



## HISTOMORPHOLOGICAL SPECTRUM OF NEOPLASTIC AND NON-NEOPLASTIC LESIONS OF SKIN AT TERTIARY CARE CENTRE

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### ABSTRACT

The skin is a complex organ with multiple functions and three key anatomical components: the epidermis with skin appendages, the melanocytic system, and the dermis and subcutaneous tissue. Dermatological lesions, which are commonly encountered worldwide, vary in type and prevalence across different countries and regions, influenced by factors such as sex, age, systemic disorders, socioeconomic status, literacy, and social customs. While the majority of skin lesions are diagnosed based on clinical presentation and patient history, histological analysis plays a crucial role in confirming the diagnosis and guiding appropriate management. Clinical diagnosis can be challenging, especially for appendageal tumors, which often present as asymptomatic papules or nodules. Although factors such as anatomical location, lesion number, and distribution are helpful, histopathology remains indispensable for accurate diagnosis. **Aim:** To study histomorphological spectrum of neoplastic and non-neoplastic lesions of skin at tertiary care centre. **Material and methods:** This cross-sectional, observational study was conducted at a tertiary care centre for the period of 2 years to examine the histomorphological spectrum of neoplastic and non-neoplastic skin lesions. A total of 166 patients, who presented with clinically diagnosed skin lesions and underwent skin biopsy during the study period, were included. Detailed clinical history, including demographic information and symptoms, was recorded for each patient. Skin biopsies were collected using sterile biopsy punches or excisional techniques, fixed in 10% formalin, and processed for histopathological examination using Hematoxylin and Eosin (H&E) staining. The lesions were classified into neoplastic (benign and malignant) and non-neoplastic categories based on histomorphological findings. Data was analysed using descriptive statistics, and the findings were categorized and presented according to the frequency and types of lesions. **Results:** The study included a total of 166 patients, with a mean age of 43.3 years, reflecting a diverse age range among those presenting with skin lesions. In terms of gender distribution, 40.4% of the patients were female, while 59.6% were male, indicating a slightly higher incidence of skin lesions in males within the study population. Histological analysis revealed that 60.8% of lesions were non-neoplastic, while 39.2% were neoplastic, with 56.9% of neoplastic lesions being benign and 43.1% malignant. This distribution underscores the importance of identifying and differentiating between benign and malignant lesions for proper diagnosis and treatment planning. The study's findings contribute valuable insights into the spectrum of skin lesions, both neoplastic and non-neoplastic, in the population of the tertiary care centre. **Conclusion:** The study of 166 patients with a mean age of 43.3 years found a slightly higher incidence of skin lesions in males (59.6%). Most lesions were non-neoplastic (60.8%), while 39.2% were neoplastic, with 56.9% benign and 43.1% malignant. Seborrheic keratosis was the most common benign lesion, while squamous cell carcinoma was the most frequent malignant lesion. These findings highlight the importance of regular skin screenings for early detection and treatment.

**KEYWORDS :** Histomorphology, neoplastic, non-neoplastic, lesions of skin

### INTRODUCTION

Skin lesions are complex because they encompass a broad variety of both neoplastic and non-neoplastic conditions. [1]

Skin problems are among the most common health issues in India, with prevalence rates ranging from 6.3% to 11.6% [2]. These conditions can present in various forms, from simple non-neoplastic vesicular lesions to life-threatening malignant tumors. Skin diseases encompass a wide range of non-infectious, infectious, and neoplastic conditions, including both benign and malignant tumors. The distribution and nature of these lesions vary across different regions of the country and even within specific areas, influenced by factors such as age, sex, systemic diseases, socioeconomic status, education levels, racial characteristics, and social norms. Overall, skin problems affect 6.3% to 11.6% of the population [3].

With advancements in healthcare and increasing awareness of skin diseases, histological analysis of clinically diagnosed lesions has become essential for confirming diagnoses [4]. Many skin conditions can be diagnosed through clinical assessment, patient history, and biochemical tests, but histological examination remains the gold standard for resolving diagnostic challenges [5]. A skin biopsy and

histopathological analysis are vital for identifying the underlying causes, ensuring accurate diagnosis, and guiding clinicians in selecting the appropriate treatment [6].

This study aims to find the histomorphological spectrum of neoplastic and non-neoplastic lesions of skin at tertiary care centre.

**AIMS:** To study histomorphological spectrum of neoplastic and non-neoplastic lesions of skin at tertiary care centre

**OBJECTIVES :** (1) To study histomorphological features of various skin lesions. (2) To study age distribution of various skin lesions.

### MATERIAL AND METHODS:

This study was conducted at a tertiary care centre for the period of 2 years to investigate the histomorphological spectrum of both neoplastic and non-neoplastic skin lesions. The study was approved by the institutional ethics committee, and informed consent was obtained from all participants.

### STUDY DESIGN:

This was a cross-sectional, observational study conducted

over a period of 2 years Sample size: A total of 166 samples were studied.

INCLUSION CRITERIA:

All patients presenting with clinically diagnosed skin lesions, both neoplastic and non- neoplastic, who underwent skin biopsy and received in the histopathology laboratory of department of pathology at the tertiary care centre during the study period were included.

EXCLUSION CRITERIA:

Patients with incomplete clinical records or those who did not consent to biopsy were excluded from the study.

PATIENT SELECTION:

A total of 166 patients were selected, and a detailed clinical history, including demographic data (age, sex, socioeconomic status, and clinical symptoms), was recorded for each participant. Clinical examination and diagnosis were carried out by qualified dermatologists. Sample Collection:

Skin biopsies specimens which were received in our histopathology laboratory of department of pathology were immediately fixed in 10% formalin for further processing.

Histopathological Examination:

The biopsied skin samples were processed for routine paraffin embedding, sectioning, and stained with Hematoxylin and Eosin (H&E) for microscopic examination. The sections were analysed by experienced pathologists to classify the lesions into neoplastic (benign and malignant) and non-neoplastic categories based on histomorphological features.

DATA ANALYSIS:

Data collected, including the patient's demographic details, clinical presentation, and histopathological findings, were analysed using appropriate statistical methods. The lesions were categorized into neoplastic (benign and malignant) and non-neoplastic types, and their frequencies were recorded. The histological spectrum of these lesions was also described in detail.

STATISTICAL METHODS:

Descriptive statistics, including frequency and percentage, were used to summarize the data. Statistical software [name of the software, e.g., SPSS, Excel] was used for data entry and analysis.

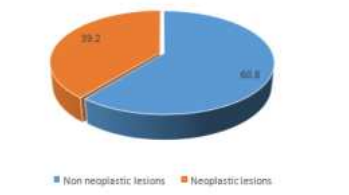
RESULTS:

The study included 166 patients with a mean age of 43.3 years, reflecting a diverse age range. Of the patients, 40.4% were female and 59.6% were male, indicating a slightly higher incidence of skin lesions in males.

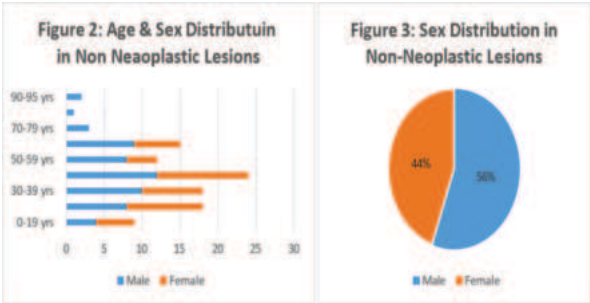
Table 1: Distribution depending on Histological diagnosis

| Type                   | Frequency | Percentage |
|------------------------|-----------|------------|
| Non neoplastic lesions | 101       | 60.8       |
| Neoplastic lesions     | 65        | 39.2       |
| Total                  | 166       | 100        |

Figure 1: Distribution depending on Histological diagnosis



Present study shows that majority lesions were non neoplastic (60.8%) and only 39.2% were neoplastic on histology findings.



In the present study peak age incidence of non-neoplastic lesions is seen in between 40-49 years accounting 25% with male predominance of 56%

Table 2: Incidence of non-neoplastic lesions

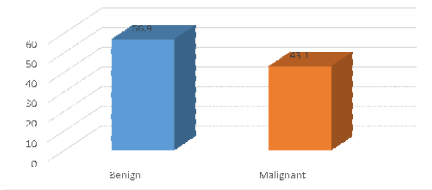
| TYPE OF LESION              | NO. OF CASES | INCIDENCE PER ALL NON-NEOPLASTIC LESIONS | INCIDENCE PER TOTAL NO. OF CASES STUDIED |
|-----------------------------|--------------|------------------------------------------|------------------------------------------|
| Genodermatoses              | 7            | 7%                                       | 4.2%                                     |
| Papulosquamous              | 21           | 21%                                      | 12.6%                                    |
| Vesiculobullous             | 16           | 16%                                      | 9.6%                                     |
| Connective tissue           | 8            | 8%                                       | 4.8%                                     |
| Infectious                  | 27           | 27%                                      | 16.2%                                    |
| Non-infectious inflammatory | 10           | 10%                                      | 6%                                       |
| Cysts                       | 4            | 4%                                       | 2.4%                                     |
| Others                      | 7            | 7%                                       | 4.2%                                     |
| TOTAL                       | 100          | 100%                                     | 60.2%                                    |

Infectious diseases were the most common lesion in the non-neoplastic group.

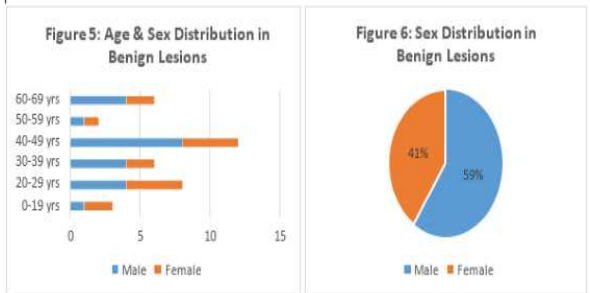
Table 3: Distribution depending on benign and malignant lesions

| Neoplastic lesions | Frequency | Percentage |
|--------------------|-----------|------------|
| Benign             | 37        | 56.9       |
| Malignant          | 28        | 43.1       |
| Total              | 65        | 100        |

Figure 4: Distribution depending on benign and malignant lesions



Among 65 (39.2%) neoplastic lesions it was seen that 56.9% were benign lesions and 43.1% malignant lesions.

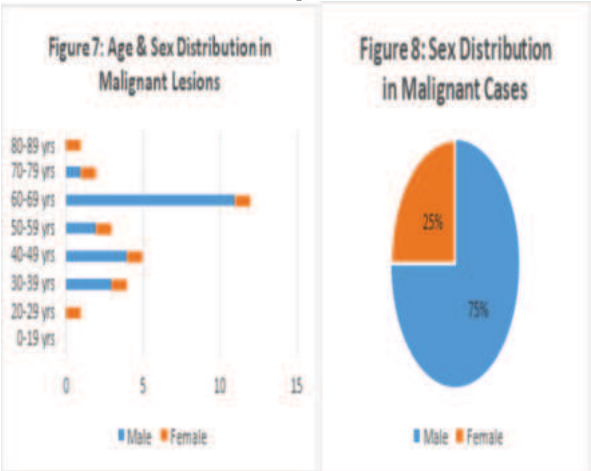


In the present study, peak age incidence of benign lesions is seen in between 40-49 years with male predominance of 59%.

Table 4: Distribution depending on types of benign lesions

| Benign lesions                  | Frequency | Percentage |
|---------------------------------|-----------|------------|
| ACTINIC LENTIGO                 | 1         | 2.7        |
| APOCRINE HYDROCYSTOMA           | 2         | 5.4        |
| BASAL CELL ADENOMA              | 1         | 2.7        |
| CLEAR CELL NODULAR HIDRADENOMA  | 2         | 5.4        |
| COMBINED BLUE NEVUS             | 1         | 2.7        |
| COMPOUND NEVUS                  | 1         | 2.7        |
| CONGENITAL NEVUS                | 1         | 2.7        |
| CUTANEOUS HORN                  | 2         | 5.4        |
| CYLINDROMA                      | 1         | 2.7        |
| ECCCRINE SPIRADENOMA            | 1         | 2.7        |
| FIBROEPITHELIAL POLYP           | 2         | 5.4        |
| HAIR FOLLICLE NEVUS             | 1         | 2.7        |
| HIDRADENOMA PAPPILLIFERUM       | 1         | 2.7        |
| LINEAR EPIDERMAL NEVUS          | 1         | 2.7        |
| NEVUS LIPOMATOSUS               | 1         | 2.7        |
| KERATOACANTHOMA                 | 1         | 2.7        |
| INTRADERMAL NEVUS               | 2         | 5.4        |
| PILOMATRICOMA                   | 2         | 5.4        |
| NEVUS SEBACEOUS                 | 1         | 2.7        |
| PROLIFERATING TRICHILEMMAL CYST | 1         | 2.7        |
| NEVUS OF ITO                    | 1         | 2.7        |
| SEBORRHEIC KERATOSIS            | 5         | 13.5       |
| RIBBON TRICHOBLASTOMA           | 1         | 2.7        |
| VERRUCA VULGARIS                | 1         | 2.7        |
| SEBAECEOUS ADENOMA              | 1         | 2.7        |
| VERRUCA PLANTARIS               | 1         | 2.7        |
| VERRUCA VULGARIS                | 1         | 2.7        |
| Total                           | 37        | 100        |

The data presented outlines the frequency and percentage distribution of various benign skin lesions. Among these, seborrheic keratosis is the most common, occurring in 5 cases (13.5%), followed by apocrine hydrocystoma, clear cell nodular hidradenoma, cutaneous horn, fibroepithelial polyp, intradermal nevus, and pilomatricoma, each occurring in 2 cases (5.4%). The remaining lesions, including actinic lentigo, basal cell adenoma, combined blue nevus, compound nevus, congenital nevus, cylindroma, eccrine spiradenoma, hair follicle nevus, hydrocystoma papilliferum, linear epidermal nevus, nevus lipomatosus, keratoacanthoma, nevus sebaceous, proliferating trichilemmal cyst, nevus of Ito, ribbon trichoblastoma, verruca vulgaris, and sebaceous adenoma, are each reported once, accounting for 2.7% of the total. This distribution highlights the variety of benign skin lesions encountered in the sample.



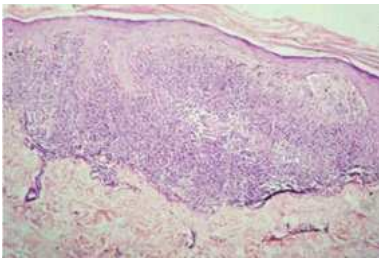
In the present study, peak age incidence of malignant lesions is seen in between 60-69 years with male predominance of 75%.

Table 5: Distribution depending on types of malignant lesions

| Malignant lesions          | Frequency | Percentage |
|----------------------------|-----------|------------|
| Squamous cell carcinoma    | 11        | 39.3       |
| Basal cell carcinoma       | 4         | 14.3       |
| Malignant melanoma         | 3         | 10.7       |
| Eccrine carcinoma          | 2         | 7.1        |
| Malignant adnexal neoplasm | 2         | 7.1        |
| Metatypical carcinoma      | 1         | 3.6        |
| Mycosis fungoides          | 1         | 3.6        |
| Porocarcinoma              | 1         | 3.6        |
| Trichilemmal carcinoma     | 1         | 3.6        |
| Verrucous carcinoma        | 1         | 3.6        |
| Cutaneous NHL              | 1         | 3.6        |
| Total                      | 28        | 100.0      |

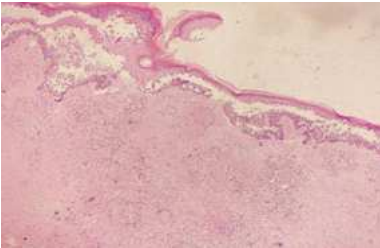
The data provided details the frequency and percentage of various malignant skin lesions. Squamous cell carcinoma is the most prevalent, accounting for 39.3% of cases with 11 occurrences. Basal cell carcinoma follows with 14.3% (4 cases), and malignant melanoma represents 10.7% (3 cases). Other malignant lesions include eccrine carcinoma and malignant adnexal neoplasm, each with 7.1% (2 cases), while metatypical carcinoma, mycosis fungoides, parocarcinoma, trichilemmal carcinoma, verrucous carcinoma, and cutaneous non-Hodgkin lymphoma (NHL) each account for 3.6% (1 case). The total number of malignant lesions is 28, representing 100% of the dataset. This distribution highlights the varied nature of malignant skin cancers within the sample.

REPRESENTATIVE CASES  
LICHEN PLANUS



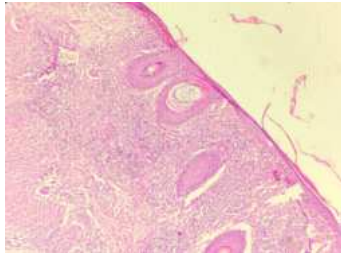
H&E (20X)- LICHEN PLANUS SHOWING MAX-JOSEPH SPACE

PEMPHIGUS VULGARIS

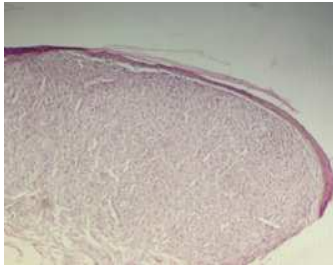


H&E (20X)- PEMPHIGUS VULGARIS SHOWING SUPRABASAL SPLIT WITH INTACT BASAL LAYER AND NUMEROUS INFLAMMATORY CELLS

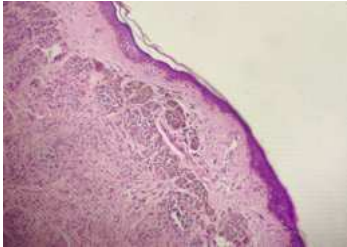
BORDERLINE LEPROSY



H&E (20X)- BORDERLINE LEPROSY SHOWING PERINEURAL FIBROSIS WITH ONION SKIN PATTERN

**LEPROMATOUS LEPROSY**

H&E (20X)- LEPROMATOUS LEPROSY SHOWING AGGREGATES OF FOAMY HISTIOCYTES AND LYMPHOCYTES

**COMPOUND NEVUS**

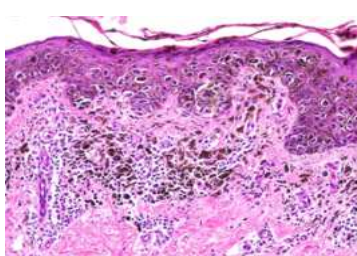
H&E (20X)- COMPOUND NEVUS SHOWING NESTS OF NEVOID CELLS IN DERMIS

**VERRUCA VULGARIS**

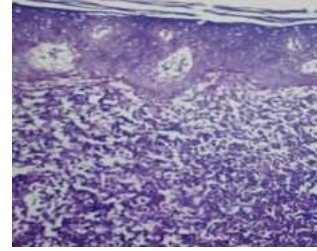
H&E (20X)- VERRUCA VULGARIS SHOWING HYPERKERATOSIS, ACANTHOSIS, AND PAPILLOMATOSIS, VERTICAL TIERS OF PARAKERATOTIC CELLS

**TRICHILEMMAL CYST**

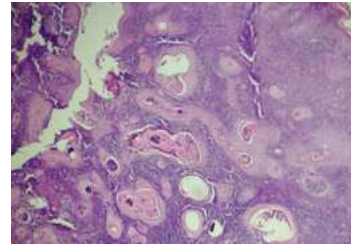
H&E (20X)- TRICHILEMMAL CYST SHOWING CYST LINED BY STRATIFIED SQUAMOUS EPITHELIUM WITH UNDERLYING EOSINOPHILIC KERATIN

**MALIGNANT MELANOMA**

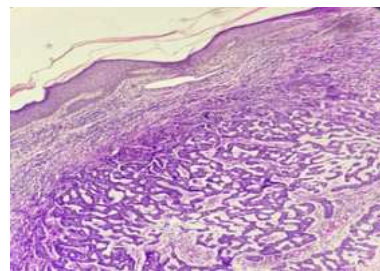
H&E (20X)- MALIGNANT MELANOMA SHOWING MELANOCYTIC NEST OF DIFFERENT SIZE AND SHAPE

**CUTANEOUS NHL**

H&E (20X)- CUTANEOUS NHL SHOWING SHEETS OF ANAPLASTIC LYMPHOID CELLS IN DERMIS

**SQUAMOUS CELL CARCINOMA**

H&E (20X)- SQUAMOUS CELL CARCINOMA SHOWING NESTS OF MALIGNANT SQUAMOUS CELLS

**BASAL CELL CARCINOMA**

H&E (20X)- BASAL CELL CARCINOMA SHOWING NUCLEAR PALISADING HYPERCHROMATIC BASALOID CELLS AND CLEFT FORMATION

**DISCUSSION**

The study included 166 patients with a mean age of 43.3 years, with a higher proportion of males (59.6%) compared to females (40.4%), indicating a slightly higher incidence of skin lesions in males.

Similar findings were seen in study by Deepthi K.N et al <sup>1</sup>, where study found that majority were in age of 40 years, with male predominance 58.4% were males and 41.6% were females. Dawande P et al <sup>2</sup> also showed that out of 50 cases, 39 were male and 11 were female, with more male patients than female patients. Similar male preponderance was seen in study by Grover et al <sup>7</sup>, C.Sushma et al <sup>8</sup> and Gaikwad SL et al. <sup>9</sup>

In present study Histology findings revealed that 60.8% of the lesions were non- neoplastic, while 39.2% were neoplastic, of which 56.9% were benign and 43.1% were malignant, and in study by Deepthi K.N et al <sup>1</sup> showed that 61.60% were non- neoplastic and 38.40% were neoplastic lesions. Dawande P et al <sup>2</sup> showed that 33 (66%) were non-neoplastic skin lesions, 14 (28%) were neoplastic skin lesions, and 3 (6%) were inconclusive. In this study, non-neoplastic cases were more prevalent than neoplastic cases, which aligns with the findings of Das KK et al. <sup>10</sup> and Sushma et al. <sup>8</sup>. However, contrary to these results, Gaikwad SL et al. <sup>9</sup> and Sonu Yadav et al. <sup>11</sup> reported a higher number of neoplastic cases. The data presents the frequency and percentage distribution of various benign skin lesions, with seborrheic keratosis being the most

common (13.5%), followed by several lesions occurring in 2 cases (5.4%). A wide range of other lesions, including actinic lentigo, basal cell adenoma, and keratoacanthoma, are each seen once, making up 2.7% of the total, reflecting the diversity of benign skin lesions in the sample. Study by Deepthi K.N et al<sup>1</sup> showed that 2 cases of seborrheic keratosis, verruca vulgaris, proliferating trichilemmal cyst, blue nevus and dermatofibroma were reported. Among 28 benign tumors, squamous papilloma (28.59 %) was the most common lesion followed by pilomatrixoma (10.72 %)

Squamous cell carcinoma is the most common malignant lesion, accounting for 39.3% of cases, followed by basal cell carcinoma (14.3%) and malignant melanoma (10.7%). Other less frequent malignancies include eccrine carcinoma, malignant adnexal neoplasm, and various rare carcinomas, with a total of 28 malignant lesions across the sample. Study by Deepthi K.N et al<sup>1</sup> showed that among 20 cases of malignant tumors, squamous cell carcinoma was most common (50 %) followed by basal cell carcinoma. Dawande P et al<sup>2</sup> showed that Squamous cell carcinoma (Figure 5) was the most common neoplastic skin lesion, observed in seven (14%) cases, followed by basal cell carcinoma (Figure 6) in five (10%) cases. Melanoma was the least common neoplastic skin lesion, found in two (4%) cases.

In the present study, squamous cell carcinoma was the most common malignant tumor, followed by basal cell carcinoma. Similar results were observed in the studies conducted by Dr. Sheela L Gaikwad et al.<sup>3</sup> and Abubakar et al. (2016)<sup>12</sup>. The prevalence of different skindiseases varies by geographical region and is influenced by racial, environmental, and socioeconomic factors of the population.

#### SUMMARY:

A histopathological study of 166 cases of non-neoplastic and neoplastic lesions was taken to know the occurrence of different types of skin lesions and was correlated with other studies. Histopathologically, lesions were classified into non-neoplastic and neoplastic lesions.

Out of total 166 skin lesions, 100 cases were non-neoplastic lesions among which infectious diseases of the skin were the most common comprising 27% of non-neoplastic lesions.

Majority of the tumours were benign constituting 57.57%, followed by malignant tumours constituting 42.2%. The epidermal tumours formed the largest group (48.48%) followed by adnexal tumours (27.7%) and melanocytic tumours (21.21%)

The commonest of all benign tumours was Seborrheic keratosis (13.15%) followed by Verruca (21.8%).

The commonest of all malignant tumours was Squamous cell carcinoma (6.6%) followed by Basal cell carcinoma (2.4%)

#### CONCLUSION:

Skin lesions are diverse and complex, making accurate classification and diagnosis is challenging. Histopathological study is crucial in diagnosing skin tumors and correlation with clinical features is essential. This study highlights various patterns of skin lesions, emphasizing the importance of understanding their histomorphology. Squamous Cell Carcinoma (SCC) is the most common malignant skin tumor in India, unlike in Western countries. Histopathological examination, when combined with clinical findings, is essential for accurate diagnosis, treatment prediction, and prognosis. Timely reporting of skin diseases plays a crucial role in reducing disease burden and enhancing the quality of life. The value of regular skin screenings for early detection and prompt treatment, which can lead to better outcomes, especially for malignant lesions.

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