Research Article

Histomorphological analysis of nonneoplastic skin lesions

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Abstract

Background: Nonneoplastic skin lesions include various skin conditions that have different histomorphological features. Many of nonneoplastic skin lesions are diagnosed by dermatologist but some others need biopsy and histopathological evaulations. Histopathological evaluation has synergistic role for diagnosis of skin disease.

Objective: To study the histopathology of various nonneoplastic skin lesions, to correlate histopathological diagnosis with clinical diagnosis and to study age, sex incidence in various nonneoplastic skin lesions.

Materials and Methods: Total 100 cases were studied. Sample is in the form of skin biopsies and staining was done with routine Hematoxylin-Eosin stain and special stains.

Results: Of the 100 cases of nonneoplastic skin lesions, inflammatory disease of the dermis and epidermis were most common (51%), followed by infectious disease of skin (25%), Vesiculobullous lesions (22%) and nonneoplastic disease of hair (2%). Of these 100 cases, there were 52 males and 48 females, and their ages ranged from 7 to 70 years. The most common age range of presentation being 21–30 years (29%). Most common presentation was seen in males (52%) and most common site was back (31%).

Conclusion: Clinicohistopathological correlation is very important in the diagnosis of nonneoplastic skin disorders rather than considering either of them alone.

KEY WORDS: Nonneoplastic skin lesions, special stains, histomorphology

Introduction

Little more than 100 years ago, the noted pathologist Rudolph Virchow understood the skin as a protective cover. Skin is a complex organ.[1] It is the largest organ of the body, accounting for about 15% of the total body weight in adult humans. It exerts multiple vital protective functions against environmental aggressions, rendered possible due to an elaborate structure, associating various tissues of ectodermal and mesodermal origin, arranged in three layers, including (from top to bottom) the epidermis (and its appendages), the dermis, and the hypodermis. Skin acts as an immune network and through its pigments provides a unique defense against UV radiation. It is concerned with the thermoregulation, conservation and excretion of fluid, sensory reception and has an aesthetic role. Skin acts like a mirror through which manifestations of systemic diseases can be visualized. A large number of skin conditions that might present to a dermatologist range from acute to chronic as well as cosmetic problem in daily practice.[3] Many skin diseases can be diagnosed by a simple clinical examination, but sometimes relatively simple diagnostic procedures are required for additional valuable information toward reaching final diagnosis.[4] 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.[2]

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The skin lesions among the patients can be classified into various categories according to the morphology of lesion and can be confirmed by skin biopsy.[3] Integrated approach of dermatologist and pathologist is required to get clinical correlation and to arrive at a definitive diagnosis. The study mainly includes histopathological evaluation of various nonneoplastic skin lesions and their clinicopathological correlations followed by the study of age and sex incidence in various nonneoplastic skin lesions. An attempt has been made to classify nonneoplastic skin lesion based on histopathology background.

Materials and Methods

This observational prospective study was undertaken in the Department of Pathology, Government Medical College affiliated to New Civil Hospital, Surat, Gujarat, India. A total of 100 cases were studied, from June 2012 to September 2014, which were reported as nonneoplastic skin lesions using routine Hematoxylin-Eosin (H & E) stains and further with immunohistochemistry and special stains, whenever needed. Their detailed clinical history was noted down in prepared pro forma. Specimens were surgical biopsies such as punch biopsies, excision biopsies, and shave biopsies specimens. Specimens were fixed in 10% neutral buffered formalin for 12–24 h and gross features were examined. Extent of sampling depended on the size of tissue: specimens measuring 3 mm or less were submitted in toto, specimens measuring 4–6 mm were cut through the center and both halves submitted for processing, and specimens measuring 7 mm or more were cut in 2–3 mm slices and submitted for processing. Gross examinations of specimens were done under heads of overall appearance, size, external appearance, appearance of cut surface, cutting sensation, and consistency. After routine paraffin processing, 3–5 μm sections were cut and stained by H & E stain method and special stains that is Ziehl Neelson Stain and Periodic acid–Schiff Stain were applied if required after thorough histopathological analysis. Histopathological evaluations were carried out under light microscope. The final diagnosis was achieved after correlating both clinical and histopathological findings. The study was approved by Human Research Ethics Committee, Government Medical College, Surat, India.

Results

In this study, nonneoplastic skin lesions in males were more common in age groups of 21–30 years whereas in female more common in age groups of 41–50 years. The Age distribution in study showed, the lowest age to be 7 years and highest age to be 70 years. The sex distribution in study showed nonneoplastic skin lesions as a whole were more common in males [Table 1].

There was significant difference between the incidence of infectious disease of skin and inflammatory disease of the dermis and epidermis in male and female. The study showed infectious disease was more common in males and inflammatory disease of dermis and epidermis had a female preponderance [Table 2].

Most of patients in this study presented with lesions, common site being back in 31 patients (31%); right upper limb in 18 patients (18%); left upper limb in 15 patients (15%); left lower limb in 14 patients (14%); right lower limb in 12 patients (12%); abdomen in 4 patients (4%); and ear, face, and scalp in 2 patients (2%) each [Table 3].

In this study, most of the patients presented with symptoms within a duration of 1–6 months (42%).

Discussion

In this study, total 100 cases were examined as nonneoplastic skin lesions. Of these 100 cases, there were 52 males and 48 females, and their ages ranged from 7 to 70 years. The ratio of males:females was 1.08:1. Most common lesions were inflammatory disease of the dermis and epidermis (51%), followed by infectious disease of skin (25%), vesiculobullous lesions (22%) and nonneoplastic disease of hair (2%). The study showed that the limbs were involved in the maximum numbers of cases. In this study, vesiculobullous lesions showed 22 cases, maximum cases were of Pemphigus group, that is, 12 of 22 cases and vesiculobullous lesions as whole shows no sex predilection. Infectious disease showed 25 cases, in that maximum number of cases were of cutaneous tuberculosis (i.e., 56%) followed by leprosy (i.e., 44%). Of the 11 cases of leprosy, 7 cases (63.63%) were of lepromatous leprosy, 2 cases each were of histoid leprosy, and tuberculoid leprosy. In this study, two cases of dermatitis herpetiformis, three cases of Hailey Hailey disease, one case of Darriere's disease were reported, and four cases (4%) were diagnosed as bullous pemphigoid and the lesions had no sex difference.

In this study, maximum number of cases were found in the age group of 21–30 years, that is 29%, whereas in the study carried out by D' Costa et al. and Rajput et al., maximum numbers of cases were found in age groups of 30–40 years (i.e. 28.6%) and 30–39 years (i.e. 26.67%), respectively.[2,3] Ratio of male:female was 1.08:1 suggestive of male preponderance, similary D'Costa et al., Rajput et al., and Singh et al. found male preponderance in their studies.[2,3,5] Of the total 100 cases of nonneoplastic skin lesions reported, there were 52 males (52%) and 48 females (48%) whereas in the study carried out by Singh et al., of the 112 cases of nonneoplastic skin lesions, there were 61 males (54.5%) and 51 females (45.5%) and in the study by Rajput et al., there were 38 males (63.33%) and 22 females (36.67%).[3,5] In this study, maximum number of cases were of inflammatory disease of the dermis and epidermis (i.e., 51%), whereas D'Costa et al. found that most number of cases in their study were of infectious nature comprising of 24.29% cases.[2] In this study, inflammatory disease of the dermis and epidermis showed maximum number of cases (i.e., 51%), followed by infectious disease of skin (i.e., 25%), vesiculobullous lesions

Table 1: Age and sex distribution of nonneoplastic skin lesions ($n = 100$)

Age in years	Female ($n = 48$)	Male ($n = 52$)	Total (%)
1–10	4	3	7
11–20	6	8	14
21–30	9	20	29
31–40	10	4	14
41–50	11	10	21
51–60	3	5	8
61–70	5	2	7

Table 2: Spectrum of disease against of sex distribution

Type of lesions	Male		Female		Total cases
	No.	%	No.	%	
Infectious disease of skin	17	32.7	8	16.7	25 (25%)
Inflammatory disease of the dermis and epidermis	23	44.2	28	58.3	51 (51%)
Nonneoplastic disease of hair	1	1.9	1	2.1	02 (2%)
Vesiculobullous lesions	11	21.2	11	22.9	22 (22%)
Total	52	100	48	100	100 (100%)

χ^2-test; $p = 0.03$ is significant.

Table 3: Duration of symptoms

Duration	Frequency	Percentage
<1 month	02	2
1–6 months	42	42
7–12 months	23	23
>1 year	33	33
Total	100	100

(i.e., 22%) and nonneoplastic disease of hair (i.e., 2%) whereas Rajput et al. found that maximum number of cases were of infectious disease (i.e., 38.33%) followed by non-infectious erythematous, popular and squamous disorders (i.e., 25%), non-infectious vesiculobullous and vesiculopustular disorders (i.e., 6.66%).[3] In this study, most cases presented within 0–6 months duration of lesions (i.e., 44%) followed by more than 1 year of duration of lesions (i.e., 33%), >6 to 12 months duration of lesions (i.e., 23%) whereas study carried out by Rajput et al. showed that most cases presented with more than 1 year duration of lesions (i.e., 45%) followed by 0–6 months duration of lesions (i.e., 35%), >6 to 12 months duration of lesions (i.e., 20%).[3] In this study, vesiculobullous lesions was found in 22 cases of 100 cases of nonneoplastic skin lesions. Of the 22 cases, maximum cases were of Pemphigus group (i.e., 12 cases). Similarly, Patel et al. observed that maximum cases were of Pemphigus group, that is, 22 of 33 cases of vesiculobullous lesions.[6] Arundhathi et al. and Khan et al. showed similar results with 69.23% and 60.03% cases of pemphigus vulgaris respectively.[8,9] In this study psoriasis had a male preponderance, that is, male to female ratio of 3:1. Similar result was also observed by Alexander et al. and Yang et al.[10,11] The most common type of interface dermatitis observed in this study was Lichen planus (i.e. 12 cases (48%) out of 25 cases). Similar results were observed by Hegde et al. and Manjunath et al.[12,13] In this study, most common type of leprosy was lepromatous leprosy (i.e., 7 cases, 63.63%) whereas study carried out by Suri et al. observed most commonly encountered type of leprosy to be borderline tuberculoid leprosy (42%).[7]

Strength and Limitation

This type of study was not done previously in this institute, and we included all the biopsies' result, which have conclusive results. Small sample size would be our limitation.

Conclusion

Clinicopathological correlation is very important in the diagnosis of nonneoplastic skin disorders rather than considering either of them alone. Inflammatory disease of the dermis and epidermis constituted the most common nonneoplastic skin disorder followed by infectious disease of skin, vesiculobullous lesions, and nonneoplastic disease of hair in this study. Histopathological examination is helpful for arriving at a definitive diagnosis in majority of nonneoplastic skin disorders. Recognition of this commonly encountered cutaneous problem depends on the familiarity of clinical presentation and the diagnosis can be confirmed with histopathology.

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