

Skin cancers in Western Saudi Arabia

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ABSTRACT

Objective: A retrospective analysis of skin cancers in a major referral centre in Taif region, Kingdom of Saudi Arabia, (KSA).

Methods: The case records of all malignant skin cancers diagnosed during a 10 year period, from 1992 through to 2001 were taken for the study. The clinical and histopathological details were noted. These were compared to reports from the rest of KSA and other countries.

Results: One hundred and four cases of malignant skin lesions including primary and metastatic tumors were seen. The majority were Saudis. The male to female ratio was 2.25:1. Most of the patients were over the age of 60 years. Basal cell carcinoma was the most frequent (51%) followed by squamous cell carcinoma (26%) and malignant

melanoma (12.5%). Other rare primary tumors were those arising from the skin appendages, dermatofibrosarcoma protuberans and Kaposi's sarcoma. Metastatic skin lesions were seen in 5; in one it resulted from a surgical procedure and in the others the primary site could not be determined.

Conclusion: The number of patients seen in this report is not high indicating that protective factors like clothing and skin type of the individual played a protective role. However, we feel that more studies should be encouraged in other regions along with the creation of a registry within each area to monitor the information regarding skin cancers. This could then be incorporated in health education programmes to be imparted to the public.

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There are several reports regarding cancer from different regions in the Kingdom of Saudi Arabia (KSA). These reports described the general pattern of cancer,¹⁻¹⁵ or cancer in one of the sexes,¹⁶ or cancer of a particular system or organ,¹⁷⁻¹⁸ or cancer in a particular population of patients.¹⁹⁻²⁰ There are, however, few of reports that focused on skin cancers in KSA.²⁰⁻²⁴ One of these reports was limited to only one type of skin cancers.²⁵

The present study was undertaken to evaluate the spectrum of cutaneous cancer in the region of Taif by analyzing the data from patients seen in King Faisal Hospital. To this date, no such report has appeared from this region. Taif with a population of 100,000

accounting for 5% of the total population in KSA is one of the provinces adjoining the holy city of Makkah in the western part of KSA. It is blessed with a temperate climate and King Faisal Hospital situated well within the precincts of the city is the main referral centre with 420 beds. All patients from the periphery and the other major specialty hospitals of the city are referred as histopathology and oncology services are available only here.

Methods. Records of newly diagnosed cases of skin cancer for a period of 10 years spanning 1992 through to 2001 were obtained. All the malignant skin

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lesions, either biopsied or excised, were included. Details included computer registration number, age, sex, nationality, clinical description when available, provisional diagnosis, histopathology report and recommended treatment. The figures were compared with those from the rest of KSA and other states in the region.

Results. One hundred and four cases of malignant cutaneous lesions, both primary and metastatic, were seen during the previous decade. Saudi nationals comprised 101 and 3 were non-Saudis, one each from Yemen, Egypt and Syria. Of the former there were 70 males and 31 females, a male to female ratio of 2.25:1; non-Saudis were one male and 2 female. The median age of presentation was almost the same in both the sexes. **Table 1** shows the various histopathological types seen in 104 patients. The majority of patients in all categories were beyond the sixth decade of life. Basal cell carcinoma (BCC) was the most frequent primary cancer, 51%, followed by squamous cell carcinoma (SCC) in 26%. The noduloulcerative type of BCC was the usual type seen, next being the pigmented variety. The histopathological study frequently revealed solid type of BCC, at times with cystic degeneration. The other histopathological types seen were 2 with adenoid picture, 3 with morphea-like features and one superficial type of BCC. In one both solid and adenoid features were observed. Malignant melanoma comprised 12.5% and tumors originating from the skin appendages were seen in 2 patients; one had malignant clear cell hidradenoma and the other sebaceous carcinoma. Miscellaneous cancers constituted four, dermatofibrosarcoma protuberans in 2, Kaposi's sarcoma in one and the last with verrucous carcinoma. Metastatic lesions were seen in 5 patients; in one it was postoperative following surgery for carcinoma of the gall bladder and in the other 4 cases the metastases were identified before the site of primary cancer was established. As shown in **Table 2** the median age among primary skin cancers was highest for BCC followed by MM, SCC, miscellaneous tumors and those arising from the skin appendages. Metastatic lesions showed a higher median age of 70 years as compared to primary skin cancers. Males predominated except in the case of cutaneous metastases. **Table 3** shows the distribution of skin cancer according to anatomical site. Eighty-eight point seven percent of BCC and 33.3% of SCC occurred in the head and neck region. Majority of the cases of MM, 61.5%, occurred in the extremities. Appendageal tumors were limited to the scalp. In the miscellaneous group, the trunk was affected in 2 patients with dermatofibrosarcoma protuberans, the lower limb in one with Kaposi's sarcoma, and the head in one with verrucous carcinoma. Metastatic skin lesions were seen in 3 over the trunk and in one case each over the

upper and lower limbs. In one it was histopathologically found to be moderately differentiated adenocarcinoma that developed on the drain exit site following surgery for carcinoma of the gall bladder a year ago. In the other four where the primary site was not known as the patients were lost to follow up, histopathology revealed undifferentiated carcinoma in one and poorly differentiated squamous cell carcinoma in 3.

Discussion. Studying the epidemiology and geographical distribution of tumors promotes understanding of the probable factors leading to the etiology of the lesion. In general, in KSA almost all known cancers have been seen to occur, though with some variations. Most of the previous epidemiological studies on cancer in the Kingdom had been based on reports from different regions. It is only recently during the past 8 years that a National Tumor Registry has taken over this task of collecting information from all over KSA. In humans, skin cancer is the most common²⁶ with the risk increasing with longevity as seen by the observation that almost one half of those who live to 65 years of age get at least one skin cancer.²⁷ There have been indications of increased incidence of skin cancer in the international literature²¹ and at least 700,000 new cases are diagnosed annually in the United States of America.²⁸

The important data regarding skin cancers obtained from studies that described the general pattern of cancers or studies that focused on skin cancers, reported from KSA and other countries, have been summarized in **Tables 4 & 5**. As Saudi nationals far outnumbered the non-Saudis, the figures may be considered representative of the situation prevalent in the respective places. Data on the prevalence of skin cancer in KSA are inconsistent³⁵ and vary from a low figure in the eastern part of the kingdom as seen in **Table 4** to the most common malignancy seen in KSA in both the sexes.¹⁻³ Some feel that the incidence skin cancers were higher when the report was based on pathology rather than clinical data.³ Skin cancer ranks highest in the southern region of the KSA⁴ with a male to female ratio of 2.4:1^{5,6} as seen in the established literature.^{21,23} The present study revealed a ratio of 2.3:1. The age of our patients ranged between 6-110 years with a median age of 62.5 years. A slightly lower age has been recently reported from the northern part of KSA.⁷ When all dermatoses in the elderly were considered, skin cancers ranked the least common.³⁶

There are many factors that influence the occurrence of skin cancers. These include the geographical environment, genetic attributes, custom, and attitude. The variations in these factors are the cause of the differences in the pattern of skin cancers in different parts of world. Although, the high altitude of Taif makes the sunlight more intense and hence more risky to cause skin cancer, the sunshine hours are less than

Table 1 - Malignant primary and metastatic skin cancer among various age groups.

Diagnosis	<40	40-59	60-79	>80	Total (%)
BCC	6	17	19	11	53 (51)
SCC	3	6	12	6	27 (26)
MM	1	4	7	1	13 (12.5)
Appendageal	1	---	1	---	2 (1.9)
Miscellaneous	1	1	1	1	4 (3.8)
Metastatic	---	1	3	1	5 (4.8)
Total	12	29	43	20	104 (100)
BCC - basal cell carcinoma, SCC - squamous cell carcinoma, MM - malignant melanoma					

Table 2 - Malignant primary and metastatic skin cancer according to mean age and sex.

Diagnosis	Median age	Male:female ratio	Total (%)
BCC	65	2.5:1	53 (51)
SCC	61	1.7:1	27 (26)
MM	64	3.3:1	13 (12.5)
Appendageal	45	1:1	2 (1.9)
Miscellaneous	60	3:1	4 (3.8)
Metastatic	70	2:3	5 (4.8)
BCC - basal cell carcinoma, SCC - squamous cell carcinoma, MM - malignant melanoma			

other parts of KSA, especially in the mountain areas, due to accumulation of clouds and fogs, mainly in the winter. This decrease in the sunshine hours may be the cause of small number of skin cancer patients encountered in this study.

Out of primary skin cancers, BCC was seen in half the number of patients in this study. In white populations, it represents a figure as high as 80%^{21,37,38} and in general is said to be the most common skin cancer.^{26,27,33} Basal cell carcinoma in this series was seen to predominantly involve the face but could rarely involve any part of the body surface. All the 3 non-Saudis in this study had BCC. Some of the patients with pigmented BCC who had initially presented to the general surgeon were referred to us with the provisional diagnosis of malignant melanoma. This misdiagnosis not only reflects the greater awareness of

Table 3 - Malignant primary and metastatic skin tumors according to location.

Diagnosis	Head and Neck	Upper limbs	Lower limbs	Trunk	Others	Total (%)
BCC	47 (88.6)	3 (5.6)	1 (1.8)	2 (3.7)	--	53 (100)
SCC	9 (33.3)	5 (18.5)	7 (25.9)	2 (7.4)	4 (14.8)	27 (100)
MM	2 (15.3)	2 (15.3)	6 (46.1)	3 (23)	--	13 (100)
Appendageal	2 (100)		--	--	--	2 (100)
Miscellaneous	1 (25)		1 (25)	2 (50)	--	4 (100)
BCC - basal cell carcinoma, SCC - squamous cell carcinoma, MM - malignant melanoma						

Table 4 - Summary of data on skin cancer obtained from selected reports that described the general pattern of cancers.

Author(s) & year	Location	Period	Total cases of all cancers	n of skin cancers	Comment(s)
Taylor, 1963 ⁹	Aramco Hospital, KSA	1950-1961	264	16 (6)	Low prevalence attributed to short life expectancy of Saudi Arabians (38 years in 1963)
Stirling et al 1979 ¹	Central laboratory, Jeddah KSA		1000	155 (15.5)	Commonest was skin cancer, SCC being most common
El Akkad 1983 ¹⁰ 1986 ¹¹	King Faisal Specialist Hospital, Riyadh, KSA	1979-1984	1696 7251	10th among cancer, 3.4% 14th among all cancers	Low incidence was attributed to minimal exposure to ultraviolet radiation, such as wearing headdress
Willen & Patterson, 1989 ²	King Fahd Hospital, Al Baha, KSA	1981-1987	659	86 (13.1)	Skin cancer ranked first in frequency among other cancer
Khan et al, 1991 ³	Asir Central Hospital, Abha, KSA	1987-1989	697	96 (13.5)	Interestingly, skin cancer was the most common one among females too in addition to males
Ajarim, 1992 ¹²	King Khalid University Hospital, Riyadh, KSA	1985-1990	1196	12, relative frequency of skin cancer was 2.4%	Skin cancer was 15th among other cancers. Low incidence of melanoma was due to minimal sun exposure
Koriech & Al Kuhaymi, 1994 ¹³	Armed Forces Hospital Riyadh, KSA		5000	85 (2)	BCC was commonest
Al Ghamdi et al, 1994 ¹⁸	Central Hospital, Asir, KSA	1987-1992	204 (head & neck)	51 (7)	BCC was commonest followed by SCC and MM
Al Saigh et al, 1995 ⁸	King Fahad Hospital, Madina Al Munawara, KSA	1981-1993	2237	156	Low incidence of skin cancer was said to be due to high temperature which forces people to remain indoors
Tandon et al, 1995 ⁵	King Fahad Central Hospital, Gizan, KSA	1982-1992	2360	305 (13)	BCC and SCC were almost equal. Only 2 cases of MM seen
Belagavi et al, 1996 ¹⁴	Armed Forces Hospital, Riyadh, KSA	1979-1994	730 post renal transplant recipients	36 patients developed Kaposi sarcoma	The average time from transplantation to development of skin tumors was 15.9 mth
Ezzat et al 1996	King Faisal Specialist Hospital & Research Centre, Riyadh, KSA	1976-1993	22836	1042 (4.6)	Low incidence of melanomas said to be related to mode of dress and absence of sunbathing
El-Helal et al 1997 ²⁹	Al Ain Hospital, UAE	1981-1995	612	52 (8.5)	High incidence of skin cancer related to pesticide use and fertilizer among the expatriate farming population
Al Tamimi et al 1997 ¹⁵	Eastern Saudi Arabia	1987-1988	1559	16 (1)	Low incidence cancers of unknown primary origin appeared to be common in Eastern region
Akhtar & Reyes 1997 ⁴	King Fahad Specialist Hospital, Buraidah, Al Qassim, KSA	1987-1995	1106	67 (6.1)	BCC was commonest followed by SCC and MM
Al Mobeerik, 1998 ¹⁷	Laboratory Dept, Riyadh, KSA	1990-1995	258	50 (19.4)	SCC was commonest followed by BCC and MM
Archibong et al, 2000 ¹⁶	Asir Central Hospital, Abha, KSA	1996-1998	274	25 (9.1)	Study limited to females, commonest was BCC followed by SCC and MM
El Hag et al, 2002 ⁷	Prince Abdul Rahman Al Sudairy Central Hospital, Al Jouf, KSA	1994-2001	314	27 (8.6)	In general, incidence of cancer was seen to be the lowest. Skin cancer was common in males
KSA - Kingdom of Saudi Arabia, UAE - United Arab Emirates SCC -squamous cell carcinoma, BCC - basal cell carcinoma, MM - malignant melanoma					

Table 5 - Summary of data on skin cancer obtained from selected reports that focused on skin cancer.

Author(s) & year	Location	Period	n of skin cancers	Comment(s)
Sayigh et al, 1977 ²³	Central Laboratory, Riyadh, KSA	10 years	487	Skin cancer ranked the third commonest among cancer cases reviewed
Mughal and Robinson, 1982 ²²	King Faisal Specialist Hospital, Riyadh, KSA	1975-1982	22 cases of MM	54% of cases showed acral distribution. Tumors were on the foot or the head, advanced at diagnosis and rapidly fatal
Hannan et al, 1984 ²⁴ 1986 ¹¹	King Faisal Specialist Hospital, Riyadh, KSA	1982	25 out of 1296 cancer cases reviewed in one year	Low incidence said to be due to protective effect of garments and skin type
Oumeish, 1984 ³¹	3 major referral hospitals in Jordan	1969-1983	74 cases of MM	Percentage of MM to the tumors biopsied was 4.1%. Prevalence was 2.1 in 1000,000.
1997 ³²	Asir Central Hospital, Abha, KSA	1969-1994	138 cases of MM (86 cases in males and 50 cases in females)	Median age 50 years for males and 53 years for females. More common in skin type 1,2,3. Majority is superficial spreading variety followed by nodular, lentigo maligna melanoma, and acrolentiginous melanoma
Quip et al, 1988 ²⁰	King Faisal Hospital & Research Center, Riyadh, KSA	1975-1986	The authors reported 14 cases of Kaposi sarcoma among 263 renal transplant recipients	An incidence of 5.3% compared with an incidence of 0.4% in renal transplant recipients from western countries
Bahamdan & Morad, 1993 ²¹	Asir Central Hospital, Abha, KSA	1987-1991	137 cases of skin cancers	Mean age was 61 years. Squamous cell carcinoma
Mahmoud & Azadeh ³³	Hamad Medical Corporation, Doha, Qatar	1990-1995	66 cases of BCC (48 men and 18 women)	16 are Qataris. The most frequent site affected were head in 54 (81.8%) and scapular region in 10.6%. Four percent of cases occurred in persons aged 60 years or older
Al-Shlash et al 1998 ²⁵	North West Military Hospital, Tabuk, KSA	1978-1996	2 cases of MM	Low incidence said to be due to presence of white, painted, sun-reflecting buildings, traditional dress-code and behavior of the indigenes
Ong et al, 1999 ³⁰	St Vincent's Hospital, Sydney, Australia	1984-1998	The authors reported 1436 skin lesions among 400 heart transplant recipients	The cumulative incidence of skin cancers was 31% at 5 years. There was no cases of Kaposi sarcoma. The authors explained this by ethnicity of the patients studied (such as non Mediterranean origin)
Akhtar & Reyes 1997 ⁴				
Kennedy & Bajdik, 2001 ³⁴	Aruba (an island nation in the Caribbean sea)	1980-1995	1605 cases of skin cancers	BCC in 50%, SCC in 31%, MM in 2% and other cancers in 3%

KSA - Kingdom of Saudi Arabia,
SCC -squamous cell carcinoma, BCC - basal cell carcinoma, MM - malignant melanoma

malignant melanoma in surgeons, but pigmentation in the lesion could be a misleading feature if careful attention is not paid to the morphological features, particularly when the lesion is located in areas other than the face. Squamous cell carcinoma ranked the second most frequent tumor after BCC accounting for 26% in the current study. Some report SCC as the frequent one^{21,23} but in major ones SCC is seen to be the second commonest skin cancer.^{2,37,39} 3 of our patients developed SCC on preexisting skin lesions: 2 had Marjolin's ulcer and in another SCC had developed from gangrene in a diabetic foot. Malignant melanoma represented 12.5% of the cutaneous cancers in Taif region with a conspicuous male to female ratio of

3.3:1. Though an equal sex distribution has been seen in most studies,^{26,28} the predominance of males in our study could be related to the infrequent exposure of women to sunlight and covering the body in accordance with the Islamic tenet.²¹ Skin cancers arising from the cutaneous appendages are common but usually benign. As the region of the head and neck is rich in appendages they frequently arise in those areas where the problem is mainly cosmetic. Only 2 cases of malignancy have been noted in our series and are in accordance with the findings of others.^{2,21} The tumors rarely seen were dermatofibrosarcoma protuberans, Kaposi's sarcoma and verrucous carcinoma. Five cases had metastatic nodules on the

skin. Metastasis from a visceral carcinoma is uncommon with an estimated frequency between 5-10%.⁴⁰ The most common primary tumors which metastasize to the skin are in the descending order cancers of the breast, lungs, kidneys, colon and other solid tumors.⁴¹ In one of our patients the metastasis was the result of a therapeutic operative procedure but in the other 4 it could not be ascertained. A high incidence of cutaneous metastases not only indicates a poor prognosis but more significantly, late diagnosis.¹⁷

Considering the size and geographical variation of KSA with one of the highest sun intensities in the world,^{21,23} here is a dearth of reports from other regions. In order to collect useful information that represents a given area we feel that a registry must be established in each region and a protocol devised to incorporate the relevant data. Health education to the community must include among other things simple ways to minimize the risk of developing skin cancers. For instance, people could be told that avoiding sun exposure between 10 am and 2 pm would diminish the carcinogenic effect of ultra-violet light up to as high as 50%.⁸ In this connection it is also important to emphasize that those with a lighter skin are more prone to develop skin cancer than pigmented individuals. So studies must grade the skin type of the patient for better correlation. Other risk factors are likely to vary from region to region and studies should be initiated to provide a good source of information for creating public awareness.

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