ORIGINAL ARTICLE

A Study of Histopathological Spectrum of Skin Lesions- Biopsy Interpretation in a Rural Tertiary Health Care Centre

Shilpa Kamble[1], Forum Shah[1], Kranti Wadekar[2] and Vijay Dombale[1]
[1]Department of Pathology, [2]DMLT Student, BKL Walawalkar Rural Medical College & Hospital, Sawarde, Chiplun, Dist - Ratnagiri, Maharashtra -415606, India.

Abstract:
Introduction: Skin is the largest organ of the body and skin diseases are not rare in India. Skin biopsy is a commonly used technique for diagnosis of skin lesions and requires clinico-pathological correlation. *Material and Methods:* The present study was conducted to determine the incidence and age-sex distribution of various skin diseases in our tertiary health care center. A total of 120 biopsies were studied retrospectively from January 2018 to December 2020. On the basis of histopathological classification, the skin diseases were divided into eight groups. *Results:* Majority of cases belonged to group III disorders of the superficial cutaneous reactive unit with 49 cases (40.9 %), followed by group V disorders of perivascular, diffuse, and granulomatous infiltrates of the reticular dermis contributing 25 cases (20.8%). However, most common individual lesion in the present study was leprosy of Group V with 21 cases (17.5%). Out of 120 skin biopsies a definitive diagnosis by histopathology was made in 108 (90 %) cases. In remaining 12 cases, definitive diagnosis could not be achieved. Most common age group was 41-50 years with 30 (25 %) cases. Sixty-four (53.3%) patients were women, thus showing female preponderance. *Conclusion:* Leprosy is still most prevalent skin disease emphasizing stronger measures to control it.

Keywords: Skin biopsy, Histopathology, Leprosy.

Introduction:

The skin forms the largest organ of our body [1]. Dermatological disorders are frequently encountered health problems in developing country like India with the prevalence rate of 6.3-11.16 % [2]. The wide spectrum of these cutaneous disorders are largely influenced by gender, age, socioeconomic status and associated systemic disorders [3]. The spectrum also vary in severity from benign to life-threatening lesions and some may even pose grave psychological impact on the quality of life [4]. The clinical presentation of cutaneous disorders is restricted to only a few changes such as hyperpigmentation, hypopigmentation, macules, papules, nodules and a few others but the histopathology spectrum is also highly variable [5]. The histopathological study of the lesion remains the gold standard method for confirming the disease [6]. Skin biopsy is a simple, fast and the most important ancillary aid to confirm clinical diagnosis [7,8]. The interpretation of a skin biopsy requires utmost clinic-pathological correlation. The biopsy contains four dimensions: length, breadth, depth and time. Pathologist considers the first three dimensions but the clinicians have the advantage of fourth dimension of time, as they can follow the patients disease status. Clinico-pathological correlation and multiple biopsies can provide all the four dimensions needed for diagnosing the disease [9,10]. The present study was conducted to evaluate the histopathological spectrum of skin lesions on biopsy material in the surrounding area of the rural hospital in Konkan.

Material and Methods:

This retrospective observational study was conducted in the Department of Pathology of our tertiary care hospital between January 2018 and December 2020. Total 120 cases were studied and the clinical information of the patients was acquired from the medical records of the patients. The formalin-fixed biopsy tissues were subjected to paraffin processing and the sections were stained with haematoxylin and

eosin. Special stains such as Fite-Faraco stain were used for cutaneous tuberculosis, leprosy and periodic acid-schiff (PAS) for fungal infections for diagnostic purpose.

Inclusion Criteria: All skin biopsies received in histopathology section.

Exclusion Criteria: Inadequate skin biopsies

Statistical analysis: The study is a descriptive study, the data is represented in the tabular form and the results are expressed in terms of percentages.

The study was ethically approved.

Results:

One hundred and twenty cases were studied; 56 were males and 64 were females. The mean age of patients is 48 years ranging from ages 8 to 80 years. Majority of the patients (30 cases) were between 41-50 years of age [Table 1].

After histopathological diagnosis, skin lesions were classified into 8 groups based on the histological pattern according to Lever's [11] [Table 2].

Out of 120 skin biopsies, 10 cases were reported in a descriptive pattern without any specific histopathological diagnosis, as the microscopic findings were not relevant with the clinical diagnosis. Two cases differential diagnosis were given for further clinical correlation to be done by the dermatologist. The final diagnosis was given in rest of the 108 cases which were further categorized into eight groups as described in Lever. Majority of the cases (49 cases) belonged to Group III. The second most common was Group V (25 cases), followed by Group IV (11 cases) [Table 3 and 4].

The most common skin lesion observed in the study was leprosy (Group V) contributing 21 cases presenting with wide manifestations, followed by 16 cases of lichen planus (Group III), 9 cases each of psoriasis (Group III) and prurigo nodularis (Group II) respectively [Figure 1]. Eight cases of lichen simplex chronicus and 5 cases of chronic dermatitis (Group III) were observed. Two cases each of pityriais rubra pilaris, pityriasis lichenoides chronic, bullous pemphigoid and atopic dermatitis were reported. Remaining cases were diagnosed on single occasions.

Table No.1: Age and gender- wise distribution of the cases

Sr. no.	Age groups	Total N (%)	Males N (%)	Females N (%)
1	1 to 10	1 (0.8)	1 (0.8)	0
2	11 to 20	8 (6.7)	3 (2.5)	5 (4.2)
3	21 to 30	17 (14.2)	5 (4.2)	12 (10)
4	31 to 40	15 (12.5)	5 (4.2)	10 (8.3)
5	41 to 50	30 (25)	17 (14.2)	13 (10.8)
6	51 to 60	22 (18.3)	10 (8.3)	12 (10)
7	61 to 70	13 (10.8)	7 (5.8)	6 (5)
8	71 to 80	14 (11.7)	8 (6.7)	6 (5)
	Total	120 (100)	56 (46.7)	64 (53.3)

Table No. 2: Categorization of the skin diseases

Group I	Disorders mostly limited to the epidermis and stratum corneum
Group II	Localized superficial epidermal or melanocytic proliferations
Group III	Disorders of the superficial cutaneous reactive unit
Group IV	Acantholytic, vesicular and pustular disorders
Group V	Perivascular, diffuse, and granulomatous infiltrates of the reticular dermis
Group VI	Tumours and cysts of the dermis and subcutis
Group VII	Inflammatory disorders of skin appendages
Group VIII	Disorders of the subcutis

Table No. 3: Distribution of cases in the 8 groups

Group/Category	No. of Cases	Percentage (%)
I	03	2.5
II	10	8.3
III	49	40.9
IV	11	9.2
V	25	20.8
VI	07	5.8
VII	03	2.5
VIII	00	0.0
Descriptive + DD	10+2	10
Total	120	100

Table No. 4: Categorisation of the 108 confirmed diagnosed cases on histopathological examination

Group	Disorders	Total (n)
Group I	Vitiligo	1
	Dermatosis papulosa nigra	1
	Pityriasis Tinea versicolor	1
Group II	Prurigo nodularis	9
	Wart	1
Group III	Lichen Planus	16
	Psoriasis	9
	Hypertrophic Lichen planus	1
	Lichen simplex chronicus	8
	Chronic dermatitis	5
	Pityriais rubra pilaris	2
	Seborrhoic dermatitis	1
	Erythrema multiforme	1
	Pityriasis lichenoides chronica	2
	Lichen striatus	1
	Progressive pigmentarydermatosis (a/k/a Schamberg disease)	1
	Drug eruption	1
	Vasculitis	1
Group IV	Bullous pemphigoid	3
	Pemphigus vulgaris	1
	Vesicular lichen planus	1
	Dermatitis Herpetiformis	1
	Atopic dermatitis	1
	Pustular dermatosis	1
	Darrier's disease	1
	Polymorphous light eruptions	1
	Congenital Erythropoietic Porphyria	1
Group V	Leprosy	21
	Scleroderma	1
	Foreign body granuloma	1
	Papularurticaria	1
	Hemochromatosis	1
Group VI	Intradermal Nevus	1
	Basal cell carcinoma	1
	Nevus lipomatosus superficialis	1
	Shagreen patch (Collagenoma)	1
	Angiofibroma (Tuberous sclerosis)	1
	Infiltrating lobular carcinoma(Recurrent)	1
	Invasive breast carcinoma- NST	1
Group VII	Scabies	1
	Peripheral neuritis	1
	Neuritic leprosy	1

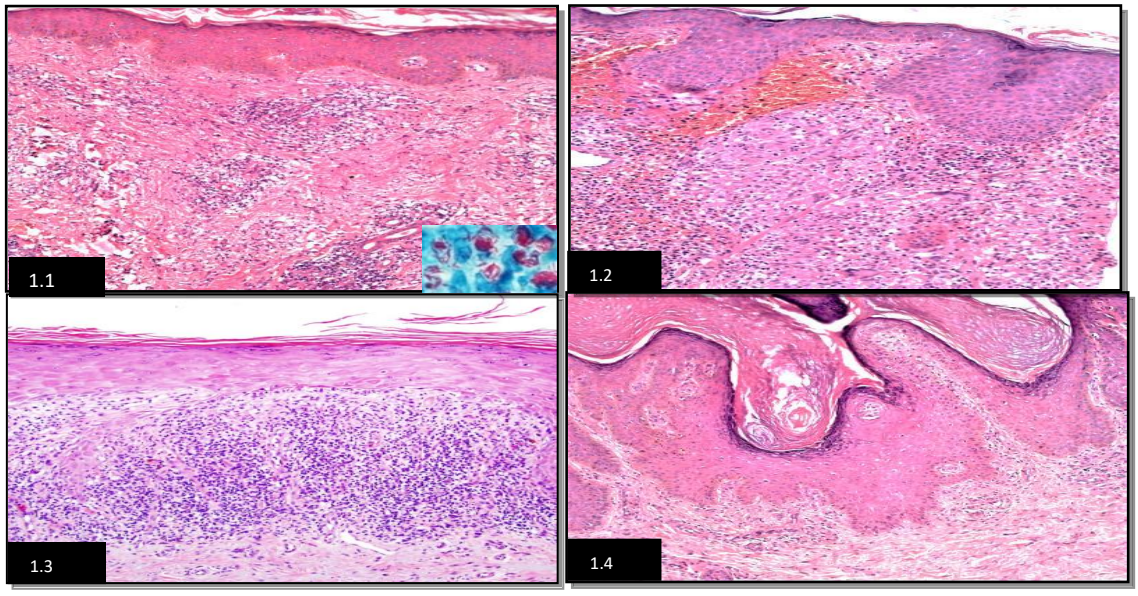

Figure 1 – Photomicrograph of common skin lesions in the study (x400, H&E stain):
1.1- Lepromatous leprosy with type 2 reaction and inset showing Fite acid fast bacilli on right lower corner,1.2 - Tuberculoid leprosy showing epithelioid granuloma with langhans giant cells (black arrow), 1.3 - Lichen planus showing band like lymphocytic infiltrate in the superficial dermis and 1.4 - Prurigo nodularis showing hyperkeratosis, acanthosis, hypergranulosis and irregular elongation of the rete ridges.

Discussion:

Histopathological confirmation of clinical diagnosis of skin biopsy is important in challenging cases where specific diagnosis is difficult due to overlapping clinical features or atypical clinical presentation [12].

In our study, out of 120 skin biopsies a definitive diagnosis was made by histopathology in 108 cases (90%) in the remaining 12 (10%) cases conclusive diagnosis could not be acheived. Rate of inconclusive diagnosis is acceptable up to 20% at a given point of time, quality control measures are needs if the limit exceeds [13]. Majority of the cases belonged to 21- 80 years of age group which included 111 cases (92.5 %). Very few cases (9 cases) were detected in patients less than 20 years of age. Slight female preponderance was observed with 64 cases (53.3%). The disorders of superficial cutaneous reactive unit or papulosquamous skin lesions (Group III) contributed majority of the cases in the present study (49 cases forming 40.9%).

However, most common lesion encountered was infective granulomatous lesions i.e., leprosy (17.5%), belonging to the Group V granulomatous inflammation category of skin lesions. A retrospective study conducted for a duration of 5 years by Chakrabarti et al studied 1280 skin biopsies out of which 24.4% lesions were granulomatous skin lesions [14].

Leprosy is a chronic granulomatous infection caused by the obligate intracellular mycobacterium leprae bacilli [15]. In 1966, Ridley and Jopling proposed a classification system for leprosy considering the immune-mediated spectrum of disease with tuberculoid leprosy (TT) at one end exhibiting strong cell-mediated immunity (CMI) and lepromatous leprosy (LL) at the other end of the spectrum having weak CMI [16]. Fite-Faraco special stain demonstrated the acid fast bacilli in the lesion [Figure 1.1 inset]. In the present study, lepromatous leprosy (LL- 9 cases) formed the most common manifestation followed by borderline leprosy (BL- 6 cases) [Table 5]. On the contrary, borderline tuberculoid leprosy constituted 44.1% and lepromatous leprosy constituted 10 % cases in a study conducted by George et al [17].

Seven cases out of 21 cases of leprosy presented in 41-50 years age group. Nine cases of lepromatous leprosy were observed in 31-80 age group with M:F ratio of 1.25:1 and 3 cases of LL cases presented in 41-50 and 71-80 age groups each. Borderline leprosy was found in 6 cases in 31-70 age group with 2 cases each in 41-50 and 61-70 age groups with M: F ratio of 1:2 [Table 6]. George et al found male preponderance in granulomatous skin lesions with male to female ratio of 1.67:1. [17] A similar finding was observed in previous studies [14,18].

The most common category in our study was papulosquamous lesions of Group III contributing 49 cases (43.75 %) with lichen planus (13.3%) being the most common lesion in the group followed by psoriasis (7.5%). Similar results were observed by Bharambhe et al. who found that lichenoid lesions were commonest (46.57%) followed by psoriasis (19.88%) [19]. Similar observation were also noted by George et al[17] Whereas Rajasekhar et al found psoriasis (42.5%) as the commonest histopathological diagnosis followed by lichen planus [20].

Female preponderance was also observed in papulosquamous lesions like lichen planus, psoriasis and prurigo nodularis whereas male were affected more by lichen simplex chronic. Predominant age group for lichen planus and lichen simplex chronicus was 31-80 years [Table 7].

Mamtha et al observed that Group V lesions were the common in there study contributing 53.84% of the cases, out of which leprosy cases formed the majority (31.81%) in the group [2]. These findings correlated with the study conducted by Narang et al Vesicobullous lesions contributed 11 (9.2%) cases [9].

Three cases of bullous pemphigoid and 1 case each of pemphigus vulgaris, vesicular lichen planus and dermatitis herpetiformis. Comparable findings were obtained in another study which documented 2.7 % of dermatoses with vesicobullous lesions, among which pemphigus vulgaris was the most predominant lesion followed by bullous pemphigoid and pemphigus foliaceus [6]. Lack of immunofluorescent study limited the confirmation of vesiculobullous lesions [17].

Neoplastic lesions of the skin contributed 6.3 % of the

cases, 1 case each of intradermal nevus and basal cell carcinoma. Few uncommon diagnosis of nevus lipomatosus superficialis and Shagreen patch (collagenoma) were found on single occasion. Youngest (8 years) male patient of the study was diagnosed with angiofibroma on skin biopsy and clinically diagnosed case of tuberous sclerosis. Narang et al and Das et al found few of malignant lesions cases in there study 3.05% and 0.94% of the cases respectively [9,21].

Table No.5: Categorization of leprosy cases (n=21 cases forming 17.5%) according to Ridley-Jopling classification

Ridley-Jopling Classification	Cases (%)
- Tuberculoid leprosy (TT)	01 (0.8%)
- Borderline tuberculoid leprosy (BT)	03 (2.5%)
- Borderline leprosy (BT)	06 (5%)
- Borderline lepromatous leprosy (BT)	02 (1.7%)
- Lepromatous leprosy (LL)	09 (7.5%)

Table No.6: Age and gender wise distribution of spectrum of leprosy cases

Leprosy spectrum		TT		BT		BB		BL		LL	
Gender	Total	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Age groups											
11 to 20	1	-	-	-	-	-	-	-	1	-	-
21 to 30	1	-	-	-	1	-	-	-	-	-	-
31 to 40	2	-	-	-	-	1	-	-	-	-	1
41 to 50	7	-	1	1	-	1	1	-	-	2	1
51 to 60	3	-	-	1	-	-	1	-	-	1	-
61 to 70	4	-	-	-	-	-	2	1	-	1	-
71 to 80	3	-	-	-	-	-	-	-	-	1	2
Total	21	-	1	2	1	2	4	1	1	5	4

Table No.7: Age and Gender wise distribution of common lesions of the study except leprosy

Lesions	Lichen Planus			Psoriasis			Lichen Simplex Chronicus			Prurigo nodularis		
Gender	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
Age groups												
11 to 20	-	-	-	-	-	-	-	-	-	2	-	2
21 to 30	-	-	-	2	1	1	-	-	-	2	-	2
31 to 40	2	-	2	1	-	1	1	1	-	1	-	1
41 to 50	4	1	3	3	-	3	2	1	1	-	-	-
51 to 60	4	2	2	2	1	1	1	-	1	2	1	1
61 to 70	2	-	2	1	1	-	3	2	1	1	-	1
71 to 80	4	2	2	-	-	-	1	1	-	1	-	1
Total	16	5	11	9	3	6	8	5	3	9	1	8

Conclusion:

Skin biopsy analysis revealed that, maximum number of cases belonged to the broad group of infectious diseases followed by non-infectious erythematous, papular and squamous disorders, and finally connective tissue disorders. Leprosy was the most common infectious disorder. Whereas, lichen planus and psoriasis constituted majority of the cases of papulosquamous disorders.

Leprosy is still the leading cause of granulomatous inflammation in spite of extensive programmes and preventive measures, emphasizing the need for stronger measures for control of the disease. The vast heterogeneity in the clinical presentation of skin diseases makes histopathological examination a gold standard tool in order to acquire final diagnosis and clinicopathological correlation.

Conflict of Interest - Nil
Sources of Support - Nil

References

1. Calonje E. Histopathology of the skin: General Principles. In: Burns T, Breathnach S, Cox N, Griffiths C, editors. Rook's Textbook of Dermatology. 8th ed. UK: Blackwell; 2010:p.10.1-10.43.
2. Mamatha K, Susmitha S, Patil VS, et al. Histopathological spectrum of dermatological lesions - an experience at tertiary care centre. *IP Archives of Cytology and Histopathology Research* 2018; 3:83-88.
3. Agarwal D, Singh K, Saluja SK, Kundu PR, Karma H. Histopathological Review of Dermatological Disorders with a Key note to Granulomatous Lesions: A Retrospective Study. *International Journal of Scientific Study* 2015; 3:66-69.
4. Mruthyunjayappa S, Mahantappa H, Gopal MG, Venugopal SB. A Study of Histopathological Features in Patients Presenting with Hyperpigmented Skin Lesions. *Archives of Medicine and Health Sciences* 2016; 4:189-195.
5. Werner B. Skin biopsy and its histopathologic analysis: Why? What for? How? Part I. *Anais Brasileiros de Dermatologia* 2009; 84:391-395.
6. Mehar R, Jain R, Kulkarni CV, Narang S, Meena M, Patidar H. Histopathological study of dermatological lesions- A retrospective approach. *International Journal of Medical Science and Public Health* 2014; 3:1082-1085.
7. Elder DE, Murphy GF, Elenitsas R, Johnson BL, Xu X: Introduction to Dermatopathologic Diagnosis. Lever's Histopathology of the skin. 10th ed. New Delhi: Wolters Kluwer; 2009.p.1-4.
8. Goyal N, Jain P, Malik R, Koshti A. Spectrum of Non Neoplastic Skin Diseases: A Histopathology Based Clinicopathological Correlation Study. *Scholars Journal of Applied Medical Sciences 2015*; 3:444- 449.
9. Narang S, Jain R. An evaluation of histopathological findings of skin biopsies in various skin disorders. *Annals of Pathology and Laboratory Medicine* 2015; 2:A42-6.
10. Vandana G, Lokesh Magar, Sandhya Anil,Sandhya Rani. Evaluation of histopathological findings of skin biopsies in various skin disorders. *Perspectives in Medical Research* 2017; 5:37- 40.
11. Elder DE, Elenitsas R, Rosenbach M, et al. Outline of skin disease. Chap- 5. In: Lever's histopathology of the skin. 11th ed. Philadelphia: Lippincott Williams and Wilkins; 2014.p.127-129.
12. Sharma S, Trivedi DP, Vyas R. Evaluation of Epidermal Reaction Pattern and Assessment of Histopathological Findings of Various Skin Disorders. *International Journal of Contemporary Medical Research* 2016; 3:1755–1759.
13. Sarkar SK, Islam A, Sen KG, Ahmed ARS. Pattern of skin diseases in patients attending OPD of Dermatology Department at Faridpur Medical College Hospital, *Bangladesh. Faridpur Medical College Journal* 2010; 5:14–16.
14. Chakrabarti S, Pal S, Biswas BK, Bose K, Pal S, Pathak S. Clinico-pathological study of cutaneous granulomatous lesions-a 5 yr experience in a tertiary care hospital in India. *Iranian Journal of Pathology* 2016; 11:54-60.
15. Lockwood DNJ. Leprosy. In: Burns DA, Breathnach SM, Cox NH, Griffiths CEM, editors. Rook's textbook of dermatology, vol. 2. 7th ed. Oxford: Blackwell Publishing; 2004.p.29.1 - 29.21.
16. Ridley DS, Jopling WH. Classification of leprosy according to immunity. *International Journal of Leprosy* 1966; 34:255- 273.
17. George VP, Sowmya S, Krishnan S, A Histopathological Study of Skin Biopsy Specimens in a Tertiary Care Hospital with a Keynote on Clinicopathological Correlation. *Annals of Pathology and Laboratory Medicine* 2020; 7: A39-45.
18. Gautam K, Pai RR, Bhat S. Granulomatous lesions of the skin. *Journal of Pathology of Nepal* 2011; 1:81–86.
19. D'Costa G, Bharambhe BM. Spectrum of NonInfectious Erythematous, Papular and Squamous lesions of the skin. *Indian Journal of Dermatology* 2010; 55: 225-228.

20. Reddy R, Krishna N. Histopathological spectrum of non-infectious erythematous, papulo-squamous lesions. *Asian Pacific Journal of Health Sciences* 2014; 1:28–34.

21. Das S, Chatterjee T. Pattern of skin diseases in a peripheral hospital's skin OPD. *Indian Journal of Dermatology* 2007; 52:93-95.

Address for correspondence: *Dr. Vijay D. Dombale, Principal and Professor, Department of Pathology, BKL Walawalkar Rural Medical College & Hospital, Sawarde, Chiplun, Dist-Ratnagiri, Maharashtra - 415606, India. Email: drvijaydombale@gmail.com, Mobile: +91 9480598017.*

How to cite this article: Shilpa Kamble, Forum Shah, Kranti Wadekar and Vijay Dombale. A study of Histopathological Spectrum of Skin lesions- Biopsy Interpretation in a Rural Tertiary Health Care Centre. Walawalkar International Medical Journal 2021; 8(2):39 - 45. http://www.wimjournal.com.

Received date: 22/04/2021 Revised date: 08/12/2021 Accepted date: 09/12/2021