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IMPORTANCE OF PROVIDING CLINICAL DETAILS FOR IMPROVING DIAGNOSTIC VALUE OF SKIN BIOPSY IN NON NEOPLASTIC SKIN LESIONS

Pathology

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ABSTRACT

Background: Diagnosis of non neoplastic skin lesions is challenging because of its varied clinical presentation and overlapping histopathological features. When skin biopsies are reported by general pathologist proper communication between dermatologist and pathologist becomes important.

Aims and objectives: Present study was carried out to estimate distribution of various non neoplastic skin diseases in our hospital set up, see their clinico- pathological correlation and determine the role of proper clinical details in improving diagnostic yield of skin biopsy.

Method: This is a retrospective study carried out in the department of pathology. Total 130 cases of non neoplastic skin lesion were included in the study. Cases were categorized in to 9 groups based on ICD 10 classification of the diseases of skin and subcutaneous tissue. Hematoxylin and eosin stained stained slides were studied. Special stain like Zeihl-Neelson and periodic acid Schiff stain were applied wherever necessary. Relevant clinical data was retrieved from requisition form.

Result: Gender wise distribution showed male predominance with male to female ratio of 73:57. Age wise distribution showed that maximum number of 48 cases (36.92%) belonged to the age group of 21-40 years. Group 1 of Infections of skin and subcutaneous tissue had the highest number of 29 cases (22.30%). Overall clinico-histopathological correlation was seen in 95 cases (73.07%). Out of total 31 discordant cases, histopathological diagnosis matched with clinical description in 10 cases. In remaining 21(16.15%) truly discordant cases, most common cause of discordance was failure to demonstrate infective organism in clinically suspected cases of tuberculosis and fungal infections.

Conclusion: Our study highlights that higher clinic-histopathological concordance can be achieved by providing detailed clinical history in cases of non neoplastic skin lesions

KEYWORDS

non neoplastic skin lesions, diagnostic value of skin biopsy, dermatopathology, clinico-pathological correlation, ICD 10 classification

INTRODUCTION:

Non neoplastic skin lesion poses a diagnostic challenge due to its varied clinical presentation and overlapping histopathological features. Definitive diagnosis becomes more difficult in the absence of proper clinical data and when biopsies are examined by general histopathologist. Sometimes an old healed lesion is biopsied which may be misleading in absence of proper clinical history. Royal college of pathology suggested that when clinically definitive diagnosis is not possible clinician can provide list of differential diagnosis.(1) Thus proper communication between dermatologist and pathologist becomes vital for proper diagnosis. In India, Dermatopathology is yet to be recognized as a separate subspeciality. At many institutes skin biopsies are reported by general pathologist with no specialized training in dermatopathology (2). At our institute also skin biopsies are reported by general histopathologist.

Present study was carried out to estimate distribution of various non neoplastic skin diseases in our hospital set up, see their clinico-pathological correlation and determine the role of proper clinical details in improving diagnostic yield of skin biopsy

Study design and setup:

This was a retrospective study conducted in the department of pathology over a period of one year from January 2020 to December 2020.

Sample size:

Total 130 cases of non neoplastic skin lesions were included in the study.

MATERIALAND METHOD:

At our institute Dermatologists were requested to send duly filled requisition form stating relevant clinical findings and provisional clinical diagnosis along with skin biopsy specimen. The nature of specimen in all cases was punch biopsy. Small punch biopsies were submitted intact while biopsies larger than 0.5 cm were bisected along their long axis before submission. Slides stained with Hematoxylin and eosin stain were studied. Special stain such as Ziehl-Neelson was applied wherever required. Relevant clinical data was retrieved from requisition forms. Many skin biopsies were received along with a duly filled requisition form stating relevant clinical findings and provisional clinical diagnosis. In case clinicians had doubts regarding final diagnosis, a list of differential diagnoses was provided with a request to rule them out by histolopathological examination. Sometimes only provisional diagnosis was mentioned without any clinical details.

To simplify the correlation, cases were categorized in to 9 groups based on ICD 10 classification of the diseases of skin and subcutaneous tissue. **Group1**: Infections of skin and subcutaneous tissue, **Group 2:** Vesiculobullous and vesiculopustular disorder, **Group 3**: Dermatitis and eczema, **Group 4**: Papulosquamous disorder, **Group 5:** Urticaria and erythema, **Group 6:** radiation related disorder, **Group 7**: Disorder of skin appendages, **Group 8:** Connective tissue disorder, **Group 9:** other disorder of skin and subcutaneous tissue

Infectious diseases affecting skin like tuberculosis, leprosy, parasitic infestation and fungal dermatitis are not included under diseases of skin and subcutaneous in ICD 10 classification. Therefore these diseases were not included in the present study. Inadequate biopsies were excluded from the study.

RESULTS:

Total 130 non neoplastic skin lesions were divided into 9 groups based on ICD 10 classification of the diseases of skin and subcutaneous as shown in table no.1 and 2.

Gender wise distribution showed male predominance with male to female ratio of 73:57. However group 8 of connective tissue disorder and group 9 of miscellaneous diseases showed female predominance.

Age wise distribution showed that youngest patient was five years old with diagnosis of lichen planus while oldest patient was 90 year old with diagnosis of non specific inflammation over prepuce. Maximum number of 48 cases (36.92%) belonged to the age group of 21-40 years followed by 34 cases (26.15%) in age group of 41-60 years, 32 (24.61%) in the age group of 0-20 years and 16 cases (12.30%) in the age group of >60 years

Group 1 of Infections of skin and subcutaneous tissue had the highest number of 29 cases (22.30%) followed by group 9 of miscellaneous category and group 4 of papulosquamous disorders with 26 cases (20%) each.

Most common specific diagnosis was pilonidal sinus in 14 cases (10.76%) followed by lichen planus and its variant (Lichen planus hypertrophicus, Lichen planus actinicus, Annular lichen planus, Lichen planus pemphigoid and Eruptive lichen planus) in 11 cases (8.46%) (Table no.1)

Clinic-histopathological correlation: Histopathological diagnosis was consistent with first differential diagnosis in 79 (60.76%) cases, with second or third differential diagnosis in 14 (10.76%) cases and overall concordance was seen in 95 cases (73.07%). In 31 (23.84%) cases histopathological diagnosis was inconsistent with the clinical diagnosis. While clinical diagnosis was not provided in 4 (3.07%) cases as shown in table no.3. Group 5 of urticaria and erythema and Group 6 of radiation-related disorders showed 100% clinico-histopathological correlation while highest discordance was seen in group 3 of dermatitis and eczema (61.52%) (Table no.3)

Out of total 31 discordant cases, histopathological diagnosis matched with clinical description in 10 cases. In remaining 21(16.15%) truly discordant cases, most common cause of discordance was failure to demonstrate infective organism in clinically suspected cases of tuberculosis and fungal infections (Table no.4).

Table no. 1 Distribution of cases according to ICD 10

Group number	ICD 10 Group	Total No. of cases n=130
Group 1	Infections of the skin and subcutaneous tissue	
	• Cutaneous abscess	3
	• Necrotizing fasciitis	2
	• Acute necrotizing lesion	2
	• Chronic Nonspecific	7
	• Pilonidal sinus	15
Group 2	Bullous disorders	
	• Pemphigus vulgaris	2
	• Pemphigus foliaceous	3
	• Pemphigus herpetiformis	1
	• Bullous pemphigoid	3
	• Dermatitis herpetiformis	2
	• Subcorneal pustular dermatosis	1
Group 3	Dermatitis and eczema	
	• Acute eczema	1
	• Psoriasiform eczema	2
	• Non specific dermatitis	5
	• Spongiotic dermatitis	2
	• Lichenoid dermatitis	1
	• Prurigo simplex	1
	• Fixed drug eruption	1
Group 4	Papulosquamous disorders	
	• Lichen planus and variant	11
	• Lichen planus like keratosis	1
	• Lichen striatus	1
	• Psoriasis	9
	• Parapsoriasis	1
	• Pityriasis rosea	1
	• Pityriasis lichenoid chronic	2
Group 5	Urticaria and erythema	
	• Erythema multiform	1
Group 6	Radiation-related disorders of the skin and subcutaneous tissue	
	• Polymorphous light eruption	2
	• Atrophic actinic keratosis	1
Group 7	Disorders of skin appendages	
	• pseudopelade of Brocq	1
	• perforating folliculitis	1
	• kyrle's disease	1
	• reactive perforating collangenosis	1
Group8	Connective tissue disorder	
	• lupus erythematosus	3
	• DLE	2
	• Linear Scleroderma	1
	• Morphea (localized scleroderma)	5
	• Lichen sclerosis et atrophicus	4
Group 9	Other disorders of the skin and subcutaneous tissue	27
total		130

Table no. 2: Distribution of cases belonging to group 9

Group 9: Miscellaneous skin Disorder	Number of cases n=27
Corns	1
Epidermal thickening:	
Cutaneous horn	1
kerratoderma blennorrhagicum	2
pseudoepitheliomatous hyperplasia	4
Hypertrophic scar	3
Keloid scar	3
Leukocytoclastic vasculitis	2
coagulative necrosis	1
Idiopathic calcinosis cutis (tumoral calcinosis)	4
Stasis dermatitis/ lipodermatosclerosis	2
Acanthosis nigricans	1
Vitiligo	1
Post inflammatory hypopigmentation	1
Pruritic urticarial papules and plaques of pregnancy	1

Table no. 3: Clinico-histopathological correlation of skin biopsies

ICD Group	Total no. of skin biopsy cases with clinical diagnosis	Total no. of cases with clinic-histopathological correlation				Total no. of cases inconsistent with clinical diagnosis	Total no. of cases in which clinical diagnosis not provided
		Clinico-histopathological correlation with 1st diagnosis	Clinico-histopathological correlation 2nd differential diagnosis	Clinico-histopathological correlation 3rd differential diagnosis	overall clinic-histopathological correlation		
1	29	20 (68.96%)		-	20 (68.96%)	07 (24.13%)	02 (6.89%)
2	12	06 (50%)	02 (16.66%)	-	08 (66.66%)	04 (33.33%)	-
3	13	03 (23.07%)	02 (15.38%)	-	05 (38.46%)	08 (61.52%)	-
4	26	17 (65.38%)	05 (19.23%)	-	22 (84.61%)	03 (11.53%)	01 (3.84%)
5	01	01 (100%)	-	-	01 (100%)	-	-
6	03	03 (100%)	-	-	03 (100%)	-	-
7	04	01 (25%)	-	02 (50%)	03 (75%)	01 (25%)	-
8	15	13 (86.66%)	01 (6.66%)	-	14 (93.33%)	01 (6.66%)	-
9	27	17 (62.96%)	01 (3.70%)	01 (3.70%)	19 (70.37%)	09 (33.33%)	01 (3.70%)

Table no.4 showing completely discordant cases

Clinical diagnosis	Histopathological diagnosis	Total number of cases
Tubercular infection		
• Lupus vulgaris	Non specific dermatitis	1
• Tubercular verrucosa cutis	Non specific dermatitis	1
• Tubercular ulcer	Acute necrotizing lesion	3
• Tubercular abscess	Acute necrotizing lesion	2
• Tubercular ulcer	Ischemic inflammatory lesion with leucocytoclastic vasculitidis	1

Fungal infection • T. cruis, T. corporis • Generalized dermatophytosis • Sporotrichosis	 Non specific dermatitis Non specific dermatitis Chronic non specific inflammation	 1 1 1
Lichen planus	Morphea	1
Perforetrix folliculitis, lichen planus, dermatitis cruris pustulosa et atrophicus	Lichen striatus	1
Bowen disease	Lichenoid dermatitis	1
Lichen sclerosis of perineal region	Intraepidermal vesiculobullous lesion possibly of pemphigus group	1
Ganglion	Cutaneous horn	1
Dermatitis herpetiformis	Prurigo simplex Early psoriasis	1 1
Foreign body granuloma	Chronic non specific inflammation	1
Cyst	Pseudoepitheliomatous hyperplasia	1
Cellulitis	Bullous pemhigoid Chronic non specific inflammation	1 1
Verruca plana	Lichen planus like keratosis	1

DISCUSSION:

Non neoplastic skin lesions can occur in any age group with varied clinical presentation and lesion is often biopsied by dermatologist to confirm the clinical diagnosis. In the present study 130 skin biopsies taken for non neoplastic skin lesions were studied. We found that non neoplastic skin lesions occurred in all the age groups with highest frequency in the young adults belonging to the age group of 21-40 years and gender wise distribution showed a male predominance. These findings are in concordance with the previous studies from India (3,4). However no gender predilection was reported by studies from other countries like Africa and Nepal (5,6).

In the present study, highest number of 29 cases (22.30%) belonged to Group 1 of Infections of skin and subcutaneous tissue with pilonidal sinus being the most common specific diagnosis in 14 cases (10.76%). Though a study from India by Jyoti singh rajput et al[3] reported infectious diseases of skin as the most common lesion, but in their study leprosy was the most common diagnosis among infectious diseases. In contrast to our findings, previous studies from India (4,7) and from Nepal (6) reported noninfectious erythematous papulosquamous/ lichenoid lesions as the most common disorder. Also in a study from Nigeria by Ogun GO[5] most cases belonged to the dermatitis/eczema group with non specific dermatitis being the most common specific diagnosis.

In the present study overall clinico-histopathological concordance for non neoplastic skin lesions was 73.07%, which is comparable with previous study from India (3). However other studies from India by Gupta I et al[8] and Umarji S et al[9] reported higher rate of clinicopathological correlation of non neoplastic skin lesions. This may be due to inclusion of cases whose clinical description matched with histopathological diagnosis as concordant by Umarji S et al[9].

In our study also, histopathological diagnosis in some discordant cases matched with the clinical description of lesions.

Pemphigus herpetiformis usually present as erythematous papules or plaque over extremities and trunk. These lesions often grow in a "herpetiform" pattern with severe pruritus and clinically as resembles dermatitis herpetiformis (10). In the present study pemphigus herpetiformis was diagnosed in a 38 year old woman who presented with multiple elevated plaque and papule with necrotic center over bilateral forearm and legs. Her provisional clinical diagnosis was dermatitis herpetiformis. However histopathological examination revealed presence of subcorneal pustule (blister) with eosinophilic-neutrophilic infiltrate and spongiosis.

In present study prurigo simplex (PS) was diagnosed in a 43 year old female who had history of itchy lesions over upper extremities and provisional clinical diagnosis was dermatitis herpetiformis (DH). In both PS and DH lesions are extremely itchy, show symmetric distribution over extensor surface of extremities, neck and buttocks however grouping of lesions is not seen in PS (11). Histopathological examination in dermatitis herpetiformis show neutrophilic infiltrate with formation of microabscess in dermal papillae along with subepidermal blister. However microscopic examination in our case showed focally ulcerated epidermis with parakeratosis, acanthosis and mild spongiosis along with perivascular lymphohistiocytic infiltrate in the dermis which suggested diagnosis of PS.

In present study pseudopelade of Brocq (PPB) was diagnosed in a teenage girl who presented with alopecia, multiple patches of hair loss, scaling over few areas of scalp. However her provisional clinical diagnosis was Lichen planopilaris (LPP). LPP and PPB both causes scarring alopecia and may resemble each other but there are some subtle differences in their presentation and in microscopy. In both conditions patients present with itching and burning sensation in scalp along with scaling and flaking. However due to lack of inflammation in PPB scalp appear normal in color with irregular patches of hair loss. In cases of LPP there may be redness in scalp and around hair follicle. On microscopy PPB show preserved elastic fibres whereas in LPP elastic fibres are destroyed (12).

In present study two cases of chronic non healing leg ulcer showed features of leukocytoclastic vasculitis. Vasculitis or other autoimmune diseases contribute 20-23% of cases of chronic non healing leg ulcer (13). Though these patients usually presents with purpuric papules over lower limbs but sometime they can also present with necrotic or ulcerated lesions.

In two cases of pseudoepitheliomatous hyperplasia, male patients presented with non healing ulcer over lower extremity with provisional diagnosis of squamous cell carcinoma. Histopatho logically also pseudoepitheliomatous hyperplasia can mimic squamous cell carcinoma and distinguishing these two conditions is not always easy (14). Certain histopathological features like width of strand and degree of cytological atypia can help in reaching final diagnosis. In cases were definitive diagnosis is not possible, studying expression of MMP-7,MMP-13, MMP-12 and MMP-19 can be helpful (15).

The provisional clinical diagnosis in a case of pemphigus foliaceus was psoriasis vulgaris. The patient presented with multiple erosions and crusting following vesicular eruption over lower limb and histopathological examination revealed subcorneal blister, acantholysis along with inflammatory infiltrate. Systematic review by Kridin K. et al[16] showed a significant association between pemphigus and psoriasis. In some cases pemphigus foliaceus developed over pre existing psoriasis whereas in other cases these two disease occurred simultaneously (16). In our study repeat biopsy was advised from other site to rule out coexisting psoriasis however second sample was not received.

In case of lichen striatus a 35 year old woman presented with multiple hyperpigmented papules, nodules with pustules and abscess over bilateral legs and her provisional clinical diagnosis was lichen planus or perforating folliculitis. On microscopy the biopsy showed acanthosis, focal hyperkeratosis, parakeratosis and lymphohistiocytic infiltrate surrounding dermal blood vessels, hair follicles and eccrine gland, thereby giving diagnosis of lichen striatus. Though Lichen striatus usually occur in children it may occur occasionally in adults (17). The lesions most frequently appear over legs and arms as flesh colored or erythematous papules. Quite often these papules coalesce to form hyperpigmented linear band. Lichen planus is its close differential diagnosis.

In our study most common cause of totally discordant cases was clinical suspicion of tubercular and fungal infection. Microscopic examination did not reveal histologic features specific to tubercular or fungal infection. Also special stain like Zeihl Neelson and PAS were negative for Acid fast bacilli and PAS positive fungus. Other discordant cases are shown in table no. 4

Histopathological diagnosis in a case of cellulitis of lower limb was bullous pemphigoid. Review of literature showed one reported case of bullous pemphigiod diagnosed as cellulitis of upper limb by Ivyanskiy I et al[18].

Availability of clinical details helped general pathologist in diagnosing non neoplastic skin lesions especially in those cases where histopathological diagnosis did not match with the list of differential diagnosis.

CONCLUSION:

Our study highlights that higher clinic-histopathological concordance can be achieved by providing detailed clinical history in cases of non neoplastic skin lesions.

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