

# Histomorphological study of lichenoid dermatitides – A retrospective study



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## ABSTRACT

**Background:** Lichenoid dermatitis is a very common dermatological condition and is defined by features of basal cell damage and a dense band-like infiltration at the dermo-epidermal junction. There is a wide range of lesions included under this and the prototype lesion is Lichen Planus. **Aims and Objectives:** The aims of this study were to study the histopathological spectrum of the conditions with lichenoid tissue reaction and to find clinicopathological concordance of the lichenoid lesions. **Materials and Methods:** A retrospective study was conducted in a tertiary care center, where all the skin biopsy cases diagnosed clinically and/or histologically as lichenoid dermatitis for 2 years (2018–2019) were included in the study. Demographic details, clinical diagnosis, histological diagnosis, and the different histological features were collected from the respective case sheets and biopsy reports and entered in an excel worksheet. Frequency and percentages were used to represent the data. **Results:** A total of 47 cases were clinically diagnosed as lichenoid dermatitis, of which 38 cases showed concordance between clinical and histopathological diagnosis. Nine cases showed discordance between clinical and histopathological diagnosis and were categorized as lesions without lichenoid features. Seven cases were diagnosed as lichenoid dermatitis only on the histopathological study with an absence of such a differential diagnosis clinically. Out of the total 45 cases diagnosed as lichenoid dermatitis, 27 were lichen planus, five were lichen planus pigmentosus, four were hypertrophic lichen planus, three were lichenoid dermatitis, and two cases each of lichen planopilaris, lichen keratosis, and lichen sclerosis. Lichenoid dermatitis was seen commonly among the 41–50 years age group. Females were more commonly affected than males. **Conclusion:** Lichen planus is the prototype lesion among the lichenoid dermatitides. Definitive diagnosis of the specific entity among the lichenoid lesions is important as decision-making regarding the treatment modality and prognosis of the patient depends on it. Histopathological examination is vital for the definitive diagnosis, along with clinical correlation which concludes that clinicopathological correlation is the key.

**Key words:** Lichenoid dermatitis; Lichen planus; Band like infiltrate; Histopathology

## INTRODUCTION

Lichenoid dermatitis is the most commonly encountered lesion clinically and histopathologically in dermatology.<sup>1</sup> Lichenoid dermatitis/lichenoid tissue reactions are those which have epidermal basal cell damage that initiates a cascade of events that are recognized on histopathological examination.<sup>1</sup> Histologically lichenoid dermatitis is characterized by epidermal basal cell damage as liquefactive/

hydropic/vacuolar degeneration, along with a dense band-like inflammatory cell infiltrate comprised mostly of lymphocytes at the dermoepidermal (DE) junction. The epidermis shows acanthosis, elongation of rete-ridges, hyperkeratosis, and many other varying epidermal features.<sup>2,3</sup>

The morphological characteristics of lichenoid dermatitis are seen in a wide variety of skin diseases. The prototype skin lesion of this category is lichen planus. Lichen planus is the most common chronic dermatosis lesion and represents

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approximately 0.38% of all dermatological outpatients in India.<sup>3</sup> Although lichen planus is the prototype of lichenoid tissue reactions, it also includes lichen planus such as keratosis, lichen nitidus, lichen amyloidosis, lichenoid drug eruptions, lupus erythematosus, lichen striatus, keratosis lichenoides chronicus, lichen planopilaris, and hypertrophic lichen planus.<sup>4</sup>

The histological features of epidermal basal cell damage and a band-like inflammatory cell infiltrate at the DE junction are common for all lichenoid dermatitis, but all the skin diseases included under this category have a few specific features which aid in definitive diagnosis. In most circumstances, the clinical features help in diagnosis, but the definitive diagnosis is often by histological examination and is important in the management of the patient. In this study, we have aimed to study the histomorphological spectrum of lichenoid dermatitis in the local population.

### Aims and objectives

The aims of this study were as follows:

1. To study the histopathological spectrum of the conditions with lichenoid tissue reaction
2. To find clinicopathological concordance of the lichenoid lesions.

## MATERIALS AND METHODS

This was a retrospective study conducted in a tertiary care hospital. All skin biopsy cases diagnosed clinically and/or histologically as any of the lichenoid lesions for 2 years from 2018 to 2019 were used for the study, after getting approval from the Institute Ethics Committee (IEC) (Human studies), Indira Gandhi Medical College and Research Institute, Pondicherry with approval No. 41/308/IEC-30/PP/2020. Cases with insufficient tissue material and clinical details were excluded from the study.

The patient details and clinical diagnoses were obtained from the histopathology request form received with the skin biopsy sample. The histopathology slides were retrieved from the filed/archived material and in case of damaged or faded slides new sections were made from the respective paraffin blocks and the histopathological study was again performed.

The histopathological features were studied as epidermal changes and dermal changes. The epidermal changes are hyperkeratosis, parakeratosis, acanthosis, papillomatosis, atrophy, spongiosis, hypergranulosis, elongation of rete ridges, and basal cell degeneration. The dermal features studied included band-like inflammatory cell infiltrate at the DE interface, type of inflammatory cells, and melanin

incontinence. Based on these features, the definitive diagnosis of lichenoid dermatitis was made. The clinical diagnosis and histopathological diagnosis were compared.

### Statistical analysis

Statistical analysis was carried out for 47 cases. The data were entered into a Microsoft Excel sheet and expressed as percentages. The clinicopathological concordance and discordance were estimated.

## RESULTS

A total of 47 cases of clinically diagnosed lichenoid dermatitis were received during the study period, of which 38 cases showed that the clinical diagnoses were concordant with histopathological diagnosis, and nine were discordant with histological features not supportive of the clinical diagnosis. In addition, there were seven cases which were diagnosed as lichenoid dermatitis based purely on histopathological examination. With these cases, there were a total of 45 cases which were diagnosed as lichenoid lesions in our study (Table 1).

Out of 45 cases, 27 (62.2%) were female and 18 (37.7%) were male. Female predominance was observed in this study, with a male-to-female ratio of 0.6: 1. Lichenoid lesions were mostly seen in the 41–50 years age group. The youngest patient in this study was a 4-year-old male and the oldest patient was a 62-year-old female. From our study results, the most commonly affected patients were found to be in the 4<sup>th</sup> and 5<sup>th</sup> decade of life followed by the 2<sup>nd</sup> decade of life and 3<sup>rd</sup> decade of life, respectively (Table 2).

**Table 1: Clinicopathological correlation of lichenoid dermatitis**

Correlation	Number of cases	Percentage
Clinic-histopathological concordance	38	80.85
Clinic-histopathological discordance	9	19.14
Diagnosed solely on histological examination	7	-

**Table 2: The age and sex distribution of the cases**

Age group	Male	Female	Total	Percentage
1–10	2	1	3	6.66
11–20	2	0	2	4.44
21–30	4	7	11	24.4
31–40	4	6	10	22.2
41–50	5	10	15	33.3
51–60	0	3	3	6.66
61–70	0	1	1	2.22
Total	17 (37.7%)	28 (62.25%)	45	

Out of the 45 cases, 27 (60%) cases were classical lichen planus, 5 (11.11%) were lichen planus pigmentosus, 4 (8.8%) cases were of hypertrophic lichen planus, 2 (4.44%) cases each of lichen planopilaris, lichen keratosis, and lichen sclerosis. There were three cases (6.66%) which were reported as lichenoid dermatitis (Table 3).

The histopathological features of lichen planus and lichen planus pigmentosus are shown in Figures 1 and 2, respectively.

The histopathological examination showed various epidermal changes such as acanthosis, hyperkeratosis, orthokeratosis, and elongation of rete ridges. The dermal features noted were a band-like inflammatory infiltrate at the DE interface, a type of inflammatory cell infiltrate, and pigment incontinence into the dermis (Table 4).

Out of the 45 cases of lichenoid dermatitis, 38 were diagnosed as one of the lichenoid dermatitides; clinically, therefore, the histological and clinical diagnoses were in agreement. The remaining seven cases were diagnosed only on histology as follows: lichen planus (five cases), hypertrophic lichen planus (one case), and lichen sclerosis

(one case). The differential diagnoses for the above cases include morphea, pityriasis lichenoides chronicus, polymorphous light eruption, psoriasis, and fungal infection.

## DISCUSSION

Lichenoid tissue reaction refers to a papular lesion of the skin characterized by epidermal basal cell damage in the form of degeneration or cell death by apoptosis or necrosis. Lichenoid dermatitis includes a spectrum of various conditions. The classical prototype of the lichenoid dermatitides is lichen planus.

Our study was conducted to find the histomorphological spectrum of lichenoid dermatitides in our hospital cases and their concordance with the clinical diagnosis.

Table 3: Histomorphological spectrum of lichenoid dermatitis observed in the study	
Diagnosis	Number of cases (%)
Lichen planus	27 (60)
Lichen planus pigmentosus	5 (11.11)
Hypertrophic lichen planus	4 (8.8)
Lichen planopilaris	2 (4.4)
Lichen keratosis	2 (4.4)
Lichen sclerosis	2 (4.4)
Lichenoid dermatitis	3 (6.66)

Table 4: Histopathological features observed in this study	
Histological features	Number of cases (%)
Epidermal changes	
Hyperkeratosis	39 (86.66)
Parakeratosis	3 (6.66)
Acanthosis	29 (64.44)
Papillomatosis	7 (15.55)
Atrophy	5 (11.11)
Spongiosis	18 (40)
Elongation of rete ridges	31 (68.8)
Hypergranulosis	16 (35.5)
Follicular	11 (24.44)
Basal layer degeneration	37 (82.2)
Dermal changes	
Band-like inflammatory infiltrate at the D-E interface	40 (88.8)
Melanin incontinence in the dermis	32 (71.11)
Lymphocytes	45 (100)
Plasma cells	4 (8.88)
Eosinophils	2 (4.44)

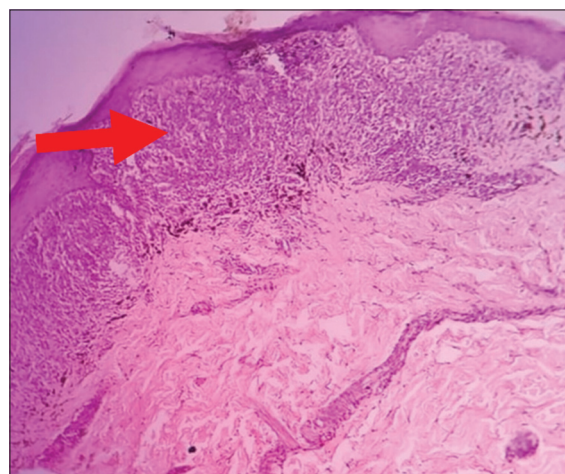


Figure 1: Microphotograph (Scanner x4) image of Lichen planus with dense band-like chronic inflammatory infiltrate shown by the red arrow

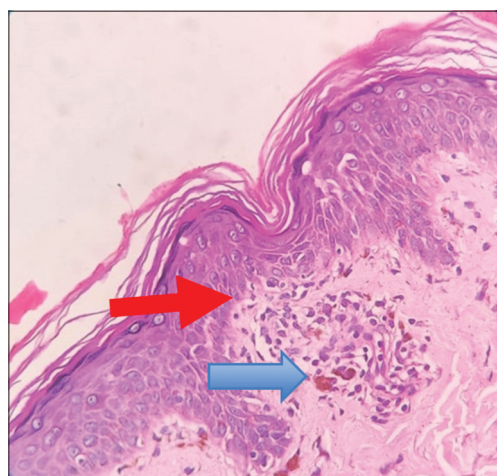


Figure 2: Microphotograph (x10) showing the thinned-out epidermis, pigment incontinence in the dermis (blue arrow) with lymphocytic infiltration and basal cell damage (red arrow) – lichen planus pigmentosus

In our study, there was a female preponderance, 28 were female (62.2%) out of the 45 cases which were in concordance with a study by Priya et al.,<sup>5</sup> which also showed a female preponderance of 62.5%. Likewise in a study by Kumar et al.,<sup>6</sup> 38 (42.2%) were male and 52 (57.7%) were female and in the study by Parihar et al.,<sup>7</sup> the male-to-female ratio was 0.8:1 which was the same as in our study. Studies by Hegde and Khadilkar,<sup>2</sup> Banushree et al.,<sup>8</sup> and Chauhan et al.,<sup>9</sup> also showed a female preponderance. There have been no proven reasons for the female preponderance in the literature<sup>7</sup> but as mentioned above most of the studies showed a female preponderance. The autoimmunity hypothesis of lichenoid lesions<sup>10</sup> can be one of the reasons for female preponderance. A point to be noted is that the female preponderance started with the age groups above 20 years.

In the present study, it was observed that most of the patients belonged to the age group of 20–50 years with maximum cases in the 5<sup>th</sup> decade of life similar to the studies conducted by Hegde et al., Banushree et al., and Dixit et al.,<sup>2,8,11</sup> whereas studies by Parihar et al., and Gupta et al., had most of the cases in the age group of 20–40 years of age.<sup>7,12</sup> Our study also had five cases in the pediatric age group. Kanwar and De conducted a study on pediatric cases which showed a prevalence of 5% among the outpatients who visited their department.<sup>13</sup> Chauhan et al., observed that 16.67% of cases were below 18 years of age which indicates that lichenoid lesions are observed in the pediatric age group as well.<sup>9</sup> From this, it is understood that lichenoid lesions have a wide range of age distribution.

In the present study of 45 cases, 27 cases (60%) were the classical lichen planus which was the single major entity, followed by lichen planus pigmentosus – five cases (11.11%), hypertrophic lichen planus – four cases (8.88%), lichen planopilaris, lichen keratosis, and lichen sclerosis each of them having two cases (4.44%) in their category and three cases of lichen dermatitis. This broad-based and generic diagnosis was given based only on lichenoid inflammatory

infiltrate, where more specific features categorizable under a specific lichenoid entity were not possible.

Banushree et al., showed the following distribution of cases in their study: Classical lichen planus 73.3% cases was the most common diagnosis, followed by lichen planus pigmentosus 8.3% cases, follicular lichen planus 5% cases, lichen nitidus 3.3% cases, 1.7% each of lichen planus hypertrophicus, lichen planus atrophicus, lichen planus actinicus, benign lichenoid keratosis, lichenoid eruption, and lichen striatus.<sup>8</sup> A study conducted by Chauhan et al., showed the following findings: classical lichen planus (37.87%), which was the largest single group, followed by lichen planus pigmentosus 11 cases (16.66%), hypertrophic lichen planus 11 cases (16.66%), pityriasis lichenoides chronica 4 cases (6.06%), lupus erythematosus two cases (4.54%), two cases (3.03%) each of oral lichen planus, lichen nitidus, and lichen sclerosis et atrophicus. One case (1.51%) each of drug-induced lichenoid reaction, fixed drug eruption, follicular lichen planus, bullous lichen planus, lichen striatus, and lichenoid tattoo reaction were seen.<sup>9</sup> Other studies conducted by Hegde and Khadilkar; Kumar et al., and Maheshwari et al., also showed that lichen planus was the most common diagnosis.<sup>2,6,14</sup> Lichen planus was the prototype and the most common lesion among the lichenoid dermatitides, which was also observed in 60% of the total cases in our study. Studies by Kumar et al., and Banushree et al., showed lichen planus pigmentosus as the second most common entity in concordance with the present study, as also in the study by Dixit et al.<sup>6,8,11</sup>

The histopathological features of lichenoid dermatitis are attributed to a T-cell-mediated autoimmune attack of epidermal basal cells; hence, it leads to basal cell damage.<sup>10</sup> The most common epidermal features observed were acanthosis, hyperkeratosis with elongation of rete ridges, and dense DE interface inflammatory infiltrate in almost all the cases, with the lymphocyte as the major inflammatory cell (Table 5).

**Table 5: Comparison of histopathological features of lichenoid dermatitis (%)**

Histological features	Present study (%)	Kumar et al. <sup>6</sup> (%)	Dixit et al. <sup>11</sup> (%)
Epidermal changes			
Hyperkeratosis	86.66	93.33	97.97
Acanthosis	64.44	83.3	85.81
Atrophy	11.11	15.5	13.51
Spongiosis	40	67.7	26.35
Elongation of rete ridges	68.88	60	80.4
Basal cell damage	82.2	96.6	77.03
Follicular plugging	24.44	13.3	31.76
Dermal changes			
Band-like inflammatory infiltrate at the D-E interface	88.8	93.3	98.65
Lymphocytes	100	100	-
Plasma cells	8.8	8.8	-
Eosinophils	4.4	4.4	-
Pigment incontinence	71.11	93.3	-



Differences between some lichenoid lesions:

Lichenoid dermatitis is a diverse group of diseases which have basal cell damage with dense inflammatory infiltrate at the DE junction as the cardinal feature. Lichenoid keratosis presents as solitary violaceous and crusty eruptions which show lichenoid inflammatory infiltrate in the upper dermis with epidermal changes which may be difficult to distinguish from lichen planus.<sup>15</sup> Lichenoid keratosis has prominent parakeratosis, which is uncommon in lichen planus.<sup>16</sup> Lichen planopilaris has a lichenoid inflammatory infiltrate in the infundibulum of the hair follicle and interfollicular areas with prominent follicular plugging. There is more vacuolar degeneration of the basal cells of the hair follicle.<sup>17</sup>

Lichen sclerosis et atrophicus is seen commonly in genital areas as well as present in the extra-genital areas such as extremities and the face. Histologically, atrophy and thinning of epithelium and in the dermis, there is homogenization with a lymphohistiocytic inflammatory cell infiltrate.<sup>18</sup> Lichen sclerosis is characterized by loss of elastic fibers mainly in the papillary dermis which appears as homogenized areas. This is important in differentiating it from morphea where there is fibrosis of the deep dermis and there may also be a dense band-like inflammatory infiltrate.<sup>19</sup> In our study of clinicopathological correlation, one of the cases with a clinical diagnosis of Morphea was later diagnosed as lichen sclerosis by histopathological examination.

Histopathological examination plays an important role in the diagnosis of specific entities in lichenoid dermatosis, many a time due to the mimickers. It is important to differentiate each lichenoid dermatosis as they require different modalities of treatment and also have a variable prognosis. Hypertrophic lichen planus should be differentiated from lichen planus, even though it is a variant of lichen planus due to the risk of malignant transformation of long-standing cases of hypertrophic lichen planus to squamous cell carcinoma and thus requires regular follow-up.<sup>20</sup>

Our study showed 80.85% clinicopathological concordance which was similar to the study by Kumar et al., which showed 78.50% concordance.<sup>6</sup> Dixit et al., and Batchu et al., showed much higher concordance percentages of 87.41% and 86%, respectively.<sup>11,21</sup> Even though the concordance rate was higher, there were a few cases (19.67%) that showed discordance with clinical and histological diagnosis, which was similar to the study by Kumar et al., with 21.50% discordance.<sup>6</sup> The reasons for this discordance can be due to poor clinicopathological correlation and in some instances making a clinical diagnosis may be challenging. In all those challenging situations, histopathological

examination is vital in reaching a definitive diagnosis. There were seven cases in our study which did not have lichenoid dermatitis in their clinical differential diagnoses and later were diagnosed as lichenoid dermatitis by histopathological examination. Hence, histopathological examination plays a key role in the diagnosis of specific entities of lichenoid dermatitis along with clinical correlation.

The clinical correlation was difficult in our because it was a retrospective study. Few cases were rejected due to damaged slides and blocks since it was a retrospective study. This was one of the reasons our sample size was reduced. The spectrum of the lichenoid dermatitis entities in our study was limited due to the small sample size. The above-mentioned were the limitations of our study.

#### Limitations of the study

1. Limited Clinical information
2. Lack of follow-up biopsy.

## CONCLUSION

A wide spectrum of lesions come under lichenoid dermatitis and the most common is lichen planus. Definitive diagnosis of the lesion is important as the therapeutic approach and prognosis vary between the specific entities. Definitive diagnosis is often through histopathological examination. Clinicopathological discordance occurs when there are discrepancies in the availability of clinical details. The accuracy of a definitive diagnosis made through pathological examination also depends on the clinical details provided by the clinician. Histopathological examination is the most significant method of making a diagnosis of lichenoid dermatosis, which, further, facilitates providing appropriate therapy and also in prognosticating long-term patient outcomes.

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**KS-** Collected and compiled the data, statistical analysis, and results, prepared the first draft of the manuscript; **BP-** Design of the study, Concept of the study, coordination, reviewed the literature, revision of the manuscript; **CJ-** Correction of the initial draft, coordination; **UC-** Clinical details, performed the skin biopsy.

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