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Original Article

Clinical and histopathological spectrum of lichen planus

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Abstract

Objective To determine histopathological correlation with clinical presentation of lichen planus (LP).

Methods From the patients attending the outpatient department of Dermatology of Dayanand Medical College & Hospital, Ludhiana, those who were clinically diagnosed as LP constituted the study material.

Results Oral LP was the most common clinical variant with 24 (40%) cases, out of which 18 (30%) were of reticular oral LP, 6 (10%) were of erosive oral lichen planus. 19 (31.7%) cases were of classical LP, 6 (10%) were of hypertrophic LP, 5 (8.3%) were of LP pigmentosus, 3 (5%) were of eruptive LP, 1 (1.7%) was of genital LP, 1 (1.7%) was of lichen planopilaris, 1 (1.7%) was of actinic LP with DLE overlap. Both oral LP and classical LP were the most common histopathological variants with both having 21 (35%) cases. Second most common histopathological variant was that of hypertrophic LP with 6 (10%) cases. Majority of patients were in the age group of 41-60 years. Our study had a female preponderance. Most of the cases sought medical help within 6-10 months of development of symptoms. Lower limbs were the most common site involved in cutaneous LP. Burning sensation was the main presenting complaint in the patients of oral LP. In cutaneous LP moderate to severe itching was the most common symptom. The commonest recognized histopathological features were saw-toothed rete ridges/ irregular acanthosis, vacuolar degeneration of basal layer and band like infiltrate in our study.

Conclusion Oral LP is the most common clinical variant followed by classical LP with histopathological findings adequately consistent with the clinical diagnosis.

Key words
Clinical features, histopathology, lichen planus.

Introduction

Lichen planus (LP) is an idiopathic inflammatory skin disease affecting the skin and mucous membranes, often with a chronic course with relapses and periods of remission. Its prevalence is approximately 0.5% of the population.[1]

The incidence varies between 0.22% and 1% of the adult population worldwide.[2] In contrast, oral LP seems to be more frequent with a reported incidence between 1% and 4% of the population.[1] LP is rare in children and commonly affects adults during their fourth to sixth decade. According to one study, LP represents 0.38% of all dermatology outpatients in India.[3]

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Several hypotheses have been made regarding its etiology including genetic, infective, psychogenic and autoimmune factors.[4] Several studies have suggested a role for hepatitis C virus (HCV) in LP.[5] Both antigen-specific and nonspecific mechanisms are involved in initiation of the immune reaction.[6]

The classic clinical presentation of LP includes primary lesions consisting of firm, shiny, polygonal, 1-3 mm diameter papules with a red to violet colour. "Pruritic, Purple, Polygonal, Planar, Papules and Plaques" are the traditional 6 "P's" of LP.[7] Annular lesions are especially common on the penis and rarely may be the predominant type of lesion present, later leading to atrophy.[8] When the palms and soles are affected, the lesions tend to be firm and rough with a yellowish hue.[9] Linear LP occurring in Blaschko's lines can also be observed.[10] Mucous membrane lesions are very common, occurring in 30-70% of cases. The buccal mucosa and tongue are most often involved. White streaks, often forming a lacework, on the buccal mucosa are highly characteristic. Oral LP carries a significant risk of malignant transformation. Many studies have reported malignant transformation rate between 0.4 and 1.5%.[11] Nail involvement occurs in up to 10% of cases.[12]

On standard histopathology, LP is characterized by the presence of a band-like lymphohistiocytic infiltrate at the dermal-epidermal junction with hydropic degeneration of the epidermis. Resultant dyskeratosis is represented by the presence of necrotic keratinocytes (Civatte bodies or cytoid bodies), which are extruded into the papillary dermis. Subepidermal clefts (Max-Joseph spaces) may form as a consequence of interface inflammation. Irregular acanthosis may assume a saw-toothed appearance. Hyperkeratosis is also seen.[13]

Methods

Sixty clinically diagnosed patients of LP attending the outpatient department of Dermatology of Dayanand Medical College & Hospital, Ludhiana, constituted the study material.

An informed consent was taken from the patients regarding the biopsy and participation in the study. The patients were subjected to detailed clinical examination and skin/mucosal biopsy was done which was subjected to detailed histopathological examination.

Results

Out of 60 patients of LP enrolled in the study, 24 (40%) were of oral LP, 19 (31.7%) were of classical LP **(Table1)**.

Oral LP and classical LP constituted the most common histopathological variants (35%). Biopsy was inconclusive in 10 (16%) cases **(Table 2)**.

Majority of patients i.e. 24 (40%) were in age group of 41-60 years. LP in our study showed a female preponderance with 38 (63.3%) patients enrolled in the study being females. Majority of the cases (36.7%) sought medical help within 6-10 months of development of symptoms. Only 5% cases waited for more than 15 months before seeking medical help. Maximum number of cases (45%) showed only cutaneous involvement while 43.3% cases showed only mucosal involvement **(Table 3)**.

Oral cavity was the most common site involved with 28 (46.7%) cases showing oral involvement. Lower limbs were the second most common site involved in 27 (45%) cases. Burning sensation was reported in 48.3% cases. It was closely followed by pruritus in 45% cases.

Table 1 Various clinical variants of lichen planus (n=60).

Clinical diagnosis	*N (%)*
Classical lichen planus	19 (31.7)
Reticular oral lichen planus	18 (30.0)
Erosive oral lichen planus	6 (10.0)
Hypertrophic lichen planus	6 (10.0)
Lichen planus pigmentosus	5 (8.3)
Eruptive lichen planus	3 (5.0)
Genital lichen planus	1 (1.7)
Lichen planopilaris	1 (1.7)
Actinic lichen planus with discoid lupus erythematosus overlap	1 (1.7)

Table 2 Histopathological variants of lichen planus (n=60).

Histopathological diagnosis	*N (%)*
Classical lichen planus	21 (35)
Reticular oral lichen planus	19 (31.7)
Hypertrophic lichen planus	6 (10.0)
Erosive oral lichen planus	2 (3.3)
Lichen Planopilaris	1 (1.7)
Lichen planus pigmentosus	1 (1.7)
Inconsistent	10 (16.7)

Table 3 Sites of involvement (n=60).

Sites involved	*N (%)*
Cutaneous	27 (45.0)
Mucosal	26 (43.3)
Cutaneous + nail	4 (6.7)
Cutaneous + oral	2 (3.3)
Cutaneous + nail+ oral	1 (1.7)

Table 4 Spectrum of signs and symptoms of lichen planus (n=60).

Signs and symptoms	*N (%)*
Burning sensation	29 (48.3)
Pruritus	27 (45.0)
Pain	14 (23.3)
Ulcers/erosions	7 (11.7)
Postinflammatory hyperpigmentation	5 (8.3)
Cicatricial alopecia	1 (1.7)
Longitudinal ridging	6 (10.0)
Nail plate thinning	2 (3.3)
Onycholysis	1 (1.7)
Koebner's phenomenon	10 (16.7)
Wickham striae	21 (35)

23.3% of patients complained of pain. Wickham's striae were observed in 35% of cases while Koebner's phenomenon **(Figure 1)** was seen in 16.7% of cases.

Table 5 Various histopathological features (n=60).

Clinical diagnosis	*N (%)*
Hyperkeratosis/ orthokeratosis	38 (63.3)
Wedge shaped hypergranulosis	37 (61.7)
Irregular acanthosis/sawtooth rete ridges	51 (85.0)
Vacuolar degeneration of basal layer	49 (81.7)
Band-like infiltrate	43 (71.7)
Melanophages in upper dermis	26 (43.3)
Civatte bodies	27 (45.0)
Max-Joseph spaces	10 (16.7)
Pigment incontinence	25 (41.7)
Follicular plugging	5 (8.3)
Perivascular infiltrate	17 (28.3)
Papillomatosis	1 (1.7)
Chronic inflammatory infiltrate	6 (10.0)
Atrophy	5 (8.3)
Erosion	2 (3.3)

In nail changes, longitudinal ridging was the most common finding observed in 10% cases **(Table 4)**.

Of all the cases, 16.7% patients complained of intense pruritus, 15% complained of moderate pruritus and only 13.3% experienced mild pruritus. 5 (8.3%) cases presented with only hyperpigmented violaceous papules and plaques without any associated symptoms. The commonest histopathological features recognized in our study were sawtooth rete ridges/ irregular acanthosis in 85%, vacuolar degeneration of basal layer in 81.7%, band-like infiltrate in 71.7%, hyperkeratosis/ orthokeratosis in 63.3% and wedge-shaped hypergranulosis in 61.7% of cases **(Figure 2)**.

Classical LP was the most common histopathological diagnosis, followed by oral reticular LP. LP pigmentosus showed saw-toothed rete ridges/ irregular acanthosis, vacuolar degeneration of the basal layer, band-like infiltrate, melanophages in upper dermis, Civatte bodies, pigment incontinence, chronic inflammatory infiltrate and perivascular infiltrate. Single case of lichen planopilaris enrolled in our study showed vacuolar

Figure 1 Wickham's striae and Koebner's phenomenon.

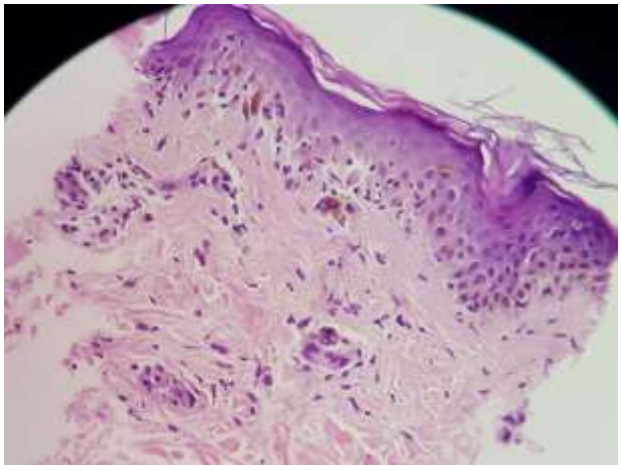

Figure 2 Hyperkeratosis, irregular acanthosis and vacuolar degeneration of basal layer along with pigment incontinence.

Table 6 Clinico-histopathological correlation of lichen planus (n=60).

Subtype	*Clinical diagnosis*	*Consistent with subtype*	*Histopathological diagnosis*		*Sensitivity to dig lichen planus*
			Inconsistent	*Consistent with lichen planus but not subtype*	
Classical lichen planus	19	17	2-inconsistent	17-lichen planus	89.50%
Reticular oral lichen planus	18	17	1-inconsistent	17- oral lichen planus	94.40%
Erosive oral lichen planus	6	2	2-inconsistent	2-oral lichen planus	33.30%
Eruptive lichen planus	3	0	0	3-lichen planus	100.00%
Genital lichen planus	1	0	0	1-lichen planus	100.00%
Hypertrophic lichen planus	6	6	0	0	100.00%
Lichen planopilaris	1	1	0	0	100.00%
Actinic lichen planus with DLE overlap	1	0	1-inconsistent	0	0.00%
Lichen planus pigmentosus	5	0	4-inconsistent	1-lichen planus	20.00%

degeneration of basal layer, melanophages in upper dermis and perivascular infiltrate on histopathological examination. Ten cases did not show any features of lichen planus and were labelled as inconsistent **(Table 5)**.

In the present study, 50 out of 60 clinically diagnosed cases were confirmed on histopathology and only 10 cases were found inconsistent hence giving a sensitivity of 83.3%. Histopathological examination showed a sensitivity of 71.6% in identifying the various subtypes of lichen planus **(Table 6)**.

Regarding various associated comorbidities, hypertension was present in 18.3% cases, diabetes mellitus was seen in 6.7% cases, hepatitis C infection was present in 6.7% cases.

Discussion

Lichen planus (LP) is an idiopathic inflammatory skin disease affecting the skin and mucous membranes, often with a chronic course with relapses and periods of remission. In our study, majority of patients i.e. 24 (40%) were in age group of 41-60 years, close second i.e. 20 (33.4%) patients were in the age group of 21- 40

years. These findings are similar with other studies of the western population[14,15]; however, in the studies of Indian population by Bhattacharya *et al*.,[3] Singh and Kanwar,[16] a younger age group has been reported. However, in one Indian study by Arora *et al*.[17] an older age group of 31-60 years has been reported. Furthermore, in the western literature LP is considered to be rare in children.[18] Even in those studies, which are published from the European countries, a proportion of patients were Indians.[19] In our study, we found that female gender is more commonly affected with lichen planus than males. Even though in the literature there has been no consensus regarding any sex preference of LP, but most of the studies have shown that females are more commonly affected than males[20,21,22]; however, study by Kachhawa *et al*.[23] have shown male preponderance.

In our study, the most common variant was oral LP seen in 40% of all enrolled cases. Reticular oral LP was the most common variant seen in 75% of total cases of oral LP followed by erosive oral LP seen in 25%. These findings are consistent with the study done by Munde *et al*.[24] Classical LP (31.7%) was the second most common subtype overall and the most common subtype (52.7%) in cutaneous LP followed by hypertrophic LP (16.6%). These findings are consistent with another study by Abdallat *et al*.[25] Oral cavity was the most common site involved in 46.7% of cases. In cutaneous LP lower limbs was the most commonly involved site seen in 75% of cases, which is in concordance with other studies done by Kachhawa *et al*.[23] and Kanwar *et al*.[26] Lichen planus pigmentosus showed a predilection for back involving 60% of cases. In another study by Parihar *et al*.[27] it was observed that face and neck were the most frequent initial sites of involvement followed by the trunk. Similar findings have been reported in previous studies by Bhutani *et al*.[28] and Kanwar *et al*.[29] Only one case of lichen planopilaris was enrolled in our study and it had lesions on the scalp. In the study by Parihar *et al*.[27] also, the most common site involved was scalp, seen in 82% patients.

In the present study, burning sensation was the most common symptom in oral LP, although pruritus was the most common symptom in cutaneous LP as observed in the studies done by Parihar *et al*.[27] and Arora *et al*.[17] In the present study, Wickham's striae were observed in 35% of cases while Koebner's phenomenon was seen in 16.7% of cases. However, Koebner's phenomenon was observed in only 6% patients in the study done by Kanwar and De.[19] In our study, postinflammatory hyperpigmentation was seen in 8.3% of cases, while it was seen in 15.9% of patients in a study done by Abdallat *et al*.[25] In our study, nail involvement in the form of longitudinal ridging was seen in 10% of cases similar to a study by Garg *et al*.[30] On the contrary, Kanwar and De[26] have observed nail involvement in 19% of their patients

In our study, the commonest histopathological features recognized were saw-toothed rete ridges/ irregular acanthosis seen in 85%, vacuolar degeneration of basal layer in 81.7%, band-like infiltrate in 71.7%, hyperkeratosis/ orthokeratosis in 63.3% and wedge-shaped hypergranulosis in 61.7% of cases followed by Civatte bodies in 45%, melanophages in upper dermis in 43.3%, pigment incontinence in 41.7%, perivascular infiltrate in 28.3% and Max-Joseph spaces in 16.7% of cases.

In a study done by Arora et al.[17] and Garg *et al*.,[30] epidermal changes included hypergranulosis (82%), hyperkeratosis (92%) and basal cell vacuolization (100%). The dermis showed band-like lymphocytic inflammatory cell infiltrate, predominantly perivascular in location.[17,30]

In another study done by Parihar *et al*.[27] all the cases showed orthokeratosis. Irregular acanthosis was seen in 94% cases. Pointed rete ridges and dome-shaped papillae were identified in 76% cases, wedge-shaped hypergranulosis in 96.5%. The infiltrate in the upper dermis was band-like in 94% of cases, Civatte bodies or necrotic keratinocytes were present in 82% of cases in the lower epidermis and especially in the papillary dermis. Pigment incontinence was seen in 99% of cases. Max-Joseph spaces were apparent in 29.5% of cases.

In our study, single case of lichen planopilaris enrolled showed vacuolar degeneration of basal layer, melanophages in upper dermis and perivascular infiltrate on histopathological examination. In the study done by Garg *et al*.[30] lichen planopilaris showed more marked keratotic plugging than classical LP and inflammatory infiltrate was predominantly perifollicular in nature.

LP pigmentosus showed saw-toothed rete ridges/ irregular acanthosis, vacuolar degeneration of basal layer, band-like infiltrate, melanophages in upper dermis, Civatte bodies, erosion, pigment incontinence, chronic inflammatory infiltrate and perivascular infiltrate. In study by Parihar *et al*.[30] all the cases showed epidermal thinning and pigment incontinence, and 85% cases showed basal layer vacuolation.

In our study hypertension was present in 18.3% of cases and diabetes mellitus in 6.7% of cases. While in a study done by Kachhawa *et al.*,[23] hypertension was seen in 2.3% of cases and association with diabetes was also noted. Association with hypertension and diabetes was also noted by Bajaj *et al*.[31] Hepatitis C infection was present in 6.7% of cases enrolled in our study, while study done by Das *et al*.[32] showed associated HCV infection in 3.07% of cases while no association was found in the study done by Prabhu *et al*.[33]

Conclusion

Lichen planus is a common entity encountered in our day-to-day practice. In the majority of cases diagnosis can be made clinically. However, in difficult cases diagnosis can be clinched by histopathological examination as it shows a high sensitivity. Histopathological examination also shows a high sensitivity to effectively identify the various subtypes of lichen planus.

It is important to identify the various subtypes of lichen planus as the prognosis, duration of treatment and advice to the patient varies for different subtypes.

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