

BCC: Basal cell carcinoma; **SCC:** Squamous cell carcinoma

Table 4. Distributions of working outdoor, exposed to chemicals, sun protective clothing, sunbathing habits, sun screen cream using in basal cell carcinoma, squamous cell carcinoma and the control groups.Chi-square test (Fischer Test)/p<0,05 difference between control group.

	BCC group	SCC group	Control group	p	
Working outdoor	Present	58 (40.3%)	13 (36.1%)	27 (36.0%)	0.788
	Absent	86 (59.7%)	23 (63.9%)	48 (64.0%)	
Exposure to chemicals	Present	6 (4.2%)	0 (0%)	4 (5.3%)	p>0.05
	Absent	138 (95.8%)	36 (100%)	71 (94.7%)	
Sunprotective clothing	Present	7 (4.9%)	4 (11.1%)	26 (34.7%)	0.000
	Multiple protective behaviors	2	1	5	
	Clothing and shade	2	1	7	
	Pants only	2	1	6	
	Hats	1	1	8	
	Absent	137 (95.1%)	32 (88.9%)	49 (65.3%)	
Sunbathing habits	Present	61 (42.4%)	9 (25%)	11 (14.7%)	0.000
	(amount) >10 days/year	42	13	6	
	≤10 days/year	19	12	5	
	(duration) >10 years	40	11	5	
	≤10 years	21	14	6	
	Absent	83 (57.6%)	27 (75%)	64 (85.3%)	
Sun screen cream using	Present	14 (9.7%)	2 (5.6%)	11 (14.7%)	0.302
	Four seasons	8	1	5	
	Summer only	6	1	6	
	Absent	130 (90.3%)	34 (94.4%)	64 (85.3%)	

BCC: Basal cell carcinoma; **SCC:** Squamous cell carcinoma

4. Discussion

Our study is the first study to examine all malignant skin and skin adnexal tumors in geriatric patients in the literature. But only risk factors BCC and SCC were determined in geriatric population in our study. Khaled et al. (2008) determined retrospectively the nature of skin cancers (BCC, SCC and MM) in elderly patients and they showed that the most common skin cancer was BCC and followed by SCC and MM. They suggested that geriatric patients have a high risk of developing cutaneous neoplasms especially carcinomas. Our results were similar to their study.

Lambelin et al. (2014) examined geriatric patients by nursing during hospitalization in acute geriatric unit to evaluate the feasibility of skin cancer. Thirtytwo patients were admitted the study and three suspicious skin lesions were detected in three patients. They concluded that prevalance of skin cancer risk factors is high in geriatric population and suggested that complete skin examination is necessary in geriatric population to evaluate suspicious skin cancer.

Templier et al. (2015) evaluated the prevalence of skin cancer in geriatric population and found a prevalence of 4.9% in their study group. The most common skin cancers were BCC, SCC and malignant melanoma, respectively. The results were similiar to our study.

Fontaine et al. (2008) examined geriatric patients in rehabilitation and long-term care units whom no dermatological advice had been given and were examined by a dermatogist. They found out 32 of 306 patients (10.5%) presented 42 suspicious lesions. The lesions were diagnosed as 16 BCC, seven SCC and two in situ melanomas. Skin cancers were localized on the head and neck in 80% of the cases. In our study most common skin cancer was BCC, and most common localization was the face (149 tumors, 82.8%), followed by the scalp (13 tumors, 7.2%), and the neck (4 tumors, 4%). Our results were similar to those of their study.

Most of cancer survival studies showed that skin cancers have the high incidence among all cancers in the geriatric patients (Akbari et al., 2011). In a descriptive survey study, Bradley (1991) detected that BCC and SCC were seen predominantly among all skin cancers in the geriatric patients.

Some risk factors were suggested as precipitant factors for the skin cancers. Australian data showed that spending more times outdoors as well as not wearing covering cloths increases exposing to sun and leading to have skin cancers (Makin, 2011). Long-term exposure to ultraviolet radiation have an impact for development of BCC, SCC and MM (Simic et al., 2011). In our study a few number of patients who had sun protective clothing habits in BCC and SCC group and there was a statistically significant difference between the control group and we detected that more patients had sunbathing habits in BCC group. Our results were consistent with the literature for geriatric patients too. Also in our study Glagou's Phodamage Classification Scale score four were the most common score in BCC and SCC groups. Sun exposure seems to be a big risk factor in BCC and SCC group in geriatric patients too. The fact that the fair skin type is associated with the increase risk of BCC has been shown in many studies (Dessinioti et al., 2011, Ahluwalia et al., 2012). National Council on Skin Cancer Prevention suggested that the fair skin is a risk factor for SCC and BCC (National Council on Skin Cancer Prevention, 2013). In our study we interestingly did not find any association between the Fitzpatrick's skin type and BCC and SCC. Whereas, considering hair and eye color, Lighter hair and lighter eye color seemed relevant risk factors with BCC and SCC (Lichte et al., 2010; Khalesi et al., 2013; Kaskel et al., 2014).

Generally speaking, we have a population Fitzpatrick's skin type III and IV in Turkey, while types I and V are seen relatively rare. As we compared the two main groups of skin types (1-3 and 4-6) it is probable not to reveal the real difference between fair skin types and cancers (BCC and SCC) more accurately. On the other hand, Turkey is a considerably sunny country and folks are often exposed to the

Table 5. Fitzpatrick skin type, Glogau's Photodamage Classification Scale scores in three of groups. Chi-square test p<0.05 difference between control group.

		BCC group	SCC group	Control group	p
Hair colour	Brown	75 (52.1%)	18 (50 %)	60 (80%)	0.000
Dark	Black	29 (20.1%)	8 (22.2 %)	11 (14.7%)	
Light	Blond	40 (27.8%	10 (27.8 %)	4 (5.3%)	
Eye colour	Brown	54 (37.5%)	16 (44.4 %)	56 (74.7%)	0.000
Dark	Hazel	2 (1.4%)	0 (0%)	0 (0%)	
	Black	9 (6.3%)	3 (8.3%)	4 (5.3%)	
Light	Blue	41 (28.5%)	11 (30.6%)	4 (5.3%)	
	Green	38 (26.4%)	6 (16.7%)	11 (14.7%)	
Fitzpatrick's skin type	1	7 (4.9%)	2 (5.6%)	3 (4.0%)	0.963
	2	37 (25.7%)	13 (36.1%)	25 (33.3%)	
	3	62 (43.1%)	11 (30.6%)	26 (34.7%)	
	4	26 (18.1%)	9 (25%)	15 (20.0%)	
	5	7 (4.9%)	1 (2.8%)	6 (8.0%)	
	6	5 (3.5%)	0 (0%)	0 (0%)	
Glogau's photodamage classification scale score	2	2 (1.4%)	0 (0%)	4 (5.3%)	0.000
	3	53 (36.8%)	15 (41.7%)	70 (93.3%)	
	4	89 (61.8%)	21 (58.3%)	1 (1.3%)	

BCC: Basal cell carcinoma; **SCC:** Squamous cell carcinoma

sun. Therefore, it is reasonable to underline the cumulative effects of sun rays even our study did show not any significant difference between fair skin and cancers or dark skin and cancers (Akbari et al., 2011).

McBride et al. (2011) investigated the association between the tobocco smoking and cutaneous SCC for 16-years period. The follow-study results showed that tobocco smoking did not increase the risk of SCC of the skin. Freedman et al. (2003) conducted a study in which whether alcohol intake and smoking affect the risk of BCC was investigated. They did not find a clear association between smoking and BCC, but suggested that a significant increased risk is assocciated with alcohol consumption. Rollison et al. (2012) studied on the relationship between BCC and SCC and found that there was a significant association between smoking and SCC but not BCC. Leonardi Ree et al. (2012) demonstrated similar results in their study. In our study we didn't find an association between the tobocco smoking and both SCC and BCC in geriatric patients. Therefore, our results regarding the link between smoking and BCC were consistent with these studies, but the same was not relevant for SCC. Our results were consistent with the McBride's study.

Hirst et al. (2012) investigated the lifetime health cost and benefits of sunscreen using habits in the primary prevention of skin cancers. They showed that the sunscreen intervention was cost-effective. In our study we didnt't find any difference between three of groups. regarding sunscreen cream using habits although all groups had lower rate of sunscreen cream using habits. Also in BCC and SCC groups more patients had sunbathing habits, and a few number of patients had sun protective clothing habits. In our country sun protection should be emphasized the prevention of skin cancer.

BCC was the most common skin tumor in geriatric patients and the most common localization was the face. Adnexial tumors were less as expected. While UV radiation and sun exposure seemed to be the main risk factors of skin tumors, the other probable risk factors were smoking, alcohol consumption, aging, and photodamage. In elderly patients persistant lesions must be examined carefully especially who had sun bathing habits and exposed the UV radiation.

Limitations of the study: First, the study is in a retrospective nature. Secondly, the number of patients in the study group were limited to evaluate risk factors for skin cancers The study could be designed as a prospective multicenter study to enroll more patients thus risk factors such as smoking habits, alcohol consumption, vitamine intake, sunprotective clothing, sunbathing habits, sunscreen cream using habits would be evaluated more detailed.

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