Non-Neoplastic Lesions of Skin - A Histopathological Study on Punch Biopsy

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Abstract: *Introduction: India with diverse population groups having different customs, thus offering the perfect backdrop for a wide variety of peculiar and distinctive dermatosis. Skin is the largest external organ of the body accounting for 16-20% of the total body weight.[8] The pattern of skin diseases varies from one country to another country and across different parts in the same country. Though the spectrum of histopathology of skin disorders is varied, clinical presentation is restricted to only a few changes such as hyperpigmentation, hypopigmentation, macules, papules, nodules and a few others.[9] Each clinical presentation is common to different histopathological pictures and thus definitely require histopathology for their confirmation. Aims and Objectives: 1) To study the incidence of various Non-neoplastic lesions of skin. 2) To study the age and sex wise distribution of Non-neoplastic skin lesions. 3) To study the morphological patterns of Non-neoplastic skin lesions. Materials and Methods: The present study comprised of a total 400 punch biopsy specimens of skin lesions and studied over a consecutive period of about 2 years and 4 months (June 2017 to October 2019) in a tertiary care centre Ahmedabad, Gujarat. All the tiny punch biopsy bits, poorly preserved tissue bits and cases with clinical impression of neoplastic etiology were excluded from the study. Descriptive cross-sectional study of cases including detailed clinical data of age, sex, clinical features, and type of lesion of patients was obtained. The data was retrieved from computerised software laboratory information system (LIS). Results: In the study, maximum number of cases were observed in the age group of 21-30 years with 22.25% of total cases (male=57 and female=32) and Male: Female ratio is 1.58:1. Thus male is affected more than female and particularly after the age of 40. There were 26.5% cases of Non-infectious erythematous, papular and squamous diseases as well as of infectious diseases. Among non-infectious erythematous, papular and squamous lesions, 33.9% cases were of Lichen planus. Of all the infective lesions, Leprosy was the most common (62.2% of all infective lesions). Discussion: Skin biopsy is the most common diagnostic tests in dermatology. To achieve accurate and rapid diagnosis, it is important to incorporate clinical knowledge of the disease. Skin diseases in general population in various studies varies from 6.3% to 11.16%.The most common age group in the present study was 21-30 years with 22.25% of all the cases. Leprosy comprised maximum of 38 cases, largest number of cases were that of Borderline Tuberculoid type of leprosy (22 cases), followed by tuberculoid Leprosy. Conclusion: In the present study, wide spectrum of skin lesions, common and rare were observed. Leprosy is a still a disease of increasing frequency. Skin diseases are common in adult life third to fourth decade affecting males more than females. Vascular, viral, protozoan diseases are the rare lesions of skin.*

Keywords: Skin lesions, Non-neoplastic skin lesions, Dermatosis, Leprosy, Lichen planus

Non-neoplastic lesions of skin- A Histopathological Study on punch Biopsy (A study of 400 cases)

1. Introduction

India being a vast country with diverse population groups having different customs, thus offering the perfect backdrop for a wide variety of peculiar and distinctive dermatosis.In 1960, Desai observed that more than 50% of a general hospital's skin out-patient attendance consisted of infections that were acute and usually recurrent –scabies, pyodermas, superficial fungal infections, pediculosis, parasitic, viral infections and were the diseases of a poor economy.**[2]**The pattern of skin diseases in India is influenced by the developing economy, level of literacy, social backwardness, varied climate, industrialization, access to primary health care, and different religious ritual and cultural factors**[3]**.The prevalence of skin diseases in the general population has varied from 7.86% to 11.16% in various studies.**[5,6,7]**The exact incidence of all Non-neoplastic lesions of skin is not given, though the incidence of individual skin disease we can find.Separation of each of these becomes important because the treatment and prognosis tends to be disease specific.[10] The histologic diagnosis in turn is used by clinicians to aid in the management of patients. The most accurate diagnosis is the one that most closely correlates with clinical outcome and helps direct the most appropriate clinical intervention.[11] Thus, there is a close relationship between diagnosis and prognostication. Skin biopsy probably is the most important ancillary aid to confirm clinical diagnosis. The interpretation of many skin biopsies requires the identification and integration of two different morphological features – the tissue reaction pattern and the pattern of inflammation.**[12,13]**

Skin diseases also pose huge financial, psychological burden for the patients and their families. Improvement in the standard of living, education of the general public, improvement in the environmental sanitation, and good nutritious food may help us to bring down the skin diseases in this area. Therefore, prevention by identifying the risk factor is the most effective approach especially in resource restrained settings of India.

2. Materials and Methods

The present study comprised of a total 400 punch biopsy specimens of skin lesions and studied over a consecutive period of about 2 years and 4 months (June 2017 to October 2019) in a tertiary care centre Ahmedabad, Gujarat. All the tiny punch biopsy bits, poorly preserved tissue bits and cases with clinical impression of neoplastic etiology were excluded from the study. Descriptive cross-sectional study of cases including detailed clinical data of age, sex, clinical features, and type of lesion of patients was obtained.

The punch biopsy specimens were received in the 10% formalin and were allowed to fix for 24 hours. The biopsy bit was submitted whole, processed in automated tissue processor for routine paraffin embedding. Tissue sections of 5-micron thickness were cut by microtomy. All cases were analyzed by examining Hematoxylin and Eosin stained slides. FF stain was used in all the suspected cases of leprosy.

Ethical Consideration
All the procedures performed were in accordance with the ethical standards of the institution.

3. Observation and Results

Present study was carried out at Pathology department of tertiary care centre, Ahmedabad from June 2017 to October 2019. A total 400 cases of skin lesions were studied in detail and observations are noted down.

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

Age (In Years)	Male	Female	Total	Percentage
0-10	6	6	12	3%
11-20	21	20	41	10.25%
21-30	57	32	89	22.25%
31-40	44	35	79	19.75%
41-50	37	28	65	16.25%
51-60	38	15	53	13.25%
61-70	35	15	50	12.5%
71-80	4	4	8	2%
81-90	3	0	3	0.75%
TOTAL	245	155	400	100%

Table 2: Distribution of various Non-neoplastic skin lesions

Name of the disease	Total number of cases	Percentage
Genodermatoses	12	3%
Non-infectious Erythematous, Papular and Squamous diseases	106	26.5%
Vascular Diseases	4	1%
Non-infectious vesiculobullous and vesiculopustular diseases	105	26.25%
Connective tissue disorders	16	4%
Photosensitivity disorders	2	0.5%
Non-infectious Granulomas	14	3.5%
Degenerative disease and perforating disorders	5	1.25%
Cutaneous manifestations of nutritional deficiency states and gastrointestinal disease	8	2%
Metabolic diseases of skin	6	1.5%
Inflammatory diseases of subcutaneous fat	3	0.75%
Bacterial Diseases	95	23.75%
Viral diseases	4	1%
Fungal Diseases	6	1.5%
Protozoal diseases	1	0.25%
Miscellaneous	13	3.25%

26.5% of the cases were of Non-infectious erythematous, papular and squamous diseasesas well as of infectious diseases, 26.25% cases were vesiculobullous and vesiculopustular diseases. Protozoal disease was the least common (0.25%) among all the cases.

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

Non-infectious erythematous, papular and squamous lesions	Variants	Number of cases	Percentage of cases
Psoriasis	Psoriasis vulgaris	14	25.47%
	Pustular Psoriasis	3	
	Parapsoriasis	2	
	Erythrodermic psoriasis	7	
	Sebopsoriasis	1	
Lichen Planus	Lichen planus	26	33.9%
	Hypertrophic lichen planus	2	
	Pigmented lichen planus	4	
	Lichen planus actinicus	1	
	Drug induced lichen planus	1	
	Lichen planopilaris	2	
Ashy dermatosis		13	12.26%
Pityriasis Lichenoides		13	12.26%

Out of a total of 106 cases of non-infectious erythematous, papular and squamous diseases, there were 25.47% cases of Psoriasis and 33.9% cases of Lichen planus and 12.26% cases each of Ashy dermatosis and Pityriasis lichenoides.

Table 4: Patterns invesiculobullous and vesiculopustular lesions

Non-infectious vesiculobullous and vesiculopustular lesions	Disease morphological patterns	Number of cases	Percentage
Dermatitis	Allergic dermatitis	2	27.6%
	Psoriasiform dermatitis	5	
	Atopic dermatitis	3	
	Exfoliative dermatitis	1	
	Chronic dermatitis	9	
	Interface dermatitis	3	
	Hypertrophic dermatitis	1	
	Lichenoid dermatitis	2	
	Subacute spongiotic dermatitis	1	
	Seborrheic dermatitis	1	
	Photodermatitis	1	
Pemphigus vulgaris		36	34.2%

Pemphigus foliaceus		11	10.47%
Bullous Pemphigoid		16	15.23%
Dermatitis herpetiformis		8	7.61%

Table 5: Spectrum of Granulomatous inflammation

Disease type	Morphological pattern	Number of cases	Percentage
Mycobacterial inflammation	Tuberculous inflammation	6	15.78%
	Tuberculous verrucose cutis	3	
	Lupus vulgaris	6	
Granuloma annulare		4	4.21%
Sarcoidosis		1	1.05%
Tattoo granuloma		6	6.31%
Granulomatous inflammation		3	3.15%
Syphilis		2	2.10%
Leprosy	Indeterminate leprosy	1	82.10%
	Histoid leprosy	10	
	Borderline tuberculoid leprosy	11	
	Tuberculoid leprosy	14	
	Mid borderline leprosy	1	
	Borderline lepromatous leprosy	12	
	Lepromatous leprosy	17	

82.1% of the bacterial lesions comprised of leprosy followed by 15.78 % cases of mycobacterial lesions. In leprosy, the most common morphological pattern was lepromatous leprosy with 21.79% of all leprosy cases and least common granulomatous lesion was sarcoidosis

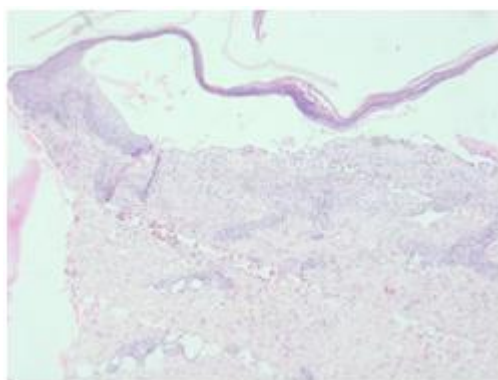**Histopathological Images of Various Lesions**

Figure 1: Bullous pemphigoid

subepidermal blister formation and an inflammatory infiltrate composed predominantly of eosinophils and a few neutrophils in the dermis and bullous cavity.
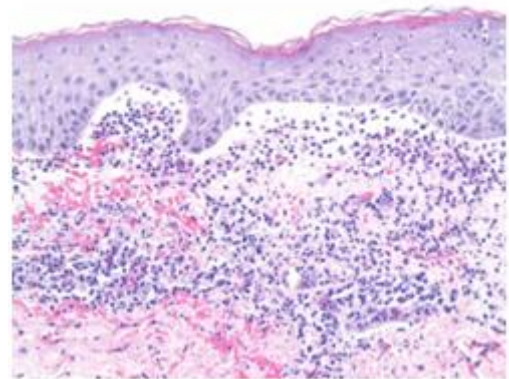

Figure 2: Dermatitis herpetiformis

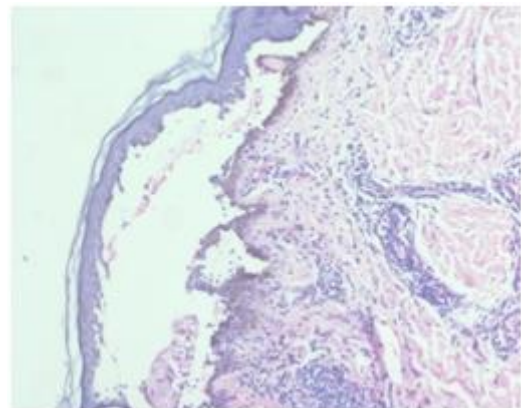Dermal papillary neutrophilic micro abscesses are characteristic.

Figure 3: Pemphigus Vulgaris showing intraepidermal acantholytic blister in suprabasalplane.
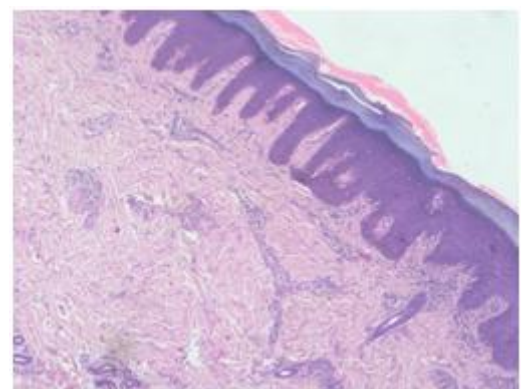

Figure 4: Psoriasis Vulgaris

Shows uniform acanthosis of the epidermis with prominent parakeratosisand attenuation of the epidermis overlying the dermal papillae, a feature known as "suprapapillary thinning"
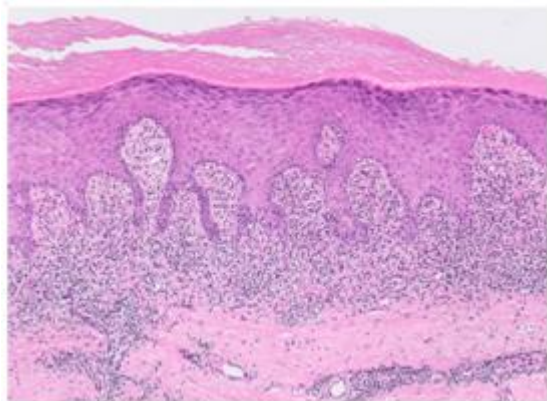
Figure 5: Lichen planus

Showing hyperkeratosis, acanthosis in the epidermis with a prominent granular cell layer, saw toothing of the rete ridges, band like chronic inflammatory infiltrate in the papillary dermis.
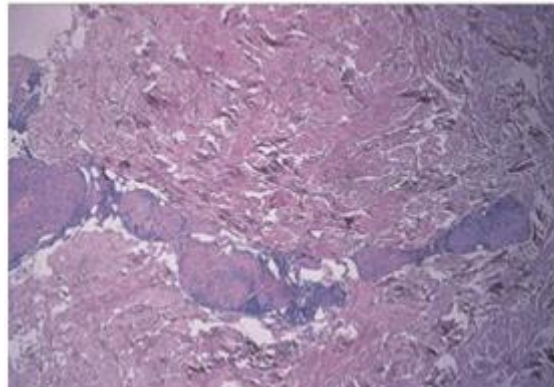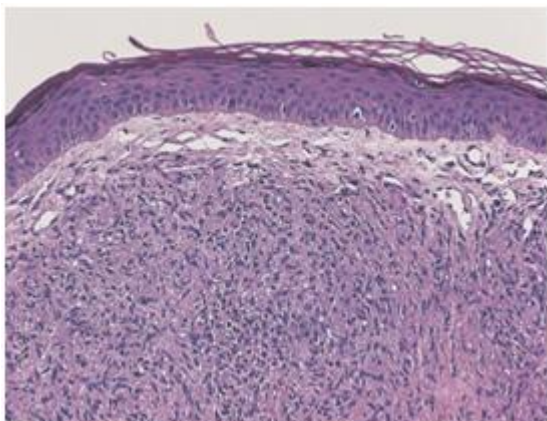

Figure 6 (A): Lepromatous leprosy shows Grenz zone that separates dermis from epidermis and macrophages (foamy histiocytes) in the dermis. There is no granuloma formation

Figure 6 (B): Lepra bacilli on FF Stain BI-6.

Figure 7: Tuberculoid leprosy

Shows large epithelioid cells arranged in compact granulomas along with neurovascular bundles, with dense peripheral lymphocyte accumulation.

4. Discussion

Skin biopsy is the most common diagnostic tests in dermatology. To achieve accurate and rapid diagnosis, it is important to incorporate clinical knowledge of the disease. Skin diseases in general population in various studies varies from 6.3% to 11.16%.[7].

Table 6: Comparison of total number of cases and male: female ratio in present study with other studies

Study	Total cases	Male: female ratio
Isha gupta et al[26]	205	1.05:1
Vedurthy VS et al[27]	92	0.70:1
Grover et al[28]	522	1.64:1
Mathur et al[29]	102	1.68:1
Adhikari RC et al[30]	1040	1.08:1
Rajput JS et al[31]	60	1.72:1
R Singh et al[32]	112	1.19:1
Present study	400	1.58:1

Table 7: Comparison of disease frequency in age groups in present study with other studies

Study	AGE IN YEARS						
	0-10	11-20	21-30	31-40	41-50	51-60	>60
Vedurthy VS et al[26]	1.08%	25%	31.5%	17.3%	14.1%	6.5%	4.3%
Grover et al[28]	12.8%	31.4%	19.3%	14.6%	11.3%	7.5%	3.1%
Mathur et al[29]	3.9%	16.6%	18.6%	20.58%	16.6%	9.8%	13.7%
Rajput JS et al[31]	1.6%	20%	23.3%	26.6%	13.3%	11.6%	3.3%
Present study	3%	10.25%	22.25%	19.75%	16.25%	13.25%	15.25%

The most common age group in the present study was 21-30 years with 22.25% of all the cases.

Table 8: Comparison of Histopathological diagnosis in present study with other studies

Histopathological Lesion	Study				
	Isha gupta et al[26]	Mathur et al[29]	Adhikari RC et al[30]	Rajput JS et al[31]	Present study
Genodermatoses	1.95%	4.9%	1.1%	3.33%	3%
Non-infectious erythematous,papular and squamous lesions	31.21%	26.47%	25.9%	25%	26.5%
Non-infectious vesiculobullous and vesiculopustular lesions	17.07%	6.86%	28.6%	6.66%	26.25%
Infectious diseases	21.4%	35.29%	11.4%	38.33%	26.5%
Connective tissue disorders	7.32%	9.8%	2.4%	11.67%	4%

In the study of Isha gupta et al, maximum cases (31.21%) belonged to non-infectious erythematous, papular and squamous lesions. Most of the lesions were attributed to trauma, infection, metabolic causes, drugs etc. Maximum number of cases (31 cases; 48.43%) were that of Lichen planus. There were 95 bacterial lesions in our study while 43 cases in the study of Isha gupta et al. Leprosy comprised maximum of 38 cases, largest number of cases were that of Borderline Tuberculoid type of leprosy (22 cases), followed by tuberculoid Leprosy.

5. Conclusion

Total of 400 cases were studied in 2-year 4 monthperiod in tertiary care centre, Ahmedabad from June 2017 – October 2019:

1) Most cases of non-neoplastic skin lesions occurred in the age group of 21-30 years.
2) Male predominance was noted with Male: female ratio was 1.58:1.
3) Non-infectious erythematous, papular and squamous lesions and infective lesions constituted were most common lesions with 26.5% of all cases each.
4) Lichen planus is the most common among non-infectious erythematous, papular and squamous lesions.
5) Bacterial diseases were the most common among infectious lesions and Leprosy constituted maximum number of cases.
6) Leprosy still remains a major public health problem in many parts of the world including India. At the beginning of the year 2001, the total number of registered cases in the world over was 0.6 million.
7) Non-infectious vesiculobullous and vesiculopustular lesion also constituted a significant number of cases and Pemphigus vulgaris was the commonest.

In the present study, wide spectrum of skin lesions, common and rare were observed. Leprosy is a still a disease of increasing frequency. Skin diseases are common in adult life third to fourth decade affecting males more than females.

Declaration of conflicts of interest: The authors declare that they have no conflicts of interest.

Ethical considerations: All procedures performed were in accordance with the ethical standards of the institution.

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