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Original Article

Demographic Profile of Keratinocyte Tumours

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Abstract

Background: Keratinocytic tumours of epidermis constitute the bulk of neoplastic lesions of the skin, and comprise benign, borderline and malignant lesions.

Objective: To study the characteristics of keratinocytic tumours in our hospital population and compare the collected local data with the available international data.

Materials and Methods: This cross-sectional, descriptive study was conducted in University of Health Science and Mayo Hospital, Lahore from March 2010 to October 2010. A total of 112 consecutive cases of histologically diagnosed keratinocytic tumours were included in the study. Age, gender, histologic types and site distribution of these tumours were recorded and analyzed.

Results: Among keratinocytic tumours, basal and squamous cell carcinomas were the most frequent malignant lesions and viral warts were the commonest benign lesion. Males were affected more commonly than females. Patients were in the age range of 13-85 years. Head and neck region was the most frequent site of involvement.

Conclusion: The results of the study are comparable with international data regarding age, gender and site distribution of keratinocytic tumours.

Key words: Keratinocytic tumours; Squamous cell carcinoma, Basal cell carcinoma

Introduction

Skin is a remarkable organ being the largest in human body accounting for 15% of the total body weight in adults.[1] It has 6 million cells, 5000 sensory points and 150 glands in each square centimeter.[2] Epidermis of skin is a continuously regenerative tissue. This dynamicity makes it a 'fertile land' for neoplastic lesions. In fact, the tumours derived from epidermal keratinocytes i.e. keratinocytic tumours account for most of the neoplastic lesions of skin.

Skin tumours are much common than those occurring in any other organ. According to American Cancer Society, number of new cases of skin cancer diagnosed each year is more than the combined number of cancers of the breast, prostate, lung and colon.[3] Melanoma and other skin cancers are ranked 12th most common in men and 15th most common in women by a WHO report.[4] These were found in 706,000 persons out of a total population of 6,437 million. In a local study conducted at Ayub Medical College, skin cancers were found to be just 1.04% of the total cancers reported over a period of nine years indicating low incidence in the region.[5] Keratinocytic tumours account for approximately 90% or more of all skin malignancies. Among keratinocytic tumours, basal cell carcinomas constitute the major bulk i.e. 70% of all keratinocytic tumours and 50% of all skin malignancies according to different studies.[5,6]

Keratinocytic tumours pose a significant public health problem and a financial burden. Fortunately these tumours have low mortality rate and are mostly curable on complete excision. These facts necessitate a better approach towards the early diagnosis and a deeper understanding of the pathogenesis of these lesions.

The main aetiological factor is solar radiation which causes DNA damage. Especially ultraviolet B radiation (UVB, 290-320 nm) is found to contribute in the formation of squamous and basal cell carcinomas.[7,8] Other carcinogenic agents include tobacco, human papilloma viruses, arsenic, industrial chemicals such as vinyl chloride, polycyclic aromatic hydrocarbons, and exposure to gasoline.[6]

The purpose of this study was to study different characteristics of keratinocytic tumours including gender, age, histological types and site distribution and to compare our data with international studies. This study will help in understanding the keratinocytic tumours found in our local population.

Materials and Methods

Study Design, Setting and Duration: This cross-sectional, descriptive study was conducted in the Department of Dermatology and the Department of Plastic and Reconstructive Surgery, Mayo Hospital, Lahore and the Department of Pathology, University of Health Sciences, Lahore. Histologically diagnosed cases of keratinocytic tumours were selected and data regarding age, gender and site was recorded and analyzed. The study was completed in eight months, March 2010 to October 2010.

Sample size: One hundred and twelve new and old diagnosed cases of keratinocytic tumours of skin were included in the study.

Sampling Technique: Convenient non-probability sampling

Inclusion Criteria: Histologically diagnosed cases of keratinocytic tumours of skin, belonging to all age and both genders

Results

A total of 112 cases of keratinocytic tumours were selected according to inclusion criteria. All the six types of keratinocytic tumours according to WHO classification were included. As shown in table 1, basal cell carcinoma (BCC) and squamous cell carcinoma (SCC) were the commonly observed types of keratinocytic tumours with 36 (32.1%) cases each (fig 2). The next common type was verrucas with 29 (25.9%) cases (fig 4). The other three types were relatively uncommon with 6 (5.4%) cases of acanthomas, 3 (2.7%) cases of Bowen's disease (fig 1) and only 2 (1.8%) cases of actinic keratosis.

Table1: Histological types of keratinocytic tumours (n 112)

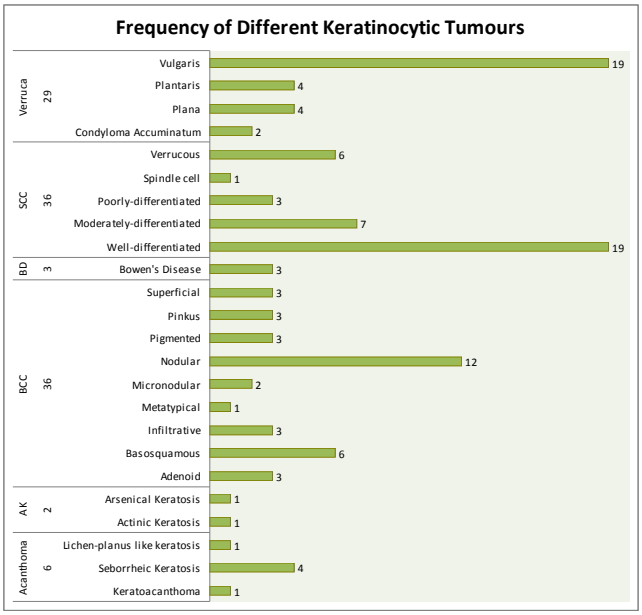
Type of Keratinocytic Tumour	No. (%)
Acanthomas	06 (5.36)
Actinic keratosis	02 (1.79)
Verrucas	29 (25.89)
Bowen's disease	03 (2.68)
Basal cell carcinomas	36 (32.14)
Squamous cell carcinomas	36 (32.14)

Various subtypes of keratinocytic tumours were found during the study. These are shown in Graph 1.

Association of keratinocytic tumours with gender: Keratinocytic tumours were diagnosed more commonly in men. Among the 112 cases, 70 (64.3%) were males and 42 (35.7%) were females. Among different types of keratinocytic tumours, all the six types showed male preponderance. In fact, 66.7% cases of acanthoma, 100% cases of actinic keratosis, 55.6% cases of BCC, 66.7% cases of Bowen's disease, 63.9% cases of SCC and 72.4% cases of verrucas were males. In case of Pinkus BCC and moderately differentiated SCC, female patients were more frequent.

Association of keratinocytic tumours with age: Among 106 cases for which age data was available, the youngest patient was 13 years old and the eldest one was 85 years. Most of the patients presented in 3rd and 6th decades of life. Lesser number of keratinocytic tumours was found in 2nd and 4th decade (Table 2).

The median age for patients of keratinocytic tumours was 50 years. Among different types, all patients except those of verrucas had median age of 50 or more. For verrucas, the median age was 25 years. For Bowen's disease and actinic keratosis, all the patients were older than 55 years. For other types, the age distribution was diverse. The youngest patients of the two cancers i.e. SCC and BCC were 13 years old and 22 years old respectively.



Graph 1: Frequency of different types and subtypes of keratinocytic tumours.

Table 2: Age distribution of patients (n 112)

Age range (Years)	No. (%)
11-20	11 (9.82)
21-30	24 (21.43)
31-40	8 (7.14)
41-50	13 (11.60)
51-60	26 (23.21)
61-70	19 (16.96)
Above 70	05 (4.46)
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Association of keratinocytic tumours with site: Keratinocytic tumours were found in all parts of body. Among the sites, the data of 104 cases showed that 69.23% (72 cases) of tumours were present in head and neck region. Nose was the most frequently involved site with 15 (13.4%) cases. The second and third most common sites were also from head and neck region i.e. face (not otherwise specified) and head. Besides head and neck region, upper limbs were also involved in 13 cases with hands being the most common site of occurrence.

The site distribution among different types of keratinocytic tumours showed that head and neck region was most commonly involved by all types except verrucas. Verrucas most commonly occurred on hands. The two cancers among keratinocytic tumours i.e. SCC and BCC were most

frequently seen on different parts of face. Nose was the most frequent site of involvement for BCC whereas ear was the most common site for SCC. Chest, abdomen and back were less commonly involved sites with one case each.

Table 3: Frequent sites of different types and sub-types of keratinocytic tumours*

	Type of	Total	Frequent Sites of
1.	Acanthoma	6	Back , Chin
	Keratoacanthom	1	Chin
	Seborrheic	4	Back , Chin, Thigh
	Lichen-planus	1	Hip
2.	Actinic Keratosis	2	Head, Hand
	Actinic Keratosis	1	Head
	Arsenical	1	Hand
3.	BCC	36	Nose , Cheek
	Adenoid	3	Cheek, Face, Nose
	Basosquamous	6	Cheek , Nose
	Infiltrative	3	Eyelid, Nose
	Metatypical	1	Head
	Micronodular	2	Cheek, Face
	Nodular	12	Nose, Eye
	Pigmented	3	Face, Head, Eyelid
	Pinkus	3	Back, Cheek, Nose
	Superficial	3	Nose, Back
4.	Bowen's Disease	3	Face, Forearm, Leg
5.	SCC	36	Ear, Nose
	Well-	19	Ear, Hip, Lip, Nose
	Moderately-	7	Ear, Flank, Head,
	Poorly-	3	Face , Ear
	Spindle cell	1	Nose
	Verrucous	6	Head, Mouth, Ear,
6.	Verruca	29	Hand, Face
	Condyloma	2	Genital area
	Plana	4	Arm , Chest,
	Plantaris	4	Hand, Foot
	Vulgaris	19	Face, Hand, Lip,

**Valid Percentage is used. Single cases are not assigned percentage*

Considering the sub-types of different keratinocytic tumours, there is great diversity among sites of occurrence. Seborrheic keratosis, the most frequent acanthomas in our study, commonly involved skin of back. Nose was the most frequent site of nodular and superficial BCCs, whereas

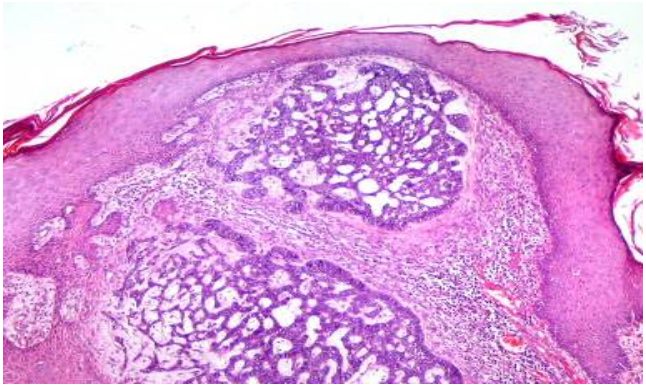

Figure1. Bowen's disease showing full thickness epidermal atypia and lichenoid upper dermal chronic inflammatory infiltrate (H & E stain, 10x)

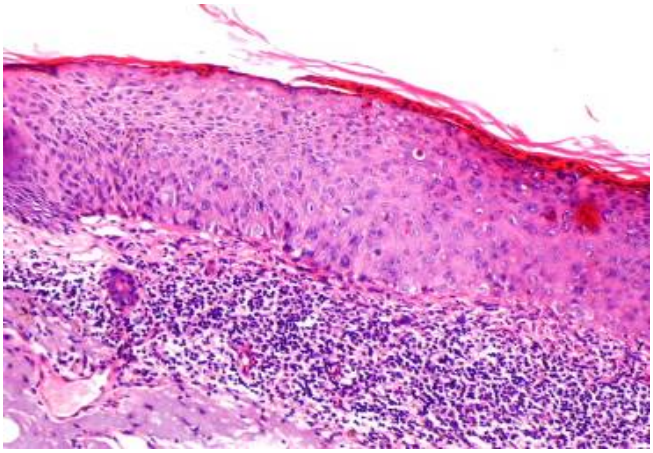

Fig.2. Adenoid BCC showing strands of basaloid cells in a reticulate pattern. (H&E stains, 4x)

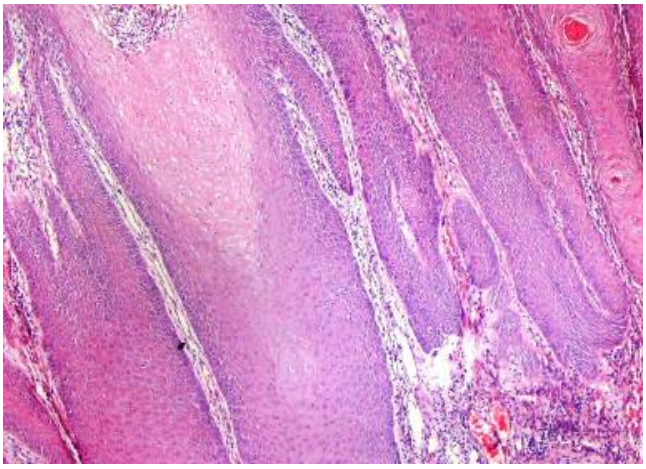

Fig.3. Verrucous SCC showing bulbous nature of squamous downgrowths and mild atypia of keratinocytes (H&E stains, 4x)

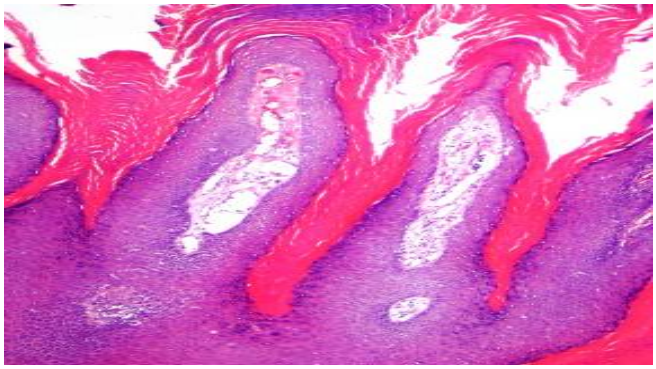

Fig.4: Verruca vulgaris showing papillomatosis, parakeratosis and hyperkeratosis. (H&E stains, 4x)

micronodular and basosquamous BCCs most commonly involved cheek. The aggressive variant of BCC i.e. infiltrative BCC was most commonly found on eyelids. Ear was the frequent site of well-differentiated and moderately differentiated SCCs. The most common sites of poorly-differentiated SCC and verrucous SCC were face and head respectively. Among verrucas, vulgaris type was the most common on face while planatris and plana types were the most frequent at hand and arm respectively (Table 3).

Discussion

Keratinocytic tumours are a diverse group of lesions derived from proliferation of keratinocytes and behaviour ranging from benign entities to highly aggressive carcinomas. These tumours impose a common public health problem, but fortunately have low mortality and morbidity rate.

In present study, BCC and SCC which are the two malignant entities in keratinocytic tumours' category were found to be equal in frequency with each comprising 32.1% of the cases. However, previously done local studies have shown contradicting results. Mansour et al.[9], Baloch et al.[10] and Yasmeen et al.[11] found BCC to be more frequent than SCC whereas the study by Ahmed et al.[5] found more SCC than BCC. Globally BCC is the more frequent keratinocytic malignancy and BCC constitutes 60% of keratinocytic malignancies according to WHO[6]. The difference might be due to limited sample size, duration and population representation in different studies. As regards the other keratinocytic lesions, no comparative reference could be found. In our study, verrucas were the commonest non-malignant keratinocytic lesion comprising 25.9% of total cases, and this may be due to the fact that viral warts are quite frequent in children and adolescents[6]. Among the different subtypes of BCC, nodular or solid BCC is the most frequent type constituting 56% and 30-75% of the total cases seen in two different studies[12,13]. Our results are compatible with these studies with nodular BCC constituting 33.3% of total BCC cases. The second most frequent type of BCC found was basosquamous BCC but this is in contrast to the studies of Vantochuva et al. and Bircon et al.[12, 13] who found superficial BCC and adenoid BCC as second most frequent BCC types respectively. The histoogical subtypes of SCC have not been found to be studied for comparison of frequencies, however, literature favors well-differentiated or conventional SCC to be most frequent[6,14] and the same was the result that we found with well-differentiated SCC constituting 52.8% of total SCC.

Regarding gender distribution, we found keratinocytic tumours to be more frequent in males. Most keratinocytic tumours also showed male predominance. In present study, keratoacanthoma, lichen-planus like keratosis and actinic keratosis were found only in males. Le Boit et al.[6] quoted similar results in case of keratoacanthoma and actinic keratosis but contradictory results for lichen-planus like keratosis where it was reported to be more in females. However, a study from China showed the results matching with ours with Lichen Planus Like Keratosis (LPLK) more frequent in males[15]. We found equal gender distribution for seborrheic keratosis and this matches with the literature as well[6]. Different local and international studies found BCC to be more common in malesas seen in our study.[5,6,11,16,17] In Bowen's disease, SCC and verrucas, our study revealed male predominance with 66.7%, 63.9% and 72.4% of total cases respectively. These results are comparable with the available literature; local[5,11] and international[6].

In present study, the youngest patient having keratinocytic tumour was 13 years old and the eldest one was 85 years old. This wide range of age distribution is most likely due to the diversity of keratinocytic lesions with verrucas more common in younger age group and carcinomas being a problem of old age. Keratoacanthoma is found in older individuals[6] and the only patient in our study was 83 years old. It is unusual to have seborrheic keratosis in children[6] and we found this lesion in the age range of 42-68 years. In present study, age range for actinic keratosis was found to be 60-85 years that matches with the literature[6]. If we look at the age range of BCC in our study i.e. 22-85 years, there exists some differences. In previous local studies, the age ranges for BCC were found to be 50-70 years from Jamshoro[16], 30-90 years from Chandka Medical College Larkana[18], 51-60 from Faisalabad[17], 8-92 years JPMC Karachi[11] and 15-103 years from Abbotabad[5]. These differences might be because different sample size and populations employed for various studies. In literature, the average age for Bowen's disease is 48 years, but we found the median age to be 61.5 years. This contrast might be because of limited no. of cases included in our study i.e. only 3 cases. Among SCC cases, we found a few cases in young patients with minimum age in cases of well-differentiated, moderately-differentiated and poorly-differentiated SCCs to be 13, 18 and 13 years respectively. In literature, SCC is more of a lesion of older age group[6,19]. In our study, the majority of SCC cases were of older age group and the few unusual younger age group cases might be related to familial disorders or syndromes like xeroderma

pigmentosa in which SCC appears at young age. Another unusual result in our study was a very wide age range (12-70 years) for verrucas. Viral warts are usually common among school going children i.e. below and /or around 10 years. We have no case of school going age group because of the fact that children and their parents were found to be less compliant towards getting biopsies done.

Skin is everywhere on our body, so keratinocytic tumours could be present on any body part. Our study validates this fact and we found these lesions in all parts of the body. However, head and neck region was found to be the most favoured site with 72 (69.2%) out of total 112 cases; perhaps this is the most frequent site exposed to solar radiations or sun exposure. Keratoacanthomas are usually present on face[6] and our only case had this lesion on chin. The only case of Lichen Planus Like Keratosis in our study had this lesion on hip and Le Boit et al.[6] found the same with predilection for upper trunk and extremities. Seborrheic keratosis could occur anywhere[6] and in our cases, the lesions were present in diverse locations as well. Palms and soles are the common sites for arsenical keratosis and our result is comparable with the only case having the lesion on hand. Regarding BCC, Memon et al.[16] found nose as commonest site while Fayyaz et al.[17] reported cheek and eyelids as most frequent sites. In our study, nose was the commonest site for BCC and cheek was the second most frequent site of involvement. Our results regarding sites of different BCC subtypes are comparable with literature. For instance, head is the favored site for nodular BCC[6] and we found the same with nose and eye being the commonest sites. Bowen's disease can occur on both exposed and non-exposed parts of body[6] and we found compatible results with this disease found at face, forearm and leg in our three cases. In present study, SCC was found mostly on exposed parts with only a few cases on non-exposed parts like hip, flank or leg. These results match with the WHO results[6]. Dotto and Glusac[20] reported nose as the commonest site for spindle cell SCC and our only case had the lesion on nose too. We found verrucous SCC to be more common on head and around mouth and according to Le Boit et al[6]; buccal mucosa is the favored site for verrucous SCC. Verruca vulgaris is found more commonly on exposed parts particularly fingers and dorsum of hand[6]. In present study, the results are comparable, with face (21.1%) and hands (15.8%) being the two most frequent sites of involvement for verruca vulgaris.

Conclusion

The characteristics of keratinocytic tumours found in local population are similar to those found in other regions of world. In Pakistan, this is the first study analyzing various types and subtypes of keratinocytic tumours in local population. Our data regarding age, gender and site distribution is comparable with international data. This data will help in better understanding of the epidemiology of keratinocytic lesions present in our country.

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