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ORIGINAL ARTICLE

Clinicopathological Spectrum and Prevalence of Cutaneous Carcinomas: Experience from a Single Institution

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ABSTRACT

Background: Cutaneous carcinomas are relatively uncommon in the Asian population but nonetheless consist of a significant proportion of carcinomas .Early diagnosis is required to avoid destructive surgeries and potential disfiguring which is both psychologically and physically detrimental for patients. Basal cell carcinoma and squamous cell carcinoma encompass most of the cases of cutaneous carcinomas in Asian populations such as those living in Pakistan.

Objectives: To determine the frequency, clinical features, and morphological spectrum of cutaneous carcinomas in patients presented to Services Hospital Lahore.

Methodology: It is a retrospective cohort study conducted at Services Hospital Lahore from 1st January 2014 to 31st December 2022 and comprised 100 cases.

Results: The ratio of male to female was 1:1.3 and the mean age of presentation was 56.42 years. Basal cell carcinoma (76%) was the most frequent occurrence followed by squamous cell carcinoma (24%). The nose was the most common site of presentation (13%) followed by the cheek (11%). The Nodular histological subtype was most common (37%) followed by basosquamous (15%). Sun exposure was the most common etiological factor with the least common being genetic disorders including xeroderma pigmentosa 3%. Grade 1 tumors were the most common (58%).

Conclusion: Nodular basal cell carcinoma was the most prevalent subtype of basal cell carcinoma, while keratinising type was the most common subtype of squamous cell carcinoma. The average age of presentation was 56.42 years.

Keywords: Basal cell carcinoma, Squamous cell carcinoma, Morphological spectrum, Clinical features

INTRODUCTION

Skin cancer ranks fifth among the ten most common types of cancer and accounts for a small portion of global mortality.[1] The most common kind of non-melanoma skin cancer is basal cell carcinoma, which is closely followed by squamous cell carcinoma. In 2017, the skin cancer rates for men and women in Punjab, the largest province of Pakistan, were rated eighth and ninth, respectively. Still, women's skin cancer rates in Karachi were placed tenth according to the Karachi cancer registry.[2] Skin cancers are categorized into two categories: keratinocyte and melanocytic neoplasms.[3] Basal cell carcinoma (BCC) is the most frequent kind of skin cancer globally, and it is getting more common as the population ages. The most common kind of skin cancer in the world, BCC is classified as non-melanocytic or keratinocyte skin cancer.[4] Basal cell carcinoma is more likely to occur in exposed areas, such as the head and neck. It is a type of carcinoma that originates from the basal cells of the epidermis and is locally invasive but rarely metastasizes.[5,6] While extensive local tissue destruction is frequently observed, metastasis is extremely rare.[7] Several types of BCC include nodular, superficial, micronodular, infiltrating, sclerosing/morphogenic, basosquamous, pigmented, BCC with sarcomatous differentiation, BCC with adnexal differentiation, and fibroepithelial BCC are the histological subtypes that have been identified by WHO.[8] Perturbation risk further subdivides the histological subtypes of BCC. Nodular BCC, Superficial BCC, Pigmented BCC, Infundibulocystic BCC, and Fibroepithelial BCC are variants with a lower risk.

The variants with a high risk include micronodular BCC, sclerosing BCC, infiltrating BCC, basosquamous carcinoma, and BCC with sarcomatoid differentiation. Since the clinical behavior of BCC is predicted by its histological pattern, a skin punch or excisional biopsy is required to confirm the different histological subtypes. If left untreated for a long time, it is associated with significant morbidity.[9].Most BCC cases occur on sun-exposed skin, primarily on the head and less frequently on the trunk. A pearly telangiectatic papule that may be eroded or ulcerated is a classic clinical feature. Superficial BCC can appear as an annular, slightly scaly plaque. According to the WHO, infiltrating and sclerosing BCC can resemble scars, and pigmented BCC can resemble melanoma. Clusters of basaloid cells with little cytoplasm, hyperchromatic nuclei, fibromyxoid stroma, and possible keratinization were all present in different BCC variations.[10] The second most prevalent form of skin cancer is known as squamous cell carcinoma (SCC), which is a malignancy of the epidermal keratinocytes.[11]

Squamous cell carcinoma can either be invasive or in situ and can spread to other areas of the body. A variety of factors, including immunosuppression, exposure to arsenic, ultraviolet light, chronic ulcers, HPV infection, and others, are known to contribute to its development.[12] This type of cancer is commonly found in areas that are frequently exposed to sunlight, such as the lips, ears, balding scalp, arms, and legs.[13] Clinically, SCC appears as arough, hyperkeratotic lesion, and ulceration may occur due to invasion.[14] Conventional, Adenosquamous carcinoma, clear cell SCC, spindle cell SCC, verrucous SCC, acantholytic SCC, and other subtypes of SCC are recognized.[15]Numerous prognostic factors, including differentiation, depth of invasion, histological subtypes, and perineural invasion, are considered in predicting outcomes.[16] These high-risk variants can only be differentiated from their counterparts through histopathological analysis to prevent the likelihood of metastasis and death via rapid therapeutic intervention.[17]

However, research on skin cancer is limited. There is a lack of information regarding the incidence and prevalence of skin cancers, particularly in Lahore, where exposure to UV radiation and non-healing skin ulcers, such as those caused by diabetes and tuberculosis, pose a significant risk. This study is unique because it focuses on the frequency, morphology, and clinical spectrum of skin cancers, along with causes like chronic, non-healing skin ulcers. More studies are needed as it is important to know the less common subtypes of these cancers so that carcinomas are not misdiagnosed as benign lesions. Our study aims to determine the frequency and clinicopathological features of squamous cell and Basal cell carcinoma.

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MATERIALS AND METHODS

This retrospective cohort study was conducted at Dermatology Department of Services Hospital and submitted to the Pathology Department of Services Institute of Medical Sciences from 1st January 2014 to 31st December 2022. A total of 100 malignant skin tumors were enrolled. Tumors diagnosed as basal cell carcinoma and squamous cell carcinoma was retrieved. The cases were collected bynon-probability consecutive technique. Hematoxylin and eosin-stained slides were examined under a microscope and the histopathological diagnosis was confirmed. The demographic details of the patients, anatomic location, and other clinical features were retrieved from patient charts. Benign cases, inadequate biopsy samples (less than the full thickness of the dermis and sub-cutis), re-biopsy samples of clinically recurrent tumors, or treated tumors were excluded from the study. The tumors were classified according to the World Health Organization (WHO) classification.

The tumor was referred to as nodular BCC if it was characterized by well-defined islands and strands that originated from the basal cells of the epithelium and featured uniform dark-staining basaloid cells with moderately sized nuclei and relatively minimal cytoplasm. If it contained dendritic melanocytes and melanophages, it was labeled as pigmented BCC. If it had strands of basaloid tumor cells with a dense collagenous background, it was classified as Sclerosing. If it had isolated lobules of tumor cells projecting from the lower margin of the epidermis ,it was termed superficial BCC. When BCC was biphasic with foci of neoplastic squamous differentiation, it was labeled as Basosquamous. If the tumor cells contained hyperchromatic nuclei, large amounts of keratin pearls, intercellular bridges, a high degree of atypia, and frequent mitoses, it was considered invasive squamous cell carcinoma. The tumor was classified as clear cell squamous cell carcinoma if it had sheets of tumor cells with clear, empty-appearing cytoplasm with a bubbled appearance. Lastly, the tumor was considered verrucous if it contained exophytic and endophytic blunt bulbous projections of well differentiated squamous cells that would descend into the deeper dermis, which is usually inflamed. The data was entered and analyzed through SPSS-27. The Chi square test was applied and p-value <0.05 considered as significant.

RESULTS

There were 53% males and 47% females. The study population had a mean age of 56.42 years. The prevalence of BCC and SCC, predominant kind of skin cancer and most of the tumors were grade 1 followed by grade 2 (Tables 1-2). There was a significant association between the etiological factors of cancer and the histological subtype of basal cell carcinoma and squamous cell carcinoma (Table 3). The nodular subtype was the most common histological type, seen in 37% of cases, followed by the basosquamous type at 15% (Table 4). The common anatomical sites of tumor, nose accounted for the most common site (13%) [Table 5]. According to grades of squamous cell carcinoma, 56% of cases were identified as grade 1 cancer (Table 6). Gross morphology of a BCC with raised rolled edges and black pigmentation (Fig. 1). High magnification microscopic image of nodules composed of basaloid cells along with which peripheral palisading and clearing are also seen (Fig. 2).

Table 1: Demographic information of the patients (n=100)

Variable	No.	%
Gender		
Male	53	53.0
Female	47	47.0
Age (years)		
40 – 60	74	74.0
> 60	26	26.0

Table 2: Prevalence of Basal cell carcinoma (BCC) and Squamous cell carcinoma (SCC)

Type	No.	%
BCC	76	76.0
SCC	24	24.0

Table 3: Correlation between risk factors and skin cancer

History	Basal cell carcinoma	Squamous cell carcinoma	Overall contribution (%)
UV radiation	59	10	69.0
Burnscars	6	8	14.0
Chronic ulcers/inflammation	8	6	14.0
Xeroderma pigmentosa	3	0	3
Total	76	24	100

Table 4: Histological Subtypes of SCC and BCC

Subtypes	No.	%
Histological subtypes of BCC		
Basosquamous	15	15.0
Nodular	37	37.0
Micronodular	7	0.7
Pigmented	12	12.0
Infiltrating	4	4.0
Histologic subtypes of SCC		
Acantholytic	1	1.0
Keratinizing	14	145
Non keratinizing	6	6.0
Verrucous	3	3.0

Table 5: Frequency and percentage of BCC and SCC at different skin sites (n=100)

Site on body	No.	%
Cheeks	11	11.0
Hand	5	5.0
Foot	8	8.0
Legs	6	6.0
Arms	5	5.0
Scalp	4	4.0
Perineal skin	4	4.0
Vulvar skin	2	2.0
Chest wall	2	2.0
Forehead	10	10.0
Eyelid	7	7.0
Ear	6	6.0
Lips	8	8.0
Nose	13	13.0
Neck	1	1.0
Thigh	4	4.0
Back	3	3.0
Abdomen	1	1.0

Table 6: Grades of squamous cell carcinoma (n=100)

Grades	No.	%
1	58	58.0
2	33	33.0
3	8	8.0
4	1	1.0

Fig. 1: Clinical picture of a BCC with raised rolled edges and black pigmentation

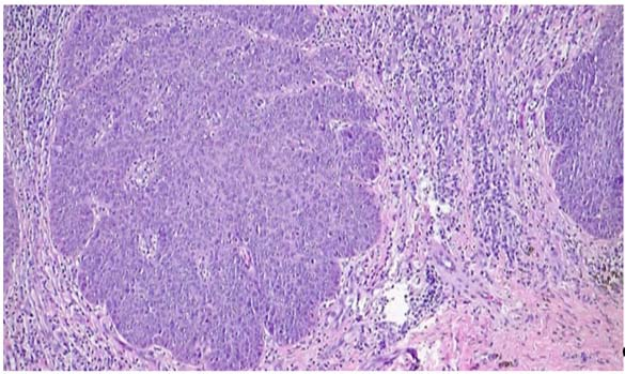

Fig. 2: Histopathology shows nodules composed of basaloid cells (10x). In addition peripheral palisading and clearing are also seen

DISCUSSION

According to the all-encompassing neoplasm incidence ranking done in the Global Burden of Disease Study (1990-2017), BCCs had a rank of 2 whereas SCCs were ranked 6th which was just below lung, breast, and colorectal cancer respectively.[18,19] Our study consists of 76% BCCs and 24% SCCs. This is in line with the global predominance of BCCs as the most frequently occurring and clinically visible subtype amongst NMSCs.

The male-to-female ratio in our study was 1.13:1, indicating a slightly higher preponderance of skin cancer risk in males compared to females. This finding is consistent with previous studies in Janjua[20] Pakistan (1.4:1), India (2:1), and Raasch[21]Australia (1.76:1). The higher risk in males could be due to their greater exposure to sunlight from outdoor occupations. However, this is opposite to the findings in Turkey by Tiftikcioğlu et al[22] where females had a slightly higher risk (9:10 male-to-female ratio).

The mean age of our study group at the time of recording was 56.42 years, with 74% falling within the 40 to 60 years range and 26% above 60 years. In contrast, Demirseren et al[23] study were in the 60–70 age group (34.7%), which is higher than our study, with a mean age of 65 years in the Scrivener et al[24] study, which is again higher than our study. Al Qarqaz et al[25] reported a mean age of 65.4 years in males and 61.9 years in females, which is also higher than our study. The late onset of skin cancer in our population can be attributed to the fact that Asians have darker skin tones compared to Europeans, who are more prone to skin cancer at an early age. The dark skin contains excess melanin pigment, which protects against the harmful UV rays of the sun.

Our study showed that the most common part of the body with NMSC was the nose (13%), followed by the cheeks (11%), and the forehead. Their contribution to overall malignancy in the patient population was substantial, accounting for 12% of cases. Sun-protected areas, such as the legs, may be associated with venous stasis, trauma, immunosuppression, X-ray exposure, and chronic ulcers for skin malignancy.[26] However, it is essential to note that this relationship may be misleading, as sun-protected areas may simply have burn scars (back, abdomen, thigh, chest wall)**.** The hands (13%) and cheeks (13%) were the next most frequent locations. The nose (32.3%) was the most common site of presentation in Demirseren et al.[23] The most common anatomical site was the nose, followed by the cheek in Janjua et al.[20] For all histological subtypes and both sexes, the relative tumor density was highest for the face, followed by the neck, which is consistent with our study. Cheeks and nose were the most likely areas of the face to be involved (83%) by Al Qarqaz et al.[25] The non-facial site most involved in this study was the scalp (16%), while in our study, it was the foot (5%). Areas such as the legs and arms are generally protected and have a lower risk of skin cancer due to protective clothing. In Asian culture, people usually wear long sleeves, which protect the arms and legs from the sun and reduce the risk of skin cancer. Only burns in the arms and legs can lead to skin cancer later in life.

Upon histological examination, the majority of cases were found to be nodular tumors, which is consistent with previous studies conducted in Japan by Kikuchi et al[.26], as well as in Turkey by Tiftikcioğlu et al[22] in Pakistan by Janjua et al[20] and in France by Scrivener et al.[24] Least common subtype was infiltrating basal cell carcinoma in this study. However, since it is an aggressive subtype with high risk of local recurrence and punch biopsy cannot always detect it. There must always be a high index of suspicion to search for such aggressive subtypes, since the therapeutic outcomes are different for these aggressive subtypes.[27]

The leading cause of skin cancer is sun exposure. According to our research, sun exposure accounts for 69% of cases, which is consistent with findings from de Vries et al[28] and Brantsch et al.[29] This is primarily due to the high carcinogenicity of UV rays present in sunlight.

In our analysis, burns accounted for almost 14% of cases, making them the second most important risk factor for skin cancer. These results run counter to those of Lindelof et al[30], whose cohort analysis indicated that burns have no role in skin growth.

Despite limited sample size we tried to cover different aspects of clinical features, risk factors, and histopathological characteristics of both basal cell and squamous cell carcinoma of skin cancer. It is one of the few cross-sectional institute based studies in Pakistan depicting skin cancer prevalence in this region of Punjab. We also tried to study the association between various etiological factors and skin cancer.

CONCLUSION

There is a growing trend of skin cancer worldwide and challenges the notion that skin cancer exclusively affects those with fair complexion by highlighting an increasing frequency of the disease in a variety of demographics. Basal cell carcinoma was the most common type of skin cancer, followed by squamous cell carcinoma. The nodular variant was the most common histological subtype for BCC, while keratinising type was the most common subtype for SCC. In addition to sun exposure, other risk factors for skin cancer include burn scars, chronic ulcers/ inflammation and genetic disorders like Xeroderma Pigmentosum. This study provides significant data from this region and useful references for future research.

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