


Clinical and Pathological Characteristics of 755 Patients with Skin Cancers in Hainan, China: A 12-Year Retrospective Study

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Background: Skin cancers are the most frequent types of all malignant tumours with increasing incidence rates. The incidence rate varies between different countries around the world.

Objective: This study aimed to analyze the clinical-pathological characteristics of skin cancers in patients visited at the Department of Dermatology of the Fifth People's Hospital of Hainan Province from China during the last 12 years.

Methods: The hospital database was searched for patients with skin cancers over a period of 12 years (from January 1, 2009 to December 31, 2020), and a retrospective review was conducted and a descriptive data analysis was undertaken on patients.

Results: A total of 755 specimens of skin cancers were confirmed during this period. The common skin cancers were basal cell carcinoma (341, 48.99%), followed by squamous cell carcinoma (148, 21.26%) and Bowen's disease (109, 15.66%). The range of age at the time of skin cancers onset was mainly from 40 to 79 years (73.01%). The disease duration ranged from 7 days to 70 years, mainly occurred in 2 years (53.30%). The lesions were most frequently located in the region of head, face and neck (452, 59.87%), followed by extremity (107, 14.17%) and trunk (87, 11.52%). The accordance rate of clinical-pathological diagnosis in common skin cancers was about 43.14%, while that of rare skin cancers was only 27.59%.

Conclusion: Overall, head, face and neck region was the most common sites for sun-related skin cancers in Hainan, China. The coincidence rate of initial diagnosis and pathological diagnosis was low in skin cancers. Consequently, any suspicious lesion, for which the clinical diagnosis is uncertain, should be biopsied for histopathological examination to rule out malignancy.

Keywords: skin cancers, retrospective study, Hainan, China

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Introduction

Skin cancers showed increasing incidences around the world.¹ The most common types of skin cancers, comprising of skin melanoma and non-melanoma skin cancers (NMSCs), account for more than one-third of all cancers.² NMSCs are the most frequent human malignancies, and the main types of that, basal cell carcinoma (BCC) and squamous cell carcinoma (SCC), represent about 99% of all NMSCs.^{2,3} Other NMSCs refer to Merkel cell carcinoma, dermatofibrosarcoma protuberans, Kaposi sarcoma and other rare tumours.⁴ The incidence of malignant melanoma (MM) has shown a continuous increase, during the past few decades, which accounts for 80% of skin cancer deaths.⁵

Table 1 The Clinical Characteristics of 696 Patients with Common Skin Cancers

Common Skin Cancers	No. (%)	Male	Female	Onset Age ($\bar{x}\pm s$, Years)	Age at Diagnosis ($\bar{x}\pm s$, Years)	Duration ($\bar{x}\pm s$, Months)	Location							
							Head, Face and Neck	Trunk	Extremity	Vulva	Perianal Region	Mucosa	Acral Region	Not Indicated Region
BCC	341 (48.99)	152 (44.57)	189 (55.43)	59.32 \pm 17.78	65.16 \pm 14.57	73.12 \pm 115.95	311 (91.20)	12 (3.52)	11 (3.23)	3 (0.88)	0	0	1 (0.29)	3 (0.88)
SCC	148 (21.27)	75 (50.68)	73 (49.32)	67.67 \pm 15.25	70.57 \pm 14.93	36.26 \pm 63.94	90 (60.81)	18 (12.16)	25 (16.89)	9 (6.08)	1 (0.68)	1 (0.68)	2 (1.35)	2 (1.35)
Bowen's disease	109 (15.66)	57 (52.29)	52 (47.71)	60.09 \pm 16.95	64.91 \pm 15.21	67.54 \pm 94.50	38 (34.86)	24 (22.02)	11 (10.09)	26 (23.85)	2 (1.84)	0	7 (6.42)	1 (0.92)
Paget's disease	47 (6.75)	32 (68.09)	15 (31.91)	64.28 \pm 13.77	67.66 \pm 12.43	42.33 \pm 46.04	1 (2.13)	11 (23.40)	0	34 (72.34)	1 (2.13)	0	0	0
MM	28 (4.02)	14 (50.00)	14 (50.00)	58.70 \pm 16.12	60.50 \pm 15.53	36.00 \pm 39.80	1 (3.57)	1 (3.57)	17 (60.72)	1 (3.57)	0	0	7 (25.00)	1 (3.57)
KS	23 (3.31)	20 (86.96)	3 (13.04)	63.20 \pm 17.39	65.17 \pm 14.74	44.25 \pm 90.85	0	2 (8.69)	20 (86.96)	1 (4.35)	0	0	0	0
Total	696 (100)	350 (50.29)	346 (49.71)	61.65 \pm 17.16	66.26 \pm 14.88	60.06 \pm 98.20	441 (63.36)	68 (9.77)	84 (12.07)	74 (10.63)	4 (0.58)	1 (0.14)	17 (2.44)	7 (1.01)

Table 2 The Clinical Characteristics of 59 Patients with Rare Skin Cancers

Rare Skin Cancers	No. (%)	Male	Female	Onset Age ($\bar{x} \pm s$, Years)	Age at Diagnosis ($\bar{x} \pm s$, Years)	Duration ($\bar{x} \pm s$, Months)	Location							
							Head, Face and Neck	Trunk	Extremity	Vulva	Perianal Region	Mucosa	Acral Region	Not Indicated Region
Cutaneous lymphomas	14	6	8	11–91	12–91	0.5–60	1	4	9	0	0	0	0	0
Cutaneous metastatic carcinoma	10	4	6	50–89	50–89	2–24	0	5	4	1	0	0	0	0
Dermatofibrosarcoma	8	5	3	10–63	10–73	0.5–180	0	4	3	0	0	0	1	0
Angiosarcoma	7	6	1	56–89	56–90	2–12	6	1	0	0	0	0	0	0
Mycosis fungoides	5	3	2	35–70	51–70	1–240	0	2	3	0	0	0	0	0
Verrucous carcinoma	4	3	1	35–70	35–71	4–96	0	0	2	1	0	0	1	0
Hematological malignancies	3	2	1	14–82	14–83	4–120	2	0	1	0	0	0	0	0
Eccrine carcinoma	3	2	1	41–58	47–61	6–96	2	0	1	0	0	0	0	0
Langerhans cell histiocytosis	2	1	1	0.08–0.42	0.33–0.66	3	0	2	0	0	0	0	0	0
Sebaceous carcinomas	1	0	1	41	41	6	0	0	0	0	0	0	1	0
Leiomyosarcoma	1	0	1	48	50	24	0	0	0	1	0	0	0	0
Breast ductal carcinoma	1	1	0	36	38	24	0	1	0	0	0	0	0	0
Total	59	33	26	–	–	–	11	19	23	3	0	0	3	0

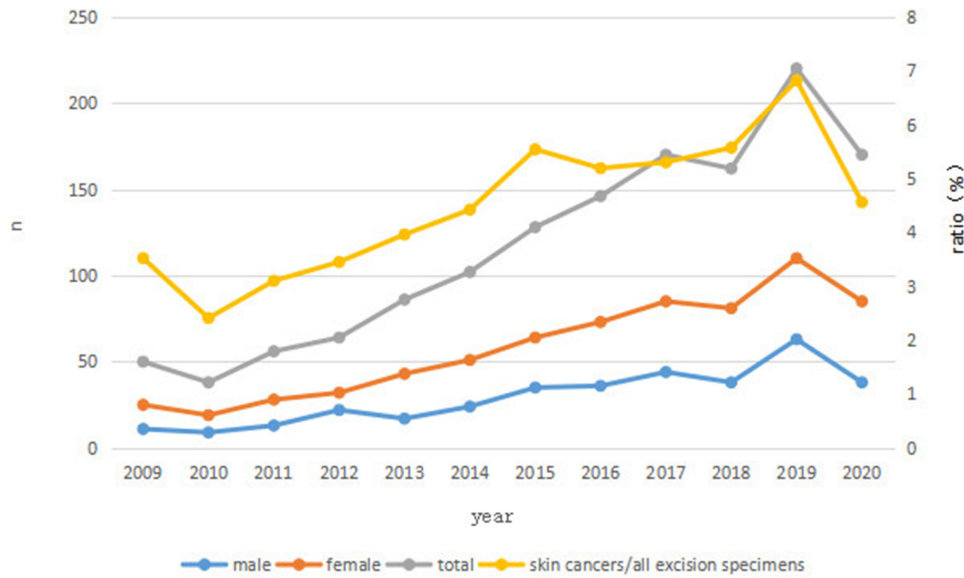


Figure 1 Trend of skin cancers between 2009 and 2020.

The majority of skin cancers published in the literature are white-skinned populations with few references reported to date in the literature on Asians, especially in China. Hainan, as the southernmost province in China, has a tropical monsoon climate and high ultraviolet (UV) intensity, so the occurrence of skin cancers may has its

particularity. However, similar comparative studies are lacking. Therefore, the first population-based data of skin cancers in patients visited at the Department of Dermatology of the Fifth People’s Hospital of Hainan Province are presented in this paper and compared with other regions in China. Further results on clinical–

Table 3 Distribution of Gender and Location of Skin Cancers

Skin Cancers	No. (%)	Male	Female	Location							
				Head, Face and Neck	Trunk	Extremity	Vulva	Perianal Region	Mucosa	Acral Region	Not Indicated Region
BCC	341	152	189	311	12	11	3	0	0	1	3
SCC	148	75	73	90	18	25	9	1	1	2	2
Bowen's disease	109	57	52	38	24	11	26	2	0	7	1
Paget's disease	47	32	15	1	11	0	34	1	0	0	0
MM	28	14	14	1	1	17	1	0	0	7	1
KS	23	20	3	0	2	20	1	0	0	0	0
Rare skin cancers	59	33	26	11	19	23	3	0	0	3	0
Total	755 (100)	383 (50.73)	372 (49.27)	452 (59.87)	87 (11.52)	107 (14.17)	77 (10.20)	4(0.53)	1(0.13)	20 (2.65)	7(0.93)

Table 4 Age Distribution of Skin Cancers

Skin Cancers	Onset Age (Years)				
	0–19	20–39	40–59	60–79	80–99
BCC	10	33	110	136	38
SCC	1	7	32	62	37
Bowen's disease	2	9	38	41	11
Paget's disease	0	2	13	25	6
MM	0	3	10	7	3
KS	1	0	5	10	4
Rare skin cancers	6	11	20	13	9
Total	20 (2.8)	65 (9.09)	228 (31.89)	294 (41.12)	108 (15.1)

pathological characteristics are discussed in the context of global data.

Materials and Methods

A retrospective and descriptive analysis of the patients with definite histopathologic diagnosis of skin cancers, based on the histopathologic analysis of all excision specimens and incisional biopsy specimens performed between 1 January 2009 and 31 December 2020 at the Department of Dermatology, the Fifth People's Hospital of Hainan

Table 5 Analysis of the Duration of Skin Cancers

Skin Cancers	Duration (Months)				
	0–24	25–48	49–72	73–96	≥96
BCC	142	64	31	9	78
SCC	98	15	11	1	14
Bowen's disease	39	22	14	5	22
Paget's disease	24	9	6	1	6
MM	13	6	2	0	3
KS	17	0	0	0	3
Rare skin cancers	47	0	4	0	7
Total	380 (53.30)	116 (16.27)	68 (9.54)	16 (2.24)	133 (18.65)

Province, Hainan, China. Complete clinical and pathological data were collected and reviewed.

Biopsies showing recurrence or persistence of previously diagnosed neoplasms were excluded. The suspected diagnosis and incomplete clinical-pathological data were not collected.

Skin cancers in the present study were considered, as follows: BCC, SCC, Bowen's disease, Paget's disease, MM, Kaposi's sarcoma (KS), cutaneous lymphomas, cutaneous metastatic carcinoma, dermatofibrosarcoma, angiosarcoma, mycosis fungoides, verrucous carcinoma, hematological malignancies, eccrine carcinoma, Langerhans cell histiocytosis, sebaceous carcinomas, leiomyosarcoma, breast ductal carcinoma.

The data were compiled and analyzed for various data such as gender, age of onset and of diagnosis, disease duration, distribution of lesions, clinical and histopathologic diagnosis.

Results

A total of 755 specimens of skin cancers were confirmed during this period, of which 696 were common skin cancers (Table 1) and of which 59 were rare skin cancers (Table 2). 755 cases of skin cancers constituted 5.15% of 14,664 cases of excision specimens and incisional biopsy specimens in the same period. The incidence is on the rise year by year, with a marked decline in 2020, as shown in Figure 1.

There were 383 males (50.73%) and 372 females (49.27%) with skin cancers, no significant difference in gender was observed (Table 3). The range of age at the time of skin cancers onset was from 1 month to 96 years, of which most of them were between 40 and 79 years, with an incidence of 73.01% (Table 4, Figure 2). The disease duration ranged from 7 days to 70 years, mainly occurred in 2 years (Table 5, Figure 3).

The most frequent location was head, face and neck region (452, 59.87%), followed by trunk (87, 11.52%), extremity (107, 14.17%), vulva (77, 10.20%), perianal region (4, 0.53%), mucosa (1, 0.13%), acral region (20, 2.65%) and not indicated region (7, 0.93%). Overall, head, face and neck region was the most common site for BCC (91.20%), SCC (60.81%) and Bowen's disease (34.86%); Paget's disease was most frequently found on vulva and extremity, while Kaposi's sarcoma was most frequently found on the extremity (86.96%), as shown in Table 3.

755 cases of skin cancers has a low coincidence rate of clinical-pathological diagnosis, as shown in Table 6. The

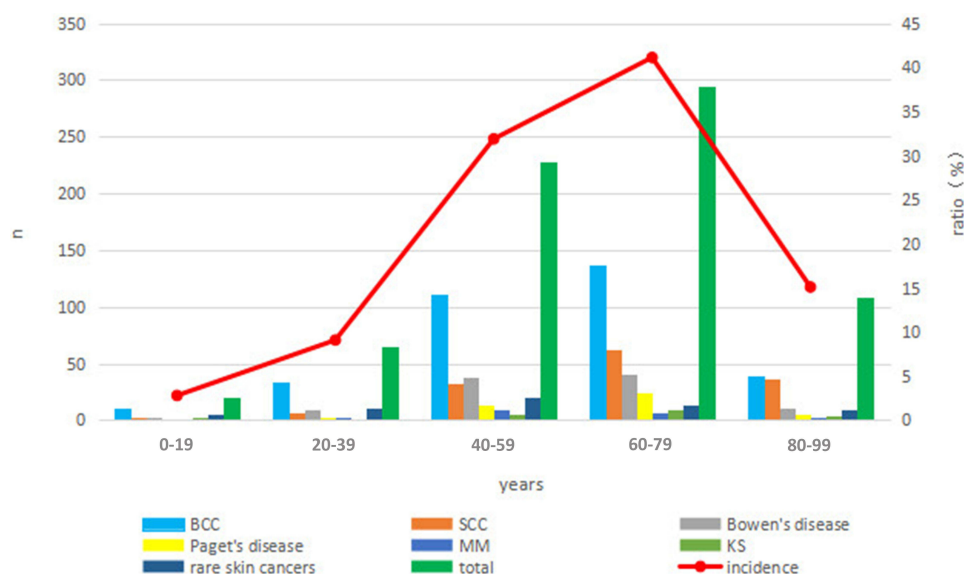


Figure 2 Age distribution of skin cancers.

coincidence rate was defined as the concordant ratio between clinical diagnosis and pathological diagnosis. The coincidence of clinical-pathological diagnosis ranged from 25.00% to 63.83%, which indicated a difficulty in clinical diagnosis.

Discussion

Eighteen types of skin cancers were observed in the present study. These were BCC (48.99%), SCC (21.26%),

Bowen's disease (15.66%), Paget's disease (6.75%), MM (4.02%), KS (3.30%) in common skin cancers and twelve types were in rare skin cancers.

The percentage of common skin cancers was compared with similar reports from other areas of China. The top three skin cancers of different areas were similar, including Tianjin (North of China; BCC, 50.97%, Bowen's disease, 16.01% and SCC, 11.06%),⁶ Chongqing (Southwest of China; BCC, 34.06%, SCC, 17.63% and Bowen's

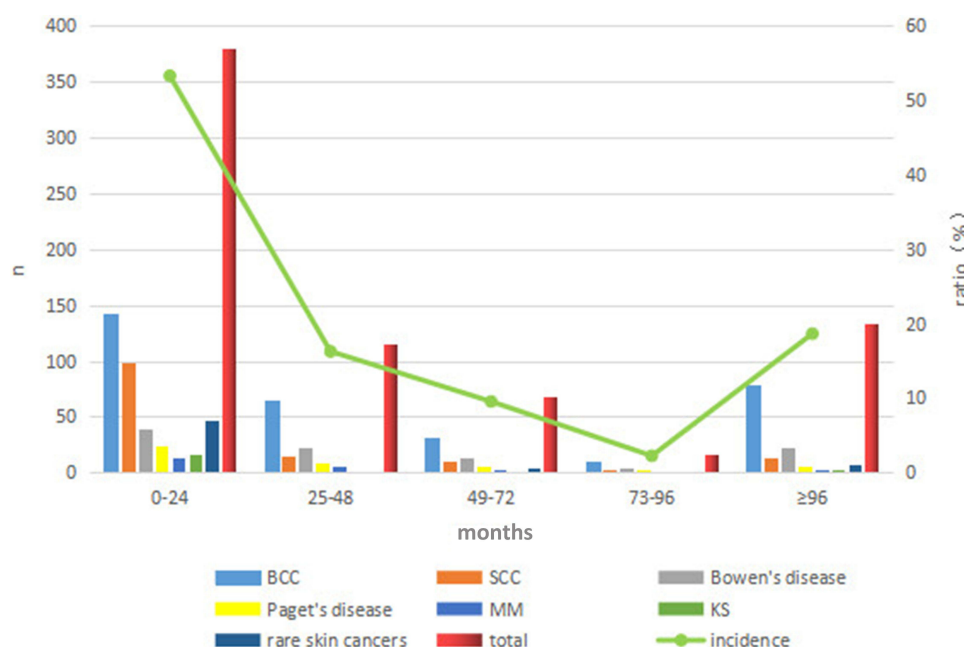


Figure 3 Analysis of the duration of skin cancers.

Table 6 The Coincidence of Clinical-Pathological Diagnosis in 755 Cases of Skin Cancers

Skin Cancers	No.	The Coincidence of Clinical-Pathological Diagnosis (%)	Misdiagnosed Diseases (Cases)
BCC	341	53.37	Pigmented nevi (47), MM(24), SCC(17), seborrheic keratosis(10), Bowen's disease (9), skin ulcer(5), keratoacanthoma(5), cutaneous granuloma(5), deep mycosis(3), other diseases(18)
SCC	148	25.00	SCC(36), BCC(32), seborrheic keratosis(12), keratoacanthoma(10), cutaneous granuloma(6), verruca vulgaris(5), Bowen's disease(5), deep mycosis(4), skin ulcer (4), condylomata acuminata(3), solar keratosis(3), cutaneous horn(3), eczema(3), epidermal cyst(3), other diseases(22)
Bowen's disease	109	27.52	BCC(17), seborrheic keratosis(13), eczema(9), SCC(5), condylomata acuminata (3), Paget's disease(3), other diseases(22)
Paget's disease	47	63.83	eczema (10), SCC(3), other diseases(3)
MM	28	50.00	BCC(3), SCC(2), pigmented nevi(2), cutaneous granuloma(2), lichen planus(1), melanoma(1), onychomycosis(1), deep mycosis(1), keratoacanthoma(1)
KS	23	39.13	MM(2), eczema(2), pigmented nevi(1), skin tuberculosis(1), hemangioma(1), deep mycosis(1), keratoacanthoma(1), dermatofibroma(1)
Rare skin cancers	59	27.59	BCC(4), SCC(4), sebaceous cyst(3), other diseases(35)

disease, 10.20%),⁷ Xinjiang (Northwest of China; BCC, 47.00%, SCC, 26.22% and KS, 15.17%),⁸ Qinghai (Northwest of China; BCC, 47.00%, SCC, 26.22% and KS, 15.17%).⁹ BCC, SCC, Bowen's disease and KS were the most common skin cancers in China. This can be attributed to prolonged exposure to sun rays, environment, altitude and so on.⁹

In both sexes, males and females observed an almost similar incidence.⁸⁻¹⁰ In our study, BCC was slightly more common in females than in males; Paget's disease and KS were more common in males; SCC, MM and Bowen's disease showed an almost similar incidence in gender. Interestingly, Katalinic et al² found a female predominance in melanoma, while some clear gender differences were not observed in nonmelanoma.

Although skin cancers may present at a very young age,¹¹ it is essentially senile disease in elderly people,¹² which is consistent with the results of our study. In our study, the most common age group ranged between 40 and 79 years. Furthermore, the disease duration mainly occurred in 2 years, which suggested that most of these tumors progress rapidly. Therefore, we should pay attention to the occurrence of skin cancers in young and middle-aged patients.

The most common site of skin cancers were located on the head, face and neck region (59.87%), of which BCC was 91.20% and SCC was 60.81%. It is suggested that UV plays an important role in the pathogenesis of BCC and SCC. This may be related to prolonged exposure to sun rays. Our results was in accordance with prior studies of similar latitudes such as Norwegian.¹³ Skin cancers are rare in rarely UV-exposed areas such as the buttocks in both sexes. In addition, Paget's disease is more common in genital parts, and it is easy to be misdiagnosed as eczema in male.

Our findings has indicated a higher incidence of misdiagnosis clinically. The coincidence rate of clinical and pathological diagnosis of Paget's disease is only 63.83%, followed by BCC 53.37%, MM 50.00%, KS 39.13%, other rare skin cancers 27.59%, Bowen's disease 27.52%, and SCC 25.00%. Hence, it is of great significance to master the characteristics of skin cancers and the accurate diagnosis should be confirmed by pathological diagnosis.

In conclusion, BCC, SCC and Bowen's disease are the most common skin cancers in Hainan Province, with head, face and neck region being the most common site involved. Moreover, skin cancers has a low coincidence rate of clinical-pathological diagnosis. Consequently, any suspicious lesion, for which the clinical diagnosis is

uncertain, should be biopsied for histopathological examination to rule out malignancy.

Ethics Approval and Consent to Participate

This study was conducted with approval from the Ethics Committee of the Fifth People's Hospital of Hainan Province. This study was conducted in accordance with the declaration of Helsinki. Written informed consent was obtained from the patients prior to study commencement.

Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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Disclosure

The authors declare no conflicts of interest.

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