



Original Article

Histomorphological evaluation of non-neoplastic cutaneous disorders

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Non-neoplastic;
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ABSTRACT

Background: The similarity in clinical presentations of a wide gamut of non-neoplastic cutaneous pathology leads to diagnostic challenges. Histopathological study of skin biopsy aids in the accurate identification of skin lesions so that they can be managed appropriately.

Materials and Methods: A retrospective descriptive study was performed in the Department of Pathology at Patan Academy of Health Sciences from April 2017 to March 2020. Data from the histopathology database were analyzed using SPSS version 17.0.

Results: Non-neoplastic lesions constituted 180 cases (31.86%) of the total of 565 skin biopsies received during the study period. The age ranged from 5 months to 95 years with a mean age of 36 years. There was no overall particular gender predilection. Amongst the diagnostic categories, the prevalence of non-infectious erythematous, papular, and squamous diseases was the highest followed by microbial diseases and non-infectious vesiculobullous and vesiculopustular diseases. Lichen planus followed by urticaria was the most frequently encountered lesions in non-infectious erythematous, papular, and squamous diseases. Leprosy was the commonest microbial disease. In the non-infectious vesiculobullous and vesiculopustular category, spongiotic dermatitis was most prevalent. Spongiotic dermatitis followed by lichen planus, leprosy, and calcinosis cutis were the commonest non-neoplastic disorders.

Conclusions: Amongst the diagnostic categories, the prevalence of non-infectious erythematous, papular, and squamous diseases was the highest followed by microbial diseases and non-infectious vesiculobullous and vesiculopustular diseases. In this study, spongiotic dermatitis followed by lichen planus, leprosy, and calcinosis cutis were the commonest non-neoplastic cutaneous disorders.

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INTRODUCTION

Skin, the largest organ of the body functions as a protective covering to internal viscera; provides a passive protective barrier to fluid loss and mechanical damage; has a sensory contribution and endocrine role of vitamin D synthesis. A spectrum of conditions varying from wrinkles and hair loss, blisters, and rashes to life-threatening malignancies may be consequences of imbalances in factors that maintain the homeostasis amongst skin cells.¹ Most skin conditions are diagnosed based on the patient's history, anatomical distribution, and clinical appearance of the

lesion. However, the restriction of clinical presentation to limited changes for a wide gamut of cutaneous pathology causes diagnostic challenges. In such scenarios, a skin biopsy can contribute by providing a definitive answer appropriate to the patient's clinical context or by ruling out important pathology even though an exact diagnosis cannot be made and thus guides further management.² Special stains, immunohistochemistry, immunofluorescence, and molecular techniques are additional modalities that may aid in reaching a diagnostic conclusion.

The current study aims to find the prevalence of various non-neoplastic skin diseases according to its diagnostic categories and determine its age and gender-wise distribution over a study period of three years. This study could help us gain an insight into the spectrum of non-neoplastic diseases existing in the Nepalese population.

MATERIALS AND METHODS

This is a retrospective descriptive hospital-based study performed at the Department of Pathology at Patan Academy

of Health Sciences. This study was conducted over three years, from April 2017 to March 2020. The study included skin biopsies that were received at histopathology laboratory and diagnosed as non-neoplastic skin diseases. The material is comprised of punch, incisional, and excisional biopsy specimens. Neoplastic lesions, skin biopsies with descriptive reports, and those without definitive diagnostic opinions were excluded from the study. All the relevant data were retrieved from the archived reports from the histopathology database and entered and coded in an Excel sheet. The data variables were histopathology number, age, gender, anatomical site, and diagnosis of the lesions. Analysis of the data was performed using SPSS version 17.0. The variables were summarized using mean, percentage, and range, and the data was represented with tables and figures.

RESULTS

During the study period, we received 565 skin biopsies at our institution. Among them, non-neoplastic lesions constituted 180 cases (31.86%) and were included in our study. Non-neoplastic skin lesions were present in all

Table 1: Categories of non-neoplastic skin diseases based on histopathology

Categories	Number	Percentage
Genodermatoses	4	2.2
Non-infectious erythematous, papular, and squamous diseases	46	25.5
Vascular diseases	16	8.9
Non-infectious vesiculobullous and vesiculopustular diseases	25	13.9
Connective tissue diseases	15	8.4
Cutaneous toxicities of drugs	6	3.3
Photosensitivity disorders	4	2.2
Non-infectious granulomas	2	1.1
Metabolic diseases of the skin	15	8.4
Inflammatory diseases of hair follicles, sweat glands, and cartilage	6	3.3
Inflammatory diseases of subcutaneous fat	5	2.8
Microbial diseases	34	18.9
Pigmentary disorders	2	1.1
Total	180	100

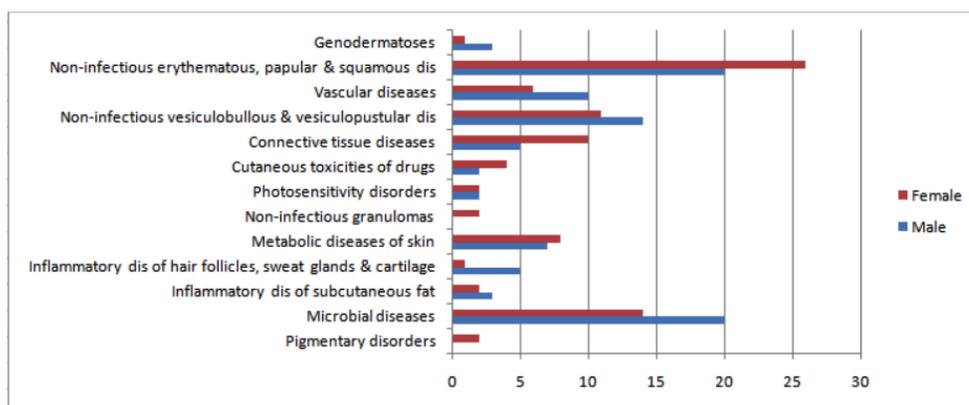


Figure 1: Gender wise distribution of different diagnostic categories

Table 2: Non-infectious erythematous, papular and squamous diseases

Disease	Number	Percentage
Erythema annulare centrifugum	3	6.5
Erythema dyschromicum perstans	5	10.7
Inflammatory linear verrucous epidermal nevus	1	2.2
Lichen planopilaris	2	4.4
Lichen planus	8	17.4
Lichen planus like keratosis	1	2.2
Lichen striatus	1	2.2
Pityriasis lichenoides chronica	4	8.7
Pityriasis lichenoides et varioliformis acuta	2	4.4
Pityriasis rosea	1	2.2
Pityriasis rubra pilaris	4	8.7
Prurigo nodularis	3	6.5
Prurigo simplex	1	2.2
Psoriasis	4	8.7
Urticaria	6	13
Total	46	100

Table 3: Microbial disease of skin

Microbial Agent	Disease	Number	Percentage
Bacterial	Chronic folliculitis	1	2.9
	Hidradenitis suppurativa	1	2.9
	Leprosy	8	23.5
	Tuberculosis	5	14.7
Viral	Deep palmoplantar wart	1	2.9
	Molluscum contagiosum (Figure 2)	3	8.9
	Verruca plana	1	2.9
Fungal	Verruca vulgaris	5	14.7
	Sporotrichosis	2	5.9
Protozoan & Parasitic	Cutaneous leishmaniasis (Figure 3)	4	11.8
	Arthropod bite reaction	3	8.9
Total		34	100

age groups. The age ranged from 5 months, a male child diagnosed with urticaria pigmentosa to 95 years male with borderline tuberculoid leprosy. The mean age of the patients with non-neoplastic lesions was 36 years. The maximum number of patients was found in 31-40 years followed by 11-20 years of age group. There was no overall particular gender predilection with a male to female ratio of 1.02:1. However, significant gender preferences were noted in various diagnostic categories as shown in Figure 1. Microbial diseases, inflammatory disease of hair follicles, sweat glands, and cartilage and vascular diseases had male preponderance whereas connective tissue diseases and non-infectious erythematous, papular, and squamous diseases were more common in females.

Amongst the diagnostic categories, the prevalence of non-infectious erythematous, papular, and squamous diseases (46 cases, 25.5%) was highest followed by microbial diseases (34 cases, 18.9%) and non-infectious vesiculobullous

and vesiculopustular diseases (25 cases, 13.9%). Vascular (16 cases, 8.9%), connective tissue (15 cases, 8.4%) and metabolic diseases (15 cases, 8.4%) constituted the major bulk of remaining categories. The residual categories each comprised less than 3.5% of the total cases (Table 1).

Lichen planus followed by urticaria was the most frequently encountered lesions in non-infectious erythematous, papular, and squamous diseases (Table 2). Leprosy was the commonest microbial disease (Table 3). In the non-infectious vesiculobullous and vesiculopustular category, spongiotic dermatitis was most prevalent (Table 4). Overall, spongiotic dermatitis followed by lichen planus, leprosy, and calcinosis cutis were the commonest non-neoplastic disorders.

DISCUSSION

The existing pattern of dermatological diseases is influenced

Table 4: Non-infectious vesiculobullous and vesiculopustular diseases

Disease	Number	Percentage
Atopic dermatitis	2	8
Bullous pemphigoid	2	8
Contact dermatitis	1	4
Erythema multiforme	2	8
Lichen simplex chronicus	3	12
Pemphigus foliaceus	1	4
Pemphigus vulgaris	2	8
Seborrheic dermatitis	1	4
Spongiotic dermatitis	9	36
Stevens Johnson syndrome	1	4
Suprabasal bullous lesion	1	4
Total	25	100

Table 5: Remaining categories of non-neoplastic skin disorders

Categories	Disease	Number	Percentage
Genodermatoses	Urticaria pigmentosa (Figure 4)	1	25
	Darier's disease	1	25
	Hailey Hailey disease	1	25
	Netherton syndrome	1	25
	Total	4	100
Vascular	Henoch Schonlein purpura	1	6.2
	Leukocytoclastic vasculitis	7	43.8
	Pigmented purpuric dermatitis	1	6.2
	Pyoderma gangrenosum	2	12.6
	Sweet's syndrome	1	6.2
	Vasculitis	4	25
Total	16	100	
Connective tissue diseases	Atrophoderma of Pasini and Pierini	1	6.7
	Discoid lupus erythematosus	4	26.7
	Morphea	6	40
	Scleroderma	2	13.3
	Subacute cutaneous lupus erythematosus	2	13.3
Total	15	100	
Cutaneous toxicities of drugs	Acute generalized exanthematous pustulosis	2	33.2
	Cutaneous drug reaction	1	16.7
	Drug induced dermatitis	1	16.7
	Exanthematous drug reaction	1	16.7
	Morbilliform drug reaction	1	16.7
Total	6	100	
Metabolic diseases	Calcinosis cutis	8	53.3
	Colloid millium	1	6.7
	Confluent and reticulated papillomatosis	1	6.7
	Gouty tophus	4	26.6
	Lichen amyloidosis	1	6.7
Total	15	100	
Inflammatory diseases of hair follicles, sweat gland and cartilage	Alopecia areata	1	16.7
	Lichen spinulosus	1	16.7
	Pseudopelade of Brocq	3	49.9
	Rosacea	1	16.7
Total	6	100	

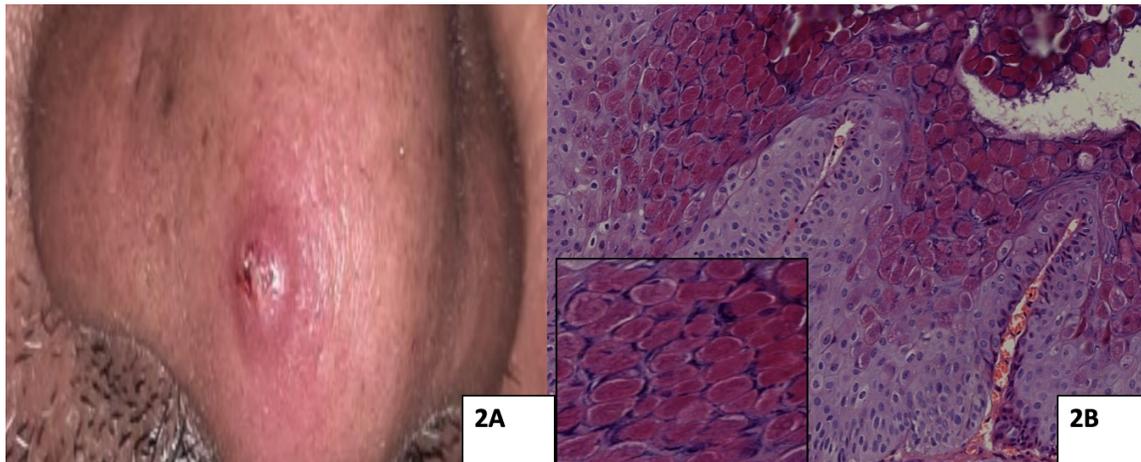


Figure 2: *Molluscum contagiosum.* **A:** An umbilicated papule over the right side of the tip of nose with multi-loculated, pearly-white colored solid content visible within the crater; surrounding erythema present. **B:** Molluscum bodies in the epidermis with extension to the skin surface (HE stain; X40) Inset shows a higher power view of molluscum bodies with eosinophilic granular cytoplasmic inclusion and crescentic peripheral nucleus.

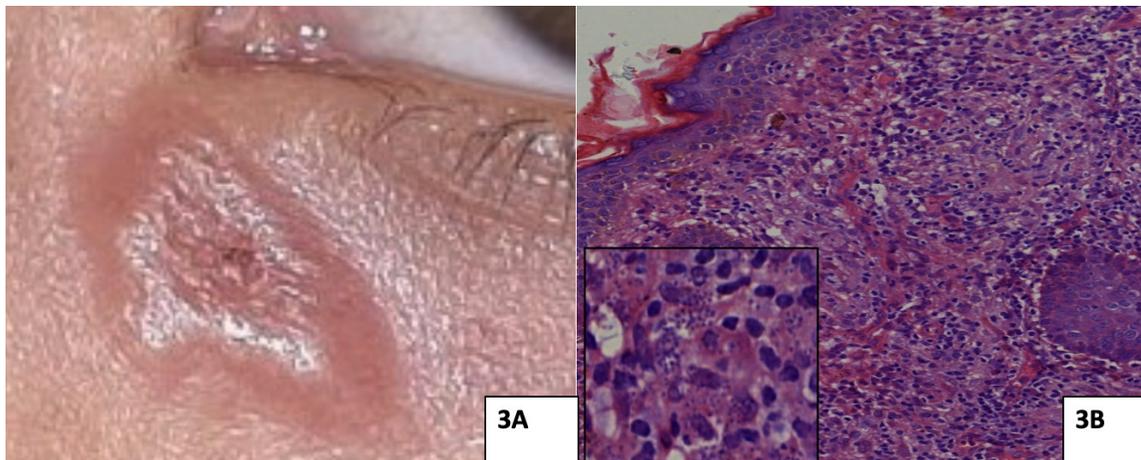


Figure 3: *Cutaneous leishmaniasis.* **A:** An annular non-scaly, glistening, skin-colored plaque of 1x0.75 cm present below the inner canthus of the left eye with scanty adherent scales in the center; yellow apple-jelly appearance was observed on diascopy. **B:** Dense mixed dermal inflammatory infiltrates composed of histiocytes, lymphocytes, and plasma cells (HE stain; X40) Inset shows a higher power view of abundant amastigote forms of *Leishmania* within histiocytes.

by numerous factors like environment, economy, literacy, racial, and social customs. It varies amongst different countries as well as within various geographical regions of a country.³ We received 565 skin biopsies at our institution and this represented 5.7% of all the histopathology specimens submitted to the laboratory over the study period. Among them, 294 (52.04%) were neoplastic lesions comprising of 253 (44.78%) benign and 41 (7.26%) malignant neoplasms. Non-neoplastic lesions constituted 180 cases (31.86%) and were included in our study. Thus, neoplastic lesions were more common than non-neoplastic ones. This could be attributed to the possibility that many non-neoplastic lesions are not subjected to biopsy as they are diagnosed clinically and managed accordingly. The ratio of benign to malignant neoplasm was 6.1:1. The remaining 91 cases (16.1%) showed either a descriptive report or was inconclusive for a definitive diagnostic conclusion.

Non-neoplastic skin lesions were present in all age groups.

The age ranged from 5 months, a male child diagnosed with urticaria pigmentosa to 95 years male with borderline tuberculoid leprosy. The mean age of the patients with non-neoplastic lesions was 36 years. The age distribution pattern revealed that the maximum number of patients was found in 31-40 years. This finding is comparable to studies performed in Nepal by Adhikari et al⁴ and in neighboring country India by D' Costa et al⁵ and Gupta et al.⁶ In contrast, the maximum number of patients were present in a younger age range of 21-30 years in a study conducted by Veldurthy et al.⁷ There was no overall particular gender predilection with male to female ratio of 1.02:1 which is in accordance with numerous studies.^{4,8,9} Some studies¹⁰ showed female preponderance whereas male predominance was observed in other studies.^{7,11} However, we noted significant gender preferences in individual diagnostic categories. Microbial diseases, inflammatory disease of hair follicles, sweat glands, and cartilage and vascular diseases had male preponderance whereas connective tissue diseases and non-infectious

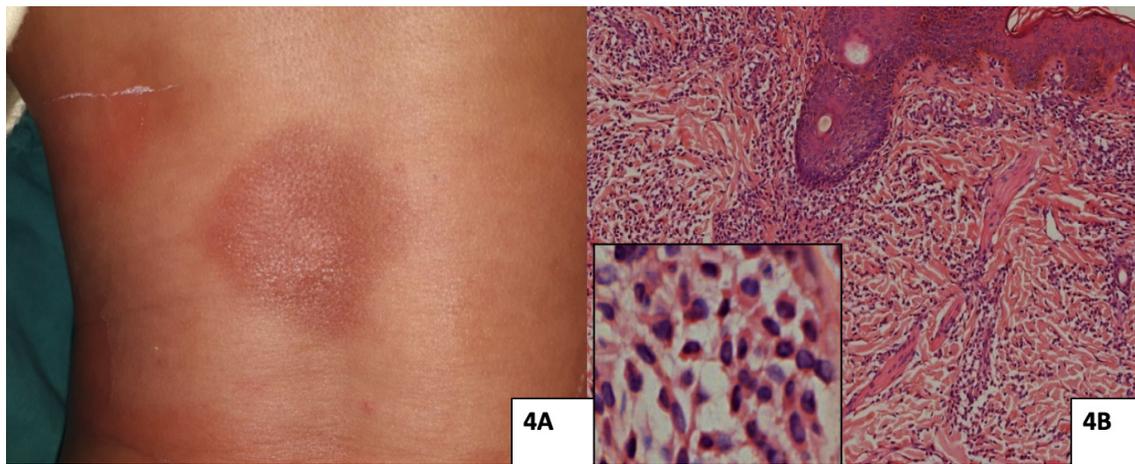


Figure 4: Urticaria pigmentosa in a 5-month male child. **A:** Erythematous, well-circumscribed, slightly raised, a wheal-like plaque of about 5x5 cm size over the left side of back; Darier sign was positive. **B:** An infiltrate composed of mast cells in the dermis (HE stain; X40) Inset shows a higher power view of individual cells with ample eosinophilic granular cytoplasm with well-defined border and cuboidal to ovoid nucleus.

erythematous, papular, and squamous diseases were more common in females. Vaghela et al observed male and female predominance in infectious disease and inflammatory diseases of dermis and epidermis respectively.⁸

Amongst the diagnostic categories, the prevalence of non-infectious erythematous, papular, and squamous diseases (46 cases, 25.5%) was highest followed by microbial diseases (34 cases, 18.9%) and non-infectious vesiculobullous and vesiculopustular diseases (25 cases, 13.9%). A similar pattern of result was observed by Gupta et al⁶ and Ogun et al⁹. Lichen planus followed by urticaria was the most frequently encountered lesions in non-infectious erythematous, papular, and squamous diseases. Gupta et al⁶ found lichen planus followed by psoriasis and Adhikari et al⁴ observed erythema dyschromicum perstans followed by psoriasis to be most prevalent in this category. Leprosy was the commonest microbial disease which is in concordance with a study done by Gupta et al.⁶ There was one case of tuberculoid leprosy, two of borderline tuberculoid leprosy, one mid-borderline, two borderline lepromatous, and two indeterminate leprosy in our study. Veldhurty et al found 23.9% (22 cases) of leprosy in their study population on non-neoplastic cutaneous lesions.⁷ Cutaneous tuberculosis was the commonest microbial disease in a study by Vaghela et al.⁸ The most frequently encountered microbial disease by Adhikari et al⁴ was various fungal infections and by Ogun et al⁹ was viral infections comprising of verruca vulgaris and molluscum contagiosum. Similar to studies by Adhikari et al⁴ and Gupta et al⁶, spongiotic dermatitis was most prevalent in the non-infectious vesiculobullous and vesiculopustular category. In the same category, pemphigus group emerged as the commonest disorder in some studies¹²⁻¹⁴ focusing on vesiculobullous disorders as well as in a study⁸ encompassing the entire spectrum of non-neoplastic disorders. Vascular (16 cases, 8.9%), connective tissue (15 cases, 8.4%), and metabolic diseases (15 cases, 8.4%) constituted the major bulk of remaining categories, and leukocytoclastic vasculitis, morphea, and calcinosis

cutis were the commonest diseases in these categories respectively. The residual categories each comprised less than 3.5% of the total cases. Overall, spongiotic dermatitis followed by lichen planus, leprosy, and calcinosis cutis were the commonest non-neoplastic disorders. Spongiotic dermatitis followed by Erythema dyschromicum perstans was commonest in a study by Adhikari et al⁴ and leprosy followed by lichen planus was most prevalent in studies by Gupta et al⁶ as well as Kumar et al¹⁰.

CONCLUSIONS

Amongst the diagnostic categories, the prevalence of non-infectious erythematous, papular, and squamous diseases was highest followed by microbial diseases and non-infectious vesiculobullous and vesiculopustular diseases. Overall, in this histopathological study, spongiotic dermatitis followed by lichen planus, leprosy, and calcinosis cutis were the commonest non-neoplastic disorder.

Conflict of interests: None

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