Clinicopathological Correlation of Noninfectious Erythematous Papulosquamous Cutaneous Lesions in a Tertiary Care Hospital

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Abstract

Aims and Objectives: Papulosquamous lesions, the largest conglomerate of skin diseases, are characterized by scaling papules and plaques which amount to lots of confusion, and hence, a definitive histopathological diagnosis has a significant role. Our study was thus aimed at evaluation of correlation between clinical diagnosis with histopathological diagnosis of different noninfectious erythematous papulosquamous skin lesions encountered in a tertiary care center. Materials and Methods: A total of 50 cases of noninfectious erythematous, papulosquamous lesions prediagnosed by dermatologists of the same institute were included over a period of 1 year. Diagnosis was confirmed by histopathological examination using hematoxylin and eosin stain. Cases were tabulated according to the distribution of age, gender, localization of lesions, clinical, and histopathological diagnosis. Results: Majority of the patients were in the 20–40 years age group (66%) with slight female preponderance (52%). The limbs (42%) were most frequently involved site. Histopathologically, lichen planus was the most common (52%) followed by psoriatic lesions (20%), pityriasis rosea (4%), pityriasis rubra pilaris (4%), subacute cutaneous lupus erythematosus (4%), prurigo simplex (4%), pityriasis lichenoides chronica (4%), urticaria (2%) and ashy dermatitis (2%). Correlation of clinical with histopathological diagnosis was positive in 92% cases and negative in 8% cases. Conclusion: The contribution of histopathology to the final diagnosis was significant. Skin biopsy is thus valuable in daily dermatology practice and appropriate clinicopathological correlation is very important for the effective diagnosis and treatment of patients.

Keywords: Clinicopathological correlation, cutaneous lesions, papulosquamous

INTRODUCTION

The skin, largest organ in the body, has a limited number of reaction patterns to pathological stimuli.[1] Therefore, clinically different lesions may show similar histological patterns. A proper histopathological study is considered the gold standard in diagnosing dermatological lesions, but it has its limitations and very often a definite specific diagnosis is not possible without clinical details. In these cases, correlation of histopathological findings with clinical findings makes a diagnosis possible.[2]

Papulosquamous diseases comprise the largest conglomerate of diseases seen by the dermatologist.[3] Lesions such as psoriasis and lichen planus mimic diverse dermatological conditions and pose to be a diagnostic dilemma for the clinician. In such diseases, studies are also lacking in India, and hence a histopathological study with clinical correlation will help the dermatologist in instituting proper therapy and can improve the prognosis significantly.

MATERIALS AND METHODS

An institutional-based cross-sectional observational study was conducted in a tertiary care center of West Bengal from February 2014 to January 2015 in the Department of Pathology in collaboration with Department of Dermatology. The work was initiated after obtaining ethical clearance from Institutional Ethical Committee and informed consent from the study population. A total of 50 cases were selected from the patients attending Dermatology outpatient department with a clinical diagnosis of erythematous papulosquamous lesion with the exclusion of cases with infectious etiology (eg, Tinea) and

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inadequate skin biopsies. Census method of sampling was used. Punch skin biopsy or excision biopsy was done by the clinician as indicated in the selected cases. Data was collected using a pre-designed, pretested, semi-structured schedule on dependent variables such as age of onset, duration of the disease, specific type of lesion, distribution of lesions, involvement of nail, mucous membrane, scalp, provisional clinical diagnosis and subsequent histological findings. Data was collected by interview, observations and laboratory techniques including histopathology.

**Histopathology**

Gross photographs of some of the lesions were taken before a punch or excision biopsy was done. 10% neutral buffered formalin was used as fixative. Excision biopsies were inked and sectioned. Microscopic sections of 2–3 μm thickness were obtained by microtome. Sections were stained by Hematoxylin and Eosin (H and E) and special stains were used as required. Skin biopsy specimens (measuring >3 mm in maximum dimension) along with the presence of both epidermis and dermis and absence of crush artifact were taken as adequate for histological examination.

Histological parameters:

- Epidermal changes: Hyperkeratosis, parakeratosis, hypergranulosis, basal layer vacuolation, abscess formation, elongation of rete ridges, atrophy.

Dermal changes: Inflammatory infiltration, pigmentation, vascular changes, exocytosis of red blood cells (RBCs).

**RESULTS**

Noninfectious erythematous papulosquamous disorders comprised 0.8% of the total surgical pathology load of the department and 6.9% of the total number of skin biopsies at our institute [Figure 1]. The age distribution pattern revealed that the maximum numbers of patients (66%) were seen in the 20–40 years age range with slight female predominance (52%). The anatomical distribution pattern of the lesions revealed extremities were involved in the maximum number of cases (42%) followed by the trunk (22%) head, neck and face (20%) and whole body (14%). Lichen planus constituted the highest percentage of cases (52%) followed by psoriasis (20%). Other lesions were pityriasis rosea (4%), pityriasis rubra pilaris (4%), lupus erythematosus (4%), prurigo simplex (4%), pityriasis lichenoides chronica (4%), urticaria (2%) and ashy dermatosis (2%).

Among the lichenoid group of lesions, lichen planus [Figure 2] was the most frequent (33.33%) followed by lichen planus pigmentosus (25%), lichen planopilaris (16.66%) [Figure 3], lichen striatus (8.33%) and an equal number of lesions of annular lichen planus (4.16%), lichen nitidus (4.16%), bullous lichen planus (4.16%) and oral lichen planus (4.16%).

Histopathological findings of clinically diagnosed cases of lichen planus and variants have been tabulated [Table 1].

| Lichenoid variant       | Histopathological findings                                 |
|------------------------|------------------------------------------------------------|
| Classical lichen planus| Compact orthokeratosis, wedge-shaped                        |
|                        | hypergranulosis, irregular acanthosis, vascular             |
|                        | alteration of the basal layer, band-like dermal             |
|                        | lymphocytic infiltrate, and civatte body                    |
| Lichen planus pigmentosus| Thinning of epidermis and pigmentary incontinence           |
| Lichen planopilaris     | Hourglass configuration of infundibulum                     |
|                        | Perifollicular fibrosis, and inflammation                   |
| Lichen striatus         | Focal parakeratosis, acanthosis, spongiosis                 |
|                        | with lymphocytes and histiocytes infiltrate, and            |
|                        | exocytosis of lymphocytes                                   |
| Lichen nitidus          | Mixed-cell granulomatous infiltrate confined to              |
|                        | a widened dermal papilla. Rete ridges extending             |
|                        | downward in a claw clutching a ball-like manner             |
| Bullous lichen planus   | Sloughing of epidermis with a focus of subepidermal bulla.   |
|                        | Bulla consists of neutrophils, lymphocytes, and eosinophils  |
| Oral planus             | Alternating areas of keratinization with the presence of    |
|                        | granular layer and atrophic epidermis                       |
| Nail lichen planus      | Inconclusive                                               |

**Table 2: Histopathological changes observed in lichen planus (n=24)**

| Histopathological changes | n (%) |
|---------------------------|-------|
| Epidermal changes         |       |
| Hyperkeratosis            | 17 (70.83) |
| Parakeratosis             | 2 (8.33) |
| Hypergranulosis           | 14 (58.33) |
| Vaccumulation of basal layer | 20 (81.33) |
| Acanthosis                | 17 (70.83) |
| Thinning of epidermis     | 5 (20.8) |
| Max Joseph spaces         | 1 (4.16) |
| Epidermal inflammation    | 3 (12.5) |
| Dermal changes            |       |
| Inflammation              | 22 (91.6) |
| Dermal pigmentation       | 13 (54.16) |
| Exocytosis of RBC         | 4 (16.66) |

RBC: Red blood cell
As far as contribution of histopathology to the diagnosis was concerned, histopathology confirmed the diagnosis in 92% of cases, gave the diagnosis in 4% of cases, and was noncontributory in only 4% of cases, thus emphasizing the importance and utility of histopathology in arriving at a conclusive diagnosis [Figure 1]. The noncorrelated cases include two cases of pityriasis rubra pilaris which was diagnosed on histology as psoriasis, and one each of erythroderma and nail lichen planus which were subsequently reported as chronic inflammation.

**DISCUSSION**

Papulosquamous diseases are usually characterized by scaling papules and plaques. This amounts to lot of confusion in clinical diagnosis, and hence, a definitive histopathological diagnosis goes a long way in treatment of such diseases.\(^4\)

### Table 3: Histopathological findings observed in psoriasiform lesions

| Psoriasis variants                        | Histological findings                                                                                                                                 |
|------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| Pityriasis rosea                         | Extravasated of RBCs, superficial perivascular dermal lymphocytes                                                                                      |
|                                          | Exocytosis of lymphocytes, mild acanthosis, areas of absent granular layer, and mounds of parakeratosis                                                  |
| Pityriasis rubra pilaris                 | Acanthosis with broad and short rete ridges, alternating orthokeratosis, and parakeratosis oriented in both vertical and horizontal directions with focal hypergranulosis |
| Pityriasis lichenoides                   | Dermal-epidermal junction is obscured, marked exocytosis of lymphocytes and erythrocytes, perivascular, and dense band-like lymphocytic infiltrate in the dermis |
| Et varioliformis acuta (Mucha-Habermann disease) | Superficial perivascular infiltrate composed of lymphocytes extending into the epidermis and confluent parakeratosis                                     |
| Pityriasis lichenoides chronica          | Superficial perivascular infiltrate composed of lymphocytes extending into the epidermis and confluent parakeratosis                                     |
| Urticaria                                | Interstitial dermal edema, perivascular, and interstitial mixed-cell infiltrate                                                                          |
| Lupus erythematosus                      | Squamatization of basal keratinocytes, follicular plugging, flattening of epidermis, dense lymphocytic infiltrate arranged along the dermal-epidermal junction, perifollicular, periappendageal, and in an interstitium. PAS stain highlighting the basement membrane thickening and tortuosity |
| Erythema dyschronicum perstans (ashy dermatis) | Perivascular infiltrate of lymphocytes and histiocytes intermingled with melanophages                                                                    |
Separation of each of these becomes important because the treatment and prognosis for each tends to be disease specific. In accordance with this a total of 50 clinically diagnosed cases of papulosquamous disorders were included in this study and subsequent skin biopsies were taken during February 2014 to July 2015. Non-infectious, erythematous, papulosquamous disorders comprised 0.8% of the total surgical pathology load of the department and 6.9% of the total number of skin biopsies at our institute. Similar study conducted by D’ Costa and Bharambe found it to constitute 15.8% of the total surgical pathology load and 30.99% of the total number of skin biopsies at their institute. This is concordant with the study conducted by Ozgur et al. where they showed that papulosquamous lesions comprised 14.3% of the total load of surgical pathology and 9.1% of total number of skin biopsies in their institution. In our study, lichen planus constituted the highest percentage of cases (52%) followed by psoriatic lesions (20%). This was in accordance with the study conducted by D’ Costa and Bharambe. where they found most frequently encountered lesion was the lichenoid group (46.57%), followed by psoriasiform lesion (23.6%). The study of Younas et al. also showed that the most common lesions were psoriasis (36.8%) and lichen planus (31.5%) and these findings were comparable to the present study.

Among the lichenoid group of lesions, lichen planus was the most frequent (33.33%) followed by lichen planus pigmentedosus (25%), lichen planopilaris (16.66%), lichen striatus (8.33%) and an equal number of lesions of annular lichen planus (4.16%), lichen nitidus (4.16%), bullous lichen planus (4.16%) and oral lichen planus (4.16%). This is corroborated with study of Parihar et al., who observed that classical lichen planus was the most common, constituting 61% of total cases followed by lichen planus pigmentedosus (27.5%) and lichen planopilaris (11.5%).

In the present study of 26 cases of lichen planus, clinical and pathological relation was seen in 24 cases (92.3% correlation). Two cases which did not correlate were clinically diagnosed with annular lichen planus and nail lichen planus. Similar study done by Reddy et al. and Boid et al. showed clinical and pathological correlation in 87.5%. However, Francis

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**Table 4: Histopathological changes observed in psoriasis**

| Histopathological changes       | Number of cases (n=9) (%) |
|---------------------------------|---------------------------|
| Epidermal changes               |                           |
| Hyperkeratosis                  | 7 (77.77)                 |
| Parakeratosis                   | 8 (88.88)                 |
| Hypogranulosis                  | 4 (44.44)                 |
| Micromunroabscess               | 4 (44.44)                 |
| Acanthosis                      | 8 (88.88)                 |
| Suprapapillary thinning         | 6 (66.66)                 |
| Vessel changes                  | 8 (88.88)                 |
| Inflammation                    | 8 (88.88)                 |
| Papillary edema                 | 3 (33.33)                 |

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**Figure 3:** Lichen planopilaris (a) Scarring alopecia over the scalp. (b) Photomicrograph showing perifollicular fibrosis and epithelial atrophy at the level of the infundibulum and isthmus forming characteristic hourglass configuration (H and E, ×100). (c) Van Gieson stain (verhoeff modification) (VG) highlighting perifollicular fibrosis (VG, ×400)

**Figure 4:** Psoriasis vulgaris (a) Erythematous plaques with silvery white scales. (b) Epidermis shows hyperkeratosis, parakeratosis with regular elongation of rete ridges, and suprapapillary thinning. The upper dermis shows capillary dilatation and inflammatory infiltrate (H and E, ×100)

**Figure 5:** Lupus erythematosus (a) Depigmented plaques with peripheral hyperpigmentation. (b) Photomicrograph shows hyperkeratosis with follicular plugging, dense lymphocytic infiltrate arranged along the dermal-epidermal junction, perifollicular, and periappendageal area (H and E, ×100). (c) Basement membrane thickening and tortuosity (PAS, ×400)
A. Ellis\(^9\) in 1967 studied histopathology of 100 cases of lichen planus based on biopsy specimens and showed 100% clinicopathological correlation.

The next category was of the psoriasiform lesions (9%) in which psoriasis vulgaris was the most frequent (44.4%). This was followed by palmoplantar psoriasis (33.3%) and pustular psoriasis (22.2%). Similar study by D’ Costa and Bharambe\(^1\) also showed that psoriasis vulgaris had the highest number of lesions (81.58%) within psoriatic lesion group.

In the present study comprising of nine cases of psoriatic lesions, 100% clinicopathological correlation was seen in contrast to Reddy et al. who observed 94.1%\(^5\) as well as Karumbaiah et al.\(^{10}\)

In the present study after lichen planus and psoriasis, remaining lesions constituted 26% cases. Among these lesions, pityriasis rubra pilaris constituted 3 (6%), purigo simplex 2 (4%) pityriasis rosea 2 (4%), lichen nitidus 1 (2%), pityriasis lichenoides 2 (4%), lupus erythematosus and erythoderma 1 (2%), erythema dyschromicum perstans and urticaria (2%) cases respectively which was quite similar to the study of Reddy et al.\(^5\)

An analysis of the clinical diagnosis with the histopathological diagnosis revealed a positive correlation in 92% of cases and a negative correlation in 8% of cases [Figure 1]. As far as contribution of histopathology to the diagnosis was concerned, histopathology confirmed the diagnosis in 92% of cases, gave the diagnosis in 4% of cases and was noncontributory in only 4% of cases, [Table 5] thus emphasizing the importance and utility of histopathology in arriving at a conclusive diagnosis, almost similar to the study results of D’ Costa et al.\(^1\) who reported 97.52% positive and 2.48% negative clinicopathological correlation. Moreover, their study confirmed the diagnosis in 92.55% of cases and gave the diagnosis in only 4.97%. It was not contributory in 2.48% of cases. Reddy et al. also showed clinicopathological correlation in 86.25% of cases.\(^5\) Chaudhary et al. found 68.72% positive and 31.28% negative clinicopathological correlation.\(^{11}\)

This study provides the correlation of clinicopathological data from Eastern part of India regarding papulosquamous lesions. All previous studies are either from Western or Southern India. In addition, few rare cases have also been reported such as coexistence of lichen planus and vitiligo in sunexposed areas. Cases with a family history of lichen planus and drug-induced erythroderma have also been reported in the study. Papulosquamous lesions mimic diverse dermatological diseases and create diagnostic dilemma because of the limited reaction patterns. Hence, a definite histological diagnosis with proper clinical details is mandatory to accurately diagnose such group of diseases.

**Conclusions**

Histopathological classification of the skin lesions into broad categories revealed that the lichenoid lesions (52%) were most frequently encountered followed by the psoriasiform lesions (18%) in the study. Correlation of clinical diagnosis with the histopathological diagnosis was positive in 92% of cases and negative in 8% of cases. It confirmed the diagnosis in 92% of cases and gave the diagnosis solely by histopathology in only 4%. It was not contributory in 4% of cases. Hence, the contribution of histopathology to the final diagnosis was significant.

Thus, emphasizing the role of clinicopathological correlation to see the two aspects simultaneously for the effective diagnosis and treatment of patients.

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**Conflicts of interest**

There are no conflicts of interest.

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**Table 5: Overall correlation of clinical diagnosis with histopathological diagnosis**

| Clinical correlation | Number of biopsies (%) |
|----------------------|------------------------|
| Positive            | 46 (92)                |
| Negative            | 4 (8)                  |
| Total               | 50 (100)               |

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