

An Analysis of Histomorphological Spectrum of Skin Lesions at a Tertiary Care Hospital

K. Usha^{1*}, A.L. Alagammai², Deepti Maduraimuthu³

¹Associate Professor, Department of Pathology, Government K.A.P.V Medical College, Tamil Nadu

²Assistant Professor, Department of Pathology, Govt. Pudukkottai Medical College, Tamil Nadu

³Post Graduate, Department of Pathology, Government K.A.P.V Medical College, Tamil Nadu

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Corresponding Author: Dr. K.Usha

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Abstract:

Background: Skin diseases encompass a wide array of pathologies influenced by genetic, environmental, and socioeconomic factors. Accurate diagnosis is paramount for effective management, with histopathological examination serving as the gold standard. Despite advances in diagnostic modalities, histopathology remains gold standard for a definitive diagnosis.

Methods: The study was conducted in Department of Pathology, KAP Viswanatham Government Medical College Trichy, and Tamilnadu over a period of 1 year from July 2022 to June 2023. Skin biopsies from 169 patients of all ages were analyzed. Histopathological techniques, including routine staining and special stains, were employed for in depth analysis.

Results: The study exhibited a diverse age range >50 years being most frequently affected, with a male predominance. The trunk was the most commonly affected site, followed by the extremities. Non-infectious diseases were predominant, with vesiculobullous dermatoses and spongiotic/psoriatic dermatoses being the most common. Granulomatous diseases, malignant tumors, and adnexal tumors were also observed. Leprosy emerged as the most common granulomatous lesion with Fite farraco stain positive, while squamous cell carcinoma and basal cell carcinoma were the predominant malignant tumors.

Discussion: Findings were consistent with existing literature, highlighting the varied nature of skin lesions and the necessity of biopsy for accurate diagnosis. The age and sex distribution of patients, as well as the prevalence of different types of skin lesions, were discussed in relation to previous studies.

Conclusion: Our study of 169 skin biopsy samples revealed a significant prevalence of infectious lesions and vesiculobullous disorders, with Leprosy and Bullous Pemphigoid being prominent. In conclusion, despite advancements in molecular and genetic techniques, histopathological analysis remains pivotal in diagnosing skin lesions and inflammatory conditions.

Keywords: Vesiculo-bullous, Leprosy, Granulomatous skin, Skin biopsy.

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Introduction

Skin, being the initial point of contact for numerous pathogens, irritants, electromagnetic waves, and various environmental antigens, serves as the primary protective barrier. In addition to genetic and autoimmune factors, a wide range of skin diseases arise as a result of these exposures. Skin diseases are widespread in developing nations, affecting individuals of all ages. Up to this point, there have been around 2000 known skin diseases [1].

The pattern of skin diseases shows variation from country to country, and even region to region within a country, due to diverse ecological factors, genetic influences, hygienic standards and social customs [2]. Skin diseases manifest in various patterns, ranging from uncomplicated vesicular

non-neoplastic lesions to potentially life-threatening neoplastic lesions [3,4]. Various techniques are available for obtaining a skin biopsy, including excisional biopsy, punch biopsy, shave biopsy, and curettage biopsy. In our study, we focus on analysing samples obtained through the punch biopsy method [5]. The histomorphology of skin disorders shows wide spectrum, however the clinical presentations are very few like hypopigmentation, hyperpigmentation, macules, papules, nodules and few others [6].

Accurate diagnosis of skin disorders is of utmost importance as treatment is varied for different skin disorders presenting with the similar clinical lesions [7]. Histopathological study required for definitive diagnosis and identifying causative agent

with special stains wherever feasible, help clinicians to decide the appropriate management and clinical intervention [8] till now, there have been only few studies investigating the histopathological spectrum of skin diseases in Southern India.

Our study aims to investigate the occurrence and distribution of different motifs of skin diseases based on factors such as age, sex, and site. Additionally, we seek to classify the lesions that can predict clinically valuable attributes ultimately aiding clinicians in diagnosing and treating these conditions effectively.

Materials and Methods

This hospital-based cross-sectional study was conducted in Department of Pathology, Govt. KAP Viswanatham medical college, Trichy, Tamilnadu, India over a period of one year from July 2022 to June 2023. The study was carried out on skin biopsies of patients of all age group, coming to our tertiary care hospital histopathology laboratory and all cases coming during the study period. A total of 169 cases were selected as sample size on the basis of inclusion and exclusion criteria.

Aims and Objective:

- To study the histomorphological spectrum of non-neoplastic and neoplastic skin lesions received at a tertiary care institute
- To study the age and sex distribution
- To classify the lesions into major categories and determine the incidence of each subcategory.

Study Design: Retrospective study

Inclusion criteria: All skin biopsies that showed definite signs of any specific pathology received in

histopathology laboratory of the Department of Pathology during the study period were included irrespective of age, sex and clinical diagnosis.

Exclusion criteria: Inadequate, inconclusive, poorly fixed and Autolysed skin biopsies that did not show definite signs of any specific pathology were excluded from this study.

Patient with history of chemotherapy and radiotherapy were excluded from study. Specimen collection and processing: The biopsy sample taken from clinically diagnosed skin lesions were sent immediately to histology laboratory in 10% formalin. Clinical history and relevant data were recorded.

All received skin biopsies were fixed in 10% buffered formalin for 12 to 24 hrs and then tissues were processed. Paraffin wax embedding was done and 3-4 mm thin sections were cut in microtome from prepared tissue blocks. All sections were stained with routine Hematoxylin and Eosin stain. Special stains like Periodic acid-Schiff stain, Gomori Methamine Silver stain, Acid fast bacillus stains like Fite-Faraco and Ziehl-Neelson were done wherever necessary to confirm the diagnosis. Relevant demographic data was obtained from requisition form provided with the specimens.

Statistical Analysis: Data was entered in Microsoft excel and descriptive data was obtained.

Results: N=169

In this study, the youngest participant observed was aged ten, while the eldest was 84 years old. (Table 1 and Fig 1).

Table 1:

Age	N% (169)
<25 yrs	16 (9.5%)
25 -50 yrs	68 (40.3%)
>50 yrs	85 (50.2%)

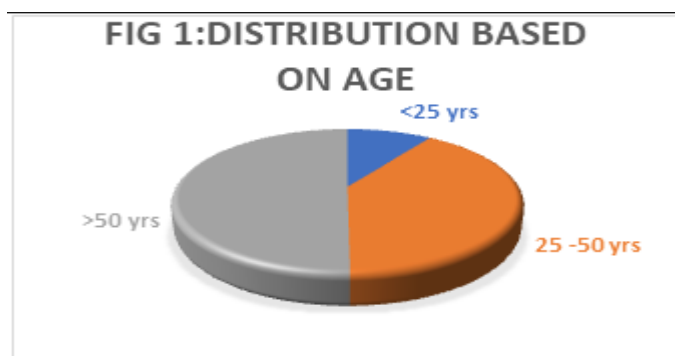


Figure 1: Distribution based on Age

The majority of patients in the study were over the age of 50, comprising 85 cases (50.2%), with the 25-50 age group following closely at 68 cases (40.3%), while those under 25 years accounted for 16 cases (10%). The male-to-female ratio was 1.4 to 1. [Table2].

Table 2: Distribution Based On Sex

Sex	N% (169)
Male	99 (58.6%)
Female	70 (41.4%)

In this investigation comprising 169 cases, the predominant site affected was the trunk in 43 instances (25.5%), with the lower limb following closely at 40 cases (24%). The upper limb was involved in 39 cases (23%), while the face was affected in 26 cases (15.4%). Scalp involvement was noted in 6 cases (3.5%), with the genitals in 4 cases (2.3%), the ear in 2 cases (1.1%), and the neck in 2 cases (1.1%). (Table3).

Table 3: Distribution Based on Site of Different Skin Lesion

Site	N% (169)	%
Face	26	15.4%
Ear	2	1.1%
Cheek	7	4.1%
Scalp	6	3.5%
Neck	2	1.1%
Upper Extremities	39	23%
Lower Extremities	40	24%
Trunk	43	25.5%
Genitals	4	2.3%
Total	169	100%

In this study, out of a total of 169 skin lesions, the most prevalent were non-infectious, accounting for 98 cases (58%), followed by neoplastic lesions with 38 cases (22.5%), and infectious diseases with 33 cases (19.5%) [See Table 4]. Within the non-infectious category, Vesiculobullous dermatoses were the most common, comprising 29 cases (17.2%), followed by spongiotic/psoriatic dermatoses with 26 cases (15.3%). Bullous pemphigoid was the most common within this category, occurring in 12 cases (7.1%) followed by

pemphigus vulgaris 3 cases (1.8%). Infectious diseases accounted for 33 cases (19.5%), with granulomatous lesions being the most common at 19 cases (11.2%). Malignant tumors accounted for 23 cases (13.6%), connective tissue disease/autoimmune diseases for 9 cases (5.3%), benign skin adnexal tumors for 10 cases (5.9%), lichenoid lesions for 15 cases (8.9%), pigmentary skin tumors for 4 cases (2.3%), soft tissue tumors for 1 case (0.6%), panniculitides for 2 cases (1.2%), and non-specific dermatoses for 3 cases (1.8%) [Fig 2].

Table 4: Distribution of Skin lesions based on histopathological diagnosis

Histopathological classification	N (169)	%
Vesiculobullous dermatoses	29	17.2%
Lichenoid dermatosis	6	3.6%
Connective tissue/ Autoimmune disorder	8	4.7%
Pigmented skin tumours	4	2.3%
Spongiotic/Psoriatic dermatosis	26	15.3%
Granulomatous Diseases	19	11.2%
Deposition disorder	4	2.3%
Infectious disorder	15	9%
Panniculitides	2	1.2%
Vasculitis/ Perivascular dermatoses	1	0.6%
Photosensitive Dermatoses	2	1.2%
Lichenoid and vacuolar interface dermatoses	9	5.3%
Disorder of epidermal maturation & keratinization	3	1.8%
Drug induced reaction	1	0.6%
Pilosebaceous disorder	3	1.8%
Adnexal tumours	10	5.9%
Soft tissue tumour	1	0.6%
Malignant tumours	23	13.6%
others	3	1.8%
Total	169	100%

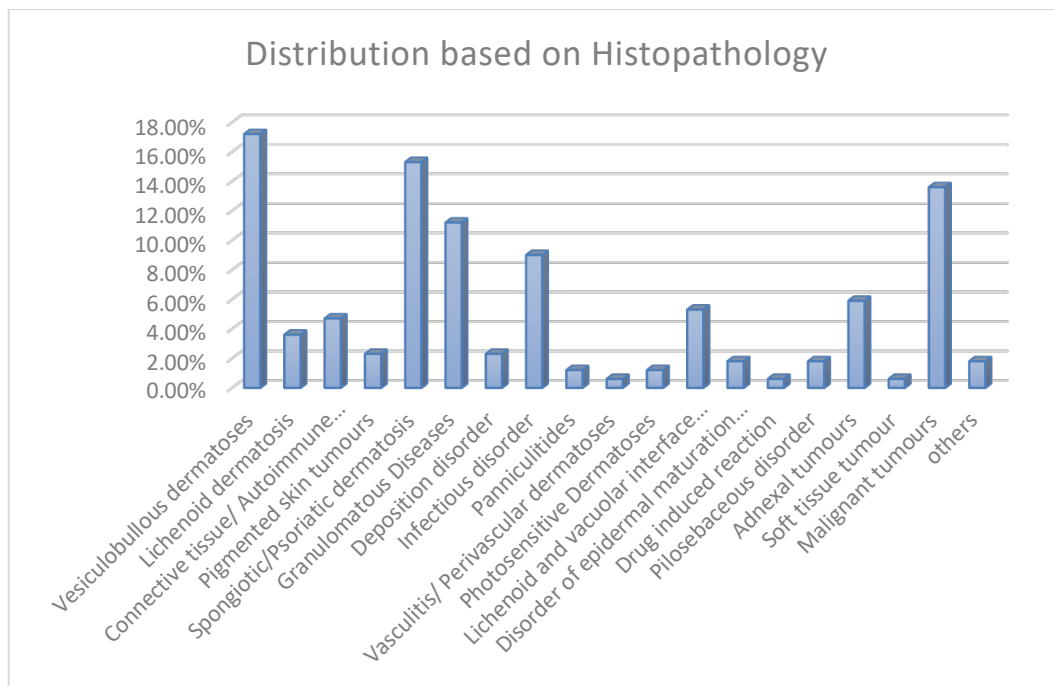


Figure 2: Distribution based on Histopathology

In this investigation involving 169 cases, infectious diseases were identified in 33 instances (19.5%). Among these, bacterial diseases were the most prevalent, occurring in 17 cases (10%), followed by fungal infections in 2 cases (1.2%) and viral infections in 2 cases (1.2%). The most frequently diagnosed infectious disease histologically was

leprosy, with 14 cases (8.3%) followed by Tuberculosis. One case (0.6%) of Verruca vulgaris was reported under viral infection.

In fungal infections, 2 cases (1.2%) were reported special stain Periodic Acid Schiff (PAS) [Fig 3] and Gomori Methamine Silver (GMS) positive.

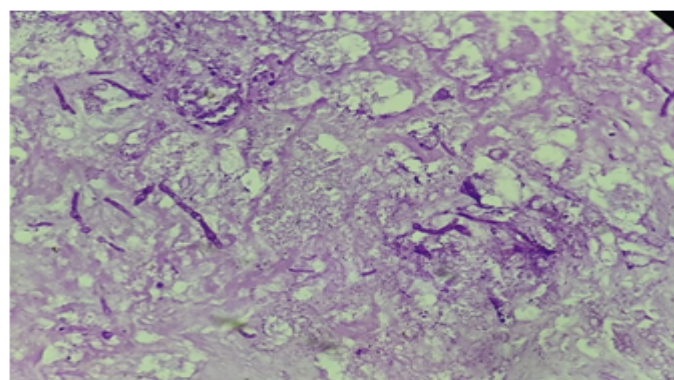


Figure 3; High Power view: Fungal hyphae on PAS stain

Furthermore, in this study, one case (0.6%) of tuberculosis tested positive for acid-fast bacilli (AFB) on Ziehl-Neelsen (ZN) stain, and out of the 14 leprosy cases, 12 cases (7.1%) tested positive for AFB on Fite-Faraco stain [See Table 4].

Table 5: Distribution of Granulomatous Diseases

Granulomatous lesion	n (19)	Special stain
Lupus vulgaris	4 (2.4%)	AFB positive in 1 case
Leprosy	14 (8.3%)	FFS positive
Granuloma annulare	1	-

In this study, out of 169 cases, 4 (2.4%) cases were diagnosed as lupus vulgaris, of which 1 case is positive for tuberculosis with AFB positive on ZN stain, and 14 (8.3%) cases of leprosy were found AFB positive on Fite farraco stain, (Table 5, Fig 4 and 5).

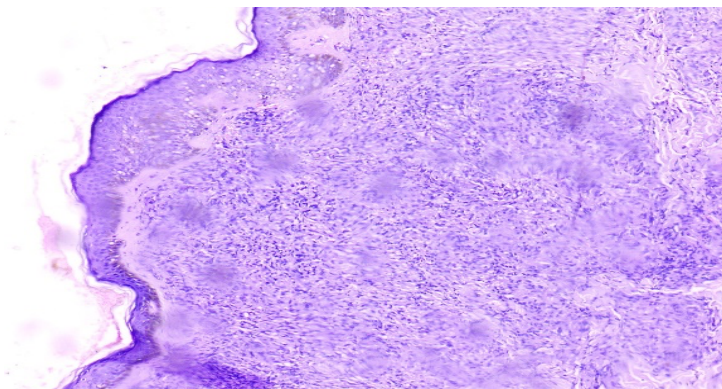


Figure 4 H&E; Lepromatous leprosy

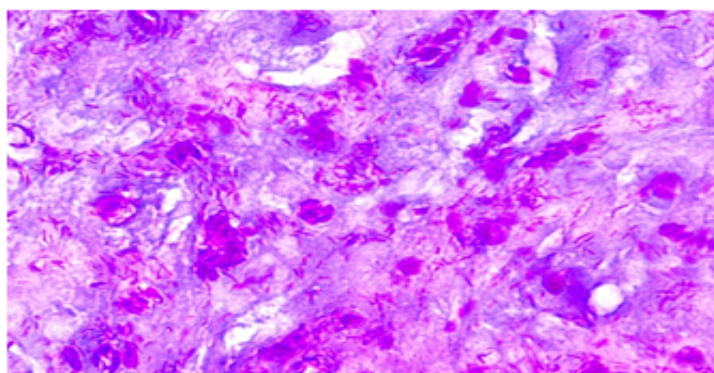


Figure 5: Special stain Fite Farraco- Leprosy

Table 6: Distribution of Adnexal Tumours

Adnexal tumours	N (10)
Nodular Hidradenoma	2
Cylindroma	1
Chondroid syringoma	1
Proliferating Trichelelmal tumor	1
Eccrine poroma	1
Pilar cyst	2
Trichoepithelioma	1
Sebaceous adenoma	1

In this study, out of 169 cases, 10 cases were diagnosed as skin adnexal tumors, of which 2 cases of Nodular Hidradenoma, 1 case of Cylindroma, 1 case of Chondroid syringoma, 1 case of Proliferating Trichelelmal cyst, 1 case of Eccrine poroma, 2 cases of Pilar cyst, 1 case of Trichoepithelioma [Fig6], 1 case of Sebaceous hyperplasia (Table 6) were reported.

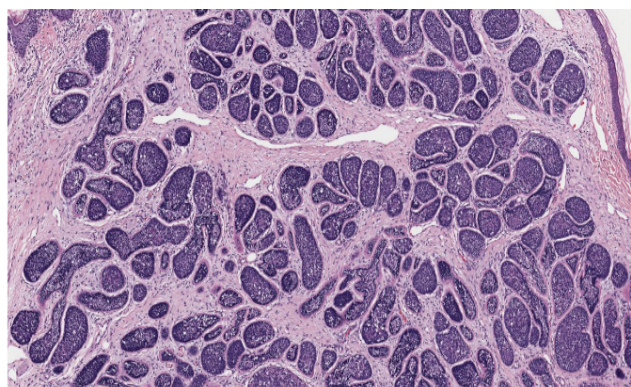


Figure 6: Cylindroma- Section shows compact nests of basaloid cells arranged like a jigsaw puzzle.

Table 7: Distribution of Malignant tumours

Malignant tumours	n (23)
Basal cell carcinoma	9
Squamous cell carcinoma	9
Malignant melanoma	2
Verrucous Carcinoma	3

In this study, out of 169 cases, 23(13.6%) cases were diagnosed as malignant tumors, of which 9 cases of Basal cell carcinoma, 9 cases of Squamous cell carcinoma, 2 cases of malignant melanoma, 3 cases of Verrucous Carcinoma

Discussion:

Skin lesions arise from disparities in homeostasis, leading to various conditions. While not all require biopsy, dermatologists use it for accurate diagnosis and identification of causative agents [9]. The pattern of skin diseases varies depending on economic status, education level, climate variations, healthcare facilities, industrialization, and religious and cultural factors [8]. Skin lesions display a broad clinical and histopathological spectrum, with histopathological examination serving as the gold standard for diagnosis. Clinical history, thorough histopathological examination of biopsy samples, and clinicopathological correlation are crucial for reaching a definitive diagnosis and providing appropriate treatment [10]. Special stains, alongside histopathological examination, may be necessary for an etiological diagnosis [10]. Skin biopsy, a simple outpatient procedure, confirms clinical diagnoses [11].

The present study aims to investigate histomorphological spectrum of skin lesions, to find the aetiology of skin lesions using special stains like ZN stain, Fite stain as and when required and to concur the age wise prevalence of different aetiologies of skin lesions. Biopsy specimen is expected to provide a fairly good estimate of patterns of skin disorders. In this study, youngest case was seen in seven years of age and the oldest case encountered was 83 years of age. The present study encountered patient's age between 1st to 9th decades, which is concordant with Bezbaruah R and Baruah M, Adhikari RC et al., found patients in 1st to 9th decade of life [12,1], However, Ayesha N et al., George VP et al., Deepthi KN et al found patients from 1st to 8th decade [13,14,15]. In this study maximum number of cases were found in more than 50 years of age group (50.2%), which is closely reported by Varghese Padinjattadathu George et al, and Chalise et al (9,4). Our study observed a male predominance with (58.6%). This finding was similar to study conducted by Chandrakanta et al [8]. However Bezbaruah R et al found female predominance in their study.[12]

In this study, the most common site involved was trunk in 43 cases (%) followed by lower extremi-

ties(40 cases) and upper extremities (39 cases) which is in concordance with the observations of previous researchers of Chandrakanta et al(8)., However Bezbaruah R and Baruah M, (57.52% cases), Bharadwaj V et al., (33% cases); Chalise S et al., (29.32% cases) and Adhikari RC et al., (30.2% cases) found head and neck region being the most common site [1,9,11,12]. This could be due to the geographical differences of the study place.

In this study most common lesion observed is Vesiculo-bullous dermatoses 29 cases,(17.2 %), which is similar to the study of Adhikari RC et al and Chalise S et al (1,9) and discordance with studies show Bezbaruah et al study show neoplastic lesion (81.42%) and Deepthi. KN al study shows cutaneous cyst 41.6 %. (2,5). In this study among the granulomatous skin lesions were studied(19 cases), leprosy was the most frequent diseases 14 cases(8.3%) followed by lupus vulgaris 4 cases(2.4%) which is similar to the study of Varughese Padinjattata et al and Jha H K et al(14,16). In this study the most common skin adnexal tumor was nodular hidradenoma 2 cases, which similar to the study of K Radhika [17].

In this study most, common malignant tumor was squamous cell carcinoma 9 cases(%) and basal cell carcinoma 9 cases(%), which is concordance with Varughese Padinjattadathu et al and Ayesha N [13,14].

Conclusion

In spite of the progress made in molecular techniques, genetics and various other techniques, the foundation of diagnosis for the majority of skin tumors and numerous inflammatory dermatological conditions still relies on their histomorphological specifics. Within our research, we studied 169 instances of skin biopsy samples, detailing the histopathological characteristics of skin abnormalities at our advanced tertiary care center. This analysis revealed a notable prevalence of infectious lesions and vesiculobullous disorders. The largest portion of biopsies originated from individuals aged over 50 years, with a distinct bias towards males. Within our investigation, the most frequent non-neoplastic skin anomaly was identified as Leprosy. Among different types of leprosy, Lepromatous leprosy took precedence and exhibited a positive AFB and Fite Faraco staining. Among vesicobullous diseases, Bullous Pemphigoid ranked as the most prevalent, followed

by Pemphigus Vulgaris. Given the diverse array of clinical presentations in skin disorders, histopathological examination remains the definitive standard technique for reaching a conclusive diagnosis and establishing a meaningful connection between clinical and pathological observations.

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