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Original Article

Clinical Spectrum of Cutaneous Malignancies in Nepal: A Retrospective Cross-Sectional Study at Dhulikhel Hospital

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Abstract

Background

Skin cancer epidemiology varies by geography and ethnicity. While basal cell carcinoma predominates globally, squamous cell carcinoma may be more common in high-ultraviolet (UV) regions with darker-skinned populations.

Materials and Methods

A 5-year retrospective cross-sectional study (2019-2023) of histologically confirmed skin cancers at Dhulikhel Hospital, Nepal. Data on demographics, histology, tumor sites, and risk factors were analyzed. Pearson correlation assessed the sun exposure association.

Results

A total of 140 patients were included. The mean age was 60.04 ± 18.04 years, with 57.1% aged over 60. Males comprised 55% and women 45% (M:F ratio = 1.2:1). Squamous cell carcinoma was the most common skin cancer (52.9%), followed by basal cell carcinoma (42.1%) and melanoma (5%). The head and neck was the most frequently affected site. A history of prolonged sun exposure was present in 75.7% of patients, and a statistically significant correlation was found between sun exposure and skin cancer (Pearson correlation = 0.191, p = 0.024). Six patients had xeroderma-pigmentosum.

Conclusion

Squamous cell carcinoma predominates in Dhulikhel Hospital, Kavre, contrasting global Basal cell carcinoma (BCC) trends. Elderly males with high sun exposure are most affected, highlighting ultraviolet(UV) radiation's role.

Keywords: *Basal cell carcinoma, Dermatology, Skin cancer, Squamous cell carcinoma*

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Introduction

Cutaneous malignancies represent a significant global health burden with varying incidence patterns across regions. Non-melanoma skin cancers (NMSCs), primarily basal cell carcinoma (BCC) and squamous cell carcinoma (SCC), are most prevalent in fair-skinned populations. However, their epidemiology differs substantially by geography, ethnicity, and environmental factors like ultraviolet (UV) radiation exposure [1, 2].

In South Asian nations like Nepal, unique factors may alter skin cancer presentation. The predominantly darker-skinned population resides at high altitudes with intense UV exposure. Occupational sun exposure (e.g., farming), limited healthcare access, delayed presentation, and low photoprotection awareness further influence risk and severity [3, 4]. Data remains scarce due to underreporting, diagnostic limitations, and absent cancer registries [5], with existing studies lacking epidemiological depth.

This study aims to evaluate the clinico-demographic profile, histological spectrum, anatomical distribution, and associated risk factors of cutaneous malignancies in patients presenting to a tertiary care center in Nepal.

Materials and Methods

The study was a retrospective cross-sectional study conducted at Dhulikhel Hospital Kathmandu University Hospital from January 2019 to December 2023. Dhulikhel Hospital is located in Kavre District. The histopathology records of the patients in present study were obtained from the pathology department of Dhulikhel Hospital.

This retrospective cross-sectional study analyzed histopathologically confirmed cutaneous malignancies diagnosed at Dhulikhel Hospital-Kathmandu University Hospital in Kavre District, Nepal, between January 2019 and December 2023. Ethical approval was obtained from the Institutional Review Board (KU-IRB number 273/24) and Ethical Review Committee, with waiver of individual consent granted for anonymized retrospective data. The study included all biopsy-proven skin cancers from dermatology department specimens, while excluding non-cutaneous malignancies and cases with incomplete clinical or histopathological records. A total of 140 consecutive cases meeting inclusion criteria were enrolled, representing all eligible skin cancer biopsies during the study period. As this was a retrospective study, the sample size was not pre-determined but rather comprised all available cases that fulfilled the inclusion criteria. Statistical analyses were performed using SPSS version 25 (IBM Corp), employing descriptive statistics (frequencies, percentages, mean ± standard deviation) to characterize demographic and clinical variables. Pearson correlation analysis assessed the relationship between prolonged sun exposure and skin cancer diagnosis, with statistical significance set at $p<0.05$.

Results

Of a total of 1127 biopsy specimens submitted to the pathology laboratory during the 5-year period (2019 to 2023), 140biopsy specimens were found making the magnitude of skin cancers.

The ages of patients ranged from 11 to 93 years,with a mean age of 60.04 ± 18.04 years, with the majority (n=80, 57.1%) being over 60 years of age. Age-wise distribution is detailed in Table 1, and a graphical representation is shown in Figure 1.

Table 1: Age-wise distribution of skin cancer patients

Age Group			
<=20 (n)	21-40 (n)	40-60 (n)	>60 (n)
5	16	39	80

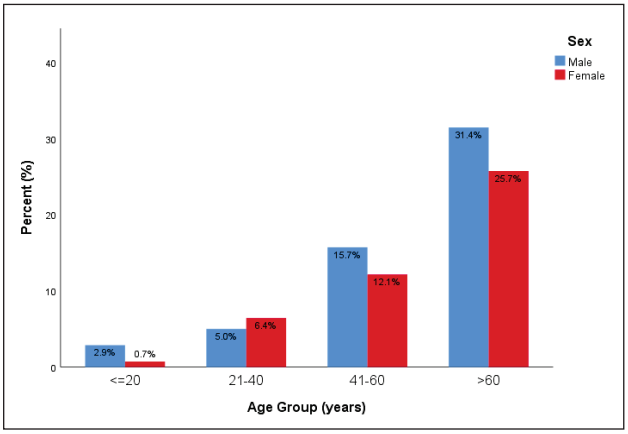

Figure 1: Bar graph showing distribution by age group and sex

Of the 140 skin cancers identified in this 5-year period, 77(55%) were men and 63(45%) were women, giving a male: female ratio of 1.2:1.

Among the total cases:

- Squamous Cell Carcinoma (SCC) was the most common, accounting for 74 cases (52.9%)
- Basal Cell Carcinoma (BCC) comprised 59 cases (42.1%)
- Melanoma was diagnosed in 7 patients (5%)

The sex-wise distribution of each diagnosis is summarized in Table 2. SCC was more common

in males (n=49) than females (n=25), whereas BCC showed a female predominance (n=34 vs. 25). Melanoma was slightly more common in females (n=4) than in males (n=3).

Table 2: Distribution of diagnoses by sex

	BCC	SCC	Melanoma
Male	25	49	3
Female	34	25	4
	59(42.1%)	74 (52.9%)	7(5%)

The majority of skin tumors were seen in the older age group >60 years 80/140 (57.1%). 5/140 (3.57%) caseswere found in the age group range under 20 and it occurred mostly in patients with XerodermaPigmentosum.

The majority of lesions occurred on sun-exposed areas, particularly the head and neck, which was the most common site for both BCC and SCC. Melanoma was most frequently seen on the extremities. Site-wise distribution by diagnosis is as follows:

		BCC	SCC	Melanoma
Site	Head and Neck	48	47	1
	Trunk	6	15	0
	Extremities	5	9	6
	Genitalia	0	3	0

Prolonged sun exposure was reported by 106 patients (75.7%).Pearson's correlation analysis revealed a significant but weak positive correlation between prolonged sun exposure and diagnosis of skin cancer (r = 0.191, p = 0.024) [Table 3]. This suggests an association between UV exposure and skin carcinogenesis.

Table 3: Correlation of sun exposure and skin cancer (Pearson correlation for skin cancer and prolonged exposure to sunlight = 0.191) (significant)

Diagnosis	Pearson Correlation	1	.191*
	Sig. (2-tailed)		.024
	N	140	140
Prolonged Sun Exposure	Pearson Correlation	.191*	1
	Sig. (2-tailed)	.024	
	N	140	140

*. Correlation is significant at the 0.05 level (2-tailed).

A known history of xerodermapigmentosum (XP) was present in 6 patients (4 with BCC and 2 with SCC). The remaining 134 patients (95.7%) reported no identifiable predisposing conditions.

Year-wise distribution of diagnoses is presented in Figure 2. The number of BCC and SCC cases remained relatively stable across the five-year study period, with a mild increase observed in 2023. Notably, melanoma cases were only reported from 2019 to 2021, with no cases documented in 2022 and 2023.

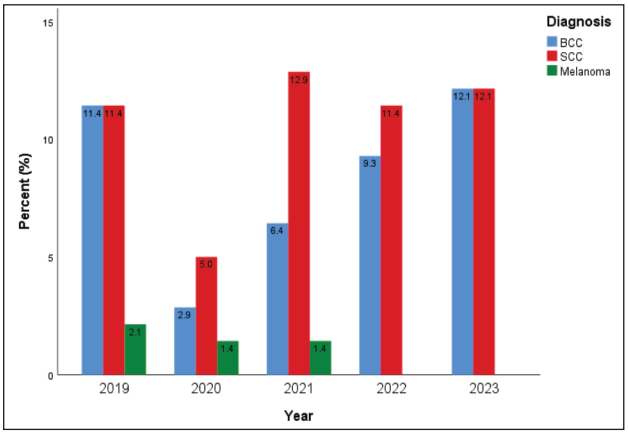

Figure 2: Bar diagram showing year-wise distribution of skin cancer diagnoses

The majority of patients (117/140) did not have any symptoms. Among those with associated symptoms, blood mixed discharge was the most common accounting for 23/140 (16.4%). The other symptoms encountered were pain, ulceration, and itching, alone or in combination.

Discussion

Cutaneous malignancies, while less prevalent than many internal cancers, pose a significant burden due to their potential for local invasion, disfigurement, and occasional metastasis. Numerous environmental, genetic, and lifestyle factors influence their incidence and clinical appearance; the most important ones are geographic altitude, skin phototype, and ultraviolet (UV) radiation exposure [2,6].

The risk of UV-induced skin damage and consequent cancer is increased in high-altitude nations like Nepal, where UV intensity is higher and occupational sun exposure is prevalent. Despite this, skin cancers remain underreported and understudied in Nepal.

The present study is a 5-year retrospective study that aimed to describe the clinical spectrum of histopathologically confirmed skin cancers over a five-year period at Dhulikhel Hospital, thereby contributing to the limited literature on skin cancer epidemiology in the Nepalese context.

The study found the magnitude of skin tumors to be 12.42% of the total biopsies obtained during the 5-year period. Our study found Squamous cell carcinoma (SCC) was the most prevalent type of skin cancer, followed by Basal cell carcinoma (BCC) and malignant melanoma. This distribution is consistent with the global trend where non-melanoma skin cancers (NMSCs), particularly BCC and SCC, are the most common skin malignancies. This contrasts with global data, where BCC is the most commonly reported skin cancer, especially in fair-skinned Caucasian

populations [2]. However, in many Asian countries, including India and Nepal, studies have shown a higher or comparable incidence of SCC compared to BCC [7-9], possibly due to differences in skin phototypes, environmental exposures, and occupational sun exposure patterns. Our study aligns with those of Sherpa P et al. [10], Kaur et al. [11] and contrasts with those of Adhikari et al.[12], Tiwari et al.[13], and Shrestha et al. [14] who reported a high frequency of BCC.

The mean age of patients was 60.04 ± 18.04 years, with the highest number of cases occurring in individuals aged over 60 years (57.1%). This aligns with the well documented trend of increased skin cancer risk with advancing age, likely due to cumulative ultraviolet (UV) radiation exposure, age related decline in immune surveillance and decreased DNA repair capacity[1,15].

A male predominance (M:F = 1.2:1) was noted, aligning with global trends that suggest males are more frequently affected due to greater outdoor activity and lower rates of sun protection usage[16].

In terms of anatomical distribution, the head and neck region was the most common site for both BCC and SCC, consistent with the role of chronic sun exposure in the pathogenesis of non-melanoma skin cancers.[4] Melanoma, though relatively rare in this cohort, was more frequently observed on the extremities, which is in agreement with patterns reported in Asian populations [17]. Melanoma, though relatively rare in this cohort, was more frequently observed on the extremities, which is in agreement with patterns reported in Asian population[18].

A significant proportion (75.7%) of patients reported prolonged sun exposure, and a positive correlation was observed between UV exposure and skin cancer diagnosis (Pearson correlation = 0.191, p = 0.024). Although the correlation was weak, it was statistically significant, reaffirming the role of UV radiation as a critical risk factor for skin carcinogenesis [19,20]. This underscores the need for public health interventions promoting sun safety, particularly for high-risk occupational groups.

Interestingly, genetic predisposition in the form of xerodermapigmentosum (XP) was reported in six patients four with BCC and two with SCC. XP is a rare autosomal recessive disorder characterized by defective DNA repair and a markedly increased risk of UV-induced skin cancers [21]. Although rare in the general population, its presence in a subset of patients highlights the contribution of inherited syndromes in skin cancer pathogenesis.

Overall, our findings emphasize the growing burden of non-melanoma skin cancers in aging populations with high sun exposure, and highlight the need for early detection, awareness, and preventive strategies in rural and semi-urban settings.

However, this study has some limitations. As a single-center retrospective study, the findings may not be fully generalizable to the broader population. Regional referral bias, diagnostic variability, and limited access to specialized care may also have influenced the observed trends. Furthermore, the lower incidence of melanoma compared to global reports may reflect underreporting or misdiagnosis rather than true epidemiological patterns. Future multi-center and population-based studies are needed to validate and expand upon these findings.

Conclusion

This study sheds important light on the clinico-demographic trends of skin cancer in Nepal's tertiary care system. The most prevalent kind was found to be squamous cell carcinoma (SCC), which was followed by melanoma and basal cell carcinoma (BCC). Elderly males and individuals with prolonged sun exposure were most frequently affected, and the head and neck region was the predominant site involved.

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Conflict of interest: None

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