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HISTOMORPHOLOGICAL SPECTRUM OF LICHEN PLANUS AND ITS VARIANTS: A DESCRIPTIVE STUDY

Pathology

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ABSTRACT

Background: A common dermatological disorder, Lichen planus (LP) is a fairly distinctive lesion of uncertain aetiology and unique histopathology. Due to overlapping clinical features, accurate diagnosis can be challenging. Our study aimed to examine the histopathological patterns of lichen planus and its variants and correlate them with clinical findings and establish a correlation to improve diagnostic accuracy and clinical management. **Methodology:** This descriptive study, conducted at Department of Pathology, Mahadevappa Rampure Medical College, included 66 subjects following inclusion. Data were collected using a structured proforma, and punch biopsies from hyperpigmented skin lesions were processed for histopathological examination, stained with haematoxylin and eosin. Chi-square tests were used for qualitative data, and sensitivity, specificity, and accuracy were calculated. **Results:** Out of 66 cases of lichen planus, dominant age group was 31-40 years (27.7%)) with high male(56.15%) preponderence. The clinical with histopathological diagnosis revealed highest sensitivity, specificity and accuracy. **Conclusion:** Lichen planus has distinct histological features and varied clinical presentations, making diagnosis challenging. Accurate identification and differentiation is the key to effective treatment.

KEYWORDS

Lichen planus; Lichen simplex; Lichen striatus; Lichen nitidus

INTRODUCTION

The skin, as the largest organ in the human body, serves as an essential barrier protecting the body from environmental stressors such as pathogens, chemicals, and physical trauma.[1] In addition to its protective role, the skin also serves as a mirror, reflecting various internal diseases and systemic conditions.[2]

A common dermatological disorder, Lichen planus (LP) is a fairly distinctive mucocutaneous disease, of uncertain aetiology but of somewhat unique histopathological features. LP predominantly is a disease of the middle aged and elderly with ages ranging from 30-70 years with the prevalence differing between different racial groups.[3]

These lesions are frequently chronic, and their appearance can cause considerable distress, both physically and psychologically, for affected individuals.[4]

Despite the advancements in dermatological diagnostics and therapies, there is still a lack of clarity in understanding the exact pathophysiology of this lesions. Various factors, including genetics, immune system dysfunction, environmental triggers, and infections, contribute to the development of these conditions. For example, psoriasis is thought to be primarily an autoimmune disorder where the immune system mistakenly attacks healthy skin cells, leading to the rapid turnover of skin cells and the formation of plaques.

Lichen planus is believed to be an immune-mediated condition that targets the basal layer of the skin, leading to the characteristic flat-topped papules and violaceous coloration[4]

Some conditions present with numerous clinical variants and mimic various dermatological conditions.[5]

Lichen planus (LP) is an inflammatory skin condition presents as pruritic, polygonal, violaceous flat-topped papules and plaques; many variants in morphology and location also exist, including oral, nail, linear, annular, atrophic, hypertrophic, inverse, eruptive, bullous, ulcerative, LP pigmentosus, lichen planopilaris, vulvovaginal, actinic, lichen planus-lupus erythematosus overlap syndrome, and lichen planus pemphigoides. Histopathological features are consistent for LP and its variants. Light microscopic evaluation of LP lesions shows circumscribed, wedge shaped hypergranulosis in the epidermis; marked hyperkeratosis; and irregular sawtooth-like acanthosis of rete ridges. The dermal– epidermal junction typically shows signs of vacuolar degeneration with apoptotic keratinocytes, while the upper dermis characteristically contains a dense, band-like lymphocytic infiltrate that can obscure the dermal–epidermal junction. Civatte bodies, hypothesized to be apoptotic keratinocytes ready for phagocytosis, can be seen in the epithelium and upper dermis. Direct immunofluorescence often reveals a large number of IgM-staining cytoid bodies in the dermal papillae or peribasilar areas.[6]

The chronicity, fluctuating nature, and potential for recurrence of these disorders make them complex to manage.[7,8]

Therefore this lesions has similar clinical presentation, and there is a lack of consensus on the most reliable biomarkers for differentiating between other similar conditions.[9]

Hence present study was conducted to study histopathological patterns of lichen planus and its variants.

METHODOLOGY

The present descriptive study was conducted in the Department of Pathology, Mahadevappa Rampure Medical College, Kalaburagi; attached with Basweshwar Teaching and General Hospital, Kalaburagi on 66 participants.

Inclusion Criteria:

1. All newly diagnosed patients with papulosquamous lesions of skin attending the OPD.
2. The patients were selected irrespective of age, sex, socioeconomic status and site of lesions.

Exclusion Criteria:

1. Papulosquamous lesions with infective etiology will be excluded.
2. Scar lesions like keloid will be excluded.
3. Patients on treatment.

Study Procedure

Study subjects were selected after applying inclusion and exclusion criteria. Information was collected through prepared proforma from each case. Punch biopsy was obtained from hyperpigmented skin lesions. The biopsy samples obtained were submitted in the pathology laboratory, fixed in 10% formalin and sections stained with haematoxylin and eosin stains.

For retrospective study haematoxylin and eosin-stained histo-pathology slides of all the skin biopsies were retrieved from the archives of pathology department and reviewed.

Statistical Analysis

The data collected was analyzed statistically using SPSS software version 30.0, P-value less than 0.05 was considered significant. Test of significance (Chi square test) was used for qualitative analysis. Percentage of involvement was calculated manually. Graphs and charts were generated to represent the data using Microsoft office-365. Sensitivity, Specificity, and Accuracy were calculate using the statistical software SPSS.

RESULTS

Our findings showed that in a total of 66 cases diagnosed predominantly with Lichen planus and its variants, with majority belonging to age range of 31-40 years. Flat topped papule and plaques are the commonest type of clinical patterns seen in lichen planus in our study. (TABLE-1) Most of the cases among lichen planus patient, showed hyperkeratosis, hypergranulosis, irregular acanthosis with saw toothed rete ridges,vacuolar degeneration, dermal band like infiltrate and pigment incontinence. All cases showed mononuclear type of cellular infiltrate. (TABLE-2) Out of a total of 62 participants who were histopathologically diagnosed as Lichen planus, only 40 (TP) of these could be diagnosed clinically, and in the rest 22 (FN) there was no clinical suspicion of Lichen planus. But, there were an additional of 3 (FP) cases which were clinically suspected as Lichen planus, but could not be confirmed histopathologically. (TABLE-3) GRAPH-1 shows the gender-wise distribution of lichen planus with high male predominance. GRAPH -2 shows Statistical outcome of the clinical diagnosis & histopathological correlation of lichen planus and its variants.

Table-1: Histologically Diagnosed Lichen Planus, With Different Clinical Presentation

Papule	Scaly Plaque	Flat topped papule/plaque	Scaly patches/ Macule	Verrucous nodule/ Paque	Itching
04	08	32	04	04	10

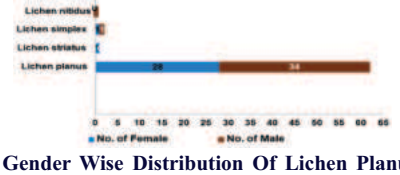
Table-2: Histopathological Changes Observed In Lichen Planus

Histopathological Changes	Number of cases	Percentage
Epidermal Changes		
Hyperkeratosis	10	28.57
Focal Parakeratosis	02	5.71
Irregular Acanthosis with saw toothed rete ridges	23	65.71
Hypergranulosis	31	88.57
Vacuolar degeneration of basal cells	29	82.85
Civatte Bodies	02	5.71
Dermal Changes		
Dermal infiltrate -Band like -Spotty	 31 04	 88.57 11.43
Cell type infiltrate -Mononuclear -Epithelioid	 35 --	 100 --
Pigment incontinence	17	48.57
Vascular changes	--	--

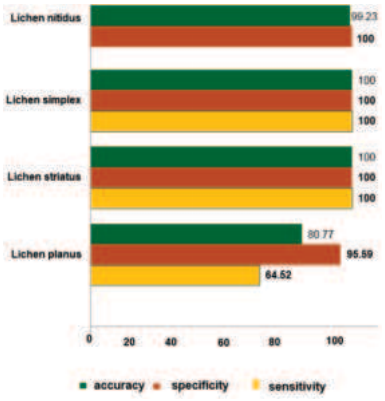
Table-3: Correlation Of Clinical Diagnosis With Histopathological Findings

VARIANTS	Clinically diagnosed			Histopathologically diagnosed		
	TP	FP	Total	TP	FN	Total
Lichen planus	40	3	43	40	22	62
Lichen striatus	1	0	1	1	0	1
Lichen simplex	2	0	2	2	0	2
Lichen nitidus	0	0	0	0	1	1

a) True Positive (TP) = Histopathologically Positive + Clinically Positive
b) False Negative (FN) = Histopathologically Positive + Clinically Negative
c) False Positive (FP) = Histopathologically Negative + Clinically Positive
d) True Negative (TN) = Histopathologically Negative + Clinically Negative



Graph-1: Gender Wise Distribution Of Lichen Planus And Its Variants



Graph 2: Statistical Outcome Of The Clinical Diagnosis & Histopathological Correlation

DISCUSSION

In the present study, the age incidence was distributed from 05years to 80years corresponding to 47.6% of total cases of Lichen Planus. <20 years had 11.54% of cases and 21-30 years had 10.77% of cases. From 31- 40 years the cases comprised of 13.85%, being the most common age group. 41- 50 years had 3.085 % cases. 51-60 years had 4.61% of cases and >60 years had 3.08% cases.

In a study by J. Gandhi et al (2021)[10] age group was 11-14 years, Shimray R et al (2021)[11] studied age 02-70 years, K. Chabbi et al (2022)[12], 31-60 years, Patel PA et. al (2023)[13], 31-40 years, Sabhlok A. et al (2024)[16], 21-30 years and Parvatala A. et al (2024)[14] showed 31-40 years.

In all the above studies conducted by J. Gandhi et al[9], Shimray R et al[10], K. Chabbi et al[11], Patel PA et. al[12], Sabhlok A. et al[16], Parvatala A. et al[13] male preponderance were reported. In the present study, Lichen Planus was reported more commonly in males.

In the present study 62 cases (47.69%) were classical Lichen Planus. Majority of the cases showed hyperkeratosis, irregular acanthosis with saw toothed rete ridges, hypergranulosis, vacuolar degeneration of basal cells and dermal band like mononuclear infiltrate and pigment incontinence. These findings are consistent with the classic description of lichen planus given by Parvatala A et al (2024)[14] and contrasting findings were seen in studies by Patel PA et. al.[13] and Sabhlok A. et. al.[16]

Other than classical Lichen planus, Pigmented Lichen planus was the commonest subtype seen followed by Hypertrophic Lichen planus.

In the present study biopsies of 17 cases of lichen planus pigmentosus showed increased pigmented macrophages in upper dermis along with other classical features of Lichen planus.

08 cases of hypertrophic lichen planus showed hyperkeratosis, focal parakeratosis, papillomatosis and acanthosis of epidermis. Dermis showed typical dermal infiltrate. These changes were consistent with the description given by Parvatala A. et al. [14] However, our findings were inconsistent to results showed by Chandanwale SS et. al. (2024)[15] and Patel PA et. al. (2023)[13]

Parvatala A et al[14] had 21 cases histologically diagnosed as Lichen Planus. 19 subjects were clinically diagnosed (without differential diagnosis) and confirmed histologically.

In our study, a total of 62 participants were histopathologically diagnosed as Lichen planus. Whereas, only 40 of these could be diagnosed clinically, and in the rest 22 there was no clinical suspicion of Lichen planus.

CONCLUSION

Lichen planus is a skin disorders with diverse, distinct histological features and varied clinical presentations, making diagnosis challenging. Accurate identification and differentiation, ensuring appropriate treatment is the key as misdiagnosis can lead to ineffective treatment and worsen outcomes.

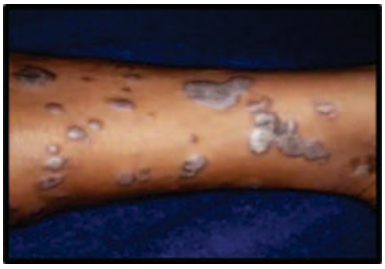


Figure 1a: Lichen Planus. Multiple Violaceous Papule To Plaque Like Lesions On Leg

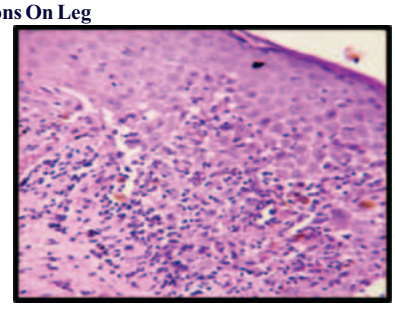


Figure 1b : Lichen Planus: Photomicrograph Shows Civatte / Cytoid Bodies (apoptotic Basal Keratinocytes) H&E(40x)

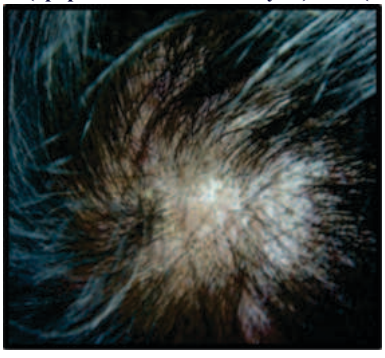


Figure 2a : Lichen Plano Pilaris : Scalp With Visible Hair Loss And Scaling.

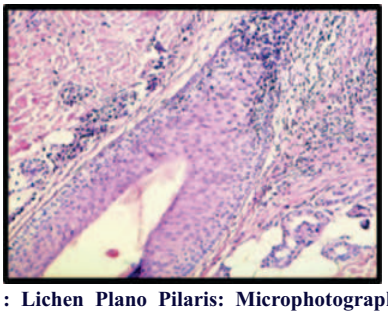


Figure 2b : Lichen Plano Pilaris: Microphotograph Showing Follicular Involvement By Lymphocytes, Histiocytes And Perifollicular Mucinous Fibroplasia.[h&E,40x]

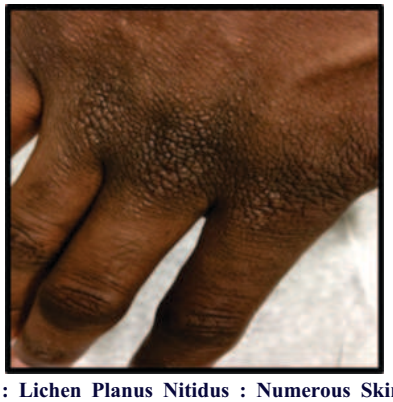


Figure 3a : Lichen Planus Nitidus : Numerous Skin Covered Hyperpigmented Small And Pin Point Papules On The Hand Noted.

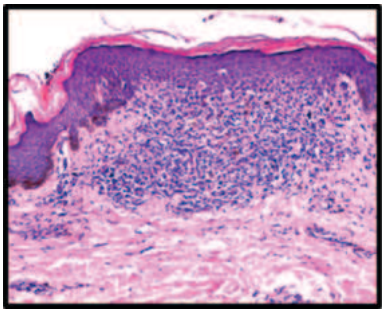


Figure 3b : Lichen Planus Nitidus: Microphotograph Showing Epidermis And Dermis. Epidermal Atrophy With Prominent Basal Layer Vacuolation With Apoptotic Keratinocytes Noted . Dermis Shows Mixed Lymphohistiocytic Infiltrate With Scattered Melanophages Giving A Ball And Claw Appearance .[H&E,40x]

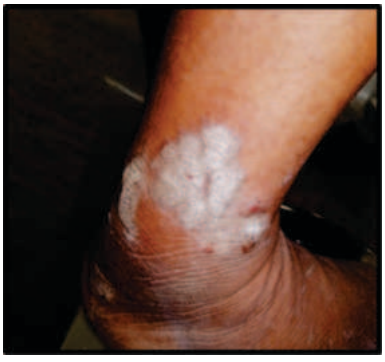


Figure 4a: Hypertrophic Lichen Planus : Microphotograph Showing Hyperkeratosis, Acanthosis, Wedge Shaped Hypergranulosis, Sawtoothing Of Rete Ridges, Band-like Lymphohistiocytic Infiltrate Obscuring The Dermoepidermal Junction. [H&E, 40x]

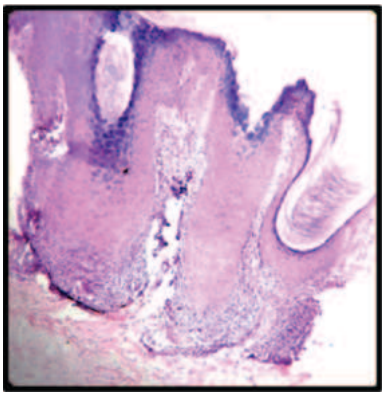


Figure 4b: Hypertrophic Lichen Planus : Well Demarcated, Raised, Hyperkeratotic, Hyperpigmented, Thickened, And Scaly Lesion On The Ankle Region

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