ORIGINAL RESEARCH

Histopathological Analysis of Non-neoplastic Skin Lesions in a Tertiary Healthcare Hospital: A Cross-sectional Study

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Abstract

Background: Skin diseases are common health concerns worldwide, with high prevalence in developing countries like India, influenced by climate, socioeconomic conditions, and healthcare access. Histopathological examination is pivotal for diagnosing non-neoplastic skin lesions, distinguishing between clinically similar conditions, and guiding appropriate treatment.

Objective: To analyze the histopathological profiles of non-neoplastic skin lesions in patients from tribal populations surrounding SMBT Medical College and Hospital, Nashik, and correlate clinical and histopathological diagnoses.

Methods: This observational study analyzed 110 cases of non-neoplastic skin lesions prospectively and retrospectively from September 2015 to May 2017. Skin biopsies were processed using standard histopathological techniques, and special stains were used when required. Clinical data, including patient demographics and lesion characteristics, were collected and correlated with histopathological findings.

Results: Among the 110 lesions analyzed, 50.9% were infectious, predominantly fungal infections (39.3%), followed by bacterial (28.6%), viral (17.9%), and parasitic (14.2%) infections. Inflammatory lesions accounted for 49.1%, with eczema (33.3%), psoriasis (25.9%), and lichen planus (22.2%) being the most common. Males (62%) were predominantly affected, with the highest incidence in the 21–30 years age group, while females were most affected in the 41–50 years age group. The back (33%) was the most commonly affected site.

Conclusion: Histopathology is critical for diagnosing non-neoplastic skin lesions, particularly in tribal populations. A high prevalence of fungal infections and inflammatory dermatoses emphasizes the need for targeted public health interventions, improved hygiene practices, and access to healthcare facilities. Early histopathological evaluation aids in precise diagnosis and effective management.

Keywords: Hematoxylin and eosin stain, Histopathology, Skin lesions, Special stains.

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Introduction

Skin diseases are among the most common health concerns worldwide, with patterns varying across regions and populations.[1] They significantly impact the quality of life, making accurate diagnosis and treatment crucial. Developing countries, including India, report a high prevalence of skin disorders, with variability in their spectrum influenced by factors such as climate, socioeconomic conditions, and healthcare access.[2, 3]

Clinical presentations of skin disorders are often limited to a few morphological changes, such as macules, papules, nodules, hyperpigmentation, and hypopigmentation. These clinical features are nonspecific and can be attributed to various underlying conditions, necessitating histopathological evaluation for definitive diagnosis.[4] Histopathological examination serves as a cornerstone for differentiating between conditions with similar clinical appearances but distinct treatment requirements and prognoses.[5]

In non-neoplastic skin lesions, conditions such as inflammatory and infectious diseases, vesiculobullous disorders, and other dermatological conditions present a diagnostic challenge. The accurate classification of these conditions is essential for effective management. Histological examination allows for a deeper understanding of disease mechanisms and aids in correlating clinical findings with tissue-level changes.[6]

The tribal population surrounding Tertiary health care Hospital provides a unique demographic for studying the

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prevalence and patterns of skin diseases. This community is characterized by distinct environmental exposures, cultural practices, and healthcare-seeking behaviors, which may influence the spectrum of dermatological conditions observed.[7]

This study aimed to analyze the histopathological profiles of non-neoplastic skin lesions in this tertiary care center. Specifically, it sought to classify skin disorders, correlate clinical and histopathological diagnoses, and assess the age and sex distribution of various conditions. By doing so, the study contributes to a better understanding of dermatological health in tribal populations and highlights the role of histopathology in clinical decision-making.

Materials and Methods

This observational study was conducted in the Department of Pathology at Tertiary health centre of north Maharashtra, Nashik, India, over a period spanning September 2015 to May 2017. A total of 110 cases of non-neoplastic skin lesions were analyzed. Ethical approval was obtained from the Institutional Human Research Ethics Committee.

Specimen Collection and Preparation

Skin biopsy specimens, including punch biopsies, excision biopsies, and shave biopsies, were collected. Each specimen was fixed in 10% neutral buffered formalin for 12–24 hours and subsequently processed using standard paraffin embedding techniques. Tissue sections of 3–5 µm thickness were cut and stained with hematoxylin and eosin (H&E). Special stains, such as Ziehl-Neelsen and Periodic Acid-Schiff, were employed where necessary to confirm specific diagnoses.[8]

Data Collection

Detailed clinical histories, including patient demographics, duration of lesions, and clinical diagnosis, were documented in a pre-designed pro forma. Gross examination of the specimens assessed size, color, consistency, and other macroscopic features. Histopathological evaluations were performed under a light microscope, and findings were correlated with clinical data to arrive at definitive diagnoses. This approach aligns with established methodologies described by Marks and Roxburgh.[9]

Inclusion and Exclusion Criteria

Cases included in the study were diagnosed as non-neoplastic skin lesions based on clinical and histopathological evaluation. Specimens with inadequate tissue or autolysis were excluded.

Statistical Analysis

Data were analyzed using SPSS version 25. Descriptive statistics summarized demographic data and lesion characteristics. Categorical variables were analyzed using the chi-square test and *p-values* < 0.05 were considered statistically significant.

Results

A histopathological analysis of 110 non-neoplastic skin lesions provided valuable insights into the demographic and clinical spectrum of these conditions. The age distribution revealed a peak incidence in the 21-30 and 31-40 age groups, suggesting a higher prevalence of skin lesions during these decades of life (Table 1). A slight male predominance was observed, with males accounting for 60% of the cases.

The analysis of infectious and inflammatory diseases demonstrated a significant sex disparity. Males were more likely to be affected by infectious diseases, comprising 41% of the cases, while females were more prone to inflammatory conditions, accounting for 70% of the inflammatory cases (Table 2).

Table 1: Age and Sex Distribution of Non-neoplastic Skin Lesions.

Age Group (Years)	Males (n)	Females (n)
0–10	0	1
11–20	10	7
21–30	20	5
31–40	10	12
41–50	5	15
51–60	8	6
61–70	7	4
Total	**60**	**50**

Table 2: Distribution of Infectious and Inflammatory Diseases by Sex.

Type of Disease	Males (n)	Females (n)
Infectious Diseases	41	15
Inflammatory Diseases	19	35
Total	60	50

Chi square value 14.66; p-value < 0.001

Table 3: Distribution of Infectious and Inflammatory Skin Lesions.

Type of Skin Lesion	Common Diagnoses	Frequency (n)	Percentage (%)
Infectious Skin Lesions (n = 56)			
- Fungal Infections	Dermatophytosis, Candidiasis	22	39.3
- Bacterial Infections	Tuberculosis, Pyoderma	16	28.6
- Viral Infections	Herpes,Molluscum Contagiosum	10	17.9
- Parasitic Infections	Scabies	8	14.2
Inflammatory Skin Lesions (n = 54)			
- Eczema	Atopic Dermatitis, Contact Dermatitis	18	33.3
- Psoriasis	Chronic Plaque Psoriasis	14	25.9
- Lichen Planus	Papulosquamous Disorder	12	22.2
- Lupus Erythematosus	Discoid Lupus Erythematosus	10	18.6
Total		**110**	**100.0**

Table 4: Distribution of lesion sites.

Site of Lesion	Number of Patients (n)	Percentage (%)
Back	36	33
Right Upper Limb	20	19
Left Upper Limb	16	14
Left Lower Limb	15	13
Right Lower Limb	13	12
Abdomen	4	3
Ear	2	2
Face	2	2
Scalp	2	2
Total	**110**	**100**

Among the infectious lesions, fungal infections emerged as the most common, constituting 39.3% of the cases, followed by bacterial infections (28.6%) and viral infections (17.9%). For inflammatory lesions, eczema was the most prevalent, affecting 33.3% of the cases, followed by psoriasis (25.9%), lichen planus (22.2%), and lupus erythematosus (18.6%) (Table 3).

The distribution of lesion sites revealed a predilection for the back, which was the most common site, accounting for 33% of the cases. The right & left upper limbs followed each comprising 19 and 14% of the cases, respectively (Table 4).

Discussion

The present study provides valuable insights into the demographic and histopathological characteristics of non-neoplastic skin lesions. Infectious lesions constituted 50.9% (56/110) of cases, with fungal infections being the most prevalent subtype (39.3%), followed by bacterial infections (28.6%). These findings are consistent with studies highlighting fungal infections as a dominant cause of infectious dermatoses in tropical regions due to humid climates and poor hygiene practices.[2,3]

Inflammatory lesions accounted for 49.1% (54/110) of cases. Eczema (33.3%) was the most frequent diagnosis, followed by psoriasis (25.9%) and lichen planus (22.2%). These findings align with previous studies reporting a high prevalence of inflammatory conditions among non-neoplastic skin lesions, emphasizing their multifactorial etiology, including genetic and environmental factors.[4,5]

The observed male predominance (62%) among patients can be attributed to greater occupational exposure and healthcare-seeking behavior among men. The age distribution showed that males were predominantly in the 21–30 years age group, while females were more commonly affected in the 41–50 years age group. These patterns underscore hormonal and lifestyle influences on dermatological disease manifestation.[6]

The anatomical distribution of lesions revealed the back as the most frequently involved site (31%), followed by the upper and lower limbs. This distribution may be linked to occupational exposure, frictional trauma, and occlusive environments. The significance of lesion site distribution was highlighted in earlier research as a diagnostic clue for specific dermatological conditions.[7]

The findings are consistent with broader analyses of rural communities, as reported by Balci *et al.*[10] Such research emphasizes the role of histopathological evaluation in understanding regional variations in disease patterns.

This study highlights the importance of histopathological evaluation in distinguishing between infectious and inflammatory skin lesions, especially in cases with overlapping clinical features. A high prevalence of fungal infections and inflammatory dermatoses underscores the need for enhanced public health interventions, including improved sanitation, health education, and access to diagnostic facilities in rural and tribal areas. The findings also advocate for early clinical evaluation and histopathological confirmation to facilitate timely and targeted management.

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