

Clinical and histopathological analysis of skin biopsies at a tertiary care hospital

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Abstract

Background: A large number of Skin conditions that might present to a dermatologist in daily practice ranging from acute to chronic. Majority of these can be quickly diagnosed. However some of these need time consuming investigation to confirm the clinical diagnosis. skin biopsy probably is the most commonly used ancillary aid to confirm clinical diagnosis. Prevalence of skin diseases varies from country to country and various regions within the same country. The skin lesions among the patients can be classified into various categories according to the morphology and can be confirmed by histology of skin biopsy. **Objective:** To analyse the clinico-histopathological pattern of various lesions of skin and to determine the agreement between clinical and histopathological diagnosis. **Methods:** A total of 60 cases of skin lesions were enrolled for the study. Clinical diagnosis was correlated by histopathological examination with H and E stain. Special stains were used as an when required. **Results:** Maximum number of cases showed infectious diseases consisting 23(38.33%) cases of all skin biopsies followed by non-infectious erythematous, papular and squamous diseases consisting of 15 (25%) cases, connective tissue diseases and biopsies having non-specific histology constituted 7 cases each (11.67%). Among non-infectious group, there were 4 (6.66%) cases of vesiculobullous and vesiculopustular diseases, and had 2 cases (3.33%) of genodermatoses. 1 case each from the group of folliculitis and cutaneous manifestation of gastrointestinal disease were seen. **Conclusion:** The overall accuracy of the clinical diagnosis depends upon the clinical and histopathological correlation and skin biopsy is clearly a worthwhile investigative procedure. Infectious diseases were the most common cutaneous diseases in our region.


Key Words: Biopsy, Histopathology, Infectious disorders, Skin lesions.

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INTRODUCTION

Dermatology evolved as a separate branch of medicine during early 19th century. Many skin diseases can be quickly diagnosed by their clinical features and need little or no investigations. On the other hand some patients need detailed and time consuming investigations to

confirm the diagnosis¹ There are clinically more than 2000 different skin conditions that might present to the dermatologist from neonate to old age. The conditions vary enormously in severity and extend ranging from cosmetic problems such as dry skin through a huge variety of acute and chronic diseases². The most common investigations performed in dermatology clinic other than simple blood tests and swabs, skin biopsies probably is the single most important diagnostic ancillary technique used for the management of patients with skin disorders.

Skin Biopsy: The technique of skin biopsy is relatively simple, fast and can be done at little inconvenience to the patient and thereafter the entire spectrum of diseases can be correlated clinically and histo-pathologically. Biopsy submitted without differential diagnosis is less likely to be successful in supporting a definitive diagnosis. Histological examination of a fully developed lesion will give more information than examination of an early or

involuting lesion³. Various skin biopsy techniques are punch biopsy, shave biopsy, excision biopsy and incision biopsy.

Interpretation of Skin Biopsies⁴: If a logical approach is adopted the great majority of skin biopsies can be diagnosed specifically and remaining can be partly categorized in a particular group of disease. 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. Various tissue reaction patterns are the lichenoid reaction pattern, the psoriasiform reaction pattern, the spongiotic reaction pattern, the vesiculobullous reaction pattern, Granulomatous reaction pattern (further divided into Sarcoidal, Tuberculoid, Necrobiotic, Suppurative, Foreign body granuloma) Vasculopathic reaction pattern (i.e. Neutrophilic vasculitis, Granulomatous vasculitis, Neutrophilic dermatoses). Various patterns of inflammation can be discerned in biopsies characterized on the basis of distribution of inflammatory cells within the skin. These are superficial perivascular inflammation, superficial and deep dermal inflammation and Panniculitis.

MATERIALS AND METHODS

A hospital based prospective observational study were done on skin biopsies of 60 patients with skin lesions. Skin biopsies which did not include the full depth of dermis together with a portion of subcutaneous fat were excluded. The present study was carried out on 60 untreated cases with one or more clinical diagnosis presenting at the Department of Dermatology, of a Tertiary Care Hospital, Jaipur from 2015 to 2016 who were biopsied for histopathological confirmation of clinical diagnosis. A detailed clinical history was recorded for each patient with particular reference to age, sex, duration of symptoms, mode of onset, characteristics and anatomic distribution of the lesions and associated symptomatology and this was recorded in a proforma prepared for then purpose. Gross photographs were taken of some of the lesions and then biopsy was taken after informed consent. Cases suspected to be having neoplastic skin diseases were also excluded from the study. The specimen was immediately put in 10% buffered formalin for fixation. A systematic analysis of the biopsy was done starting form keratin layer, epidermis, dermo-epidermal junction, the superficial and deep dermis, the fat and finally the blood vessels.

Histomorphological observations were recorded and histopathological diagnosis was made wherever possible. These findings were then correlated with clinical diagnosis. Paraffin embedded tissue sections were used.

Staining Techniques: All the sections were studied after staining with Mayer’s Hematoxylin and Eosin (HandE) stain⁵. All sections of skin biopsies diagnosed clinically as leprosy were stained with modified Fite’s stain⁶ to demonstrate Mycobacterium leprae. Some of the biopsies were stained by Ziehl-Neelsen (ZN) stain⁵ for Mycobacterium tuberculosis. When required the biopsies were stained for Gram’s Stain⁵for demonstrating organisms. For demonstration of collagen, sections are stained with Van Gieson’s stain⁵

OBSERVATION AND RESULTS

The following observations were made of the 60 cases studied. Histomorphological observations were recorded and histopathological diagnosis was made wherever possible. These findings were then correlated with clinical diagnosis.

Table 1: Distribution of cases according to age

Age (in years)	No. Of cases	Percentage
0 – 9	1	1.67
10 – 19	12	20.00
20 – 29	14	23.33
30-39	16	26.67
40-49	8	13.33
50-59	7	11.67
60+	2	3.33
Total	60	100

Table 2: Distribution of cases according to sex

Sex	No. of Cases	Percentage
Male	38	63.33
Female	22	36.67
Total	60	100

Table 3: Distribution of cases according to histopathological diagnosis group

Group	No. of Cases	Percentage
Infectious diseases	23	38.33
Non-infectious erythematous, papular and squamous disorders	15	25.00
Connective tissue diseases	7	11.67
Non-infectious vesiculobullous and vesiculopustular disorders	4	6.66
Genodermatoses	2	3.33
Cutaneous manifestations of	1	1.67
Gastrointestinal diseases	1	1.67
Folliculitis / panniculitis	1	1.67
Non specific dermatoses	7	11.67
Total	60	100

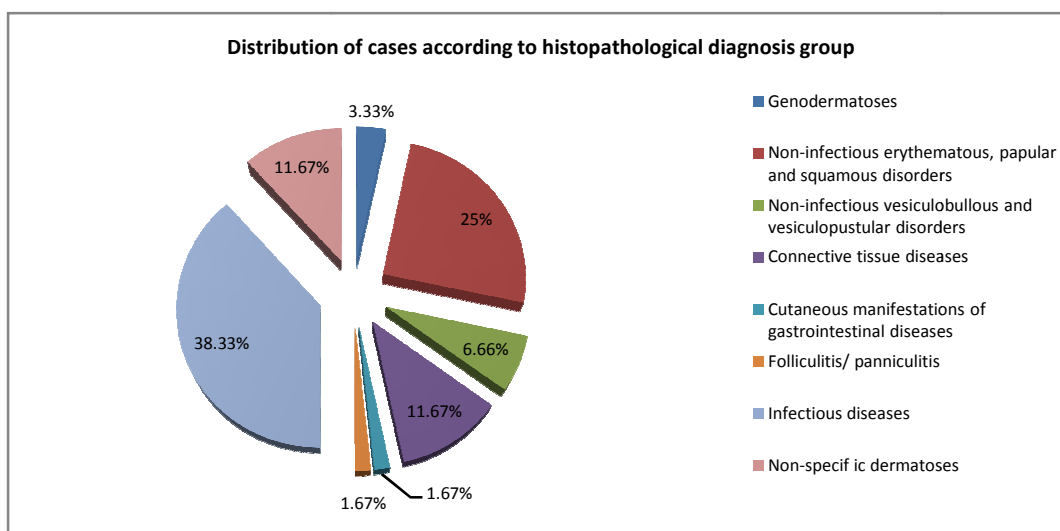


Figure 1: Age and sex distribution

Out of sixty cases maximum number of cases were in the age group of 30-39 yrs (26.67%) closely followed by age group of 20-29yrs (23.33%) and 12 cases (20%) were in the age group 10-19 yrs. Least number of cases were from the age group of 0-9 yrs i. e. 1.67% of total cases. The youngest patient was 8 year old while the oldest patient was 68 years old (Table-1). The sex distribution pattern revealed maximum number of cases were males 38(63.33%) and females 22(36.67% cases). (Table 2).

Distribution of cases according to group of disorders

Maximum number of cases showed infectious diseases i.e. 23 cases (38.33%) of all non-neoplastic skin biopsies followed by non-infectious erythematous, papular and squamous diseases consisting of 15 cases (25%), connective tissue diseases and biopsies having nonspecific histology constituted 7 cases each (11.67%). Non-infectious vesiculobullous and vesiculopustular diseases had 4 cases (6.66%) while 2 cases (3.33%) were of genodermatoses. 1 case each from the group of folliculitis and from cutaneous manifestation of gastrointestinal disease was seen (Table-3).

Table 4: Consistency between clinical diagnosis and pathological diagnosis

Group	No. of Cases	Percentage
Definite pathological diagnosis consistent with clinical diagnosis	36	60.0
Descriptive pathological diagnosis consistent with the clinical diagnosis	9	15.0
Definite pathological diagnosis inconsistent with the clinical diagnosis	8	13.33
Descriptive pathological diagnosis inconsistent with the clinical diagnosis	7	11.67
Total	60	100

Table 5: Distribution of cases according to duration of disease

Duration	No. of Cases	Percentage	Biopsy reports showing clinicopathological consistency N(%)	Biopsy reports showing clinicopathological inconsistency N(%)
0-6 Months	21	35	18 (85.71)	3 (14.29)
6 – 12 Months	12	20	8 (66.67)	4 (33.33)
> 12 months	27	45	19 (70.37)	8 (29.63)
Total	60	100	45 (75)	15 (25)

Clinical and Histopathological Correlation

Out of 60 cases examined, 36 cases (60%) were given definite pathological diagnosis consistent with the clinical diagnosis, whereas 9 cases (15%) had a descriptive

pathological diagnosis consistent with the clinical diagnosis, 8 (13.33%) cases had a definite pathological diagnosis inconsistent with clinical diagnosis while 7 cases (11.67%) had a descriptive pathological diagnosis

that was inconsistent with the clinical diagnosis. Overall clinico-histopathological consistency was there in 75% cases (Table-5). Duration of skin lesions was more than 1 year in 27 (45%) while cases with skin lesions of less than 1 year duration 33(55%). Cases with less than 6 months duration of lesions showed higher clinic-histopathological consistency as compared to cases presenting with longer duration of illness. Most cases had single clinical diagnosis 51 cases (85%) whereas 9 cases (15%) had more than one clinical diagnosis. Cases having single clinical diagnosis showed consistency in 74.50%, while cases having multiple diagnosis showed consistency in 77.78% cases. In the present series, the most common type of biopsy performed were punch biopsies in 39(65%) cases followed by excision biopsy in 18 (30%) cases and least were incision biopsies 3(5%) cases.

Table 6: Distribution of cases of infectious disorders

Type	Number of Cases	Percentage
Leprosy	18	78.26%
Cutaneous tuberculosis	2	8.69%
Actinomycosis	1	4.35%
Fungal infection	1	4.35%
Viral infection	1	4.35%

Out of 23 cases of infectious cases overwhelming majority of cases constituted of leprosy comprising of 18 cases (78.26%). 2 cases of cutaneous tuberculosis and one case each of actinomycoses, fungal infection and viral infection were observed.

Table 7: Distribution of cases of non-infectious erythematous, papular and squamous disorders

Type	Number of Cases	Percentage
Psoriasis	9	60%
Pustular Psoriasis	1	6.67%
Lichen Planus	4	26.66%
Lichen Planus Hypertrophicus	1	6.67%
Total	15	100

The most frequently encountered lesion among noninfectious erythematous, papular and squamous disorders was psoriasis constituting 60% of all the cases followed by lichen planus which constituted 26.66% of cases, one case each of pustular psoriasis and lichen planus hypertrophicus was also seen. Thus psoriasiform lesions formed the bulk with 66.67% of cases.

DISCUSSION

Skin biopsy is one of the most commonly used diagnostic tests in dermatology. To achieve accurate and rapid diagnosis, it is important to incorporate clinical description of the disease. Various studies observed that clinical diagnostic accuracy rates of dermatologists were significantly higher than those of physicians in other disciplines. Skin diseases in general population in various studies varies from 6.3% to 11.16%. The pattern of skin

diseases in India is influenced by the developing economy, level of literacy, social backwardness, climate, industrialization, access to primary health care, and different religious, ritual and cultural factors. The present study was prospective study carried out on 60 untreated cases of skin disorders presenting in the outpatient department of a tertiary care hospital at Jaipur. Maximum number of cases were found in the age group of 30-39 yrs i. e. 16 cases (26.67%) followed by 20-29yrs i. e. 14 cases (23.33%) and 12 (20%) cases were in the age group of 10-19 yrs. The youngest patient in the present series was 8 year old while the oldest patient was 68 years both of them being males. Aslan⁷ *et al* in their study in 2010 found mean age of their patients to be 46 ± 20 yrs. In the present series there were males (63.33%) and 22 females (36.67%). The male to female ratio was 1.72:1. Similarly D’Costa⁸ *et al* also found male preponderance in their study, they found that males constituted 57.94% while females were 42.06 % of total cases. An analysis of broad spectrum of the dermatological lesions revealed that maximum number of lesions were of infectious nature constituting 23 cases (38.33%) of all the cases followed by non-infectious papulosquamous disorders constituting 15 cases (25%). D’Costa⁸ *et al* also found that most number of cases in their study were of infectious nature comprising of 24.29% cases followed by papulosquamous disorders comprising of 20.56% of the total cases. The third largest group of skin disorders in the present study was of connective tissue disorders comprising of 7 cases constituting 11.67% similar to study by D’Costa⁸ *et al* found that connective tissue disorders along with eczematous dermatitis constituted third largest group in their study. Similar studies carried out by various authors have put the infectious disorders ranging from 23% to 64 % of skin dermatoses among Indian population. Out of 23 cases of infectious cases overwhelming majority of cases constituted of leprosy comprising of 18 cases (78.26%). 2 cases of cutaneous tuberculosis and one case each of action mycoses, fungal infection and viral infection were observed. D’Costa⁸ *et al* also observed leprosy to be single largest category of all dermatoses and also single largest group among infectious disorders. This may be due to the fact that distribution of various skin disorders vary from country to country and even across different parts within the same country. The second largest group of disorders in the present study was of papulosquamous disorders constituting 25% of all the cases. Similarly. D’Costa⁸ *et al* also found these to be commonest after infectious disorders. In contrast Bin Yap⁹ found papulosquamous disorders to constitute 7.7% of total cases. Out of the broad category of non infectious erythematous, papular and squamous disorders majority of cases were from psoriasiform dermatitis consisting of

10 cases out of 15 cases (66.67%), rest of the cases showed lichenoid pattern. Similarly D'Costa⁸ *et al* also found psoriasis to be the most common group among papulosquamous disorders followed by lichenoid pattern. However in another study by the same author in 2010¹⁰ of non infectious erythematous, papular and squamous lesions of the skin they found that lichenoid lesions were commonest followed by psoriasiform lesions. Psoriasis constituted 10 cases comprising of 73.33% of papulosquamous disorders and 16.67 % of overall cases. Out of 10 cases 9 (90%) cases were of psoriasis vulgaris while one case was of pustular psoriasis. D'Costa⁸ *et al* found psoriasis vulgaris in 81.58% of cases in a similar study. Five cases of lichen planus were seen in the present study constituting 8.33% of the total cases, out of these 5 cases 4 were of classical lichen planus (80%) and one case was of lichen planus hypertrophicus (20%). Similarly D'Costa⁸ *et al* in 2010 found that lichen planus was more common constituting 57.33% cases while lichen planus hypertrophicus constituted 18.67% of cases. The third largest group of skin dermatoses comprised of connective tissue disorders constituting 7 cases (11.67%) of total cases. D'Costa⁸ *et al* also found this group to comprise 6.54% of total cases while Bin Yap⁹ found them to constitute 6.0 % of their total cases. Out of seven cases 4 cases were of scleroderma with 3 cases of morphea (localized scleroderma) and one case of systemic sclerosis (systemic scleroderma). Three cases out of seven cases of connective tissue disorders were of discoid lupus erythematosus. 2 were males while one was female similar to study by Pandhi *et al*¹¹ who also found male preponderance. The next group of disorders seen was from the group of non infectious vesiculobullous and vesiculopustular disorders constituting of 4 cases (6.66%) while in the study carried out by D'Costa *et al*⁸ it constituted 3.72% of the total cases and Bin Yap⁹ found this group to constitute 1.5% of total cases. 2 cases were of pemphigus vulgaris while 2 were of subepidermal blisters with one case of pemphigoid and one of herpes gestationis. Collier and Wojnarowska¹² in 1997, Salmanpour *et al*¹³ in 2006 and Nurul Kabir *et al*¹⁴ in 2008 also found pemphigus vulgaris to be the most common blistering disorder. Single case of Pemphigoid lesion was also seen, clinically suspected to be of dermatitis herpetiformis. A single case of herpes gestationis was also seen in a 27 year old pregnant female clinically presenting with intense pruritic lesions over abdomen and lower extremities. The next group composed of 2 cases (3.33%) of genodermatosis out of total 60 cases similar to study by D'Costa *et al*⁸ who also found this group in 3.73% of cases. Out of two cases one was of ichthyosis vulgaris in 16 yr old male with lesions over abdomen and chest. One case each from broad

groups of folliculitis and from cutaneous manifestations of gastrointestinal diseases were also observed. While one case of keratosis pilaris was seen in the present series similarly D'Costa *et al*⁸ also found a single case of keratosis pilaris in their study. Overall in 88.33% cases histopathological examination was able to give diagnosis in the present series while D'Costa *et al*⁸ in their study found that histopathology was able to give diagnosis in 82.33% of cases, Rajaratnam *et al*¹⁵ were able to give a working diagnosis in 78% of cases when detailed clinical information was available to them and Bin Yap⁹ was able to achieve overall correlation in 92% cases. Thus a high level of clinicopathological correlation can be achieved when detailed clinical examination along with clinical diagnosis is available to the pathologist.

CONCLUSION

The present study was conducted on skin biopsies of 60 clinically diagnosed cases of skin disorder. Histological classification of these cases was done and then was correlated with the clinical classification. Middle aged adults constituted the major group of the present study with a preponderance of males. The analysis of cases revealed that maximum number of cases were from the broad group of infectious diseases followed by group of non infectious erythematous, papular and squamous disorders, followed by connective tissue disorders. Out of infectious disorders the largest numbers of cases seen were of leprosy, followed by cutaneous tuberculosis. Out of the broad group of papulosquamous disorders most cases were of psoriasis followed by lichen planus. Of the connective tissue disorders most cases were of scleroderma and rest were of lupus erythematosus. Of the 4 cases of non-infectious vesiculobullous and vesiculopustular disorders 2 cases were of intraepidermal bullae while 2 cases were of subepidermal bullae. Two cases of congenital disorders were also seen 1 each of ichthyosis vulgaris and epidermolysis bullosa. One case each of keratosis pilaris and Behcet's disease were seen. A proportion of cases constituting 11.67% of all the cases did not show a specific histological picture to be able to classified into a disease group. In large number of cases in the present study a definite pathological diagnosis consistent with the clinical diagnosis was possible. Along with the cases where descriptive pathological diagnosis consistent with the clinical diagnosis the present study was able to achieve a good overall clinicopathological consistency. Few of the cases had definite pathological diagnosis inconsistent with the clinical diagnosis, thus overall in a large number of cases histopathology was able to give a final diagnosis and in few cases histopathology was not able to provide a diagnosis. Overall in 88.33 % cases histopathology was able to

provide a final diagnosis. Based on the results, the following conclusions can be drawn:

1. Infectious diseases comprised of overwhelming diseases of nonneoplastic disorders.
2. Providing sufficient clinical descriptive knowledge increases the probability of an accurate diagnosis. The correlation between the pathologist and the dermatologist was high at 75%.

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