

Original Research Article

A HISTOPATHOLOGY STUDY OF THE SPECTRUM OF SKIN LESIONS AT A TERTIARY CARE HOSPITAL - A RETROSPECTIVE STUDY

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ABSTRACT

Background: Skin diseases comprise a diverse group of inflammatory, infectious, autoimmune, and neoplastic disorders with overlapping clinical manifestations. Histopathological examination remains the gold standard for accurate diagnosis and appropriate management. The present study evaluated the histopathological spectrum of skin lesions in patients undergoing skin biopsy at a tertiary care hospital.

Materials and Methods: This hospital-based cross-sectional study was conducted in the Department of Pathology at a tertiary care hospital over a two-year period (September 2023–August 2025). A total of 355 skin biopsy specimens with definitive histopathological diagnoses were included. We analysed demographic characteristics, anatomical distribution, clinical diagnoses, and histopathological findings using descriptive statistics.

Results: Of the 355 patients, 211 (59.44%) were males, and 144 (40.56%) were females (male: female ratio 1.47:1). The majority of patients belonged to the 21–40-year age group (39.72%), and the mean age was comparable between males and females ($p=0.91$). Lesions involving multiple anatomical sites (29.9%) and the lower limbs (23.1%) were the most common biopsy locations. Clinically, psoriasis (12.11%) was the most frequent diagnosis, followed by lichen planus (8.17%). Histopathological examination also identified psoriasis (15.49%) and lichen planus (8.45%) as the predominant lesions.

Conclusion: Psoriasis, lichen planus, and Hansen disease represented the most common dermatological lesions encountered on histopathological examination. Skin biopsy remains an indispensable diagnostic tool for confirming clinical impressions, differentiating morphologically similar dermatoses, and facilitating appropriate patient management.

Keywords: Skin biopsy; Psoriasis; Lichen planus; Hansen disease; Dermatological lesions.

INTRODUCTION

The skin is the largest organ of the human body, constituting approximately 16% of total body weight. [1] As the outermost protective barrier, it is continuously exposed to a wide range of environmental, physical, chemical, and biological agents. Consequently, the skin is vulnerable to

numerous disorders that range from inflammatory and infectious conditions to benign and malignant neoplasms. [2,3] Dermatological diseases present with diverse clinical and pathological manifestations, varying from simple non-neoplastic lesions to aggressive malignant tumours. These conditions encompass infectious and non-infectious disorders,

as well as a broad spectrum of benign and malignant neoplastic lesions.

The prevalence and pattern of skin diseases show considerable variation across different geographical regions and populations. Factors such as age, sex, socioeconomic status, literacy, racial characteristics, environmental conditions, cultural practices, and associated systemic illnesses significantly influence the occurrence and distribution of dermatological disorders.^[4] Skin diseases constitute an important public health concern, affecting approximately 6.3% to 11.16% of the population.^[4]

Infectious skin lesions are particularly common in tropical countries such as India and affect individuals across all age groups and both sexes.^[5] The spectrum of these lesions differs according to geographical location and is influenced by climatic conditions, socioeconomic factors, hygiene practices, literacy levels, and cultural customs.⁶ In addition, host-related factors including age, sex, and underlying systemic diseases contribute to variations in disease patterns.^[6]

Although many skin disorders can be diagnosed clinically through detailed history taking, physical examination, and relevant laboratory investigations, histopathological examination remains the gold standard for establishing a definitive diagnosis in many cases.^[7] With increasing awareness of skin diseases and improved access to healthcare facilities, histopathological evaluation has assumed a crucial role in confirming clinical diagnoses and resolving diagnostic uncertainties.^[8] Examination of skin biopsy specimens not only facilitates accurate diagnosis but also aids in identifying the underlying etiological agents and guiding appropriate treatment strategies, as management varies according to the specific type of skin lesion.^[9,10]

Data regarding the histopathological spectrum of infectious skin lesions from the western India region are limited. Therefore, the present study was undertaken to evaluate the histopathological spectrum of skin lesions with infectious aetiology, assess their distribution according to age and sex, and identify the most common skin lesions encountered in this region so that appropriate management can be instituted.

MATERIALS AND METHODS

This hospital-based retrospective cross-sectional observational study was conducted in the Department of Pathology, Dr Vasantrao Pawar Medical College, Hospital and Research Centre, Nashik, over a period of two years from September 2023 to August 2025.

Prior to commencement of the study, approval was obtained from the Institutional Ethics Committee. The study was conducted in accordance with institutional ethical guidelines.

The study included skin biopsy specimens received in the Histopathology Laboratory of the Department of Pathology during the study period. Patients of all age groups and both sexes presenting with clinically suspected skin lesions and undergoing skin biopsy were considered eligible for inclusion. All skin biopsy specimens received in the Histopathology Laboratory during the study period that demonstrated definite histopathological features of a specific dermatological lesion were included in the study. Biopsy specimens obtained from patients of all age groups and both sexes were considered eligible for inclusion. Biopsy specimens that were inadequate for histopathological evaluation, autolysed, poorly preserved, or yielded inconclusive findings were excluded from the study. In addition, specimens lacking definitive histopathological features necessary for establishing a specific diagnosis were not considered for analysis. A total of 357 skin biopsy specimens fulfilling the inclusion criteria were enrolled in the study.

Skin biopsy specimens obtained from clinically diagnosed skin lesions were immediately transported to the histopathology laboratory in 10% formalin. Relevant clinical history, demographic details, and other pertinent information were recorded from the requisition forms accompanying the specimens.

The biopsy samples were fixed in 10% neutral buffered formalin for 12–24 hours. Following fixation, routine tissue processing was performed, and paraffin-embedded tissue blocks were prepared. Sections measuring 3–4 µm in thickness were cut from the paraffin blocks and stained with Haematoxylin and Eosin (H&E). The stained sections were examined microscopically for histopathological evaluation and diagnosis.

Special histochemical stains were used whenever required to confirm the infectious aetiology and aid in diagnosis. These included Ziehl–Neelsen (ZN) stain, modified Ziehl–Neelsen (Fite–Faraco) stain, and other special stains as indicated by the histopathological findings.

The lesions were classified according to their infectious etiology based on microscopic examination. The histopathological spectrum of skin lesions was analysed, and their distribution according to age and sex was assessed.

Based on the anatomical site, groups were categorised as given below in table 1.

Table 1: Grouping criteria used for anatomical site

S.no.	Anatomical region	Sites included
1	Upper limb	Shoulder, axilla, arm, forearm, elbow, wrist, hand, palm, fingers/thumb
2	Lower limb	Thigh, leg, knee, ankle, foot, sole, heel, toe, buttock, malleolus
3	Head & Neck	Scalp, face, forehead, cheek, chin, ear, nose, neck, eyelid, lip, occipital and temporal regions.
4	Trunk	Chest, abdomen, back, waist, flank, umbilicus

5	Genital region	Scrotum, vulva, labia majora, mons pubis, prepuce
6	Multiple sites	Lesions involving more than one anatomical region

The collected data were entered into Microsoft Excel and analysed using appropriate descriptive statistical methods. Categorical variables were expressed as frequencies and percentages.

RESULTS

A total of 355 patients were included in the study, comprising 211 (59.44%) males and 144 (40.56%) females, with a male-to-female ratio of 1.47:1. The highest proportion of participants belonged to the

21–40 years age group (39.72%), followed by the 41–60 years age group (30.70%). Participants aged 1–20 years, 61–80 years, and 81–100 years accounted for 13.80%, 13.24%, and 2.54% of cases, respectively. No significant association was observed between age group and gender (χ^2 test, $p = 0.830$). The mean age was comparable between males (41.57 ± 19.25 years) and females (41.34 ± 17.83 years), with no statistically significant difference on an independent-samples t-test ($t = 0.116$, $p = 0.91$). [Table 1]

Table 2: Age- and Gender wise distribution of cases

Age group	Male	Female	Total	p
1-20	32	17	49	0.830
21-40	83	58	141	
41-60	61	48	109	
61-80	29	18	47	
81-100	06	03	09	
Total	211	144	355	
Mean $\pm$ SD	41.57 $\pm$ 19.25	41.34 $\pm$ 17.83	--	0.91

Among the 355 biopsy specimens, lesions involving multiple anatomical sites were the most common, accounting for 106 (29.9%) cases, followed by the lower limb (82; 23.1%). Head and neck lesions constituted 62 (17.5%) cases, while the trunk and

upper limb accounted for 55 (15.5%) and 42 (11.8%) cases, respectively. The genital region was the least frequently involved site, with only 8 (2.3%) cases. [Table 2]

Table 3: Distribution of cases as per site of skin lesion

Anatomical site	Frequency (n)	Percentage (%)
Multiple sites	106	29.9
Lower limb	82	23.1
Head & Neck	62	17.5
Trunk	55	15.5
Upper limb	42	11.8
Genital region	8	2.3
Total	355	100.0

Psoriasis was the most frequent clinical diagnosis, observed in 43 (12.11%) patients, followed by lichen planus (figure 1) in 29 (8.17%) cases.



Figure 1: This image of Lichen planus on H&E microscopy shows Hyperkeratosis with wedge-shaped

hypergranulosis, saw-toothed acanthosis, basal cell degeneration, and a dense band-like lymphocytic infiltrate at the dermoepidermal junction, with Civatte bodies and melanin incontinence

Lepromatous leprosy and borderline tuberculoid Hansen disease accounted for 17 (4.79%) and 16 (4.51%) cases, respectively. Histoid Hansen disease and eczema were each diagnosed in 9 (2.54%) cases, while pemphigus vulgaris (Figure 2), erythema nodosum leprosum, and seborrheic dermatitis each accounted for 8 (2.25%) cases. Lichen planus pigmentosus and pityriasis rosea were observed in 7 (1.97%) cases each, whereas discoid lupus erythematosus was identified in 6 (1.69%) cases. Lichen simplex chronicus and polymorphous light eruption were each diagnosed in 5 (1.41%) cases, while warts and granuloma annulare accounted for 4 (1.13%) cases each. Becker's nevus, morphea, hypertrophic lichen planus, allergic contact dermatitis, and pyogenic granuloma each constituted 3 (0.85%) cases, whereas tuberculoid leprosy, lichen striatus, prurigo nodularis, and tinea

corporis each accounted for 2 (0.56%) cases. Indeterminate leprosy was the least common diagnosis, occurring in 1 (0.28%) case. The remaining 147 (41.41%) cases comprised a heterogeneous group of less frequently encountered dermatological conditions and were collectively categorised as others for statistical analysis. Overall, psoriasis and lichen planus were the predominant clinical diagnoses in the study. [Table 3]

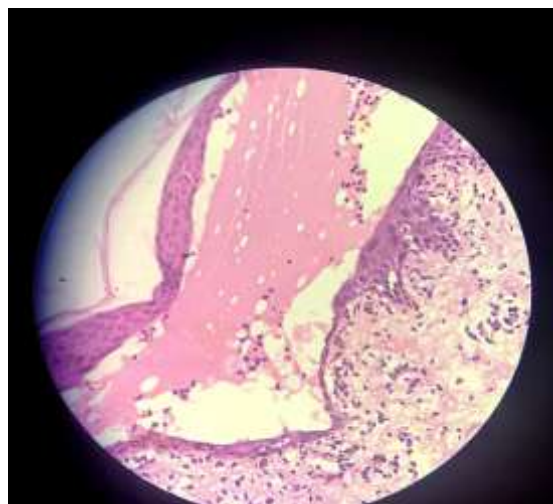


Figure 2: This image of Pemphigus vulgaris on H&E microscopy shows Intraepidermal/suprabasal cleft or blister with separation of keratinocytes

Table 4: Distribution of cases as per clinical diagnosis

S.no.	Clinical Diagnosis	Frequency (n)	%
1	Others	147	41.41
2	Psoriasis	43	12.11
3	Lichen Planus	29	8.17
4	Lepromatous Leprosy	17	4.79
5	BT Hansen Disease	16	4.51
6	Histoid Hansen Disease	9	2.54
7	Eczema	9	2.54
8	Pemphigus Vulgaris	8	2.25
9	Erythema Nodosum Leprosum	8	2.25
10	Seborrheic Dermatitis	8	2.25
11	Lichen Planus Pigmentosus	7	1.97
12	Pityriasis Rosea	7	1.97
13	Discoid Lupus Erythematosus	6	1.69
14	Lichen Simplex Chronicus	5	1.41
15	PMLE	5	1.41
16	Warts	4	1.13
17	Granuloma Annulare	4	1.13
18	Becker's Nevus	3	0.85
19	Morphea	3	0.85
20	Hypertrophic Lichen Planus	3	0.85
21	Allergic Contact Dermatitis	3	0.85
22	Pyogenic Granuloma	3	0.85
23	Tuberculoid Leprosy	2	0.56
24	Lichen Striatus	2	0.56
25	Prurigo Nodularis	2	0.56
26	Tinea Corporis	2	0.56
27	Indeterminate Leprosy	1	0.28
	Total	355	100

Histopathological examination demonstrated psoriasis as the most common diagnosis, accounting for 55 (15.49%) cases, followed by lichen planus in 30 (8.45%) cases. Lepromatous leprosy and borderline tuberculoid Hansen disease were identified in 21 (5.92%) and 13 (3.66%) cases, respectively, while eczema was diagnosed in 11 (3.10%) cases. Pemphigus vulgaris and indeterminate leprosy each accounted for 9 (2.54%) cases. Erythema nodosum leprosum and pityriasis rosea were observed in 7 (1.97%) cases each, whereas lichen planus pigmentosus, histoid Hansen disease, and tuberculoid leprosy each constituted 6 (1.69%) cases. Seborrheic dermatitis and discoid lupus erythematosus each accounted for 5 (1.41%)

cases. Lichen simplex chronicus, Becker's nevus, polymorphous light eruption, warts, morphea, and granuloma annulare were each diagnosed in 4 (1.13%) cases. Hypertrophic lichen planus, lichen striatus, allergic contact dermatitis, prurigo nodularis, tinea corporis, and pyogenic granuloma each accounted for 3 (0.85%) cases. The remaining 123 (34.65%) cases represented a wide range of infrequently encountered histopathological entities and were grouped under Others. Overall, psoriasis and lichen planus were the predominant histopathological diagnoses, while Hansen disease and its various histopathological subtypes collectively constituted a substantial proportion of the biopsy specimens. [Table 4]

Table 5: Distribution of cases as per histopathological diagnosis

S.no.	Histopathological Diagnosis	Frequency (n)	%
1	Psoriasis	55	15.49
2	Lichen Planus	30	8.45
3	Lepromatous Leprosy	21	5.92
4	BT Hansen Disease (Borderline Tuberculoid Leprosy)	13	3.66
5	Pemphigus Vulgaris	9	2.54
6	Indeterminate Leprosy	9	2.54
7	Lichen Planus Pigmentosus	6	1.69
8	Histoid Hansen Disease	6	1.69
9	Erythema Nodosum Leprosum	7	1.97
10	Pityriasis Rosea	7	1.97
11	Eczema	11	3.10
12	Seborrheic Dermatitis	5	1.41
13	Tuberculoid Leprosy	6	1.69
14	Discoid Lupus Erythematosus	5	1.41
15	Lichen Simplex Chronicus	4	1.13
16	Becker's Nevus	4	1.13
17	PMLE	4	1.13
18	Warts	4	1.13
19	Morphea	4	1.13
20	Granuloma Annulare	4	1.13
21	Hypertrophic Lichen Planus	3	0.85
22	Lichen Striatus	3	0.85
23	Allergic Contact Dermatitis	3	0.85
24	Prurigo Nodularis	3	0.85
25	Tinea Corporis	3	0.85
26	Pyogenic Granuloma	3	0.85
27	Others	123	34.65
	Total	355	100.00

Overall, serial SI, MSI, RVMSI, and RASI measurements were associated with clinical outcome, with greater abnormalities persisting among non-survivors. RVMSI showed the highest AUC at 1, 6, and 24 hours, closely followed by MSI, while RASI gained substantial predictive value over time. In contrast, ASI consistently demonstrated poor discriminatory ability, with AUC values close to 0.5. The findings therefore indicate that RVMSI and MSI were the most useful shock indices for early mortality risk stratification in this cohort of children admitted to the PICU with shock.

DISCUSSION

The present study included 355 patients who underwent skin biopsy for the evaluation of dermatological lesions. Males constituted nearly three-fifths of the study population (59.44%), with a male-to-female ratio of 1.47:1. Most patients belonged to the economically productive age group of 21–40 years (39.72%), followed by those aged 41–60 years (30.70%). Furthermore, neither the distribution of age across gender nor the mean age differed significantly between males and females, indicating that the demographic characteristics were comparable between the two sexes.

The predominance of young and middle-aged adults observed in the present study is consistent with the epidemiology of many inflammatory, infectious, and autoimmune dermatological disorders, which frequently manifest during early and middle adulthood. The male predominance may reflect greater occupational exposure to environmental and

traumatic factors, increased healthcare-seeking for symptomatic lesions requiring biopsy, as well as the relatively higher prevalence of certain infectious dermatoses among men. Similar demographic findings have been reported by Pratibha Dawande et al,^[11] who observed that most patients belonged to the 21–30-year age group with a male predominance (78%). Chandrakanta et al,^[12] likewise reported the highest number of patients in the 21–30-year age group (28.57%), followed by the 11–20-year group (23.81%), with a male-to-female ratio of 1.5:1. Comparable observations were also made by Chinedu O. Ndukwe et al,^[13] who reported that the majority of patients were between 20 and 39 years of age.

With respect to the anatomical distribution of lesions, multiple anatomical sites were the most frequently involved (29.9%), followed by the lower limbs (23.1%), head and neck (17.5%), trunk (15.5%), and upper limbs (11.8%), whereas genital lesions constituted only a small proportion (2.3%). The predominance of multisite involvement reflects the diffuse nature of several inflammatory dermatoses such as psoriasis, lichen planus, and leprosy, which commonly present with generalized or widespread lesions. Lower limb involvement may additionally be attributed to chronic inflammatory disorders, vascular changes, trauma, and infections affecting dependent areas. Similar findings were reported by Chinedu O. Ndukwe et al,^[13] who identified the lower extremities as the most frequently involved site (23.8%). In contrast, Chandrakanta et al,^[12] found the trunk to be the commonest anatomical site (40%), followed by the

upper limbs (23.81%). Such differences across studies may be explained by variations in regional disease prevalence, referral patterns, occupational exposure, climatic conditions, and the spectrum of dermatological disorders encountered at individual tertiary care centres.

The clinical spectrum in the present study demonstrated considerable heterogeneity, reflecting the broad range of dermatological conditions encountered in routine practice. Psoriasis emerged as the most common clinical diagnosis (12.11%), followed by lichen planus (8.17%). Hansen's disease, including lepromatous and borderline tuberculoid forms, together accounted for a substantial proportion of biopsied lesions, highlighting that leprosy continues to remain an important diagnostic consideration in endemic regions despite ongoing elimination efforts. Autoimmune blistering disorders, connective tissue diseases, pigmentary disorders, inflammatory dermatoses, and several less common conditions collectively constituted a sizeable proportion of cases. The large "Others" category further emphasizes the diverse spectrum of skin diseases that often require histopathological confirmation because of overlapping clinical features.

Histopathological examination largely corroborated the clinical spectrum, with psoriasis remaining the most frequent diagnosis (15.49%), followed by lichen planus (8.45%). Histopathology also confirmed a considerable burden of Hansen's disease, particularly the lepromatous and borderline tuberculoid forms. Minor differences between clinical and histopathological frequencies were observed for several disorders, reflecting the inherent challenges in clinical diagnosis of dermatological lesions. Many inflammatory and infectious skin diseases exhibit overlapping morphological features, making histopathological examination indispensable for establishing a definitive diagnosis, classifying disease subtype, and guiding appropriate management. The higher proportion of histopathologically confirmed psoriasis compared with the initial clinical diagnosis also highlights the value of biopsy in differentiating psoriasis from clinically similar papulosquamous disorders.

The present findings are in accordance with previous published studies. Chinedu O. Ndukwe et al,^[13] reported lichen planus as the most common papulosquamous disorder, accounting for 32.1% of cases. Pratibha Dawande et al,^[11] and Anamika Singh et al,^[14] similarly identified psoriasis as the most common non-infectious dermatosis, whereas leprosy represented the predominant infectious skin disease requiring histopathological evaluation. These observations support the persistent burden of chronic inflammatory dermatoses and Hansen's disease in developing countries reinforces the pivotal role of skin biopsy in distinguishing clinically similar lesions. Variations in the relative frequencies of specific diseases across studies are

likely attributable to differences in geographical distribution, endemicity of infectious diseases, referral bias, institutional specialisation, and patient selection criteria.

Overall, the findings of the present study reaffirm that psoriasis, lichen planus, and Hansen's disease constitute the major indications for skin biopsy in tertiary care practice. The close agreement between clinical impressions and histopathological diagnoses for common dermatoses underscores the importance of careful clinical evaluation, while the observed discrepancies in selected cases further highlight that histopathological examination remains the gold standard for confirming diagnosis, accurately classifying dermatological disorders, and facilitating optimal patient management.

CONCLUSION

The present study demonstrated that psoriasis and lichen planus were the most frequent clinical as well as histopathological diagnoses among patients undergoing skin biopsy, with Hansen disease and its various subtypes also constituting a substantial proportion of cases. The study population showed a male predominance, with most patients belonging to the 21–40-year age group, and no significant gender-based differences in age distribution were observed. Lesions involving multiple anatomical sites and the lower limbs were the most common biopsy locations. Overall, the findings highlight the broad spectrum of dermatological disorders encountered in routine practice and underscore the value of histopathological examination in establishing an accurate diagnosis, particularly in clinically challenging or overlapping conditions, thereby facilitating appropriate patient management.

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