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Research Article

CONCURRENCE OF CLINICAL DIAGNOSIS WITH HISTOPATHOLOGICAL EXAMINATIONS IN A SPECTRUM OF SKIN CONDITIONS: A PROSPECTIVE STUDY

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A B S T R A C T

Background: Clinical examination may suffice in making diagnosis of most dermatologic disorders but histopathological examination is often required to confirm the diagnosis and further categorize the lesions. We have carried out this study to analyse the demographic and histomorphological characteristics of skin lesions, to determine the frequency of various dermatological disorders in the region and to evaluate the agreement between clinical and histopathological diagnosis.
Methods: Punch biopsies of skin lesions received in histopathology section, were included in the study. Cases over a period of 9 months were analysed. Clinical details were recorded and histopathological analysis done. Special stains were applied wherever required.
Results: Of the 120 cases studied, maximum cases fell in the category of 31-40 years, with male predominance. We observed wide variety of non-neoplastic and neoplastic lesions. Non Infectious diseases were the most common of all pathologies. Lichen Planus was the most common histopathological diagnosis. Complete clinicopathologic correlation was seen in 51.67% of cases while partial correlation was noted in 23.33% making a total of 75%. 25% histopathological diagnosis were inconsistent with the clinical diagnosis.
Conclusions: Histopathology is a gold standard investigation and plays a very important role in confirmation of clinical diagnosis of various
skin lesions. Punch biopsy is a relatively easy outpatient procedure to perform.

INTRODUCTION

Skin is the largest organ of the body. It is a complex organ which plays many vital functions including defence via various immune mechanisms. 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 itsappendages), the dermis, and the hypodermis1. Besides having an aesthetic role, skin acts as a line of defence in our immune system, provides protection against ultraviolet radiations and helps in sensory perception.

Many diseases affect the skin viz. neoplastic, non-neoplastic lesions. Neoplastic lesions include the inflammatory, benign and malignant lesions of the epidermis and dermis. The non neoplastic lesions encompass a wide variety of lesions like Genodermatoses, Non-infectious erythematous and papulosquamous lesions, Vascular disorders,

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Non-infectious vesicobullous and vesicopustular diseases, Connective tissue diseases, Infectious diseases, Inflammatory diseases of skin adnexa, Non-infectious granuloma, Cutaneous Toxicities of Drugs, Degenerative Diseases and Perforating Disorders,
Inflammatory Diseases of subcutaneous fat, Histiocytosis, Pigmentary disorders etc1. Due to varied and diverse presentations of the dermatoses, during the early 19th century dermatology evolved as a separate branch2. Many skin diseases can be diagnosed in no time, by their unique clinical signs and symptoms but in many cases additional investigations become mandatory for the diagnosis. Skin biopsy followed by histopathology remains the gold standard for the diagnoses of plethora of lesions encountered in skin opd1. A dermatologist makes a differential diagnosis based on the clinical signs and symptoms and skin biopsy is done, to be sent for histopathology. Skin biopsy is a relatively easy, convenient and most commonly practiced method in which a tissue piece is taken from an affected area by various methods like punch biopsy, shave biopsy, excision biopsy, wedge biopsy and sent to histopathology lab in 10% Neutral Buffered Formalin.

Punch biopsy is most widely used and relatively easy method where, a piece of lesional tissue is punched out using a disposable or sterilisable punch available in varying sizes. Non-facial lesions recommend a 4-mm punch; and a punch of 5 mm or more is needed in granulomatous and atypical

lesions2. It is advisable not to take biopsies less than 3 mm as vital features may be missed in such small biopsies. The punch biopsy site heals by secondary intention. In a biopsy, a fully developed lesion gives a better result than early or involuting lesion. In conditions like dermatitis herpetiformis, a shave biopsy is preferred as it provides a larger surface area. A biopsy with perilesional area is often ideal but it's not feasible in mucosal lesions. In lesions requiring direct fluorescence studies (e.g. Cutaneous LE, Dermatomyositis, vasculitides, LP), biopsy should be taken from lesional area1. Histopathology has an added advantage that it can be supplemented with immunohistochemistry especially in case of tumors and special stains can be applied, wherever needed e.g. Ziehl Nelsen stain for acid fast bacilli, Fitefaraco stain for lepra bacilli and Periodic Acid Schiff(PAS) stain and silver stains for demonstrating fungal elements3.

Histopathological diagnosis, which gives the definite diagnosis of the lesion, helps to assess the clinicopathologic consistency of various groups of lesions and to comprehend the entire dermatologic disease spectrum. In the present era, dermatopathology has become an indispensable tool for a clinical dermatologist to confirm a clinical diagnosis. Moreover tissue specimen sent for histopathology can be used to perform ancillary tests, special stain, immunohistochemistry and immunofluorescence. Prevalence and incidence of skin diseases shows regional variation. Disease distribution patterns vary from one country to anotherand various regionswithin.

MATERIALS AND METHODS

Present study is a prospective study which was done from July 2019 onwards over a period of 9 months till march 2020 in the histopathology section of Department of Pathology, Vinayaka Missions Medical College and Hospital. All the well preserved skin punch biopsies received in the department of pathology of our hospital were included in the study. A total of 120 cases were included in the study. The punch biopsies received in 10% neutral buffered formalin were subjected to routine processing using automated tissue processor. After dehydration, clearing and impregnation, paraffin wax sections with the embedded skinbiopsy were cut in microtome and 4 micron thickness sections were taken on glass slides. Staining with routine Haematoxylin and Eosin stain was done. Special stains like Ziehl Nielsen stain (for Acid Fast Bacilli), Fitefaraco stain for lepra bacilli and Periodic Acid Schiff(PAS) stain were applied wherever necessary as per the standard protocols3. Histopathological diagnosis was made by pathologists and microscopic findings were correlated with the clinical diagnosis. Based on the histopathological diagnosis, the cases were divided into 15 broad groups, namely Genodermatoses, non-infectious erythematous, papular and squamous diseases, vascular diseases, vesicobullous and pustular diseases, connective tissue diseases, inflammatory diseases of adnexal structures, infectious diseases, tumors and cysts of skin, histiocytosis, pigmentary disorders, degenerative and perforating disorders(perforating folliculitis), non-infectious granuloma, inflammatory diseases of subcutaneous fat, pigmentary disorders1. A category of nonspecific dermatoses was given to the cases in which nonspecific histopathologic findings were reported. Other demographic data including age, sex along with site of lesion, type of lesion, duration of symptoms, provisional clinical diagnosis was

recorded and analysed. The histopathological diagnosis given was matched with the single or multiple provisional clinical diagnoses made by the dermatologist and clinicopathologic consistency was evaluated. Cases were divided as being clinicopathologically consistent where the provisional diagnosis/diagnoses matched with the histopathologic diagnosis, clinicopathologically inconsistent where it did not match. Cases were labelled as partially consistent, where a specific variety of a dermatologic lesion was missed in the clinical diagnosis or authors found some another pathologic lesion in addition to the provisional clinical diagnosis. The collected data were fed into Microsoft Excel [2007] and analyzed using Statistical Package for Social Sciences [SPSS] version 21.0 Chicago, USA

RESULTS

A total of 120 cases were studied in the present study. Microscopic and clinical findings were observed, correlated and results were tabulated. Histopathological diagnoses were further divided into 15 broad groups. The age and sex distribution of the 120 cases is given in Table no.1. Maximum number of cases (%) belonged to the age group of 31-40 years age group followed by 21-30 years as depicted in Table 1. The age range recorded in our study was between 4 years to 80 years. Males were predominant in our study with a M:F ratio of 1.45:1. Amongst the various groups, we observed that female cases were seen more in cutaneous toxicity of drugs, tumors and cysts of skin and vascular lesions.

With regards to duration of illness in the various cases received, in 24 cases the patients came with a history of <1 month, 27 cases had a history of >12months (1 year), maximum cases

i.e.47 (39.16%) cases presented with a history of 1 to 6 months and 22 presented with a history of 6 to 12 months (table 3).

Table 1: Age and sex distribution.

Age group (Years)	Sex		Total	Percentage of age group (%)
	Female	Male		
<10	1	3	4	3.33
11-20	13	10	23	19.16
21-30	12	17	29	24.17
31-40	19	15	34	28.34
41-50	1	9	10	8.34
51-60	2	11	13	10.83
61-70	1	4	5	4.16
>70	0	2	2	1.67
Total	49	71	120	100
Percentage of sex	40.8%	59.2%		

Table 2: Histopathological findings and disease groups.

Group	Total cases in group (%)	Histopathological diagnosis	No. of cases	% of Histopathological diagnosis
Infectious diseases	10 (11.66%)	Leprosy	4	3.33
		Lupus vulgaris	4	3.33
		Mycetoma	1	0.83
		Tuberculosis verruca cutis	1	0.83
Non infectious erythematous, papular and squamous diseases	53 (40.83%)	Lichen planus pigmentosus	5	4.16
		Lichen planus	43	35.83
		Lichen pilopilaris	1	0.83
		Lichen nitidus	1	0.83
		Psoriasiform dermatitis	1	0.83
		Pustular psoriasis	2	1.66
Connective tissue diseases	13 (10.83)	Morphea	9	7.5
		Keloid	1	0.83
		Hypertrophic lupus erythematosus	1	0.83
		Discoid lupus erythematosus	1	0.83
		Systemic sclerosis	1	0.83
Tumors and cysts of skin	12 (10%)	Angiolipoma	1	0.83
		Basal cell adenoma	1	0.83
		Basal cell carcinoma	1	0.83

		Capillary haemangioma	1	0.83
		Dermoid cyst	1	0.83
		Pilomatricoma	1	0.83
		Sebaceous cell adenoma	1	0.83
		Sebaceous cyst	1	0.83
		Seborrhoeic keratosis	1	0.83
		Syringocystadenoma papilliferum	1	0.83
		Trichilemmal cyst	1	0.83
		Trichoepithelioma and granulomatous pathology	1	0.83
Non infectious vesicobullous and vesicopustular diseases	5 (4.16%)	Pemphigus vulgaris	2	1.66
		Pemphigus foliaceous	1	0.83
		Follicular eczema (atopic dermatitis)	1	0.83
		Bullous pemphigoid	1	0.83
Vascular diseases	2 (1.66%)	Leucocytoclastic vasculitis	4	3.33
		Calciphylaxis	1	0.83
Genodermatoses	3 (2.5%)	Hailey hailey disease	2	1.66
		Congenital icthysoform erythroderma	1	0.83
		Epidermolysis bullosa aquisita	1	0.83
Cutaneous toxicities of drugs	3 (2.5%)	Acute generalized exanthematous pustulosis with folliculitis	1	0.83
		Drug induced lupus erythematosus	1	0.83
		Pmle with focal pustule	1	0.83
Inflammatory diseases of skin adnexa	3 (2.5%)	Folliculitis	1	0.83
		Keratosis pilaris	1	0.83
		Rhinophyma	1	0.83
Histiocytoses	1 (0.83%)	Xanthelasma	1	0.83
Degenerative diseases and perforating disorders	1 (0.83%)	Perforating folliculitis	1	0.83
Inflammatory diseases of subcutaneous fat	1 (0.83%)	Panniculitis	1	0.83
Non infectious granuloma	1 (0.83%)	Granuloma annulare	1	0.83
Pigmentary disorders	1 (0.83%)	Congenital melanocytic nevus	1	0.83
Non specific dermatoses	7 (5.83%)	Descriptive morphology	7	5.83
Total	120	Total	120	100.00

Table 3 Association between duration of illness and no of case.

Sl No	Duration Of illness	No of cases
1	< 1 month	24
2	1-6 months	47
3	6-12months	22
4	>12 months	27
Total		120

Table 4 Type of lesions and no of cases.

Sl No	Type of Lesions	No of cases
1	Plaques	36
2	Macules	21
3	Papules	21
4	Nodules	9
5	Localized swelling	9
6	Bullae and vesicles	8
7	Sensory loss	6
8	Thickened skin	4
9	Ulcerated lesions	4
10	Localised pigmented lesion	1
11	Verrucous lesion	1
TOTAL		**120**

The patient presented with lesions that was of following types , plaques (36 cases), macules (21 cases), papules (21 cases), nodules (9 cases), localized swelling (9 cases), bullae and vesicles (8 cases), sensory loss (6 cases), thickened skin (4 cases), ulcerated lesions (4 cases) localized pigmented lesion (1 case) and verrucous lesion (1 case) (Table 4).

Sensory loss was clinical feature seen in leprosy cases and in a case of systemic sclerosis, while swelling was clinically seen in most tumors and cysts of skin and in a lesion of rhinophyma. Thickened skin was a feature of morphea cases. Table 2 reveals the distribution of cases based on the histopathological diagnosis and their distribution. Out of 120 cases, definite diagnosis was given in 113 cases while in 7 cases, non-specific histologic findings were described (Non-specific dermatoses). The frequency of various diagnosis shows a wide variety of neoplastic and non-neoplastic lesions. We observed 47 varieties of lesions in our experience (Figure 1-5) which we further divided into 15 broad groups1 as depicted in Table 2. In this study, maximum cases on histopathological spectrum belonged to the noninfectious diseases group (40.83% of all cases). Maximum number of cases were of lichen planus (35.83% of all noninfectious diseases)(Figure 6) followed by lichen planus pigmentosus, pustular psoriasis, lichen pilopilaris, lichen nitidus and psoriasiform dermatitis.

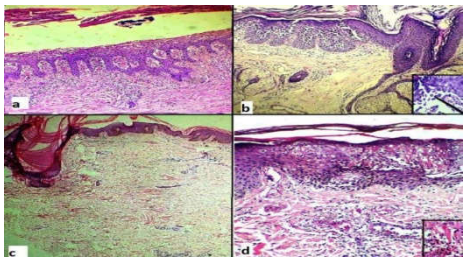

Figure 1 H&E stained sections,

a) Pustular psoriasis ,munromicroabscess,
b) Hailey Hailey disease, dilapidated brick wall appearance,
c) Keratosis pilaris, Plugged hair follicle with orthokeratin.
d) Leucocytoclasticvasculitis , Perivascular neutrophilic infiltrates and leucocytoclasis.

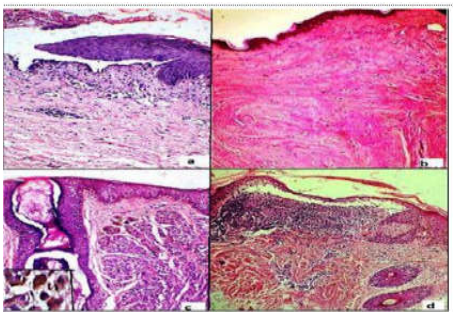

Figure 2 H&E stained sections

a) Pemphigus vulgaris ,intraepidermal blister in Suprabasal plane.
b) Morphea , absence of adnexa and presence of fibrosis and collagen.
c) (c) Congenital melanocytic nevus,group of nevus cells.(d) Lichen nitidus, dense infiltrate of Lymphocytes ,histiocytes in dermal papillae.

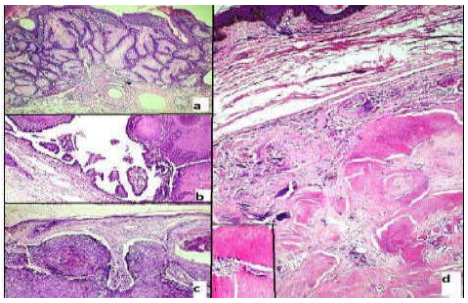

Figure 3 H&E stained sections tumorous lesions,

a) sebaceous cell adenoma
b) Syringocystadenomapapilliferum,
c) Basal cell carcinoma
d) Pilomatricoma (shadow cells).

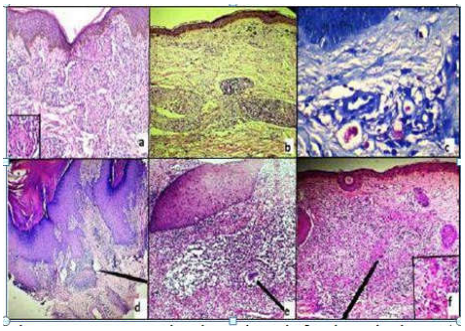

Figure 4 H&E stained sections infectious lesions,

a) Tuberculoid leprosy, subepidermal Granulomas and langhans giant cell,
b) Lepromatous leprosy, sheets of foamy macrophages in dermis. Fitefaraco stain for lepra bacilli,
c) Tuberculosis verrucose cutis , acanthosis and hyperkeratosis ,
d) Mycetoma , sulphur granules in granulation tissue,
e) Lupus vulgaris .

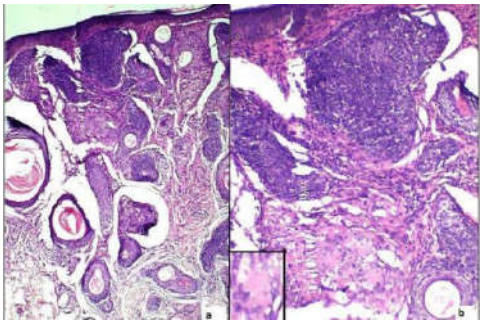

Figure 5 H&E stained sections scanner and low power view of a rare Case presentation of trichoepithelioma with granulomatous pathology, groups of basaloid cells and epitheliod cells.

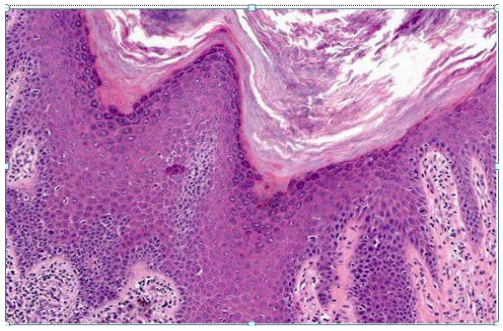

Figure 6 H&E stained sections showing wedge shaped hypergranulosis, hyperkeratosis and sawtoothed rete ridges representing hypertrophic lichen planus.

With regard to the consistency with the diagnosis between dermatologist and pathologist, it was observed that out of 120 cases, about 51.67% of cases showed complete clinicopathologic consistency. 23.33% of the cases showed partial clinicopathologic correlation. Most of these cases belonged to leprosy where there was discrepancy in the specific diagnosis in the spectrum of leprosy lesions (tuberculoid to lepromatous). One case is worth mentioning (Figure 5), where a provisional diagnosis of trichoepithelioma was given, histopathological findings aided in identifying additional finding of granulomatous pathology in the same lesion. In another case, a diagnosis of lichen planus pigmentosus was given clinically diagnosed as eruptive lichen planus. In about 25% of the cases, the clinical diagnosis was inconsistent with the histopathological cases. So overall 75% of cases were either consistent or partially consistent.

DISCUSSION

Spectrum of dermatological lesions in our country is influenced by a variety of factors like climatic conditions, availability of clinics or health care facility, socio economic status, literacy status and cultural factors. The age and sex distribution of the 120 cases revealed that maximum number of cases (28.34%) belonged to the age group of 31-40 years age group followed by 21-30 years (24.17%). The youngest patient in our study was 4 years old and the eldest, 80 years old, both being males. This is similar to studies by Rohit *et al* where also, the most common age groups were 30-39 years (26.67%) and 20-29 years (23.33%), another study by Kumar *et al*, with most common age groups 21-30 years (22%) and 31-40 years(19.8%), Study by Reddy *et al*, with maximum cases in 31 to 40 years age group(23.75%), and a study by Bajaj *et al*, with most common age group being 21-30 years followed by 31-40 years[3-5]. A contrasting result is seen in a cross sectional study by Grover *et al*, with maximum cases in 11-20 age group6. Also, males were predominant in this study with a M:F ratio of 1.45:1. The findings are similar to studies by Bajaj *et al* (1.29:1), Rohit *et al* (1.72:1), Kumar *et al* (1.56:1), D Costa *et al* (1.38:1).5,7, In this study maximum clinical lesions presented as plaque like lesions, similar to finding by study of Bajaj *et al*5. In this study, with respect to duration of illnesses, 39.16% of cases presented with a duration of 1- 6 months in agreement with the study of Vaghela *et al* where also, most cases (44%) presented within 0-6 months7.In this study we observed that maximum number of cases i.e. 49 (40.83%) cases in the non infectious diseases group out of which lichen planus cases comprised the most number of cases (35.83%, 43 cases). Second most common group was that of connective tissue disorders (10.83%;13cases),) with morphea (7.5%;9cases) being the predominant lesion. Third most common group was infectious diseases (11.66%;10cases).Infectious disorders have comprised 23% to 64 % of skin dermatoses among Indian population in various studies[2]. Vesicobullous lesions were less common in our study with 5 (4.16%) reported cases.In, a study of Non neoplastic skin lesions by Vaghela *et al* in Gujarat, most common lesion was observed to be inflammatory disease of the dermis and epidermis (51%), while infectious diseases of skin (25%) was the second most common. Bharambhe *et al*, carried out a study of non-infectious erythematous and papulosquamous lesions, where lichenoid lesions (46.57%) and psoriasis (19.88%) were the most common diagnosis on histopathology, this is in coherence with the distribution of papulosquamous lesions in this study[7,9]. In contrast, another study on the non-infectious erythematous papulosquamous lesions, by Reddy *et al*, most common histopathological diagnosis was Psoriasis(42.5%) followed by Lichen planus. Similar findings were observed by Rohit *et al*, where psoriasis was commoner lesion than lichenoid lesions amongst the category of papulosquamous lesions[4]. In terms of clinicopathologic consistency, authors found about 51.67% of cases showed complete clinicopathologic consistency and 23.33% of the cases showed partial clinicopathologic correlation, while 25% cases had histopathologic diagnosis inconsistent with the clinical diagnosis. So, overall, 75% cases had either consistent or partially consistent correlation with the clinical diagnosis. This is similar to a study by Bajaj *et al* where they found clinicopathologic consistency to be 75.34% for all the skin lesions and 84.8% for thenon neoplastic lesions. Aslan *et al* reported 76.8% cases having positive histopathologic correlation. This is in confirmation with this study10. In a study conducted in Indore by Sarang *et al* clinicohistopathological correlation was seen in 43.98% cases which is lesser as compared to thisstudy.

CONCLUSION

Present study, to our best knowledge is the first study in Karaikal region which tried to explore and characterize the various dermatological lesions encountered in skin opd. It included 120 punch biopsies and histopathological studies

revealed a wide spectrum of dermatological lesions of about 47 varieties which is representative of the spectrum oflesions seen in this region. 51.67% of the diagnosis were consistent with the clinical diagnosis, while, 25% cases were inconsistent with the clinical diagnoses. This emphasizes the role histopathology plays in coming to a definite diagnosis in various skin lesions. Maximum number of cases was in the age group 31-40 years, with males predominating. Maximum number of cases were from the broad group of non infectious diseases, lichen planus being the most common non infectious disease, which is similar to other similar Indianstudies.

Histopathology of skin biopsy is an essential and gold standard method for diagnosing various neoplastic and non neoplastic skin lesions. Punch biopsy is a relatively easy method of taking skin biopsy samples. Routine histopathological examination is very useful in making the diagnosis and it can also be supplemented with other ancillary tests like special stains, immunohistochemistry, immunofluorescence to increase the diagnostic efficacy in well equipped centers.

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