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Research Article

HISTOPATHOLOGICAL STUDY OF NON-NEOPLASTIC LESIONS OF SKIN

SWETA ITALIYA, ASHA PUROHIT, ARPIT GOHEL, HITESH PRAJAPATI*

Department of Pathology, GCS Medical College, Hospital and Research Centre, Ahmedabad. Email: drhitesh1504@gmail.com

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ABSTRACT

Objectives: The objectives of the study were as follows: (1) To find the prevalence of various non-neoplastic skin lesions in our tertiary care hospital. (2) To study the age- and sex-wise distribution of non-neoplastic skin lesions. (3) To compare the results of the present study with other studies.

Methods: The present study comprised total 200 punch biopsy specimens of diagnosed cases of non-neoplastic lesions of skin, detailed clinical data, age, sex, and sites of skin lesion of patients which were included in the study. Specimens received were fixed in 10% formalin. Biopsy bits were submitted as whole and processed in automated tissue processor for routine paraffin embedding.

Results: A total of 200 lesions were analyzed. Maximum cases were in the age group of 21–30 years followed by 31–40 years age. Fifty-five (27.5%) cases were of non-infectious erythematous, papular, and squamous diseases followed by 54 (27%) cases of vesiculobullous and vesiculopustular diseases, 37 (18.5%) cases of bacterial diseases, 20 (10%) cases of fungal diseases, and 34 (17%) cases of vascular lesions, connective tissue disorders, non-infectious granulomas, perforating disorders, etc.

Conclusion: Skin lesions were common in males than in females with male: female ratio of 1.38:1. Younger age group was more commonly affected. Non-infectious erythematous, papular, and squamous lesions were most common with psoriasis being the most common followed by non-infectious vesiculobullous and vesiculopustular lesions with pemphigus vulgaris being the most common, followed by infective lesions consisting of bacterial, fungal, and viral lesions. Other lesions consisted of vascular skin lesions, connective tissue disorders non-infectious granulomas, perforating disorders, etc.

Keywords: Non-neoplastic lesions, Non-infectious skin lesions, Dermatitis, Skin biopsy.

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INTRODUCTION

Skin is the largest organ of the body comprising 16% of total body weight. It forms a protective coat and has specific qualities adapted to its function and plays a major role in maintaining homeostasis through its barrier function [1]. The skin pattern varies geographically and also in different states of the same country. The prevalence of skin diseases has increased over the past few decades across the world. Low priority is given to skin diseases because mostly they are benign, not life-threatening and do not cause significant problem. Skin diseases cause significant non-fatal disability worldwide, especially in resource-poor regions. Greater importance to study the burden of skin disease in low-resource settings, and policy efforts toward delivering high-quality care are essential in improving the burden of skin diseases. One method of understanding the epidemiological burden of skin disease is through the global burden of disease (GBD). The GBD project is based at the Institutes of Health Metrics and supported by the Bill and Melinda Gates Foundation. GBD project has shown that skin diseases continue to be the 4th leading cause of nonfatal disease burden worldwide [2]. In India, dermatological diseases are one of the most common health problems [3]. The prevalence and pattern of skin diseases are influenced by the overall ecosystem of the region including level of literacy, social backwardness, varied climate, industrialization, access to primary health care, different religious rituals, cultural factors, and nutrition and genetics. Infective parasitic diseases were a major problem, particularly among the younger age group and those of low socioeconomic status.

However, the prevalence is reported quite high (30–40%) in pediatric population [4,5]. Apart from other diseases, skin diseases are known to cause a varied range of symptoms such as pain, itching, and discomfort which exhibit profound impact both physically and psychologically ultimately leading to significant development in patient's health related to quality of his/her life.

In 2017, age-standardized years patients lived with disability for cardiovascular diseases in India was 332.96 as compared to 455.06/100,000 patients for skin and subcutaneous diseases. In the GBD study 2017, skin diseases ranked higher than cardiovascular diseases.

In the GBD Study 2017, 12 dermatoses, that is, psoriasis, dermatitis (atopic, contact, and seborrheic), scabies, bacterial skin infections (cellulitis and pyoderma), fungal skin diseases, pruritus, viral skin diseases, acne, alopecia, urticaria, bed sore, and other skin and subcutaneous diseases are included under the category of skin and subcutaneous diseases.

Skin diseases, particularly dermatitis and urticaria, cause significant disease burden in India. The burden due to both infectious skin diseases (e.g., scabies, fungal, and viral skin diseases) and non-infectious diseases (e.g., dermatitis, urticaria, and psoriasis) has increased from 1990 to 2017 in India. The high burden of skin and subcutaneous diseases demands that they should be given due importance in national programs so as to meet the skin care needs of the population [6].

Skin lesions can be infectious or non-infectious. Although histopathological spectrum of skin lesions is varied, their clinical presentation is limited to some changes such as macules, papules, nodules, and plaques. These clinical presentations are common to many diseases. Separation of these lesions on the basis of histopathology is also important because their treatment and prognosis is disease specific [5,7,8].

A skin biopsy may not be required in all the skin lesions but for the proper diagnosis and identification of etiological agents, dermatologist frequently does it. The histopathological spectrum of which has been highly variable hence histopathology is considered as the gold standard in providing an accurate diagnosis for a variety of skin lesions. Various

skin biopsy techniques are available, tangential cut with scissors, curettage with a spoon-shaped curette, shave biopsy, punch biopsy with a circular blade, and elliptical biopsy which may be either incisional or excisional according to whether the lesion is partially or completely removed. Punch biopsy is the most common and useful procedure, as it is quick to perform, convenient, and is technique for definitive diagnosis. Mostly full-thickness sample of skin is obtained in punch biopsy and the pathologist gets a good view of the epidermis, dermis, and most of the time the sub cutis also. Punch biopsies are available in diameters from 2 to 8 mm. Small diameters (e.g., 2 mm), which are used only exceptionally, are reserved for cosmetically sensitive sites such as the face [9]. Many studies have shown a high prevalence of skin disorders in the developing countries. Early diagnosis of skin lesions by histopathological examination can prevent further infections, complications, better treatment, and early recovery. Separation of every skin case becomes important because the treatment and prognosis tend to be disease specific.

The aim of the present study is to find prevalence and age- and sex-wise distribution of various non-neoplastic lesions of skin in our tertiary care hospital.

METHODS

The present study comprised punch biopsy specimens of total 200 diagnosed cases of non-neoplastic lesions of skin, the study was carried out in the Pathology Department of GCS Medical College, Hospital and Research Centre, Ahmedabad, Gujarat. The study population included patients attending Dermatology Department of GCSMCH and RC.

Inclusion criteria

Adequate and representative punch biopsies of skin of all age groups clinically suspected of non-neoplastic skin lesions were included in the study.

Exclusion criteria

All inadequately preserved specimens with handling artifacts and diagnosed as neoplastic skin lesions were excluded from the study.

Study of cases included detailed clinical data, age, sex, and sites of skin lesion of patients. Punch biopsy specimens received in 10% formalin were fixed. The biopsy bit was submitted as whole, processed in automated tissue processor for routine paraffin embedding. Tissue sections of 4–5 micron thickness were cut by microtomy. All cases were analyzed by examining hematoxylin and eosin-stained slides. Special stains such as Alcian blue, PAS, AFB, and Fite-Faraco stains were done as and when required.

RESULTS

Total numbers of cases included in the present study were 200; out of which 116 cases (58%) were male and 84 cases (42%) were female. Male: female ratio was 1.38:1. Male predominance was observed.

Fifty-five (27.5%) cases were of non-infectious erythematous, papular, and squamous diseases, 54 (27%) cases were vesiculobullous and vesiculopustular diseases, followed by 37 (18.5%) cases of bacterial diseases, 20 cases of fungal diseases (10%), 11 cases of vascular diseases (5.5%), 8 cases of connective tissue disorders (4.0%), 7 cases of non-infectious granulomatous (3.5%), one case of degenerating, metabolic disease, and three cases of miscellaneous group.

Out of total, 55 (27.5%) cases of non-infectious erythematous, papular, and squamous diseases, 24 (43.63%) cases were of lichen planus, Chart 1 show disease spectrum of lichen planus 18 (32.72%) cases were of psoriasis (Fig. 1) Chart 2 show disease spectrum of psoriasis, 10 (18.2%) cases were of pityriasis rosea, and 3 (5.4%) cases were of ashy dermatosis.

Among the lichenoid lesions, maximum numbers of cases were that of lichen planus and most common histopathological type of psoriasis observed was psoriasis vulgaris.

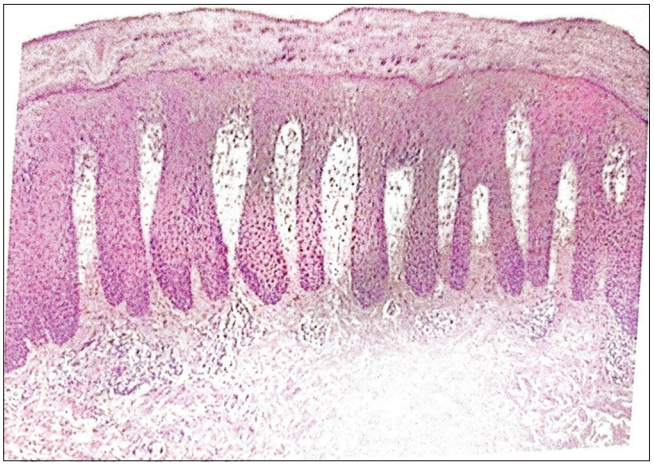

Fig. 1: Psoriasis showing uniformly elongated rete ridges, hyperkeratosis, parakeratosis, Munro's microabscess, and perivascular lymphocytic infiltrate

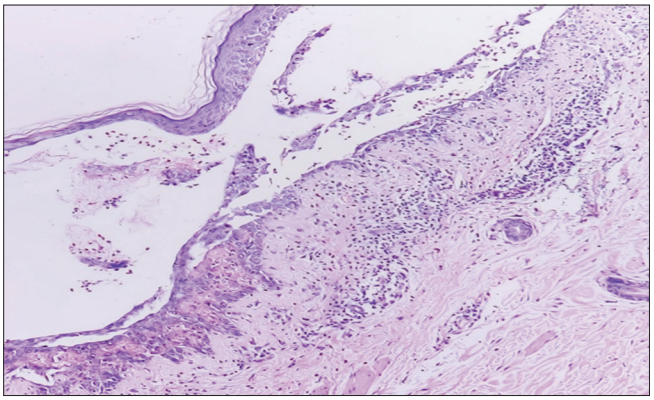

Fig. 2: Pemphigus vulgaris showing intraepidermal acantholytic blister in suprabasal plane (H and E stain) (10×)

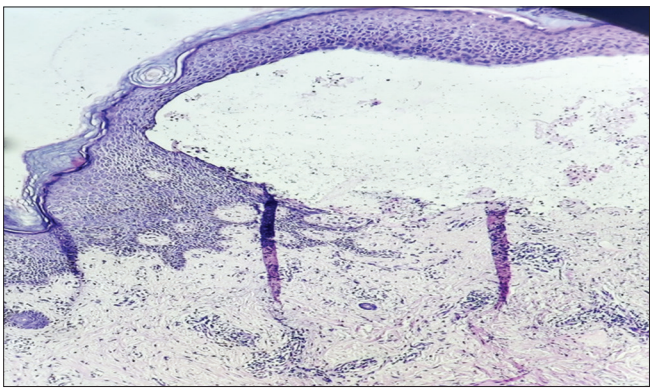

Fig. 3: Bullous pemphigoid showing subepidermal blister formation and an inflammatory infiltrate composed predominantly of eosinophils, few neutrophils in the dermis and bullous cavity (H and E stain)

Out of 54 (27%) cases of non-infectious vesiculobullous and vesiculopustular diseases, 18 (33.3%) cases were of pemphigus (Fig. 2) followed by 17 (28%) cases of dermatitis, two (3.7%) cases of subcortical pustular dermatosis (Fig. 3) and 1 (1.8%) case of transient acantholytic dermatosis. The most common histopathological type of pemphigus observed was pemphigus vulgaris.

Out of 17 (31.48%) cases of dermatitis, most common was spongiotic dermatitis 6 cases (11%), followed by chronic dermatitis 3 cases

Table 1: Age- and sex-wise distribution of non-neoplastic skin lesions

Age (in years)	Male	Female	Total	Percentage
0–10	2	0	2	1
11–20	13	8	21	10.5
21–30	44	26	70	35
31–40	23	24	47	23.5
41–50	12	13	25	12.5
51–60	12	5	17	8.5
61–70	6	7	13	6.5
71–80	4	1	5	2.5
Total	116	84	200	100

Table 2: Distribution of various non-neoplastic skin lesions according to the histopathological diagnosis (Lever's histopathology of the skin, 11th ed..ition 2019) [10]

Name of the disease	Total number of cases	Percentage
Non-infectious erythematous, papular, and squamous diseases	55	27.5
Non-infectious vesiculobullous and vesiculopustular diseases	54	27
Vascular diseases	11	5.5
Connective tissue disorders	8	4.0
Non-infectious granulomas	7	3.5
Degenerative disease and perforating disorders	2	1
Metabolic diseases of skin	2	1
Bacterial diseases	37	18.5
Viral diseases	1	0.5
Fungal diseases	20	10
Miscellaneous	3	1.5

Table 3: Patterns in various non-infectious erythematous, papular, and squamous lesions

Non-infectious erythematous, papular, and squamous lesions	Variants	Number of cases	Percentage of cases
Psoriasis	Psoriasis vulgaris	10	32.72
	Chronic plaque psoriasis	2	
	Parapsoriasis	1	
	Erythrodermic psoriasis	4	
	Sebopsoriasis	1	
Lichen planus	Lichen planus	15	43.63
	Hypertrophic lichen planus	3	
	Lichen simplex chronicus	1	
	Lichen spinulosus	1	
	Drug-induced lichen planus	1	
	Lichen planopilaris	1	
	Lichen planus actinicus	2	
Pityriasis rosea		10	18.18
Ashy dermatosis		3	5.4

(5.5%), atopic dermatitis 3 cases (5.55%), subacute eczematous dermatitis 1 case (1.85%), dyshidrotic dermatitis 1 case (1.85%), contact dermatitis 1 case (1.85%), pigmented purpuric dermatitis 1 case (1.85%), and seborrheic dermatitis 1 case (1.85%).

Table 4: Patterns in vesiculobullous and vesiculopustular lesions

Non-infectious vesiculobullous and vesiculopustular lesions	Disease morphological patterns	Number of cases	Percentage
Dermatitis	Subacute eczematous dermatitis	1	31.48
	spongiotic dermatitis	6	
	Atopic dermatitis	3	
	Dyshidrotic dermatitis	1	
	Chronic dermatitis	3	
	Contact dermatitis	1	
	Pigmented purpuric dermatitis	1	
	Seborrheic dermatitis	1	
Pemphigus vulgaris		18	33.3
Pemphigus foliaceus		6	11.1
Bullous pemphigoid		9	16.6
Subcortical pustular dermatosis		2	3.7
Transient acantholytic dermatosis		1	1.8
Miliaria profunda		1	1.8

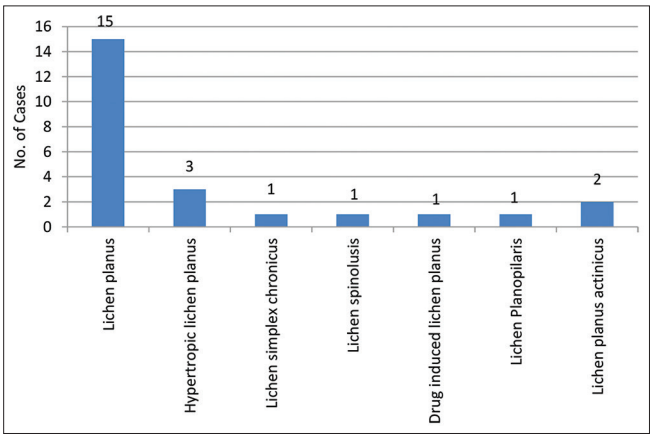

Chart 1: Disease spectrum of lichen planus

Out of 5.5% cases of vascular skin lesions, most common was leukocytoclastic vasculitis 27.2% followed by cutaneous vasculitis 18.1% and small-vessel vasculitis 18.1%.

Out of 3.5% cases of non-infectious granulomas, most common was granuloma annulare 42.8%, followed by granulomatous rosacea 28.5%, tattoo granuloma 14.2%, and cheilitis granulomatosis 14.2%.

The most common bacterial lesions constituted 18.5% cases of the present study, folliculitis decalvans was 35.1%, followed by follicular occlusion 27%, chronic superficial folliculitis 13.5%, borderline tuberculoid leprosy 8.1%, tuberculous inflammation 5.4%, tuberculosis verrucosa cutis 5.4%, tuberculoid leprosy 2.7%, and erythema nodosum 2.7%.

Out of 3.5% connective tissue disorders, systemic lupus erythematosus was 37.5%, followed by discoid lupus erythematosus, scleroderma was 25.0% of each, and lupus erythematosus profundus was 12.5%.

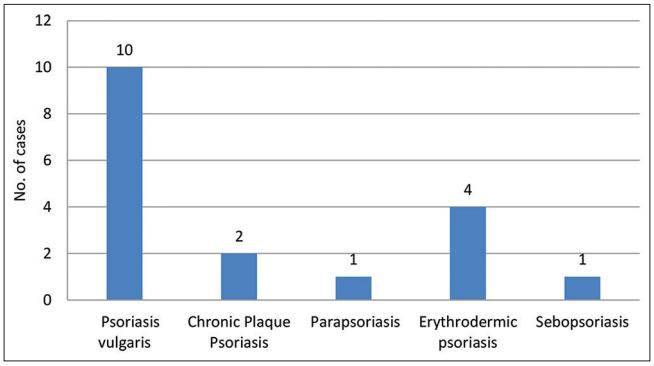

Chart 2: Disease spectrum of psoriasis

Out of 1% degenerative disease and perforating disorders, perforating folliculitis and pretibial pigmented patches were 50% of each. Out of 1% of metabolic diseases of skin, there were two cases of lichen amyloidosis. Out of 0.5% of viral disease, there was one case of verruca vulgaris. About 10% of cases of fungal disease were seen. Out of 2% of miscellaneous, reticulate acropigmentation of Kitamura 33.3%, palmoplantar keratoderma 33.3%, and melanosis 33.3% were seen.

DISCUSSION

The most common age group in the present study was 21–30 years with 35% of all the cases (Table 1). This was in concordant with the study of Vedurthy *et al.* [11] with 31.35% of cases in this age group. This was discordant with the studies of Grover *et al*. [8] where14.6% of all the cases were in the age group of 31–40 years. Male: female ratio was 1.38:1 showing male predominance which was concordant with the study of Grover *et al.* [12] which showed male: female ratio of 1.64:1 and also with the study of Mathur *et al*. [13]which showed male: female ratio of 1.68:1 and is discordant with a study of Vedurthy *et al*. [11] who observed a female predominance in their study which showed male: female ratio of 0.7:1. In the present study, maximum cases belonged to non-infectious erythematous, popular and squamous lesions (27.5%) as well as infectious lesions (29%) (Table 2). Among the non-infectious erythematous, papular, and squamous lesions, 43.6% of cases of lichen planus (Table 3) were the most common while out of infectious lesions, 18.5% of cases of bacterial lesions were most common. Out of 27% of non-infectious vesiculobullous and vesiculopustular lesions, 33.3% of cases were of pemphigus vulgaris followed by 31.4% of cases of dermatitis (Table 4).

This was in concordance with the study of Isha *et al*. [14] in which non-infectious erythematous, papular, and squamous lesions were the most common. This was also similar with the studies of Vedurthy *et al*. [11] and Mathur *et al.* [13] where infectious lesions constituted the maximum number of cases.

In the study of Isha *et al.* [14], maximum cases belonged to non-infectious erythematous, papular, and squamous lesions 31.21%. Most of the lesions belonged to lichen planus. Among the cases of leprosy, largest number of cases was that of borderline tuberculoid type followed by tuberculoid type. In the study of Vedurthy *et al*. [11], lichenoid lesions were the maximum 26% followed by leprosy 23.9% and psoriasis 11.9%. Among the lichenoid lesions, maximum number of cases was that of lichen planus 58.3%. Among the leprosy, tuberculoid, lepromatous, and indeterminate leprosy constituted 22% of total. Out of 18.5% cases of bacterial lesions, the most common was folliculitis decalvans 35.1%, followed by follicular occlusion 27%, chronic superficial folliculitis 13.5%, borderline tuberculoid leprosy 8.1%, tuberculous inflammation 5.4%, tuberculosis verrucosa cutis 5.4%, tuberculoid leprosy 2.7%, and erythema nodosum 2.7%. In the study of Grover *et al.* [12], there were a total of 343 cases (59.1%) of infective lesions, in which fungal lesions were the highest with 187 cases (54.52%). Among the non-infective cases, eczemas were the most common disorder in 93 cases (39.2%). In the eczema group, nummular eczema was found in 35 cases (37.6%) followed by hand eczema in 19 cases (20.4%).

CONCLUSION

Skin lesions were more common in males than in females. Younger age group showed predominance.

In non-infectious erythematous, papular, squamous, and infective lesions, the most common were lichen planus 55 cases (27.5%) of all the cases followed by non-infectious vesiculobullous and vesiculopustular lesions constituting 54 cases (27%) of all the cases.

Out of 55 cases (27.5%) of non-infectious erythematous, papular, and squamous lesions, 24 cases (43.6%) were of lichen planus followed by 18 cases (32.7%) of psoriasis, 10 cases (18.2%) of pityriasis rosea, and 5.4% cases of ashy dermatosis.

Out of 54 cases (27%) of non-infectious vesiculobullous and vesiculopustular lesions, 18 cases (33.3%) were of pemphigus vulgaris followed by 17 cases (31.4%) of dermatitis and 9 cases (16.6%) of bullous pemphigoid.

Out of 17 cases (31.4%) of dermatitis, most common was spongiotic dermatitis 6 cases (11%) followed by chronic dermatitis 5.5% and atopic dermatitis 5.55%.

Out of 11 cases (5.5%) of vascular skin lesions, 3 cases (27.2%) were of leukocytoclastic vasculitis followed by 2 cases (18.1%) of cutaneous vasculitis and small-vessel vasculitis.

Out of all the cases, 8 cases (4%) were of connective tissue disorders, 7 cases (3.5%) were of non-infectious granulomas, 2 cases (1%) were of metabolic disorders, and 2 cases (1%) were of degenerative disease and perforating disorders.

Among infective lesions, 37 cases (18.5%) were bacterial lesions followed by 20 cases (10%) of fungal lesions and 1 case (0.5%) was of viral lesions. Protozoal diseases were not present in the study.

Out of 37 cases (18.5%) of the bacterial diseases, 4 cases (10.8%) were of leprosy followed by tuberculous lesions constituting 4 cases (10.8%) of all the cases.

Out of 4 cases (10.8%) of leprosy, 3 cases (8.1%) were of borderline tuberculoid leprosy and 1 case (2.7%) was of tuberculoid leprosy.

Out of all cases, 1.5% of cases of miscellaneous skin lesions were reticulate acropigmentation of Kitamura, palmoplantar keratoderma, and melanosis.

AUTHORS' CONTRIBUTION

Dr. Sweta I, Dr. Hitesh P, Dr. Arpit G, and Dr. Asha P.: Preparation of manuscript. Dr. Sweta I.: Data collection. Dr. Sweta I, Dr. Hitesh P, Dr. Arpit G, and Dr. Asha P.: Data analysis. Dr. Hitesh P, Dr. Arpit G, and Dr. Asha P.: Critical revision.

CONFLICTS OF INTERESTS

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