

## **Dermoscopic features of erythematous-desquamative and papulosquamous inflammatory dermatoses: A hospital based prospective study**

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### **ABSTRACT**

**Background:** Dermoscopy can be a useful aid in evaluating inflammatory skin disorders but little is currently known about their dermoscopic features.

**Aims and objectives:** To study the dermoscopic features in erythematous-desquamative and papulosquamous inflammatory dermatoses and their correlation with histopathological findings.

**Materials and methods:** Two hundred cases were enrolled. Dermoscopic images of lesions were obtained with a videodermatoscope. Dermoscopic findings such as background colour, type of vessels, pattern of vessels, scale colour, scale distribution, Wickham striae etc. were recorded.

**Results:** There were 106 patients of psoriasis, 36 of lichen planus, 31 of eczematous dermatitis, 18 of pityriasis rosea, 5 of hypertrophic lichen planus and 4 of subacute lupus erythematosus.

Dermoscopy of psoriasis showed red dots (92.45%), either alone (17.92%) or together as red dots + glomerular vessels + globular vessels (74.53%) and a bright red background. Lichen planus showed Wickham's striae (80.56%), grey/black dots/globules (22.22%) and comedo-like openings (16.67%). Hypertrophic lichen planus showed Wickham's striae (80%), grey/black dots/globules (80%) and comedo-like openings (60%). Pityriasis rosea showed dotted vessels (50%) distributed in a patchy or peripheral pattern associated with a dull red background colour (50%), peripheral arrangements of scales (88.8%) and structureless brownish yellow areas (66.67%). Eczematous dermatitis showed dotted vessels (77.4%) in a patchy distribution and yellow serocrusts/white scaling. Subacute cutaneous lupus erythematosus showed a mixed vascular pattern [linear+dotted] (50%), arborising/irregular vessels (50%) over a bright-red background. Significant concordance was seen between dermoscopic findings and histopathology.

**Conclusion:** Dermoscopy can be a valuable tool for the diagnosis of inflammatory dermatosis and should be used.

**KEYWORDS:** dermoscopy, psoriasis, lichen planus, pityriasis rosea, eczematous dermatitis, red dots, glomerular vessels, arborising vessels

### **INTRODUCTION**

Erythematous-desquamative and papulo-squamous inflammatory dermatoses are a heterogeneous group of diseases which can be identified by the presence of red, scaly papules and plaques.<sup>1</sup> They include a number of diseases with a vast array of clinical features.

Common dermatoses amongst these are psoriasis (Ps) and lichen planus (LP), pityriasis rosea (PR), mycosis fungoides (MF), eczematous dermatitis (ED), subacute cutaneous lupus erythematosus (SCLE) etc.<sup>2</sup>

Dermoscopic findings have been described for these disorders separately in different studies.

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However, there is no study comparing the dermoscopic features of these disorders, which can be of help in differentiating these conditions. Histopathology gives an accurate diagnosis but it requires biopsy, which is an invasive procedure. It not only is cumbersome to perform biopsy in every case, but an apprehensive patient may deny the procedure altogether. So many cases may remain undiagnosed and be mismanaged.<sup>3</sup> In these cases, dermoscopy may contribute to pinpoint the diagnosis. Dermoscopy is a non-invasive diagnostic tool, which helps in visualisation of certain morphological features invisible to the naked eye.<sup>4</sup> It works on the principle of trans illumination of lesions and involves studying it under high magnification to visualise the subtle features.

The aim of our study was to study the dermoscopic features in erythematous-desquamative and papulosquamous inflammatory dermatoses and to correlate these dermoscopic features with clinical and histopathological findings.

## PATIENTS AND METHODS

This was a prospective study approved by the Institutional Ethics Committee. Patient information sheet was provided and written informed consent was taken from all the patients.

The study was conducted at the department of Dermatology & Sexually Transmitted Diseases of a tertiary care hospital between January 2021 and June 2022. Inclusion criteria for study participation were patients aged 10-60 years, of both sexes, with clinically suspected/diagnosed cases of erythematous-desquamative and papulo-squamous inflammatory dermatoses (Ps, LP, PR, MF, ED, SCLE). Exclusion criteria were; disease involving only palms and soles, only scalp, only

mucosa, only nails, patients with unstable, pustular, erythrodermic Ps, patients having only follicular or linear lesions, known infective dermatoses and patients not having any active lesions or treatment modified lesions. Demographic details were recorded and the single most recently developed lesion was examined dermoscopically and histopathologically. Non contact polarized dermoscopy was done using videodermatoscope -AM7515MZT DinoLite Edge. Immersion oil was used for better magnification. Dermoscopy image capturing was performed by a single practitioner to avoid diversification during the procedure.

Variables included in the dermoscopic evaluation were: (i) Vascular morphology (Red dots + glomerular + globular, red dots, globular vessels, glomerular/bushy vessels, radial vessels, hairpin vessels, irregular/arborising, dotted + linear); (ii) Vascular arrangement (regular, in clusters, patchy, peripheral); (iii) Background colour (bright red, dull red, pink, yellow, violet); (iv) Symmetry of vessels (symmetrical and asymmetrical); (v) Scale color (white, yellow); (vi) Scale distribution (patchy, peripheral, diffuse, central); and (vii) Others (Wickham striae, gray/black dots/globules, comedo like openings, structureless brownish yellow areas).

Arrangement of the vessels was judged as regular when vessels were distributed uniformly throughout the lesion, clustered when they were aggregated in small groups and seen only in some areas of the lesion, patchy when they were arranged in an asymmetrical distribution which could not be classified as clustered, peripheral when they were observed predominantly at the periphery of the lesion, and in rings when they were arranged in irregular circles.

Scale distribution was considered as an independent variable and was classified as diffuse when scales were arranged in a homogeneous pattern all over the lesion, patchy when scales covered a portion of the lesion asymmetrically, and central and peripheral when they were mainly arranged at the centre and periphery, respectively.

## STATISTICAL ANALYSIS

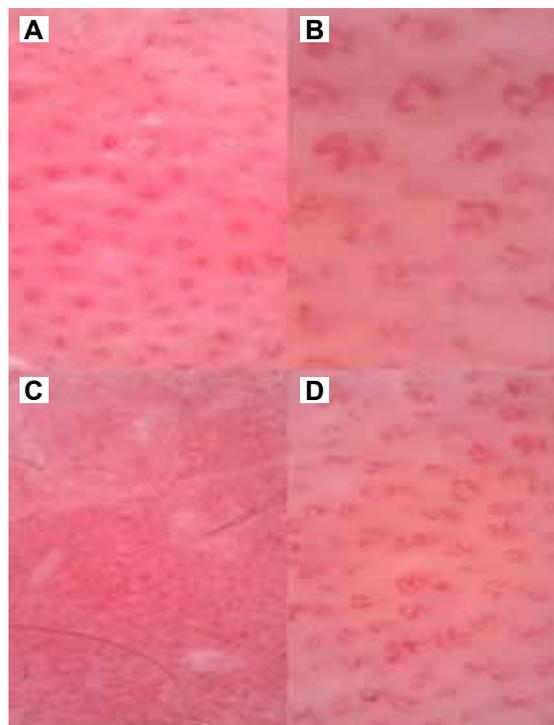
The presentation of the categorical variables was done in the form of numbers and percentages (%). On the other hand, the quantitative data were presented as mean  $\pm$  SD. The comparison of the variables which were quantitative in nature was analysed using independent t test. Univariate and multivariate logistic regression was used to find out relative risk of various factors of plaque psoriasis and lichen planus. The data entry was done in the Microsoft Excel spreadsheet and the final analysis was done with the use of Statistical Package for Social Sciences (SPSS) software, IBM manufacturer, Chicago, USA, ver 25.0. For statistical significance, p value of less than 0.05 was considered statistically significant.

## RESULTS

Out of 200 patients, 106 (53%) patients had Ps, 36 (18%) had LP, 31 (15.5%) had ED, 18 (9%) had PR, 5 (2.5%) had hypertrophic LP and 4 (2%) had SCLE. Descriptive results of the dermoscopic analysis are quoted in Table 1.

Red dots were the most common type of vessels seen in 92.45% of Ps patients either alone (n=19, 17.92%) or together as red dots + glomerular vessels + globular vessels (n=79, 74.53%). In majority (n=105, 99.06%) of patients, vessels were regularly distributed. 98.11% had symmetrical distribution of vessels. In all patients, scale

color was white, and majority (n=103, 97.17%)



**Fig. 1** Dermoscopic image of psoriasis showing (a)&(b) glomerular vessels, (c) red dots, red globules regularly distributed with (d) bright red background

had diffuse distribution of scales. (Figure 1) Wickham's striae (WS), was present in 29 (80.56%) of LP patients. Twenty-nine (80.56%), patients had dull red background colour. Red dots were the most common type of vessels seen in 25(69.44%) patients, distributed peripherally in 13(36.11%) patients and in patchy pattern in 11(30.56%) patients. (Figure 2) Among 5 patients of hypertrophic LP, 4 (80%) patients had WS and gray/black dots/globules. Among 9 (50%) out of 18 patients of PR, background colour was dull red followed by yellow in 7 patients (38.89%). Red dots were present in 10 patients (55.56%). Scales were present in all patients (100%) of PR which were white in colour, and were distributed peripherally in 16 (88.89%) patients. Structure-less brownish yellow areas were found in 12 (66.67%) patients. In ED background colour was dull red in 21

**Table 1** Comparison of dermoscopic features of erythematous-desquamative and papulo-squamous inflammatory dermatoses

Dermoscopic features	Ps (n=106)	LP (n=36)	Hypertrophic LP (n=5)	PR (n=18)	ED (n=31)	SCLE (n=4)	Total	p value
<b>Background colour</b>								
Bright red	102 (96.23%)	6 (16.67%)	0 (0%)	2 (11.11%)	10 (32.26%)	3 (75%)	123 (61.50%)	<.0001*
Dull red	2 (1.89%)	29 (80.56%)	2 (40%)	9 (50%)	21 (67.74%)	1 (25%)	64 (32%)	<.0001*
Pink	1 (0.94%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (0.50%)	1*
Yellow	1 (0.94%)	0 (0%)	0 (0%)	7 (38.89%)	0 (0%)	0 (0%)	8 (4%)	<.0001*
Violet	0 (0%)	1 (2.78%)	3 (60%)	0 (0%)	0 (0%)	0 (0%)	4 (2%)	<.0001*
<b>Type of vessels</b>								
Absent	0 (0%)	11 (30.56%)	4 (80%)	8 (44.44%)	1 (3.23%)	0 (0%)	24 (12%)	<.0001*
Red dots	19 (17.92%)	22 (61.11%)	1 (20%)	10 (55.56%)	29 (93.55%)	0 (0%)	81 (40.50%)	<.0001*
Glomerular/ bushy vessels	1 (0.94%)	0 (0%)	0 (0%)	0 (0%)	1 (3.23%)	0 (0%)	2 (1%)	0.529*
Globular vessels	7 (6.60%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	7 (3.50%)	0.429*
Red dot + glomerular + globular	79 (74.53%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	79 (39.50%)	<.0001*
Radial vessels	0 (0%)	1 (2.78%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (0.50%)	0.47*
Hairpin vessels	0 (0%)	1 (2.78%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (0.50%)	0.47*
Irregular/ar- borising	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	2 (50%)	2 (1%)	0.0003*
Dotted + linear	0 (0%)	1 (2.78%)	0 (0%)	0 (0%)	0 (0%)	2 (50%)	3 (1.50%)	0.0006*
<b>Pattern of vessels</b>								
Absent	0 (0%)	11 (30.56%)	4 (80%)	8 (44.44%)	1 (3.23%)	0 (0%)	24 (12%)	<.0001*
Regular	105 (99.06%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	105 (52.50%)	<.0001*
Cluster	0 (0%)	1 (2.78%)	0 (0%)	0 (0%)	4 (12.90%)	0 (0%)	5 (2.50%)	0.013*
Patchy	1 (0.94%)	11 (30.56%)	1 (20%)	6 (33.33%)	24 (77.42%)	4 (100%)	47 (23.50%)	<.0001*
Peripheral	0 (0%)	13 (36.11%)	0 (0%)	4 (22.22%)	2 (6.45%)	0 (0%)	19 (9.50%)	<.0001*
<b>Symmetry of vessels</b>								
Absent	0 (0%)	11 (30.56%)	4 (80%)	8 (44.44%)	1 (3.23%)	0 (0%)	24 (12%)	<.0001*
Symmetrical	104 (98.11%)	1 (2.78%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	105 (52.50%)	<.0001*
Asymmetrical	2 (1.89%)	24 (66.67%)	1 (20%)	10 (55.56%)	30 (96.77%)	4 (100%)	71 (35.50%)	<.0001*
<b>Scale colour</b>								
Absent	0 (0%)	32 (88.89%)	5 (100%)	0 (0%)	2 (6.45%)	0 (0%)	39 (19.50%)	<.0001*
White	106 (100%)	4 (11.11%)	0 (0%)	18 (100%)	23 (74.19%)	4 (100%)	155 (77.50%)	<.0001*
Yellow	0 (0%)	0 (0%)	0 (0%)	0 (0%)	6 (19.35%)	0 (0%)	6 (3%)	0.0003*
<b>Scale distribution</b>								
Absent	0 (0%)	32 (88.89%)	5 (100%)	0 (0%)	2 (6.45%)	0 (0%)	39 (19.50%)	<.0001*
Diffuse	103 (97.17%)	2 (5.56%)	0 (0%)	1 (5.56%)	3 (9.68%)	3 (75%)	112 (56%)	<.0001*
Patchy	1 (0.94%)	0 (0%)	0 (0%)	0 (0%)	4 (12.90%)	1 (25%)	6 (3%)	0.007*
Central	1 (0.94%)	1 (2.78%)	0 (0%)	1 (5.56%)	20 (64.52%)	0 (0%)	23 (11.50%)	<.0001*
Peripheral	1 (0.94%)	1 (2.78%)	0 (0%)	16 (88.89%)	2 (6.45%)	0 (0%)	20 (10%)	<.0001*
<b>Others</b>								
Wickham striae	0 (0%)	29 (80.56%)	4 (80%)	0 (0%)	0 (0%)	0 (0%)	33 (16.50%)	<.0001*
Gray/black dots/ globules	0 (0%)	8 (22.22%)	4 (80%)	0 (0%)	0 (0%)	0 (0%)	11 (5.50%)	<.0001*
Comedo like opening	0 (0%)	6 (16.67%)	3 (60%)	0 (0%)	0 (0%)	0 (0%)	9 (4.50%)	<.0001*
Structure less brownish yellow areas	0 (0%)	0 (0%)	0 (0%)	12 (66.67%)	0 (0%)	0 (0%)	12 (6%)	<.0001*

\* Fisher's exact test

**Table 2** Association of parameters of Non psoriatic inflammatory dermatoses with Plaque psoriasis

Parameters	Patients with plaque psoriasis(n=106)	Non psoriasis(n=94)	Total	P value	Relative risk ratio(95% CI)
<b>Dermoscopy-background colour</b>					
Bright red	102 (96.23%)	21 (22.34%)	123 (61.5%)	<0.0001	15.96 (6.1272 to 41.5904)
Dull red	2 (1.89%)	62 (65.96%)	64 (32%)	<0.0001	0.041 (0.01041 to 0.1604)
Pink	1 (0.94%)	0 (0%)	1 (0.50%)	0.395	1.422 (0.632 to 3.1988)
Yellow	1 (0.94%)	7 (7.45%)	8 (4%)	0.116	0.229 (0.03638 to 1.4362)
Violet	0 (0%)	4 (4.26%)	4 (2%)	0.209	0.185 (0.0133 to 2.5734)
<b>Dermoscopy-type of vessels</b>					
Absent	0 (0%)	24 (25.53%)	24 (12%)	0.015	0.033 (0.00213 to 0.5182)
Red dots	19 (17.92%)	62 (65.96%)	81 (40.50%)	<0.0001	0.321(0.2133 to 0.4826)
Glomerular/bushy vessels	1 (0.94%)	1 (1.06%)	2 (1%)	0.934	0.943(0.2343 to 3.7934)
Globular vessels	7 (6.60%)	0 (0%)	7 (3.50%)	<0.0001	1.828(1.459 to 2.2901)
Red dot + glomerular + globular	79 (74.53%)	0 (0%)	79 (39.50%)	<0.0001	4.409(3.1714 to 6.1286)
Radial vessels	0 (0%)	1 (1.06%)	1 (0.50%)	0.538	0.47(0.04242 to 5.196)
Hairpin vessels	0 (0%)	1 (1.06%)	1 (0.50%)	0.538	0.47(0.04242 to 5.196)
Irregular/arborising	0 (0%)	2 (2.13%)	2 (1%)	0.367	0.311(0.02472 to 3.9238)
Dotted + linear	0 (0%)	3 (3.19%)	3 (1.50%)	0.271	0.232(0.01733 to 3.1166)
<b>Dermoscopy-pattern of vessels</b>					
Absent	0 (0%)	24 (25.53%)	24 (12%)	0.015	0.033 (0.00213 to 0.5182)
Regular	105 (99.06%)	0 (0%)	105 (52.50%)	<0.0001	63.698 (13.01 to 311.684)
Cluster	0 (0%)	5 (5.32%)	5 (2.50%)	0.167	0.153 (0.01076 to 2.1859)
Patchy	1 (0.94%)	46 (48.94%)	47 (23.50%)	0.0005	0.031 (0.00444 to 0.2162)
Peripheral	0 (0%)	19 (20.21%)	19 (9.50%)	0.024	0.043 (0.00275 to 0.6615)
<b>Dermoscopy-symmetry of vessels</b>					
Absent	0 (0%)	24 (25.53%)	24 (12%)	0.015	0.033 (0.00213 to 0.5182)
Symmetrical	104 (98.11%)	1 (1.06%)	105 (52.5%)	<0.0001	47.048 (11.938 to 185.40)
Asymmetrical	2 (1.89%)	69 (73.40%)	71 (35.50%)	<0.0001	0.035 (0.00888 to 0.1373)
<b>Dermoscopy-scale colour</b>					
Absent	0 (0%)	39 (41.49%)	39 (19.5%)	0.005	0.019 (0.00120 to 0.2994)
White	106 (100%)	49 (52.13%)	155 (77.5%)	0.003	62.808 (3.979 to 991.189)
Yellow	0 (0%)	6 (6.38%)	6 (3%)	0.136	0.131 (0.0090 to 1.8963)
<b>Dermoscopy-scale distribution</b>					
Absent	0 (0%)	39 (41.49%)	39 (19.50%)	0.005	0.019 (0.00120 to 0.2994)
Diffuse	103 (97.17%)	9 (9.57%)	112 (56%)	<0.0001	26.976 (8.859 to 82.1422)
Patchy	1 (0.94%)	5 (5.32%)	6 (3%)	0.198	0.308 (0.05121 to 1.8516)
Central	1 (0.94%)	22 (23.40%)	23 (11.50%)	0.008	0.073 (0.01074 to 0.5003)
Peripheral	1 (0.94%)	19 (20.21%)	20 (10%)	0.012	0.086 (0.01264 to 0.5814)

\*Independent t test

**Table 3** Association of parameters of Non Lichen Planus inflammatory dermatoses with Lichen planus

Parameters	Patients with lichen planus(n=36)	Patients without lichen planus(n=164)	Total	P value	Relative risk ratio(95% CI)
<b>Dermoscopy-background colour</b>					
Bright red	6 (16.67%)	117 (71.34%)	123(61.5%)	<0.0001	0.125 (0.05465 to 0.2868)
Dull red	29 (80.56%)	35 (21.34%)	64 (32%)	<0.0001	8.804 (4.0759 to 19.0149)
Pink	0 (0%)	1 (0.61%)	1 (0.50%)	0.784	1.401 (0.1247 to 15.7435)
Yellow	0 (0%)	8 (4.88%)	8 (4%)	0.376	0.294 (0.01955 to 4.413)

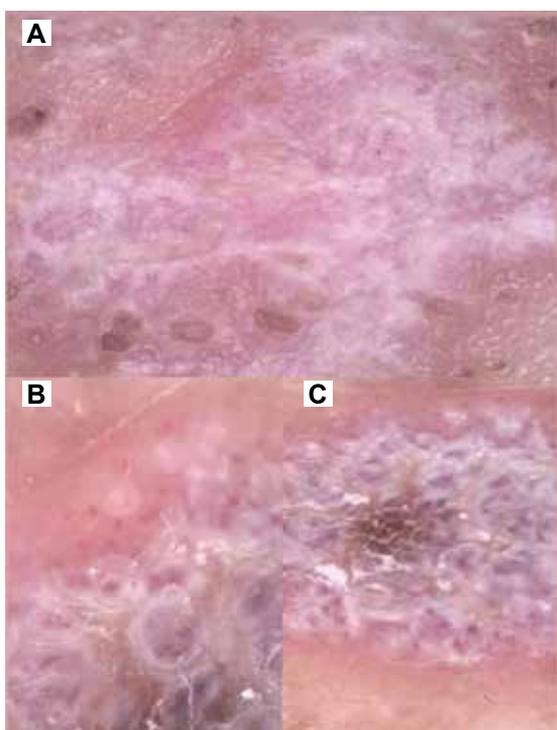
Violet	1 (2.78%)	3 (1.83%)	4 (2%)	0.702	1.4 (0.2498 to 7.8478)
<b>Dermoscopy-type of vessels</b>					
Absent	11 (30.56%)	13 (7.93%)	24 (12%)	0.0001	3.227 (1.831 to 5.6861)
Red dots	22 (61.11%)	59 (35.98%)	81 (40.5%)	0.007	2.309 (1.2573 to 4.2392)
Glomerular/bushy ves- sels	0 (0%)	2 (1.22%)	2 (1%)	0.941	0.909 (0.07114 to 11.6058)
Globular vessels	0 (0%)	7 (4.27%)	7 (3.50%)	0.424	0.332 (0.02233 to 4.9415)
Red dot + glomerular + globular	0 (0%)	79 (48.17%)	79 (39.5%)	0.006	0.021 (0.001301 to 0.3356)
Radial vessels	1 (2.78%)	0 (0%)	1 (0.50%)	0.0009	4.225 (1.7988 to 9.9252)
Hairpin vessels	1 (2.78%)	0 (0%)	1 (0.50%)	0.0009	4.225 (1.7988 to 9.9252)
Irregular/arborising	0 (0%)	2 (1.22%)	2 (1%)	0.941	0.909 (0.07114 to 11.6058)
Dotted + linear	1 (2.78%)	2 (1.22%)	3 (1.50%)	0.449	1.876 (0.3682 to 9.5595)
<b>Dermoscopy-pattern of vessels</b>					
Absent	11 (30.56%)	13 (7.93%)	24 (12%)	0.0001	3.227 (1.831 to 5.6861)
Regular	0 (0%)	105 (64.02%)	105(52.5%)	0.002	0.012 (0.0007719 to 0.1994)
Cluster	1 (2.78%)	4 (2.44%)	5 (2.50%)	0.905	1.114 (0.1882 to 6.5982)
Patchy	11 (30.56%)	36 (21.95%)	47 (23.5%)	0.263	1.432 (0.7634 to 2.6876)
Peripheral	13 (36.11%)	6 (3.66%)	19 (9.50%)	<0.0001	5.384 (3.302 to 8.7803)
<b>Dermoscopy-symmetry of vessels</b>					
Absent	11 (30.56%)	13 (7.93%)	24 (12%)	0.0001	3.227 (1.831 to 5.6861)
Symmetrical	1 (2.78%)	104 (63.41%)	105 (52.50%)	0.0003	0.026 (0.003611 to 0.1851)
Asymmetrical	24 (66.67%)	47 (28.66%)	71 (35.50%)	0.0001	3.634 (1.9362 to 6.8197)
<b>Dermoscopy-scale colour</b>					
Absent	32 (88.89%)	7 (4.27%)	39 (19.5%)	<0.0001	33.026 (12.4095 to 87.8915)
White	4 (11.11%)	151 (92.07%)	155(77.5%)	<0.0001	0.036 (0.01355 to 0.09718)
Yellow	0 (0%)	6 (3.66%)	6 (3%)	0.482	0.382 (0.02598 to 5.6048)
<b>Dermoscopy-scale distribution</b>					
Absent	32 (88.89%)	7 (4.27%)	39 (19.5%)	<0.0001	33.026 (12.4095 to 87.8915)
Diffuse	2 (5.56%)	110 (67.07%)	112 (56%)	<0.0001	0.046 (0.01141 to 0.1871)
Patchy	0 (0%)	6 (3.66%)	6 (3%)	0.482	0.382 (0.02598 to 5.6048)
Central	1 (2.78%)	22 (13.41%)	23 (11.5%)	0.126	0.22 (0.0316 to 1.5297)
Peripheral	1 (2.78%)	19 (11.59%)	20 (10%)	0.169	0.257 (0.0372 to 1.7776)
<b>Dermoscopy-Wickham striae</b>					
Absent	7 (19.44%)	160 (97.56%)	167(83.5%)	<0.0001	0.048 (0.02285 to 0.09958)
Present	29 (80.56%)	4 (2.44%)	33 (16.50%)	<0.0001	20.965 (10.0419 to 43.7713)
<b>Dermoscopy-others</b>					
Absent	24 (66.67%)	147 (89.63%)	171(85.5%)	0.0002	0.339 (0.1918 to 0.6)
Gray/black dots/ globules+comedo like opening	2 (5.56%)	3 (1.83%)	5 (2.50%)	0.145	2.294 (0.7514 to 7.004)
Gray/black dots/globules	6 (16.67%)	2 (1.22%)	8 (4%)	<0.0001	4.8 (2.86 to 8.0559)
Comedo like opening	4 (11.11%)	0 (0%)	4 (2%)	<0.0001	5.455 (3.5522 to 8.3782)
Structureless brownish yellow areas	0 (0%)	12 (7.32%)	12 (6%)	0.247	0.199 (0.01294 to 3.0647)

\* Independent t test

**Table 4** Multivariate logistic regression to find out significant risk factors of Lichen planus.

Variables	P value	Relative risk	RR Lower bound (95%)	RR Upper bound (95%)
<b>Dermoscopy-background colour</b>				
Bright red	0.484	1.114	0.571	1.194
Dull red	0.331	2.209	0.363	4.536
<b>Dermoscopy-type of vessels</b>				

Red dots	0.317	0.502	0.101	1.661
Glomerular/bushy vessels	0.882	0.798	0.017	3.115
Globular vessels	0.549	0.443	0.017	2.690
Red dot + glomerular + globular	0.237	0.344	0.042	1.674
Radial vessels	0.927	2.621	0.000	3.273
Hairpin vessels	0.943	2.318	0.000	3.273
Irregular/arborising	0.910	0.838	0.016	3.145
Dotted + linear	0.666	0.376	0.002	3.177
<b>Dermoscopy-scale colour</b>				
White	0.049	0.529	0.101	0.999
Yellow	0.184	0.475	0.024	1.082
<b>Dermoscopy-Wickham striae</b>	0.020	4.646	1.547	5.118
<b>Dermoscopy-others</b>				
Gray/black dots/globules+comedo like opening	0.071	0.087	0.002	1.093
Gray/black dots/globules	0.608	1.225	0.260	1.484
Comedo like opening	0.311	1.469	0.143	1.500
Structureless brownish yellow areas	0.789	0.882	0.160	1.417



**Fig. 2** Dermoscopic image of lichen planus showing (a) Wickham striae, (b) red dots arranged peripherally, (c) comedo like openings, gray/black dots/globules, dull red background

patients (67.74%) and bright red in 10 patients (32.26%). Out of 31 patients of ED, vessels were found in 30 patients (96.77%), and 29 patients (93.55%) showed red dots. The pattern was



**Fig. 3** Dermoscopic image of SCLE showing irregular/arborising vessels, dotted + linear vessels

patchy in 24 patients (77.42%) followed by in clusters in 4 patients (12.90%). Asymmetrical arrangement of vessels was seen in all. Scales were present in 29 patients (93.54%) of ED. The scale colour was white in 23 patients (74.19%) and yellow in 6 patients (19.35%). The scale distribution was central in 20 (64.52%) followed by patchy in 4 patients (12.90%).

In SCLE, the background color was bright red in 3 patients (75%). Vessels were present in all patients (100%). In 2 patients (50%) type of vessels were irregular/arborising and in another 2 (50%)

dotted + linear vessels were seen. The scale distribution was diffuse in 3 patients (75%) and patchy in 1 patient (25%). (Figure 3)

Bright red background colour was significantly higher in Ps as compared with non Ps (96.23% vs 22.34%) respectively (p value<.0001) with relative risk of 15.963(6.1272 to 41.5904).

Globular vessels, red dot + glomerular + globular was significantly higher in Ps as compared to non PP. (Globular vessels:- 6.60% vs 0% respectively (p value<.0001) with relative risk of 1.828(1.459 to 2.2901), Red dot + glomerular + globular:- 74.53% vs 0% respectively (p value<.0001) with relative risk of 4.409(3.1714 to 6.1286)). Regular pattern of vessels was significantly higher in Ps as compared to non-psoriasis. (99.06% vs 0% respectively (p value<.0001) with relative risk of 63.698(13.0178 to 311.6842). Symmetrically distributed vessels were significantly higher in Ps as compared to non-psoriasis. (98.11% vs 1.06% respectively (p value<.0001) with relative risk of 47.048 (11.9385 to 185.4066). White scales were significantly higher in Ps as compared to non-psoriasis. (100% vs 52.13% respectively (p value=0.003) with relative risk of 62.808 (3.9799 to 991.1895). Diffuse distribution of scales was significantly higher in Ps as compared to non-psoriasis. (97.17% vs 9.57% respectively (p value<.0001) with relative risk of 26.976(8.8592 to 82.1422). (Table 2)

Dull red background colour was significantly higher in LP as compared to patients without LP. (80.56% vs 21.34% respectively (p value<.0001) with relative risk of 8.804 (4.0759 to 19.0149), while bright red color was significantly lower in patients with LP as compared to patients without LP. (16.67% vs 71.34% respectively

(p value<.0001) with relative risk of 0.125 (0.05465 to 0.2868). Vessels were distributed peripherally in LP as compared to non LP (36.11% vs 3.66% respectively (p value<.0001) with relative risk of 5.384(3.302 to 8.7803). Distribution of dermoscopy-pattern of vessels:- cluster, patchy was comparable between patients with and without LP. (Cluster:- 2.78% vs 2.44% respectively (p value=0.905), Patchy:- 30.56% vs 21.95% respectively (p value=0.263). Vessels were distributed asymmetrically in LP as compared to non LP (66.67% vs 28.66% respectively (p value=0.0001) with relative risk of 3.634(1.9362 to 6.8197). Wickham striae were significantly higher in patients with LP as compared to patients without LP (80.56% vs 2.44% respectively (p value<.0001) with relative risk of 20.965(10.0419 to 43.7713). Gray/black dots/globules, comedo like opening was significantly higher in LP as compared to patients without LP. (Gray/black dots/globules:- 16.67% vs 1.22% respectively (p value<.0001) with relative risk of 4.8(2.86 to 8.0559), Comedo like opening:- 11.11% vs 0% respectively (p value<.0001) with relative risk of 5.455(3.5522 to 8.3782). (Table 3)

On performing multivariate regression, none of the factor was independent risk factor of plaque psoriasis. On performing multivariate regression, scale color white and WS on dermoscopy were significantly suggestive factors of LP (patients with white scales had significantly lower chances of LP with adjusted risk ratio of 0.529(0.101 to 0.999), patients with WS had significantly higher chances of LP with adjusted risk ratio of 4.646 (1.547 to 5.118). (Table 4).

## **Dermoscopic (D) and histopathological (HPE) correlation**

Ps: Among 106 patients with hyperkeratosis/parakeratosis in histopathology, all patients had white scales on dermoscopy with concordance rate of 100%. Among 105 patients with dilated and tortuous capillaries/suprapapillary thinning in histopathology, 105 patients had red dots and globules on dermoscopy with concordance rate of 99.06%. Among 106 patients with inflammation in histopathology, 105 patients had bright red background on dermoscopy with concordance rate of 99.06%.

LP: Among 36 patients with wedge shaped hypergranulosis in histopathology, 29 patients had pearly white WS on dermoscopy with concordance rate of 80.56%. Among 27 patients with pigment incontinence in histopathology, 8 patients had gray-blue dots on dermoscopy with concordance rate of 47.22%. Among 6 patients with hypergranulosis/ hyperkeratosis of dilated infundibulum in histopathology, 5 patients had CLO on dermoscopy with concordance rate of 94.44%.

PR: Among 18 patients with spongiotic pattern in histopathology, 12 patients had structureless brownish-yellow areas on dermoscopy with concordance rate of 66.67%.

ED: Among 31 patients with hyperkeratosis/parakeratosis in histopathology, 29 patients had scales on dermoscopy with concordance rate of 93.55%. Thirty patients (96.77%) had vessels on dermoscopy but none of the patients had dilated blood vessels in histopathology with discordance rate of 96.77%. Among 31 patients diagnosed with inflammation in histopathology, all patients had either bright red or dull red background on dermoscopy with concordance rate of 100%.

## **DISCUSSION**

Dermoscopy can be a useful aid for diagnosis of inflammatory dermatoses. We tried to look for certain dermoscopic findings in common inflammatory dermatoses. In majority of Ps patients (96.23%) in our study background color was bright red which was higher as compared to previous reports (58%).<sup>5</sup> Background color was noted as light red in various studies in Ps with percentage varying from 42.5%-88%, light pink in 78% and dull red in 58%.<sup>6-10</sup> The difference observed in background color may be due to the different terminologies used for the same findings by different researchers. Red dots (50-70x magnification), were the most common type of vessels seen in 92.45% of Ps patients either alone (17.92%) or together as red dots + glomerular vessels + globular vessels (74.53%) (150-200x). These were arranged in a regular and symmetrical distribution in the majority (99.06%) of our patients. Red dots with regular distribution were noted in 64-100% of patients under lower magnification (10x) in the previous studies.<sup>5,7,10</sup> We observed that lower magnification may show only dotted vessels while higher magnification (150x) shows glomerular and bushy vessels which were seen in all the Ps cases. We noted diffusely distributed (97.17%) white scales (100%) in majority of Ps cases, showing findings in consonance with previous studies.<sup>7,8,10</sup> However, diffusely distributed scales have not been observed in majority uniformly in other studies.<sup>7,10</sup> Our study demonstrates that the 'glomerular' capillary pattern is typically present in psoriatic plaques and is therefore a feature highly characteristic of psoriasis. The combination of regularly distributed dotted vessels under low magnification with other morphologies (glomerular

like vessels) under higher magnification over bright red background with diffuse white scales is highly suggestive of psoriasis.

In our study in LP patients, WS was the most significant dermoscopic feature (80.56%). Similar observation was made in the previous studies.<sup>10-14</sup> In our study, blood vessels were found in 69.44% of LP cases which is higher than the previous studies (20%).<sup>7</sup> These were seen as red dots in majority (61.11%) similar to previous studies.<sup>13</sup> Peripheral distribution was found to be lower on our study (36% Vs 60%).<sup>10</sup> However, Nwako-Mohamadi *et al*<sup>7</sup> noted peripheral distribution even lower than us (10%). Similarly, patchy distribution of vessels was also lower in their study as compared to us (10% Vs 30%).<sup>7</sup> However, these authors mostly used dermoscopes with lesser magnification, which could be a reason for these differences in the findings. Background colour was dull red in majority (80.56%) (p value <0.0001) of LP case, finding similar (64%) to another study.<sup>10</sup> However, few authors have noted violet background (45.5%) in LP.<sup>7</sup> Other dermoscopic features of LP in our study included gray/black dots/globules in 22.22% (p value <0.0001) of patients and CLO in 16.67% which have also been recorded in the previous studies.<sup>8,13</sup> White scales were observed in few cases of LP (11.11%) which is lower in comparison to the previous study (25%).<sup>8</sup>

We observed that a combination of findings of WS, over a dull red or a violaceous background and dotted vessels distributed in patchy or peripheral pattern present asymmetrically, grey/black dots globules and CLO are highly suggestive of LP.

Background color has been variably defined as dull red (35-50%), bright red (35%) light red

(36.4%) and yellow (9.1%) in PR.<sup>5,7</sup> Similarly in our study, background color was dull red in 50%. However, 38.89% cases had yellow background. Scales were present in all patients (100%) of PR, white in color in all (100%), which were distributed peripherally in majority (88.89%) in our study. Previous studies have also noted peripherally arranged white scales in majority of PR cases.<sup>10,15</sup> However, finding of peripheral pattern in majority was not observed by all the studies.<sup>7</sup> In our study, vessels visible as red dots were found in 55.56% of cases. The pattern of vessels varied from patchy (33.33%) to peripheral (22.22%) with asymmetrical distribution in all. However, vascular pattern noticed in PR in previous studies was entirely different from ours (dotted and linear vessels arranged in patchy distribution in majority).<sup>10,15</sup> In our study, structureless brownish yellow areas were present in 66.67% patients of PR. This finding was variably (5-55%) observed in the previous studies.<sup>5,15</sup>

As per our observation PR is typified by peripheral scaling (collarette scales) around a diffuse and structureless yellowish areas. Although dotted vessels distributed in patchy or peripheral pattern were seen in our cases of PR, they were generally much less evident and fewer in number compared with Ps.

In our study, 67.74% of ED cases showed dull red background with bright red background in 32.26%. Background has been variable described as dull red (66%), red (57%) patients or pink (27%) by different researchers.<sup>10,16</sup> In our study vessels as red dots (93.55%), were found in 96.77% cases of ED, distributed in a patchy pattern in majority (77.42%). Vessels were arranged asymmetrically in all. Scales were present in 93.54% of cases. However different find-

ings were observed in previous studies in ED (red dots: 95% in a patchy distribution: 59%,<sup>10</sup> an irregular arrangement: 93% of atypical vessels: 93% with dotted or globular vessels: 22%,<sup>16</sup> dotted vessels: 78.5% in a patchy distribution: 57.1%,<sup>17</sup> We noted white color scales in majority of our patients (74.19%) which were distributed centrally in 65% patients, while yellowish scales were predominantly noted in other studies.<sup>10,16,17</sup> Combination of white or yellow scales along with patchy distribution of dotted vessels suggests ED as per our observation.

Significant concordance was seen between the clinical, histopathological and dermoscopic findings in our study. This suggests that dermoscopy may be used for diagnosing these disorders and may replace histopathology in future. Our study however, had a few limitations: we performed a convenient sampling leading to unequal distribution of patients among the disease groups. Additionally, we observed that there is a lack of a standard descriptive terminology for the dermoscopic features of these inflammatory dermatoses, because of which there was a difficulty in comparing our findings with the previous studies. We therefore recommend that larger such studies should be conducted on inflammatory dermatoses so that dermoscopic criteria and a standard descriptive terminology for the erythematous-desquamative and papulosquamous inflammatory dermatoses can be devised.

## REFERENCES

1. Fox BJ, Odom RB. Papulosquamous diseases: a review. *J Am Acad Dermatol.* 1985; 12(4):597-624.
2. Errichetti E, Stinco G. Dermoscopy in General Dermatology: A Practical Overview. *Dermatol Ther.* 2016; 6(4):471-507.
3. Chauhan RC, Dash KN. A study on comparison of

dermoscopic patterns associated with plaque psoriasis and pityriasis rosea. *NJMR.* 2016; 58(9):231-33.

4. Nischal KC, Khopkar U. Dermoscope. *Indian J Dermatol Venereol Leprol.* 2005; 71(4):300-03.
5. Makhecha M, Singh T, Khatib Y. Dermoscopy differentiates guttate psoriasis from a mimicker—pityriasis rosea. *Dermatology Practical & Conceptual.* 2021; 11(1):56-78.
6. Abdel-Azim NE, Ismail SA, Fathy E. Differentiation of pityriasis rubra pilaris from plaque psoriasis by dermoscopy. *Arch Dermatol Res.* 2017; 309(4):311-14.
7. Nwako-Mohamadi MK, Masenga JE, Mavura D, Jahanpour OF, Mbwilo E, Blum A. Dermoscopic features of psoriasis, lichen planus, and pityriasis rosea in patients with skin type iv and darker attending the regional dermatology training centre in northern Tanzania. *Dermatol Pract Concept.* 2019; 9(1):44-51.
8. Penmetcha C, Awake P, Madhavi K. A cross-sectional analysis of dermoscopic patterns distinguishing between psoriasis and lichen planus: a study of 80 patients. *J Evol Med Dent Sci.* 2015; 4:17017-22.
9. Pan Y, Chamberlain AJ, Bailey M, Chong AH, Haskett M, Kelly JW. Dermatoscopy aids in the diagnosis of the solitary red scaly patch or plaque-features distinguishing superficial basal cell carcinoma, intraepidermal carcinoma, and psoriasis. *J Am Acad Dermatol.* 2008; 59(2):268-74.
10. Lallas A, Kyrgidis A, Tzellos TG, Apalla Z, Karakyrriou E, Karatolias A, *et al.* Accuracy of dermoscopic criteria for the diagnosis of psoriasis, dermatitis, lichen planus and pityriasis rosea. *Br J Dermatol.* 2012; 166:1198-205.
11. Gungor S, oguz topal I, Kocatürk E. Dermoscopic patterns in active and regressive lichen planus and lichen planus variants: a morphological study. *Dermatol Pract Concept.* 2015; 5:45-53.
12. Garg P, Kaur T, Malhotra SK, Singh A. Study of the dermoscopic findings and their correlation with histopathological findings in various lichenoid dermatoses. *J Clin Exp Dermatol Res.* 2015; 6(308):2-14.
13. Vázquez-López F, Manjón-Haces JA, Maldonado-Seral C, Raya-Aguado C, PérezOliva N, Marghoob AA. Dermoscopic features of plaque psoriasis and

- lichen planus: new observations. *Dermatol Basel Switz.* 2003; 207(2):151-56.
14. Ankad BS, Beergouder SL. Hypertrophic lichen planus versus prurigo nodularis: a dermoscopic perspective. *Dermatol Pract Concept.* 2016; 6(2):9-15.
  15. Elmas ÖF, Kilitçi A, Acar EM. Dermoscopic profile of pityriasis rosea. *Dermatol Sin.* 2019; 37(4):199-204.
  16. Yu X, Wei G, Shao C, Zhu M, Sun S, Zhang X. Analysis of dermoscopic characteristic for the differential diagnosis of palmoplantar psoriasis and palmoplantar eczema. *Medicine (Baltimore).* 2021; 100(5):238-43.
  17. Adabala SS, Doshi BR, Manjunathswamy BS. A cross-sectional study to assess the role of dermoscopy in differentiating palmar psoriasis, chronic hand eczema, and eczema in psoriatico. *Indian Dermatol Online J.* 2022; 13(1):78-85.