Journal of Population Therapeutics & Clinical Pharmacology

RESEARCH ARTICLE
DOI: 10.53555/r9wd1651

EPIDEMIOLOGY AND MORPHOLOGICAL ANALYSIS OF SKIN TUMORS AND NON-NEOPLASTIC LESIONS IN A TERTIARY CARE SETTING.

Dr. A.N Bagate[1*], Dr. Shivkanya Kale[2]

[1*]Associate professor, Department Pathology, SRTR Medical college, AMBAJOGAI, MS.
[2]MD Pathology, UDYATI Pathology lab, Parbhani, MS

***Corresponding Author:**Dr. Shivkanya kale
*MD Pathology, UDYATI Pathology lab, Parbhani, MS

Abstract

Background: Skin and adnexal lesions encompass a wide spectrum of neoplastic and non-neoplastic conditions that often present diagnostic challenges due to their overlapping clinical and histological features. Accurate histopathological evaluation is essential for proper diagnosis, particularly in distinguishing between benign, malignant, and inflammatory lesions. This study aims to analyze the epidemiological trends and morphological patterns of skin and adnexal lesions in a tertiary care setting over a two-year period.

Methods: A retrospective analysis of biopsy specimens diagnosed as skin and adnexal lesions was conducted in the Department of Pathology from November 2016 to October 2018. A total of 149 cases were analyzed for histopathological patterns, age and sex distribution, and relative proportions of neoplastic and non-neoplastic lesions. Specimens were processed using hematoxylin and eosin (H&E) staining, and additional stains were used when required. The lesions were categorized into neoplastic (benign and malignant) and non-neoplastic groups.

Results: Among 9,860 biopsy specimens, 149 (1.51%) were diagnosed as skin and adnexal lesions. Neoplastic lesions accounted for 133 cases (89.26%), of which 93 (69.92%) were benign and 40 (30.08%) were malignant. Benign lesions predominantly included soft tissue tumors (30.1%) and adnexal tumors (25.8%). Malignant lesions were mainly epidermal tumors (60%), with squamous cell carcinoma being the most frequent (42.5%). Non-neoplastic lesions constituted 16 cases (10.74%), with granulomatous inflammation being the most common subtype (18.75%). Age-wise, benign lesions were most prevalent in the 41–60 years group (40.9%), malignant lesions in 61–80 years (22.1%), and non-neoplastic lesions in 21–40 years (26.8%).

Conclusion: This study highlights the diverse spectrum of skin and adnexal lesions in a tertiary care setting, emphasizing the critical role of histopathology in their accurate diagnosis. The findings underscore the predominance of benign neoplastic lesions and the importance of early detection and differentiation of malignant and non-neoplastic conditions for effective clinical management.

Keywords: Skin tumors, Adnexal lesions, Histopathology, Epidemiology.

Introduction

The skin, as the largest organ of the body, serves as a vital interface between the body and the external environment, providing protection against physical, chemical, and microbial insults. However, this exposure makes it vulnerable to a spectrum of disorders, ranging from benign

inflammatory conditions to malignant neoplasms. Histopathology remains indispensable for accurate diagnosis, as many lesions present with overlapping clinical features, making clinical diagnosis alone insufficient.[1,2]

Skin tumors are broadly classified into neoplastic and non-neoplastic lesions, with a wide variation in their epidemiology, morphology, and clinical implications. Neoplastic lesions encompass benign and malignant tumors originating from the epidermis, dermis, and adnexal structures, with squamous cell carcinoma (SCC) and basal cell carcinoma (BCC) being among the most prevalent types.[3,4] On the other hand, non-neoplastic lesions include a range of conditions such as infections, granulomatous diseases, and inflammatory disorders, often requiring histopathological confirmation for definitive diagnosis.[5]

Globally, skin cancer constitutes a significant burden of disease, particularly in light-skinned populations with high ultraviolet radiation exposure. Studies report that non-melanoma skin cancers (NMSC), including BCC and SCC, account for over 95% of all skin cancers.[6] However, skin adnexal tumors and other rare malignancies, though less common, present diagnostic and management challenges due to their rarity and histological diversity.[7]

Non-neoplastic skin lesions, although less studied, remain prevalent in clinical settings, particularly in regions with high rates of infectious and autoimmune diseases. A thorough understanding of their morphological patterns is crucial, as these conditions often mimic neoplastic processes. For example, granulomatous inflammation may appear similar to certain cutaneous tumors and requires careful evaluation for accurate differentiation.[8]

In addition to morphological complexity, the epidemiological patterns of skin lesions exhibit significant variability across geographic regions and demographic groups. Studies highlight a higher prevalence of malignant neoplasms in older populations and a predominance of non-neoplastic lesions in younger individuals, emphasizing the importance of age-specific diagnostic considerations.[9,10]

This study aims to provide a comprehensive evaluation of the epidemiological and histopathological spectrum of skin lesions, including both neoplastic and non-neoplastic entities, in a tertiary care setting. By analyzing their patterns, this research seeks to contribute to the existing body of knowledge and facilitate accurate diagnosis and effective clinical management.

Methodology

This study was conducted in the Department of Pathology at a tertiary care hospital and spanned two years, from November 2016 to October 2018. The primary objective was to evaluate the histopathological patterns of neoplastic and non-neoplastic skin lesions. All biopsy specimens and paraffin blocks of identified skin lesions received in the department during the study period were included. Clinical data, including patient demographics such as age, sex, and clinical presentation, were documented using a structured proforma.

The tissue specimens were fixed in 10% formalin and processed using routine histopathological techniques, including paraffin embedding. Serial sections were prepared and stained with hematoxylin and eosin (H&E) to enable microscopic examination. In cases where further diagnostic precision was required, special stains such as Periodic Acid-Schiff (PAS) were employed. Both prospective and retrospective data were included, with archived paraffin blocks retrieved and reprocessed where necessary.

Inclusion criteria encompassed all biopsy specimens diagnosed as skin lesions during the study period. Patients treated conservatively or referred to other institutions were excluded from the analysis. Data were subsequently analyzed to determine the frequency, distribution, and histopathological features of neoplastic and non-neoplastic lesions, with findings categorized according to lesion type (benign, malignant, or inflammatory) and anatomical site. These results were then compared with existing literature to identify similarities and differences in patterns and trends.

Results

During the two-year study period, a total of 9,860 biopsy specimens were processed in the histopathology section, among which 149 cases (1.51%) were identified as skin and adnexal lesions. These lesions were categorized into neoplastic and non-neoplastic groups, providing valuable insights into their epidemiology and morphological diversity.

Table 1: Frequency and Proportion of Skin and Adnexal Lesions Among Biopsy Specimens

Type of Lesion	Number of Cases	Percentage (%)
Skin and Adnexal Lesions	149	1.51%
Neoplastic Lesions	133	89.26%
Non-Neoplastic Lesions	16	10.74%

The distribution of lesions varied significantly across age groups, reflecting both biological and environmental influences. Benign neoplasms were most common in the 41–60 years age group, with 42 cases (40.9%). This aligns with the natural history of many benign skin tumors, which tend to manifest in middle age.Malignant neoplasms predominantly affected individuals aged 61–80 years, with 25 cases (22.1%). This trend is consistent with cumulative environmental exposures such as ultraviolet radiation and the age-related decline in immune surveillance.Non-neoplastic lesions were most frequently observed in the 21–40 years age group, with 9 cases (26.8%). This likely reflects the higher incidence of inflammatory and infectious conditions in this relatively younger population.

Table 2: Age-Wise Distribution of Skin and Adnexal Lesions

Age Group (Years)	Benign Lesions	Malignant Lesions	Non-Neoplastic Lesions	Total Lesions	Percentage of Total (%)
0-20	12	0	3	15	10.1
21-40	31	0	9	40	26.8
41-60	42	15	4	61	40.9
61-80	8	25	0	33	22.1

Neoplastic lesions formed the majority, with 133 cases (89.26%), which were further divided into benign and malignant subcategories. Benign neoplasms accounted for 93 cases (69.92%), while malignant neoplasms represented 40 cases (30.08%). Among benign lesions, soft tissue tumors were the most prevalent, comprising 28 cases (30.1%), followed by adnexal tumors with 24 cases (25.8%), epidermal tumors with 18 cases (19.4%), and neural tumors with 13 cases (14%). The distribution of benign lesions highlights the diversity of their origins, which range from the dermis to adnexal structures.

Table 3: Subcategories of Skin Lesions with Percentage Distribution

Subcategory	Benign Cases	Malignant Cases	Benign Percentage (%)	Malignant Percentage (%)
Epidermal Tumors	18	24	19.4	60
Melanocytic Tumors	10	6	10.8	15
Soft Tissue Tumors	28	0	30.1	0
Neural Tumors	13	0	14.0	0

Table 4: Frequency and percentage of malignant tumors

Type of Lesion	Number of Cases	Percentage (%)
Squamous Cell Carcinoma	17	42.50%
Basal Cell Carcinoma	7	17.50%
Malignant Melanoma	6	15%

In the malignant category, epidermal tumors were predominant, comprising 24 cases (60%). Squamous cell carcinoma (SCC) was the most frequent malignancy, with 17 cases (42.5%), followed by basal cell carcinoma (BCC), which constituted 7 cases (17.5%). Other malignancies, including malignant melanoma, malignant proliferating trichilemmal tumor, malignant eccrine poroma, and sebaceous carcinoma, each accounted for 5% of cases. These findings underline the importance of early detection and histopathological examination, as these malignant lesions can have varied clinical presentations and prognostic implications.

Non-neoplastic lesions accounted for 16 cases (10.74%). Granulomatous inflammation was the most common subtype, comprising 18.75% of non-neoplastic cases, followed by calcinosis cutis and calcified cysts, each representing 12.5%. These lesions often mimic neoplastic conditions clinically, necessitating histopathological confirmation for accurate diagnosis. The non-neoplastic group also included inflammatory and infectious conditions, reflecting the broad pathological spectrum of this category.

Discussion

Skin and adnexal lesions represent a diverse spectrum of neoplastic and non-neoplastic conditions with significant clinical and histopathological variations. This study provides a comprehensive analysis of the epidemiological trends and morphological patterns of these lesions in a tertiary care setting over two years. The findings contribute valuable insights into the distribution, frequency, and histological characteristics of these conditions.

The overall prevalence of skin and adnexal lesions in our study was 1.51% of all biopsy specimens processed during the study period, highlighting the relatively rare but clinically significant nature of these lesions. Neoplastic lesions constituted the majority (89.26%), with benign tumors (69.92%) far outnumbering malignant ones (30.08%). These results align with previous studies, which report that most skin neoplasms referred to tertiary care centers are benign in nature, reflecting their higher prevalence in the general population.[5]

The age-wise distribution of lesions revealed that benign neoplasms were most common in the 41–60 years age group (40.9%), while malignant lesions predominated in the 61–80 years age group (22.1%). This trend is consistent with the literature, which attributes the increased incidence of malignancies in older adults to cumulative environmental exposures, particularly ultraviolet radiation, and age-related decline in immune surveillance [4]. Non-neoplastic lesions were more common in younger individuals aged 21–40 years (26.8%), likely due to the higher prevalence of inflammatory and infectious conditions in this demographic[3].

Among the neoplastic lesions, benign tumors such as soft tissue tumors (30.1%) and adnexal tumors (25.8%) were the most prevalent. These findings emphasize the diagnostic complexity of these lesions, as adnexal tumors often display overlapping morphological features with other cutaneous neoplasms. Accurate histopathological diagnosis is critical, as some benign tumors may be associated with genetic syndromes or represent precursors to malignant conditions, such as nevus sebaceous in sebaceous carcinoma[1].

Malignant lesions were predominantly epidermal tumors (60%), with squamous cell carcinoma (42.5%) being the most common, followed by basal cell carcinoma (17.5%). This distribution aligns with global patterns, where non-melanoma skin cancers dominate the malignant category[8]. Other malignancies, such as malignant melanoma and rare adnexal tumors (e.g., sebaceous carcinoma,

malignant eccrine poroma), accounted for smaller proportions but pose significant diagnostic and therapeutic challenges due to their aggressive behavior.

Non-neoplastic lesions comprised 10.74% of cases in this study, with granulomatous inflammation being the most common subtype (18.75%). These findings reflect the regional prevalence of infectious and inflammatory conditions, which are often clinically indistinguishable from neoplastic lesions without histopathological confirmation. Conditions like calcinosis cutis and calcified cysts also highlight the varied pathological spectrum within non-neoplastic lesions.

The results of this study are consistent with global and regional data on the distribution of skin and adnexal lesions. The predominance of benign neoplasms and the prevalence of SCC and BCC among malignant tumors have been well-documented in previous studies[6]. Similarly, the higher frequency of inflammatory and infectious non-neoplastic lesions in younger populations aligns with findings from other tertiary care settings[7].

The study underscores the importance of histopathological evaluation in the diagnosis and management of skin and adnexal lesions. Many benign adnexal tumors can mimic malignant lesions clinically, leading to potential misdiagnosis without histological confirmation. Similarly, inflammatory and infectious conditions often overlap with neoplastic processes in their clinical presentation. Early and accurate diagnosis can guide appropriate treatment, prevent unnecessary interventions, and improve patient outcomes.

Conclusion

This study highlights the diverse spectrum of skin and adnexal lesions, emphasizing the critical role of histopathology in distinguishing between benign and malignant conditions. The findings contribute to the existing literature by providing a detailed epidemiological and morphological analysis, which can guide clinicians and pathologists in the accurate diagnosis and effective management of these lesions.The study is limited by its retrospective design and single-center setting, which may not fully capture the broader epidemiology of skin and adnexal lesions. Future multi-center and prospective studies are warranted to validate these findings and explore potential genetic and environmental risk factors associated with these lesions.

Acknowledgement

The authors express gratitude to all who contributed to the successful completion of this study.

References

1. Kaul U, Chawla A, Sahu S, Dhar R. Spectrum of non-neoplastic skin diseases: a histopathology-based clinicopathological correlation study. MGM J Med Sci. 2023;10:660–6. doi:10.4103/mgmj.mgmj_260_23.
2. Bachtold GA, Welter CS, Cerrutti CM, Frainer DA, Fiamoncini H, Penteado R. Non-melanoma skin tumors: a retrospective study of the epidemiological profile and outcome from compromised margins. Rev Bras Cir Plást. 2022. doi:10.5935/2177-1235.2022rbcp.619-en.
3. Italiya S, Purohit A, Gohel A, Prajapati H. Histopathological study of non-neoplastic lesions of skin. Asian J Pharm Clin Res. 2022;15:45257. doi:10.22159/ajpcr.2022.v15i9.45257.
4. Pereira S, Curado M, Ribeiro AMQ. Multiple skin neoplasms in subjects under 40 years of age in Goiania, Brazil. Rev Saúde Pública. 2015;49. doi:10.1590/S0034-8910.2015049005777.
5. Rubió-Casadevall J, Hernandez-Pujol AM, Ferreira-Santos MC, Morey-Esteve G, Vilardell L, Osca-Gelis G, et al. Trends in incidence and survival analysis in non-melanoma skin cancer from 1994 to 2012 in Girona, Spain: A population-based study. Cancer Epidemiol. 2016;45:6–10. doi:10.1016/j.canep.2016.09.001.
6. Shilpa K, DeepthiK N, Saritha G. Spectrum of neoplastic and non-neoplastic skin lesions: A histopathological institutional study. IP J DiagnPathol Oncol. 2020. doi:10.18231/j.jdpo.2020.005.
7. Ogun G, Okoro O. The spectrum of non-neoplastic skin lesions in Ibadan, Nigeria: a histopathologic study. Pan Afr Med J. 2016;23:221. doi:10.11604/pamj.2016.23.221.9372.

8. Diepgen T, Mahler V. The epidemiology of skin cancer. Br J Dermatol. 2002;146(s61):1–6. doi:10.1046/j.1365-2133.146.s61.2.x.
9. Kinlen L. Infections and immune factors in cancer: the role of epidemiology. Oncogene. 2004;23:6341–8. doi:10.1038/sj.onc.1207898.
10. Karamchedu S, DeepthiK N, Saritha G. Spectrum of skin lesions including skin adnexal tumors in a North Indian tertiary care hospital. IP J DiagnPathol Oncol. 2019. doi:10.18231/2581-3706.2019.0013.