Dermatology Practical & Conceptual

Clinicopathological Study of 307 Patients with Lichen Planus Actinicus and Pigmentosus Referred to Razi Skin Hospital From 2016 to 2021

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ABSTRACT

Introduction: The two less-known subtypes of lichen planus (LP) are lichen planus actinicus (LPA) and lichen planus pigmentosus (LPP), with the highest prevalence in the Middle East.

Objectives: We aimed to evaluate the clinicopathological profile of these patients.

Methods: Three hundred and seven cases including 184 LPA and 123 LPP patients were recruited from the registered pathology reports of Razi Skin Hospital of Tehran from April 2016 to March 2021. The clinical features and pathological reports were extracted and analyzed.

Results: Among 307 patients, 117 (63.9%) in the LPA group and 88 (71.5%) in the LPP group were women. Duration of disease ranged from 1 month to 20 years and 1 month to 12 years in the LPA and LPP groups, respectively. Face (159 patients), limbs (68), and neck (23) were the most frequent sites of involvement in LPA patients, whereas face (60 patients), limbs (47), and trunk (42) were more commonly involved in the LPP patients. Pruritus and oral mucosal lesions were found with similar frequency in both groups. Pathological evaluation showed vacuolar degeneration of basal layer (100%), lymphocytes infiltration (97.3%), and melanin incontinence (58.2%) as the most frequent findings in LPA and vacuolar degeneration of basal layer (100%), lymphocytes infiltration (100%), and melanin incontinence (52/8%) as the most frequent findings in LPP cases.

Conclusions: LPA and LPP were both more prevalent among women. Face was the most common site of involvement in both LPA and LPP. Vacuolar degeneration, lymphocyte infiltration, melanin incontinence, and hyperkeratosis were more common histological findings in this study.

Introduction

Lichen planus (LP) is a chronic, inflammatory, mucocutaneous, and autoimmune disease that involves the skin and mucous membrane of the mouth and genitalia, scalp, and nails [1,2]. LP prevalence is unknown, but it is estimated that less than 1% of the population are affected by LP [2,3].

So far, about 13 subtypes of this disease have been reported including: classic, annular, hypertrophic, atrophic, ulcerative, bullous, pemphigoides, erythrodermic, inverse, linear, follicular, pigmentosus, and actinic [4].

LP actinic (LPA) is a photo-distributed type of LP which is often reported in darker-skinned people in the Middle East region and India. Lesions of LPA usually occur in the forehead, face, neck, and extensor surfaces of the forearm and hands. The lesions usually flare up in warm seasons (spring and summer) and disappear in the winter. However, in rare cases, areas such as the trunk, legs, genitals, and feet that are not usually exposed to sunlight may also be involved. Contrary to the classic LP, the actinic type usually starts at younger age with a longer duration and more tendency for involvement of women with darker skin.

Pigmentosus LP (LPP), which is more common in India and the Middle East, usually begins in the third and fourth decades of life and is slightly more common in women. Lesions usually involve the face, neck, and, less commonly, flexor areas such as the axilla, groin, and infra-mammary folds. Similar to LPA, this type of LP is also more common in areas exposed to the sun [5,6]. Lesions of both LPP and LPA often occur in sun-exposed areas such as the face and neck, as well as presenting in the third to fifth decades of life [5-8]. Thus, these lesions can cause discomfort and anxiety for patients and significantly affect their professional, social, and family relationships. Therefore, prompt and timely diagnosis and treatment of the disease can improve the quality of life of patients.

Iran is located in the Middle East region; therefore, the prevalence of LPP and LPA is higher than in countries outside the Middle East. However, no extensive study has been conducted in Iran to investigate the clinical features of these two types of diseases and to search for their indigenous differences compared to other countries. Discovering the common clinical signs and pathological features of LPA and LPP can help to accelerate the process of diagnosis, treatment, and improvement of the disease outcome, saving time and money.

Objectives

In this regard, we aimed to evaluate the clinicopathological features of patients with LPP and LPA who referred to Razi Hospital, Tehran, Iran, between April 2016 and March 2021.

Methods

This study is a cross-sectional descriptive retro-respective study including patients who referred to the outpatient clinic of Razi Hospital, and their pathology samples had been recorded in the pathology department of Razi Hospital in Tehran, Iran, from April 2016 to March 2021.

Among all patients, the cases whom LPA and LPP were reported as the differential diagnosis were evaluated and cases with final diagnosis of these two entities were selected for final evaluation. Cases that their diagnoses were postponed to clinical follow-up and needed further evaluation were excluded from the study.

Age, sex, clinical features, duration of symptoms, presence of pruritus, location of lesions, and pathology registered data were extracted and recorded from the records of patients. Pathology registered data were also extracted.

Finally, 184 patients with LPA and 123 patients with LP were included in the study.

Results

Actinic Lichen Planus

Among 184 LPA patients, 117 (63.9%) were women, and 67 (36.4%) were men and the female to male ratio was 1.74. The mean age of patients was 48.02±14.83, range of 8-102 years. The highest prevalence of LPP was among the age group of 50-59 years (29.35%). The interval between the onset of symptoms and diagnosis varied from one month to 20 years, and the average interval was 23 months. In 44.25% of patients, it was less than one year, in 22.12% one to two years, and in 8% of patients more than 5 years (Table 1).

Considering the site of involvement, 159 (86.4%) of patients had facial lesions and face was the most common site of involvement in LPA. Among 159 patients with facial lesions, the forehead, cheeks, nose were the most common sites of facial lesions, respectively. After the face, the limbs were the second most common site of involvement (68 out of 184 patients), most commonly on the dorsum of the hands, arms, forearms, and lower limbs. Followed by the face and limbs, the neck, trunk, ears, axilla, and groin were commonly involved, and in one patient, generalized lesions were recorded (Table 1 and Figure 1).

Out of 184 patients, 7 had oral mucosal involvement and 25% of patients experienced pruritus (Table 1).

Regarding the pathological features found in the skin biopsies of patients with LPA, we demonstrated that the most prevalent pathological features were vacuolar degeneration (100%), lymphocyte infiltration (97.3%), melanin incontinence (58.2%), hyperkeratosis (55.4%), and melanophage (42.9%), respectively. Among 179 skin biopsy slides that had lymphocytic infiltration, 4 types of infiltration were observed

Table 1. Clinicopathological features of lichen planus.

			LPA (N = 184)	LPP (N = 123)
Gender	Female		117 (63.59%)	88 (71.54%)
	Male		67 (36.41%)	35 (28.46%)
Age	Mean ± SD		48.02 ± 14.83	41.55 ± 14.23
	Range	0-9 year	1 (0.5%)	2 (1.6%)
		10-19	8 (4.3%)	5 (4.1%)
		20-29	9 (4.9%)	15 (12.2%)
		30-39	30 (16.3%)	35 (28.5%)
		40-49	46 (25%)	31 (25.5%)
		50-59	54 (29.3%)	20 (16.3%)
		60-69	24 (13%)	13 (10.6%)
		70-79	9 (4.9%)	2 (1.6%)
		80-89	2 (1.1%)	0
		90-99	0	0
		100-110	1 (0.5%)	0
Duration	Mean ± SD		23±36.47	21±31.66
	Range	<1year	50 (44.2%)	42 (50.6%)
		1-2	25 (22.1%)	22(26.51%)
		2-3	13 (11.5%)	3 (3.61%)
		3-4	6 (5.3%)	4 (4.81%)
		4-5	10 (8.8%)	2 (2.4%)
		5<	9 (8%)	10 (12.05%)
Pruritus			46 (25%)	30 (24.39%)
Location	Face		159 (86.4%)	60 (48.8%)
	Limbs		68 (37%)	47 (38.2%)
	Neck		23 (12.5%)	21 (17.1%)
	Trunk		11 (6%)	42 (34.1%)
	Scalp		4 (2.2%)	1 (0.8%)
	Ears and around		3 (1.6%)	3 (2.4%)
	Groin		1 (0.5%)	8 (2.4%)
	Axilla		2 (1.1%)	20 (16.3%)
	Generalized		1 (0.5%)	4 (3.3%)
Mucosal involvement			7 (3.8%)	4 (3.3%)
Histopathology	Vacuolar degeneration		184(100%)	123(100%)
	Hyperkeratosis		102 (55.4%)	54 (43.9%)
	Lymphocyte infiltration		179 (97.3%)	123 (100%)
	Melanin incontinence		107 (58.2%)	65 (52.8%)
	Acanthosis		52 (28.3%)	38 (30.9%)
	Hypergranulosis		36 (19.6%)	14 (11.4%)
	Parakeratosis		22 (12%)	4 (3.3%)
	Infiltration of melanophages		79 (42.9%)	74 (60.2%)
	Civatte body		56 (30%)	40 (32.5%)
	Thinning or atrophy of the epidermis		54 (29.3	43 (35.5%)
Infiltration type	Band like		128 (71.5%)	95 (77.2%)
	Deep		33 (18.4%)	12 (9.8%)
	Perifollicular		46 (25.7%)	19 (15.4%)
	Perivascular		85 (47.5%)	72 (58.5%)

LPA = lichen planus actinicus; LPP = lichen planus pigmentosus; SD = standard deviation.

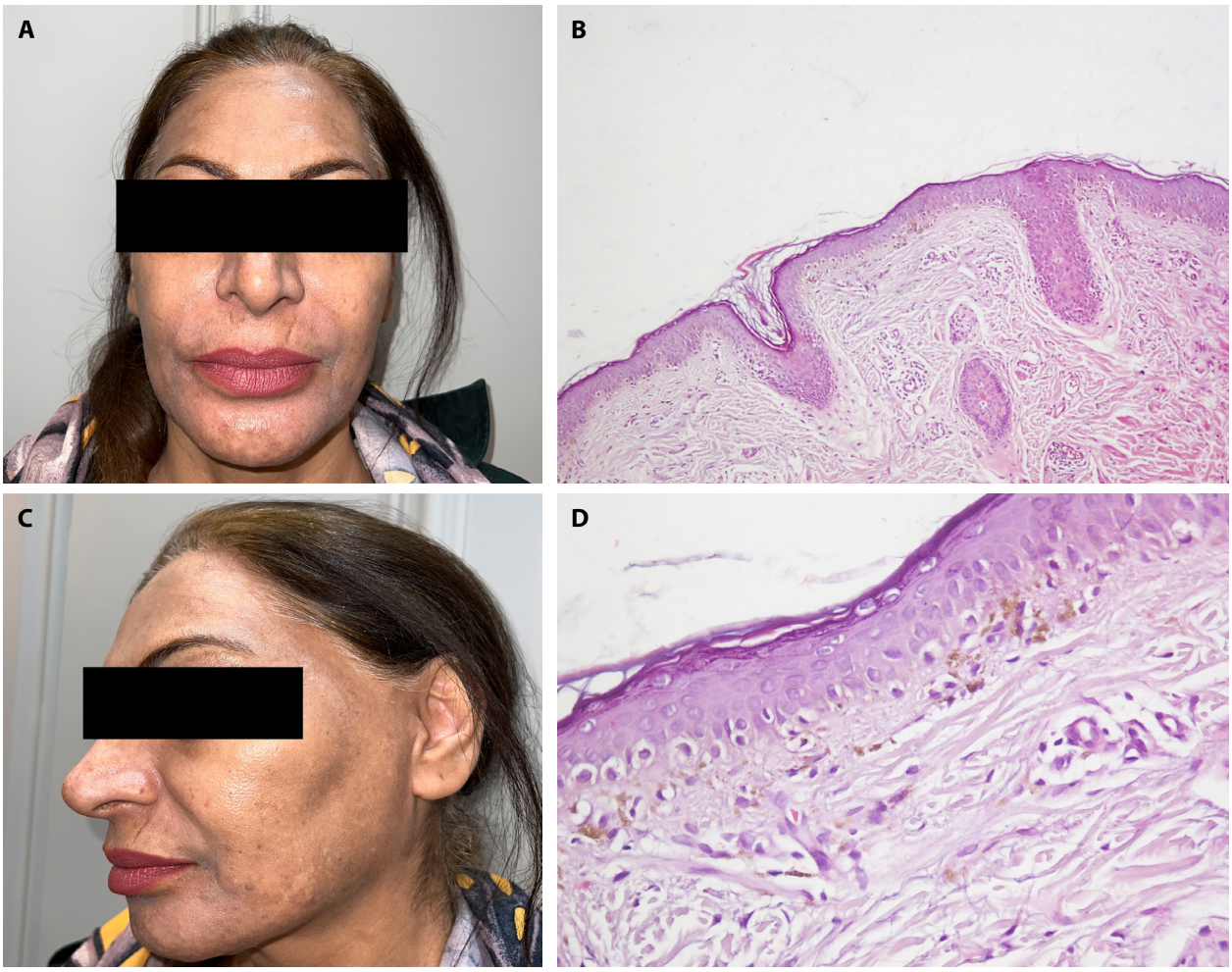

Figure 1. Clinical and histopathological features of lichen planus actinicus (LPA). (A,C) Clinical picture of LPA. (B,D) Photomicrograph of lichen planus actinicus showing hyperkeratosis, atrophy of epidermis, wedged shaped hypergranulosis, vacuolar degeneration, melanin incontinence, civatte bodies and perivascular lymphocyte infiltration.

as follow: superficial or band-like (71.5%), deep (18.4%), perifollicular (25.7%), and perivascular (47.5%) (Table 1).

Pigmented Lichen Planus

Evaluating the clinical features of 123 patients with LPP, similar to LPA, LPP was more frequent in the female sex, 88 were women (71.5%) and 35 were men (28.4%). The mean age of patients with LPP was 41.55±14.23 years (range 6-77 years). The 53.66% of patients were aged 30-49 years. The interval between the onset of symptoms and diagnosis was ranging from one month to 12 years with the average interval of 21 months. In 50.6% of patients, this interval was less than one year, in 26.51% one to two years, and in 12.05% of patients more than 5 years. Among 123 patients, 30 of them experienced itching at the time of referral or in the past. Mucosal involvement was seen in 4 of 123 patients (Table 1).

Generally, the most common sites of lesions in LPP were: face, limbs, trunk, neck, axilla, and groin, respectively. Furthermore, 4 patients had generalized lesions. Sixty patients (48.8%) had facial lesions as the most common site of involvement and forehead was the most common site on the face. Following the face, limbs were the second common site, that 47 out of 123 (38.2%) patients were presented with limb lesions, mainly on the dorsum of the hands, arms, forearms, and lower limb. Out of 42 patients (34.1%) who had trunk lesions, distribution of lesions were back lesions (15), intermammary (4), inframammary (3) chest (5), abdominal (5), lumbar (2), and 1 case of flank and buttock lesions. In addition, only 7 patients with trunk involvement were male, and 35 were female (Table 1 and Figure 1).

Regarding pathological findings, vacuolar degeneration (100%), lymphocyte infiltration (100%), melanophage infiltration (60.2%), melanin incontinence (52.8%), hyperkeratosis (43.9%), thinning or atrophy of the epidermis (35.5%), civatte body (32.5%), acanthosis (30.9%), and hypergranulosis (11.4%) were the most common findings, respectively (Table 1).

Of the 123 skin biopsy slides that had lymphocytic infiltration, four types of infiltration were found, including band-like or superficial (77.2%), deep (9.8%), perifollicular (15.4%), and perivascular (58.5%) (Table 1).

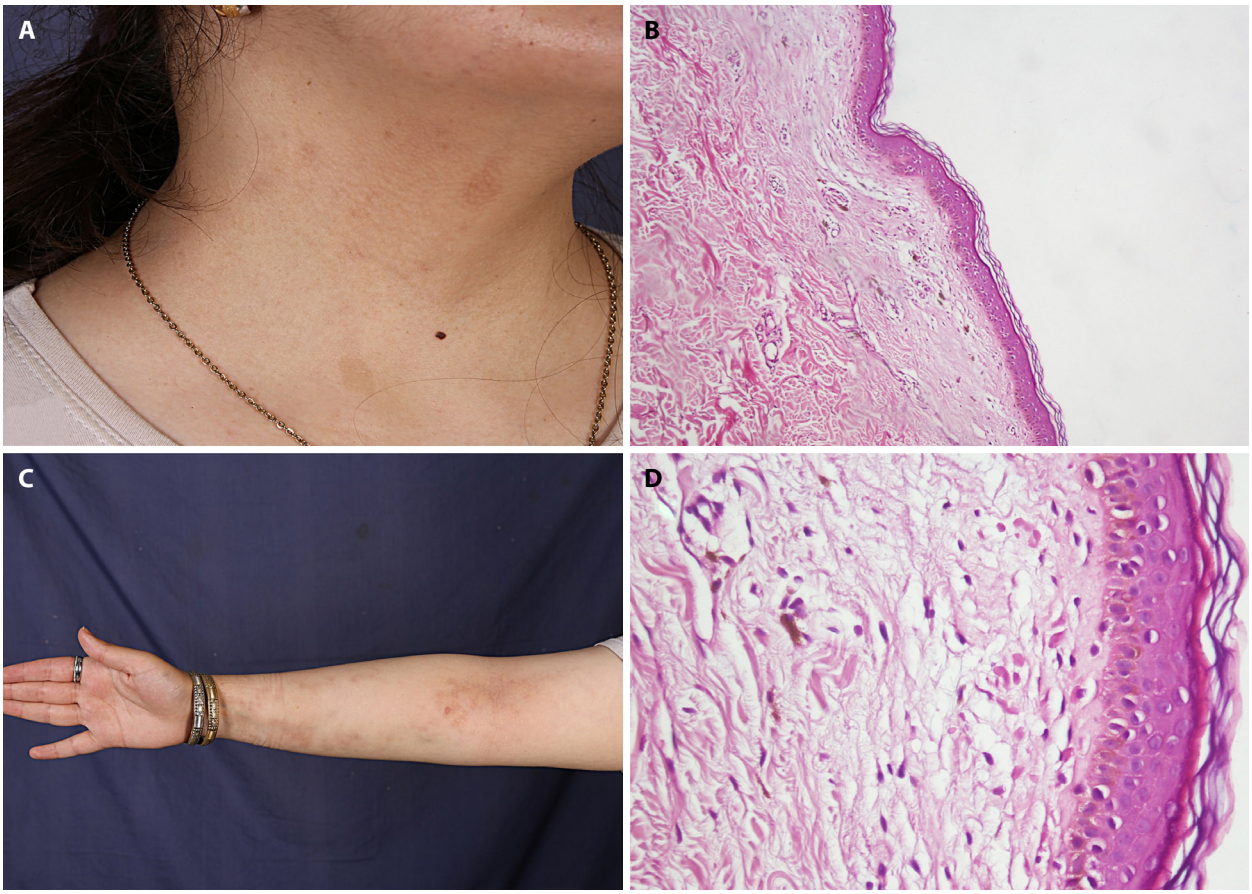

Figure 2. Clinical and histopathological features of lichen planus pigmentosus (LPP). (A,C) Clinical picture of LPP. (B,D) Photomicrograph of lichen planus pigmentosus showing epidermal thinning, hyperkeratosis, vacuolar degeneration of basal cell layer, basal cell layer pigmentation, and perivascular lymphocyte infiltration.

Conclusions

To the best of our knowledge, our study described the clinicopathological features of LPA and LPP patients in a large population for the first time.

It has been investigated that women suffering from LPA outnumbered men suffering from LPA based on previous reports similar to our results [9-12].

Dostrovsky et al have shown that LPA was most common in 21 to 31 years (39%) [9]. In the contrary, our results showed that although 90.2% of patients were over 30 years old, but the highest prevalence of LPA was in the age group of 50-59 years (29.35%). Studies reported the majority of LPA cases in young adults from second to forth decade of their lives from middle Eastern descent [13]. This difference could be attributed to the ethnic population and geographic difference [14].

According to Salman et al study, the interval between the onset of symptoms and LPA diagnosis in 81% of patients was one year or less [12].

The duration of LPA was reported one year in 74% of patients, two years in 11%, and more than two years in 13% of patients in Dostrovsky et al study [9]. In our study, this interval varied from one month to 20 years with an average interval of 23 months. In 44.25% of patients, the period was less than one year. However, 8% of patients have had a course of more than 5 years, which is a significant number compared to previous studies.

Dilaimy et al reported that minimal itching could accompany LPA lesions only in the summer [11]. Similarly, M. Salman et al. demonstrated that itching was almost always absent in LPA patients [12]. In our study, we found that out of 184 patients, 46 patients (25%) had pruritus. Therefore, the presence of pruritus cannot rule out the diagnosis of LPA.

In Salman et al study, out of 16 patients with LPA, 15 had facial lesions, 12 had involvement of the dorsum of the hands or the outer surface of the forearm, and 3 had involvement of the V area of the chest. Non-exposed areas and mucus membranes were not involved in these patients [12]. Similarly, our results demonstrated that the involvement of sun-exposed areas was predominant. Besides among patients with limb involvement, the dorsum of the hands, forearms and arms were the most affected sites, respectively. Oral mucosal involvement was also observed in 7 patients. An important finding of our results that is worth to be mentioned was the involvement of axillary and groin regions which are not exposed to the sun.

Regarding pathological findings, in our study, vacuolar degeneration was observed in all samples, which is the main finding of diseases involving dermo-epidermal junction. The next finding was lymphocytic infiltration in 97.3% of cases. The most common pattern for lymphocyte infiltration was superficial, perivascular, perifollicular, and deep, respectively. Unlike previous studies, in many cases, superficial infiltration was not band-like and continuous; instead, it was in the form of patchy and scattered areas. Contrary to expectations, infiltration was not limited to the papillary dermis, and in 18.4% of cases, infiltration was also found in the deeper layers of the dermis. Unlike the Salman and Dostrovsky et al studies, in which hypergranulosis was seen in most or all cases, in this study, hypergranulosis was only observed in 19.6% of pathology samples [12].

Unlike the Salman study, which showed hyperkeratosis in all samples and parakeratosis in 62.5% samples, in our study, hyperkeratosis was found in 58.2% and parakeratosis in 12% of the slides. Therefore, their absence will not rule out the diagnosis of LPA [12]. The difference in histopathological patterns may be attributed to different factors including the duration of the lesions and biopsy location [7,15,16].

In our study, among 123 patients with LPP, 88 were women (71.54%) and 35 men (28.46%). However, In Al-Mutairi et al study of 33 patients with LPP, men outnumbered female [15].

The mean age of the onset of the disease was 46 years (ranging from 9 to 68 years) in Vega et al study. Our results showed that patients age ranged from 6 to 77 years with a mean age of 41.5 that 54% of our patients were in the range of 30-49 years [15].

In Kanwar et al study, the duration of the disease was reported to range from 2 months to 21 years [5]. In the Al-Mutairi study, the length of the disease period varied from 3 months to 6 years [15].

In our study, 43.4% of patients were diagnosed for 6 months or less, and 50.6% less than one year. It is noteworthy that 12 patients (9.8%) in our study have had symptoms for more than 3 years. Longer LPP duration has been associated with positive anti-HCV antibodies [15].

According to Kanwar study, 31.5% of patients experienced itching with their lesions [5]. In Al-Mutairi et al study, 9 patients (27%) complained of itching, and others were completely asymptomatic [15]. In our study, 24.3% of patients also presented with itching lesions in the past or when they referred to our hospital.

In Kanwar et al study, the most common site of lesions were head and neck (88.7%), followed by the trunk (4%) and limbs (1.6%). The preauricular area and temples were the primary sites of lesions in patients with facial involvement. Involvement of flexural areas, including axilla, inframammary folds, and groin, were observed in 8.9%, 6.5%, and 3.2% of patients, respectively [5]. Mendiratta et al. found that the most common sites of involvement were the head and neck, followed by the involvement of the upper back. The disease did not affect the mucous membranes, palmar and plantar surfaces [17]. In Al-Mutairi et al study, mucosal lesions were present in only one patient, and the nails, palmar and plantar surfaces were all intact [15].

In our study, face was the most common site of involvement (48.8%). Facial involvement was mainly on the forehead, cheeks, and eyelids. Followed by the face, the limbs (38.2%), trunk (34.2%), neck (17%), axilla (16.3%), and groin (6.5%) were the most frequent involved parts, respectively. 4 patients (3.3%) had mucosal involvement. Similar to other studies, palmar and plantar surfaces were not affected in patients. The back was the most common site of lesions among trunk lesions.

Regarding pathological findings, Al-Mutairi et al reported that band-like infiltration of lymphocytes was the most common form of lymphocyte infiltration pattern in biopsy samples of LPP patients (63%) [15].

In our study, vacuolar degeneration and lymphocyte infiltration were found in all samples. The most common lymphocyte infiltration pattern was superficial. Other pathological findings were macrophage infiltration, melanin incontinence, hyperkeratosis, thinning or atrophy of the epidermis, hypergranulosis, and parakeratosis.

Our LPA cases had higher mean age. Prevalence of pruritus was 25% in LPA patients with 7 patients with oral mucosal involvement which were considered absent or rare in some studies. In contrast to prior studies, lymphocyte infiltration was not all band-like and confined to the upper dermis, in many cases, they were patchy and involved reticular dermis. Hypergranulosis, which was considered a constant finding in some studies, was present in 19.6% of cases. Among LPP cases, a higher rate of trunk lesions was recorded compared to previous studies. Vacuolar degeneration, lymphocyte infiltration, epidermal atrophy, and hyperkeratosis were also more prevalent in this study among LPP patients.

Availability of Data and Materials: The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

References

1. Le Cleach L, Chosidow O. Clinical practice. Lichen planus. *N Engl J Med*. 2012;366(8):723-732. DOI: 10.1056/NEJMcp1103641. PMID: 22356325.
2. [Usatine RP, Tinitigan M. Diagnosis and treatment of lichen planus. *Am Fam Physician*. 2011;84(1):53-60. PMID: 21766756.
3. Parihar A, Sharma S, Bhattacharya SN, Singh UR. A clinicopathological study of cutaneous lichen planus. *J Dermatology*

Dermatologic Surg. 2015;19(1):21–26. DOI: 10.1016/j.jssdds.2013.12.003.

4. Wagner G, Rose C, Sachse MM. Clinical variants of lichen planus. *J Dtsch Dermatol Ges*. 2013;11(4):309-319. DOI: 10.1111/ddg.12031. PMID: 23320493.
5. Kanwar AJ, Dogra S, Handa S, Parsad D, Radotra BD. A study of 124 Indian patients with lichen planus pigmentosus. *Clin Exp Dermatol*. 2003;28(5):481-485. DOI: 10.1046/j.1365-2230.2003.01367.x. PMID: 12950331.
6. Bourra H, Leila B. Lichen planus pigmentosus. *Pan Afr Med J*. 2013;15:55. DOI: 10.11604/pamj.2013.15.55.2976. PMID: 24147181. PMCID: PMC3801232.
7. Weston G, Payette M. Update on lichen planus and its clinical variants. *Int J Womens Dermatol*. 2015;1(3):140-149. DOI: 10.1016/j.ijwd.2015.04.001. PMID: 28491978. PMCID: PMC5418875.
8. Meads SB, Kunishige J, Ramos-Caro FA, Hassanein AM. Lichen planus actinicus. *Cutis*. 2003;72(5):377-381. PMID: 14655778.
9. DOSTROVSKY A, SAGHER F. Lichen planus in subtropical countries; study of an annular type with inverse localization (uncovered surfaces of the skin). *Arch Derm Syphilol*. 1949;59(3):308-328.DOI:10.1001/archderm.1949.01520280060007.PMID:18115015.
10. Bouassida S, Boudaya S, Turki H, Gueriani H, Zahaf A. Lichen plan actinique: 32 cas [Actinic lichen planus: 32 cases]. *Ann Dermatol Venereol*. 1998;125(6-7):408-413. PMID: 9747296.
11. Kilaimy M. Lichen planus subtropicus. *Arch Dermatol*. 1976;112(9):1251-1253. DOI: 10.1001/archderm.112.9.1251. PMID: 999301.
12. Salman SM, Kibbi AG, Zaynoun S. Actinic lichen planus. A clinicopathologic study of 16 patients. *J Am Acad Dermatol*. 1989;20(2 Pt 1):226-231. PMID: 2915056.
13. Kim T, Borok J, Wright KT. Oral prednisone: A unique and effective treatment for actinic lichen planus. *JAAD Case Rep*. 2018;4(10):976-978. DOI: 10.1016/j.jdcr.2018.07.001. PMID: 30406171. PMCID: PMC6214885.
14. Durgaraju S, Katakam N. A clinico-histopathological study of lichen planus. *Journal of Pharmaceutical Research International*. 2020;3(2):165–168. DOI: 10.9734/jpri/2021/v33i731197.
15. Al-Mutairi N, El-Khalawany M. Clinicopathological characteristics of lichen planus pigmentosus and its response to tacrolimus ointment: an open label, non-randomized, prospective study. *J Eur Acad Dermatol Venereol*. 2010;24(5):535-540. DOI: 10.1111/j.1468-3083.2009.03460.x. PMID: 19840200.
16. Boch K, Langan EA, Kridin K, Zillikens D, Ludwig RJ, Bieber K. Lichen Planus. *Front Med (Lausanne)*. 2021;8:737813. DOI: 10.3389/fmed.2021.737813. PMID: 34790675. PMCID: PMC8591129.
17. Mendiratta V, Sanke S, Chander R. Lichen Planus Pigmentosus: A Clinico-etiological Study. *Indian Dermatol Online J*. 2019;10(3):288-292. DOI: 10.4103/idoj.IDOJ_253_18. PMID: 31149573. PMCID: PMC6536068.