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Histopathological Spectrum of Skin Neoplasm in A Tertiary Care Center

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ABSTRACT

Background

Skin is the largest organ in the body. An extensive range of disease can develop from various compartment of skin.Early diagnosis can help in prognosis and planning an effective management.Hence, differentiation of malignant and benign nature of the lesion is vitally important which can be achieved by histopathological examination.The objective of this study was to analyze the histomorphological spectrum of skinneoplasm received in a tertiary center.

Methods

This is a retrospective study done from January 2018 to December 2021 in the Department of Pathology, Dhulikhel Hospital - Kathmandu University Hospital (DH - KUH). Relevant clinical data of the patients were obtained from the histopathological records of the patient from the pathology department.

Results

A total of 248 cases of skin tumours were studied, out of which 194(78.2%) cases were benign and 54(21.8%) cases were malignant. The incidence of keratinocytic tumours was highest consisting of 107(43.2%) cases followed by soft tissue tumour, melanocytic tumours appendegeal tumours and hematoplymphoid tumours. Most common benign tumour was fibroepithelial polyp and malignant neoplasm was squamous cell carcinoma. The age of patient ranged from 4 to 94 years. Benign tumours were most prevalent in age group of 31-40 years and malignant neoplasm in 61-70 years. Head and neck region was the commonest site for occurrence of the skin neoplasms.

Conclusions

Skin tumours comprise of wide spectrum of benign and malignant lesions. Histopathological study of the skin biopsies is required for definite diagnosis and treatment.

Keywords: histopathology; skin; tumours.

INTRODUCTION

Skin is a largest, sophisticated sensory organ with endocrine role.[1] This complex organ has three anatomic components epidermis and skin adnexa, melanocytic system, dermis and subcutis.[1,2]An extensive range of disease can develop from skin.[1]Skin cancer is the 19th most common cancer worldwide and can affect people of all ages.[3] UV radiation is a known risk factors for both melanoma and non-melanoma skin cancer.[4]Skin tumours clinically present as papules and nodules and may have similarity in gross appearance.Early diagnosis can help in planning an effective management.[5] Hence,differentiation of malignant and benign nature is vitally important which can be achieved by histopathological examination.[5] The current study aims to evaluate the prevalence of skin neoplasms and its distribution according to WHO classification. It evaluates the age, gender and anatomical site wise distribution of benign and malignant skin neoplasms over a 4 years study period.

METHODS

This retrospective study was carried out in the

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Department of Pathology, Dhulikhel Hospital- Kathmandu University Hospital (DH-KUH). Ethical approval from the Institutional Review Committee was obtained (Approval number: 242/2021). This study included data collected over a period of 4 years, from January 2018 to December 2021. All cases of skin that were histopathologically diagnosed as skin neoplasms, both benign as well as malignant were included. All the skin biopsies including incision and excision specimens were reviewed. Relevant clinical data which consisted of information regarding age, sex, clinical diagnosis, site and gross findings were obtained from the histopathological records. All specimens were fixed in 10% formalin. Gross examination was done and sections were taken from representative areas then processed into paraffin embedded sections and stained with Hematoxylin and Eosin. These Hematoxylin and Eosinstained slides were retrieved for microscopic examination. The tumors were classified according to World Health Organization (WHO) guidelines. Frequency of various benign and malignant tumour was listed. Patient's data was entered in Microsoft Excel and descriptive data analysis was done using Statistical Package for SocicalSciences(SPSS) 16.0 software. Results were expressed as frequency and percentage.

RESULTS

A total of 992 skin biopsies were received in department of pathology at DH-KUSMS. This represented 8.2% of all the surgical specimen that were received during the study period. Out of the total received skin biopsies 248 (25%) were skin neoplasms and 744 (75%) were non-neoplastic lesions. Among the neoplastic skin lesions, 194(78.3%) were benign and 54 (21.7%) were malignant. The ratio of benign and malignant lesion is 3.6:1 (Table 1).

Table 1. Distribution of skin neoplasm according to WHO classification.

Group of neoplasm	Benign n(%)	Malignant n(%)
Keratinocytictumours	65(26.2%)	42 (17%)
Melanocytic tumours	29(11.7%)	6(2.4%)
Appendageal tumours	17(6.8%)	3(1.2%)
Hematolymphoid tumours	-	2(0.8%)
Soft tissue tumours	83(33.5%)	1(0.4%)

Among the skin tumourskeratinocytic tumors had the highest incidence with 107(43%) cases, followed by soft tissue tumors, melanocytic tumors, appendageal tumors and hematolymphoid tumors as shown in Table 1. Soft tissue tumors were the most common benign tumors consisting of 83(33.5%) cases followed by keratinocytic, melanocytic and appendageal tumours. Keratinocytic tissue tumours were the most common malignant tumors consisting of 42(17%) cases followed by melanocytic, appendageltumours, hematolymphoid tumours and soft tissue tumour (Table 2).

Table 2. Histomorphological patterns of keratinocytic tumors.

Variables	Frequency (%)
Benign keratinocytictumors	
Fibroepithelial polyp	32(12.9%)
Verruca vulgaris	11(4.5%)
Myemecia	1(0.4%)
Seborrhoeic keratosis	10(4%)
Keratoacanthoma	7(2.8%)
Melanoacanthoma	2(0.8%)
Bowen disease	2(0.8%)
Malignant keratinocytictumours	
Squamous cell carcinoma	26(10.5%)
Basal cell carcinoma	16(6.5%)

Fibroepithelial polyp consisting of 32(12.9%) cases was the most common benign neoplasm followed by capillary hemangioma 17(6.9%), intradermal nevus 16(6.5%) and verruca vulgaris 11(4.5%). Among the malignant neoplasms, squamous cell carcinoma was most prevalent neoplasm comprising of 26(48.1%) followed by basal cell carcinoma 16(29.6%) and malignant melanoma 6(2.4%) (Table 3).

Table 3. Histomorphological patterns of Melanocytic tumours.

Variables	Frequency (%)
Benign Melanocytic tumours	
Intradermal nevus	16(6.5%)
Compound nevus	7(2.8%)
Congenital nevus	4(1.6%)
Spitz nevus	1(0.4%)
Nevus of Nanta	1(0.4%)
Malignant Melanocytic tumours	
Malignant melanoma	6(2.4%)

The histomorphological patterns of benign and malignant neoplasm of keratinocytic, melanocytic, appendegeal and soft tissue skin neoplasms are tabulated in table 2, 3, 4 and 5. Two of the

Table 4. Histomorphological patterns of Appendegealtumours.

Variables	Frequency (%)
Benign Appendegealtumours	
Pilomatrxoma	10(4%)
Nodular Hidradenoma	2(0.8%)
Chondroid syringoma	1(0.4%)
Apocrine hidrocystoma	1(0.4%)
SyringocystadenomaPapilliferum	3(1.2%)
Malignant Appendegealtumours	
Sebaceous carcinoma	2(0.8%)
Trichelemmal carcinoma	1(0.4%)

Table 5. Histomorphological patterns of soft tissue tumours.

Variables	Frequency (%)
Benign soft tissue tumours	
Angiokeratoma	3(1.2%)
Angiomatoid hyperplasia with eosinophilia	1(0.4%)
Benign fibrous histiocytoma	17(6.9%)
Capillary hemangioma	21(8.6%)
Cavernous hemangioma	1(0.4%)
Cherry hemangioma	4(1.6%)
Juvenile capillary hemangioma	1(0.4%)
Cutaneous leiomyoma	3(1.2%)
Lymphangioma circumscriptum	5(2%)
Pyogenic granuloma	10(4%)
Glomus tumour	4(1.6%)
Hypertrophic scar	2(0.8%)
Keloid	5(2%)
Fibroma	5(2%)
Fibrokeratoma	1(0.4%)
Malignant soft tissue tumours	
Dermatofibrosarcoma protuberans	1(0.4%)

hematolymphoid tumours were cutaneous lymphoma. Benign tumors were slightly more common in females in comparison to male with a ratio of female to male ratio of 1.2:1. Malignant skin neoplasm were more common in male with male to female ratio of 1.6: 1. Most common site of occurrence of skin tumors, both benign and malignant were head and neck region comprising of 128 (51.6%) of cases. The distribution of benign and malignant skin

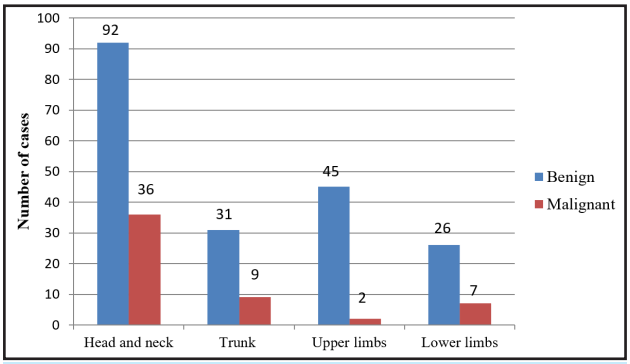

Figure 1. The distribution of benign and malignant skin neoplasm according to location. (n=248)

neoplasm according to location is shown in figure 1.

DISCUSSION

Skin can be involved by an extensive range of disease which ranges from disorders intrinsic to skin to manifestation of systemic diseases.[1,6] The prevalence of skin malignancy is increasing in the Nepalese society.[7] The etiology of skin cancer is multifactorial involving agent, host and environmental factors. Various factors involved are old age, male sex, skin type, childhood freckles/naevi, fair skin and genodermatoses.[7] Ultraviolet light exposure is the main environmental factor the exposure of which is further aggravated by stratospheric ozone layer depletion. [7] It is a known risk factors for both melanoma and non-melanoma skin cancer.[4]A total of 992 skin biopsies were received during the study period where 248(25%) were skin neoplasm and 744 (75%) were non-neoplastic lesions. Among the neoplasms, 194(78.3%) were benign and 54 (21.7%) were malignant lesions. The ratio of benign and malignant lesion is 3.6:1. Similar to our finding benign skin lesions constituted a major number of cases in studies done by Kaur et al, Pappala et al, Narhire et al and Sherpa et al.[5,6,8,9](Table 7) In contrast, malignant skin neoplasm were more common in studies carried out by Nandyal et al, Gudalli et al and Samanta et al.[10-12] The discrepancies in the type of skin neoplasm among these studies could be due to geographical variation. Neoplastic lesion of skin can be classified to keratinocytictumours, melanocytic tumours, appendageal tumours, haematolymphoidtumours, soft tissue tumours and neural tumours.[4]The epidermal layer is composed of

Table 6. Distribution of benign skin neoplasms according to gender and various age groups.

Age group (years)	Keratinocytic		Melanocytic		Appendegeal		Soft tissue		Hematolymphoid	
	M	F	M	F	M	F	M	F	M	F
0-10	1	-	1	-	1	-	1	-	-	-
11-20	1	2	2	3	1	2	7	11	-	-
21-30	2	3	-	4	-	-	8	9	-	-
31-40	4	5	5	4	3	1	10	11	-	-
41-50	2	6	1	3	3	1	3	4	-	-
51-60	9	9	3	3	3	1	6	8	-	-
61-70	7	8	-	-	1	-	1	1	-	-
71-80	2	1	-	-	-	-	1	2	-	-
81-90	-	3	-	-	-	-	-	-	-	-
91-100	-	-	-	-	-	-	-	-	-	-

Table 7. Distribution of malignant skin neoplasms according to gender and various age groups.

Age group (years)	Keratinocytic		Melanocytic		Appendegeal		Soft tissue		Hematolymphoid	
	M	F	M	F	M	F	M	F	M	F
0-10	-	-	-	-	-	-	-	-	-	-
11-20	2	-	-	-	-	-	-	-	-	-
21-30	2	-	-	1	-	-	-	-	-	-
31-40	1	-	-	-	1	-	-	-	-	-
41-50	1	2	-	-	-	-	-	1	-	-
51-60	6	2	-	2	-	1	-	-	1	-
61-70	7	5	1	-	1	-	-	-	-	-
71-80	6	4	-	-	-	-	-	-	-	-
81-90	3	1	-	1	-	-	-	-	-	1
91-100	-	-	1	-	-	-	-	-	-	-

90% of keratinocytes and remaining 10% composed by melanocytes, langerhans cells and merkelcells.[6]In present study, incidence of keratinocytic tumors was highest with 107 cases, followed by soft tissue tumors, melanocytic tumors, appendageal tumors and hematolymphoid tumour. Similar to our study keratinocytic category was predominant in studies conducted by Kaur et al, Pappala et al, Narhire et al, Sherpa et al, Nandyal et al, Samanta et al and Gundalli et al.[5,6,8-12] In present study maximum number of benign neoplasms belonged to the soft tissue tumours which is in concordance with studies done by Narhire et at and Bansal et al.[8,13] Some studies which also included soft tissue in tumourcatergory found benign tumours of keratinocytic category more prevalent.[9,14] Among the malignant neoplasms, keratinocytic neoplasm were most common category followed by melanocytic, appendagealtumours, hematolymphoid tumours and soft tissue tumour. Similar predominant malignant keratinocytictumours were seen in various other studies.[5,6,8-14] Fibroepithelial polyp also known as acrochordon or skin tag is a polypoid lesion composed of varying amount of stroma covered by a papillomatous epidermis.[1,2] Incidence of Fibroepithelial polyp was highest among the benign neoplasm in our study which is comparable to study done by Thapa et al.[15]However,Veruuca was the commonest tumour in studies by Kaur et al and Nandyal et al.[5,10] Squamous papillioma and pyogenic granuloma were the most common benign neoplasm in studies conducted by Pappala et al and Bansal et al respectively.[6,13] In study conducted by Sherpa et al and Gundalli et al intradermal nevus was commonest benign neoplasm.[9,12] Two cases of Bowen disease were present in the study which were kept under benign category. Histologically Bowen disease was characterized by atypical epithelial changes consisting of cytoplasmic vacuolization,

nuclear hyperchromasia, individual cell dyskeratosis and imcreased mitosis. Among the melanocytic lesions various forms of nevus were seen. Most common form of nevus was intradermal nevus histologically characterized by small nest and bundles of melanocytes in the upper dermis typically around the pilosebaceous unit. A single case of Nevus of Nanta characterized by presence of ectopic bone formation in intradermal nevus was also seen. Pilomatrixoma also known as calcified epithelioma of Malherbe was the most common form of benign adnexal tumour identified which on microscopic examination revealed abrupt keratinization of basaloid cells with formation of ghost or shadow cells along with secondary changes of calcification and foreign body reaction. Cherry hemangioma was the commonest soft tissue tumour characterized by well circumscribed collection of capillary vessels and venules in the superficial dermis with minimal luminal dilation.[4] Squamous cell carcinoma was most common malignant neoplasm followed by basal cell carcinoma and malignant melanoma. This is similar to the findings were present in various studies conducted in Nepal and India.[5,6,8-11] However in studies conducted in other parts of the worlds like Western region of Saudi Arabia and Poland showed basal cell carcinoma as the common malignant tumour.[17,18] This variation in in the incidence of type of skin malignancy is attributable to the difference in the people with different skin attribute and environment exposure residing in different geographical area.[7]

Out of 248 cases, 121(48.8%) were males and 126(51.2%) were females. Our study showed benign neoplasm to have slight female predominance with male to female ratio being 1:1.2. Similar to present study, Sherpa et al, Nandyal et al, Gudalli et al had female predominance in benign tumours.[9,10,12] Among the malignant tumours there was male predominance with male to female ration of 1.6:1. Similar male predominance among the malignant skin tumours were seen in studies conducted by Kaur et al, Nandyal et al, Gundalli et al and Bari et al.[5,10,12, 18] Maximum number of skin tumours were in age group of 51-60 years comprising of 54 (21.8%) cases followed by 31-40 years with 45 (18.1 %) cases. Benign neoplasms were commonly observed in 31-40 years age group followed by 51-60 years age group. Similar to our study benign tumours were common in 4th decade of life in Gundalli et al.[12] The most youngest patient with malignant neoplasm was 12 years old male who presented with multiple primary skin neoplasm and was a known case of xeroderma pigmentosum. Malignant neoplasms were more common in 61-70 years age group followed by 51-60years age group. Similar to our study maximum number of malignant tumours were in the 7th deacade in studies conducted by Kaur at al, Nandyal et al, Gundalli et al, Bari et al.[5,10,12,18] This incidence of malignant tumour older age group as compared to the benign neoplasm could be due to longer exposure to the sun's ultraviolet rays which has strong association with skin malignancy.[7] In our study, maximum number of skin neoplasms, both benign and malignant were seen in the head and neck region. This finding is in concordance with the Narhire et al, Sherpa et al and Bari et al.[8,9,18]

CONCLUSIONS

Skin tumours are relatively less common tumours which can comprise of wide spectrum of benign and malignant lesions. Histopathological study of the skin biopsies is required for definite diagnosis which is essential for prognostic assessment and planning an effective management. Fibroepithelial polyp was the most common benign lesion. Squamous cell carcinoma was the most common malignant tumour unlike Basal cell carcinoma which is more common in western countries.

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