

Histopathological pattern of skin cancer in Western region of Saudi Arabia

An 11 years experience

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ABSTRACT

الأهداف: يهدف البحث إلى دراسة الأنماط الهيستوباثولوجية لسرطان الجلد في المدينة المنورة.

الطريقة: هذه هي دراسة استرجاعية لجميع حالات سرطان الجلد التي تم تشخيصها في قسم علم الأمراض بمستشفى الملك فهد بالمدينة المنورة في الفترة من يناير 2006 إلى ديسمبر 2017، حيث تم مراجعة التقارير الطبية للمرضى وادخال البيانات والتي تشمل العمر، الجنس ومكان وتشخيص السرطان وتحليلها باستخدام برنامج SPSS النسخة ال 21.

النتائج: من بين 202 حالة سرطان جلد، كان هناك 124 (61.4%) حالة سرطان الخلايا القاعدية، 33 (16.3%) حالة سرطان الخلايا الحرشفية، 14 (6.8%) حالة سرطان فطري، و12 (5.8%) حالة dermatofibrosarcoma protuberans. شكلت حالات الميلانوما ما نسبته (1.5%) من الحالات. وقد كانت نسبة الذكور إلى الإناث لجميع الحالات هي 2.2:1. وقد تراوحت الأعمار من 5 إلى 100 سنة بمتوسط أعمار 60.1 ± 15 سنة. وبلغ عدد الحالات ذروته في الفئة العمرية 60-69 سنة. كانت معظم حالات سرطان الخلايا القاعدية والحرشفية تتمركز في منطقة الرأس والعنق. شكلت حالات الميلانوما الطرفية ما نسبته (57.1%).

الخلاصة: توافقت نتائج هذه الدراسة مع الدراسات العالمية والمحلية.

Objectives: To determine the histopathological pattern of skin cancer in Madinah region of Kingdom of Saudi Arabia (KSA).

Methods: This is a retrospective study including all cases with a histological diagnosis of skin cancer diagnosed at the Department of Pathology, King Fahad Hospital, Madinah, Saudi Arabia, between January 2006 and December 2017. Data included age, gender, site and histology of the tumor were collected from histopathological reports and analyzed using Statistical Package for the Social Sciences (SPSS) Version 21.

Results: Among the 202 cancer cases studied in our series, there were 124 (61.4%) cases of basal cell carcinoma (BCC), 33 (16.3%) cases of squamous cell carcinoma (SCC), 14 (6.8%) cases of mycosis fungoides (MF), 12 (5.8%) cases of dermatofibrosarcoma protuberans (DFSP) and 7 (3.7%) cases of malignant melanomas (MM). The male to female ratio for all cases was 2.2:1. The ages ranged from 5 to 100 years with a mean age of 60.1 ± 15 years. The peak age distribution was in the 60-69 year group. The most common site involved in BCC and SCC was the head and neck (92.7% and 66.7% respectively). Acral distribution of MM was seen in 57.1% of the cases.

Conclusion: Our data based on the histopathology history in the Madinah region match that in the world literature and Saudi national studies.

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Skin cancers, including melanoma and non-melanoma, are a common malignancy increasingly reported worldwide, with the highest incidence in locations such as the United States, Europe, Australia, and New Zealand.¹⁻³ Non-melanoma cancer (keratinocyte cancer) predominates over melanoma. Basal cell carcinoma (BCC) and squamous cell carcinoma (SCC) represent the most common malignancies.⁴⁻⁷ Malignant melanoma (MM) of the skin accounts for the majority of deaths from skin cancer in the countries

with the highest incidences.^{3,4} Various environmental, lifestyle, and genetic factors are risk factors for the development of skin cancer, especially in countries with higher incidences.⁸⁻¹⁰

Some Asian and African developing countries have a low incidence of skin cancers, with cases of MM rarely reported.¹¹⁻¹⁶ Despite the sunny, hot weather that characterizes most of these countries (sunlight is considered to be an important risk factor for epidermal damage and malignancy), several factors contribute to explain the low incidence of skin cancer in these areas compared with the other areas of the world. These factors include lifestyle factors, such as the traditional clothing in some conservative counties, daily activities and the darker skin color of most of these populations. However, data loss could also be related to the lower incidence of skin cancer cases in these countries.

The true incidence and the clinicopathological characteristic features of skin cancer in these countries are not well established. They also lack well-developed programs for skin self-checking, protection, and screening. These factors may delay detection and diagnosis, contribute to the low number of skin malignancy cases, and hinder correct identification of predisposing risk factors.

In Saudi Arabia, non-melanoma skin cancer is rarely reported and diagnosed compared to other cancers, while MM is even more rarely diagnosed. The most recent Saudi Cancer Registry (SCR) report, published in 2017, reported 310 new cases of skin cancer in 2014, making it the 11th most frequent cancer among males and females in the Saudi population.¹⁷ Reported cases of skin cancers have been published in the literature from the country's large tertiary care centers.^{11,18,19} However, the data are still insufficient to better understand and categorize skin cancer and its most important predisposing risk factors.

The aim of this study is to demonstrate the incidence of skin cancer and its characteristic histopathological features and to compare the results with data from other nations around the world. This article contributes to the growing literature on skin malignancies in Saudi Arabia and urges increased awareness and attention to the true incidence of skin cancer. The hope is to enable early detection and treatment of this type of cancer and lead to overall better survival outcomes.

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Methods. A retrospective study including all cases with a histological diagnosis of skin cancer among Saudi patients, biopsied or excised, was performed between January 2006 and December 2017 at the Department of Pathology, King Fahad Hospital, Madinah, Saudi Arabia. The specimens were preserved in 10% buffered formalin as a fixative, and they were read by a consulting general pathologist after routine slide staining with hematoxylin and eosin stains. Immunohistochemistry were used in the diagnosis of certain diseases such as CD4, CD3 and CD5 for mycosis fungoides (MF) cases and CD34 stains for dermatofibrosarcoma protuberans cases (DFSP). The data collected from the records of the histopathology department included age, gender, site and histology of the tumor. We excluded all records that did not include any of the above variables. The data were analyzed using Statistical Package for the Social Sciences (SPSS) Version 21 software (Armonk, NY: IBM Corp.).

Results. During the study period, 202 patients with skin malignancy were identified, 139 (68.8%) patients were males while 63 (31.2%) patients were females with a male to female ratio of 2.2:1. The ages ranged from 5 to 100 years with a mean age of 60.1 years. The peak incidence was in the age group of 60-69 years (29.5%), followed by the age groups of 80-89 years (24.8%) and 70-79 years (19.8%).

Table 1 shows the number, percentage and mean ages of our patients with skin malignancy. There were 124 (61.4%) cases of BCC, 33 (16.3%) cases of SCC, 14 (6.8%) cases of MF, 12 (5.8%) cases of DFSP, 7 (3.7%) cases of MM, 3 (1.5%) cases of Bowen's disease, 3 (1.5%) cases of metastatic carcinoma, 3 (1.5%) cases of adnexal carcinoma, 1 (0.5%) case of pleomorphic dermal sarcoma (PDS), 1 (0.5%) case of Kaposi's sarcoma and 1 (0.5%) case of Merkel cell carcinoma (MCC).

According to the locations, the tumor cases distributed as follows: head and neck 149 (73.7%), back 5 (2.5%), chest 15 (7.4%), upper limbs 6 (3%) and lower limbs 28 (13.4%). One hundred and fifteen (92.7%) of BCC cases and 22 (66.7%) of SCC cases were located in the head and neck region. The lower limb was the most common site for MF cases (50%). Among the BCC cases, 115 (92.7%) of the cases were located in the head region. Among the SCC cases, 22 (66.7%) were located in the head and neck region. The lower limb was the most common site for MF (50%) and melanoma cases (57.1%). Acral distribution of MM was seen in 4 (57.1%) cases. Dermatofibrosarcoma protuberans cases and PDS cases were seen in chest wall

only, while head and neck was the only site for adnexal carcinomas. All cases of metastatic carcinoma, Kaposi's sarcoma and MCC were located in the lower limb only (Table 2).

Discussion. Cancer of the skin is not an uncommon malignancy in Saudi Arabia. There is a growing number of skin malignancy studies from different regions of the country in the literature. These studies have reported different types of skin cancer, including melanoma, non-melanoma, sarcoma, cutaneous lymphoma, and

others.^{11,18-20} More recent reports collecting data from different regions better describe the geographic and clinicopathological features of cancers in the country. Recent data from the SCR show that skin cancer is still not among the 10 most-common cancers in the Saudi population. According to the 2014 SCR data on the distribution of cancer in Saudi regions, Madinah region ranks fifth for cancer in general, and 2.5% of these carcinomas are skin cancers.¹⁷

In contrast, the World Health Organization (WHO) reports that skin cancer is the most common cancer worldwide.²¹ This finding conflicts with Saudi data indicating that skin cancer is a rare diagnosis in the country, and MM is diagnosed even less frequently. Due to its rarity, skin cancer is usually included with other less common cancers without specification in the reported data.²⁰ Multiple risk factors contribute to skin cancer, including male gender, fair skin, extensive sun exposure and genetic susceptibility.¹⁸

In this study, our results match with the clinicopathological features of skin cancer in most other studies carried out in different regions of Saudi Arabia.^{11,17-19} Basal cell carcinoma is the most common type of non-melanoma skin cancer, followed by SCC. Both cancers arise in the skin of the head and neck, the area of the body most exposed to the sun in the country's traditional clothing. These results also match with international reports in which BCC is the most common skin malignancy.^{1,21} Our results indicate few cases of cutaneous T-cell lymphoma, MF, sarcoma of the skin, and DFSP, which fits with the numbers and locations reported in Saudi national data. Also, similar to other reports, the male gender predominates, with a male–female ratio of 2.2:1.

Malignant melanoma is a much rarer diagnosis, ranking as the fifth-most-common skin malignancy and making up 3.7% of all cases in our study. This result matches the melanoma incidence in other parts of the country and conflicts with the results from countries with much higher incidence. Interestingly, almost all the reported cases in Saudi national studies on MM, including our study, report diagnoses of acral MM type. This is a distinctive site for melanoma in the Saudi population because this type of melanoma is rare in Caucasian populations and usually indicates a predilection among populations with dark-colored skin (African origin). Extensive sun exposure is not a common predisposing factor for acral melanoma due to its location.^{22,23} This is an interesting observation, and this feature of MM indicates a need for further studies to better categorize MM in the Saudi population.

Table 1 - The number, percentage, mean ages and sex distribution of our patients with skin cancer.

Histopathological diagnoses	n (%)	Mean age (years)	M/F
Primary malignancy			
BCC	124 (61.4)	63.3	82/42
SCC	33 (16.3)	58.1	22/11
MF	14 (6.8)	30.7	11/3
DFSP	12 (5.8)	32.3	8/4
MM	7 (3.7)	65.1	6/1
Bowen's disease	3 (1.5)	62.7	2/1
Adnexal carcinoma	3 (1.5)	68.3	3/0
PDS	1 (0.5)	85.0	1/0
Kaposi's sarcoma	1 (0.5)	80.0	1/0
MCC	1 (0.5)	75.0	1/0
Metastatic			
Metastatic adenocarcinoma	3 (1.5)	48.0	2/1
Total	202 (100)		139/63

BCC - Basal cell carcinoma, SCC - squamous cell carcinoma, MF - mycosis fungoides, DFSP - dermatofibrosarcoma protuberans, MM - malignant melanoma

Table 2 - Distribution of the cases according to the locations.

Histopathological diagnoses	Head and neck	Chest	Back	Upper limb	Lower limb	Total
BCC	115	1	3	1	4	124
SCC	22	1	1	2	7	33
MF	4	0	0	3	7	14
DFSP	0	12	0	0	0	12
MM	3	0	0	0	4	7
Bowen's disease	2	0	1	0	0	3
Adnexal carcinoma	3	0	0	0	0	3
PDS	0	1	0	0	0	1
Kaposi's sarcoma	0	0	0	0	1	1
MCC	0	0	0	0	1	1
Metastatic	0	0	0	0	3	3
adenocarcinoma						
Total	149	15	5	6	27	202

Values are expressed as number. BCC - Basal cell carcinoma, SCC - squamous cell carcinoma, MF - mycosis fungoides, DFSP - dermatofibrosarcoma protuberans, MM - malignant melanoma

In general, our available national data show a lower incidence of skin cancer than in Western countries. However, our data are comparable to data from countries in similar geographic zones and with populations with darker skin tone.^{24,25} Exposure to ultraviolet rays from the sun are considered to be an important predisposing risk factor for skin cancer.^{9,26} Low skin-cancer incidence may result from unknown genetic factors, the protective influence of the melanin pigment against sun rays, and daily lifestyle, daytime outdoors activities, and traditional customs and clothes allowing little sun exposure. Despite this low incidence, studies have shown increasingly high mortality from skin cancer, especially melanomas in skin of color.^{27,28} Ignorance of skin protective tools, unawareness of skin-checking screening program, and different biological tumor behaviors could contribute to delayed diagnosis and decreased life expectancy. In the literature, a couple national surveys study attitudes and behavior related to sun exposure among Saudis.^{29,30}

Our study highlights the incidence of skin malignancy from one of the largest cities in Saudi Arabia's Western region. However, it does not necessarily reflect the true incidence of skin cancer in this region because most cancer cases are referred to oncology centers in the Central Region. This may be considered to be a limitation of this study and could contribute to the low number of cases of skin cancer in the Western region compared to the Central and Eastern regions of Saudi Arabia. Despite this limitation, the data can be used as a baseline for Madinah region. Further attention to such data can increase clinical awareness of early detection and diagnosis of skin cancers and motivate research to accurately record and better categorize this type of cancer.

In conclusion, the most common types seen in this study of skin cancer were BCC and SCC, followed by MF and DFSP. In contrast to Western countries, MM is a rare skin neoplasm and shows a predilection for the acral location. Our recorded data based on the histopathology history in the Madinah region match with the world literature and Saudi national studies.

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