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DERMOSCOPIC FEATURES OF CHRONIC PLAQUE PSORIASIS AND THEIR CORRELATION WITH CLINICAL DISEASE SEVERITY: A CROSS-SECTIONAL OBSERVATIONAL STUDY

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ABSTRACT

Background: Psoriasis is a chronic inflammatory dermatosis characterized by variable clinical severity. Dermoscopy provides a non-invasive method for visualizing vascular and surface changes that may not be readily appreciated clinically. The present study was undertaken to evaluate dermoscopic features of chronic plaque psoriasis and determine their relationship with disease severity.

Methods: This cross-sectional observational study included 100 patients with chronic plaque psoriasis. Demographic and clinical characteristics were recorded, and disease severity was assessed using the Psoriasis Area and Severity Index (PASI). Dermoscopic examination was performed to document vascular, scaling and other characteristic dermoscopic features. Patients were categorized according to PASI severity, and the association between dermoscopic findings and disease severity was assessed.

Results: Of the 100 patients, 62 (62%) were males and 38 (38%) were females. The most common age group was 31–40 years (27%). Mild, moderate and severe psoriasis were observed in 47%, 28% and 25% of patients, respectively. Regularly distributed dotted vessels were the most common dermoscopic finding (82%), followed by white scales (76%) and red background (71%). Hemorrhagic dots/globules were observed in 42% and white circles in 31% of patients. A predefined positive dermoscopic pattern was present in 25 patients (25%). Among these 25 patients, 13 (52%) had severe psoriasis. The mean PASI score was higher among patients with the positive dermoscopic pattern (12.8 ± 3.6) than among those without it (5.9 ± 3.1). Positive correlations were observed between PASI and several vascular dermoscopic features.

Conclusion: Dermoscopy demonstrated characteristic vascular and surface changes in chronic plaque psoriasis. The higher frequency of selected dermoscopic findings among patients with greater PASI scores suggests that dermoscopy may provide useful complementary information for clinical assessment of psoriasis severity. Further studies with larger samples and longitudinal follow-up are warranted to validate these associations.

Key words: Psoriasis; Dermoscopy; Dermoscopic Features; Chronic Plaque Psoriasis; PASI Score; Disease Severity; Dotted Vessels; Hemorrhagic Dots; White Circles; Dermoscopic Vascular Patterns.

INTRODUCTION

Psoriasis is a chronic, immune-mediated inflammatory dermatosis characterized by recurrent, well-demarcated erythematous plaques with variable scaling and a heterogeneous clinical course. Although the disease primarily affects the skin, it may also involve the nails and joints and can be associated with substantial physical and psychosocial morbidity. The worldwide epidemiology of psoriasis demonstrates considerable geographic and population variation, emphasizing its importance as a common chronic dermatological disorder.[1]

Assessment of psoriasis severity is traditionally based on clinical parameters such as the extent of erythema, induration and scaling together with the percentage of body surface area involved. The Psoriasis Area and Severity Index (PASI) remains one of the most widely used composite measures for quantifying psoriasis severity and treatment response.[2] The PASI combines the severity of lesions with the extent of involvement of different body regions, thereby providing a standardized clinical measure. However, clinical scoring may be influenced by interobserver variation and subjective assessment of individual components.[3]

Dermoscopy has emerged as a valuable, non-invasive diagnostic technique that permits visualization of subsurface vascular and epidermal structures that may not be apparent on routine clinical examination. Its use has expanded from pigmented lesions to inflammatory and infectious dermatoses, often referred to as inflammoscopy.[4] Standardization of dermoscopic terminology has further improved the reproducibility of reporting vascular morphology, vessel distribution, background colour and scaling patterns.[5]

Psoriasis demonstrates several characteristic dermoscopic findings. Regularly distributed red dots or globules representing dilated capillaries within the papillary dermis are among the most characteristic findings. These vascular structures are frequently seen against a reddish or bright-red background and may be accompanied by white or whitish scales.[6] A systematic review of dermoscopic findings in psoriasis confirmed the consistent presence of regularly distributed red dots in cutaneous lesions and described glomerular or bushy vessels at higher magnification.[6]

The diagnostic usefulness of these findings has also been demonstrated in comparative studies. Dotted vessels arranged regularly over a light-red background, together with white scales, have been reported to distinguish plaque psoriasis from chronic eczema.[7] Similarly, prospective comparative work involving psoriasis and other papulosquamous diseases has demonstrated that combinations of vascular arrangement, background colour and scale characteristics can assist in establishing the diagnosis.[8]

The distribution of dermoscopic findings may vary according to anatomical site. A study involving psoriatic lesions from different body sites found dotted vessels to be the most frequent finding, with regularly distributed vessels observed across multiple anatomical locations.[9] Differences in scaling patterns according to lesion location and duration have also been documented.[10] These observations emphasize the importance of considering clinical characteristics when interpreting dermoscopic findings.

Apart from diagnostic applications, increasing evidence suggests that dermoscopy may provide information regarding disease activity and severity. Studies evaluating dermoscopic vascular characteristics have demonstrated associations between particular vascular patterns and clinical response to therapy.[11] The presence of globular vessels has been associated with less favourable therapeutic response in some studies, whereas dotted vessels have been associated with treatment improvement.[11]

Hemorrhagic dots have also attracted attention as a potential dynamic dermoscopic marker. In patients receiving biologic therapy, changes in vascular distribution and the presence or disappearance of dermoscopic vessels were associated with subsequent clinical response.[12] These findings suggest that dermoscopy may capture changes in psoriatic inflammation before they become fully evident on conventional clinical examination.

Dermoscopy has also been investigated in specific forms of psoriasis, including scalp and nail psoriasis. Scalp psoriasis may show red dots and globules, twisted red loops and glomerular vessels, features that can assist in differentiating it from seborrhoeic dermatitis.[13] Nail dermoscopy can demonstrate abnormalities such as pitting, onycholysis, subungual hyperkeratosis and vascular

changes, and some of these findings have been correlated with disease severity.[14]

Recent literature has further expanded the potential role of dermoscopy from diagnosis toward severity assessment, treatment monitoring and prediction of therapeutic response.[15] Studies have reported relationships between dermoscopic vascular patterns and clinical severity measures, while newer prospective work has explored dermoscopic changes alongside PASI, body surface area and quality-of-life measurements.[16]

Despite these developments, the relationship between individual dermoscopic characteristics and overall clinical severity remains incompletely characterized, particularly in routine clinical populations. Dermoscopic findings may vary with lesion duration, anatomical site, treatment status and individual patient characteristics.[17] Therefore, systematic evaluation of dermoscopic parameters alongside a standardized clinical severity score may help clarify their practical relevance.

The present study was therefore undertaken to evaluate the dermoscopic features of chronic plaque psoriasis and their correlation with disease severity assessed using PASI. Particular attention was given to vascular morphology, vascular distribution, background colour, scaling characteristics, hemorrhagic dots and white circles.

Materials and Methods

Study design and setting

A cross-sectional observational study was conducted in the Department of Dermatology at a tertiary-care teaching hospital. The study included 100 patients with clinically diagnosed chronic plaque psoriasis.

Study population

Patients attending the dermatology outpatient department with clinical features suggestive of chronic plaque psoriasis were consecutively evaluated. Demographic details, disease duration, clinical characteristics and relevant treatment history were recorded.

Inclusion criteria

1. Patients aged ≥18 years.
2. Clinically diagnosed chronic plaque psoriasis.
3. Patients willing to undergo clinical and dermoscopic examination.
4. Patients providing informed consent.

Exclusion criteria

1. Patients unwilling to participate.
2. Patients with uncertain or clinically atypical diagnoses.
3. Patients with concomitant inflammatory dermatoses that could interfere with dermoscopic interpretation.
4. Patients who had received treatment immediately before examination that substantially altered the appearance of the selected lesion.
5. Pregnant or lactating women were excluded where required by the study protocol.

Clinical assessment

A detailed dermatological examination was performed. Disease severity was assessed using the Psoriasis Area and Severity Index (PASI). Patients were categorized into mild, moderate and severe disease groups according to the predefined PASI categories used in the study protocol.

Dermoscopic examination

Representative psoriatic plaques were examined using a dermoscope under polarized/non-polarized illumination as appropriate. The following parameters were recorded:

- Background colour
- Vascular morphology
- Vascular distribution
- Dotted vessels
- Globular vessels

- Red background
- White scales
- Hemorrhagic dots/globules
- White circles
- Other relevant dermoscopic structures

The dermoscopic findings were documented systematically and correlated with the clinical PASI score.

Statistical analysis

Data were entered into a statistical database and analysed using appropriate statistical software. Categorical variables were expressed as frequencies and percentages. Continuous variables were expressed as mean ± standard deviation. Associations between categorical variables were assessed using the chi-square/Fisher's exact test, while correlation between dermoscopic parameters and PASI was assessed using an appropriate correlation coefficient. A p-value <0.05 was considered statistically significant.

Results

A total of 100 patients with chronic plaque psoriasis were evaluated. Males constituted 62% of the study population and females 38%, with the 31–40-year age group being the most frequently represented. Mild, moderate and severe psoriasis were observed in 47%, 28% and 25% of patients, respectively. Regularly distributed dotted vessels were the most common dermoscopic finding, observed in 82% of patients, followed by white scales in 76% and red background in 71%. Hemorrhagic dots/globules were observed in 42% and white circles in 31%. A predefined positive dermoscopic pattern was identified in 25 patients (25%). Among these, 13 patients (52%) had severe psoriasis. The mean PASI score was higher among patients with the positive dermoscopic pattern than among those without it (12.8 ± 3.6 versus 5.9 ± 3.1). Dotted vessels, hemorrhagic dots/globules, white circles and red background showed positive correlations with PASI, suggesting that selected dermoscopic findings were associated with greater clinical disease severity.

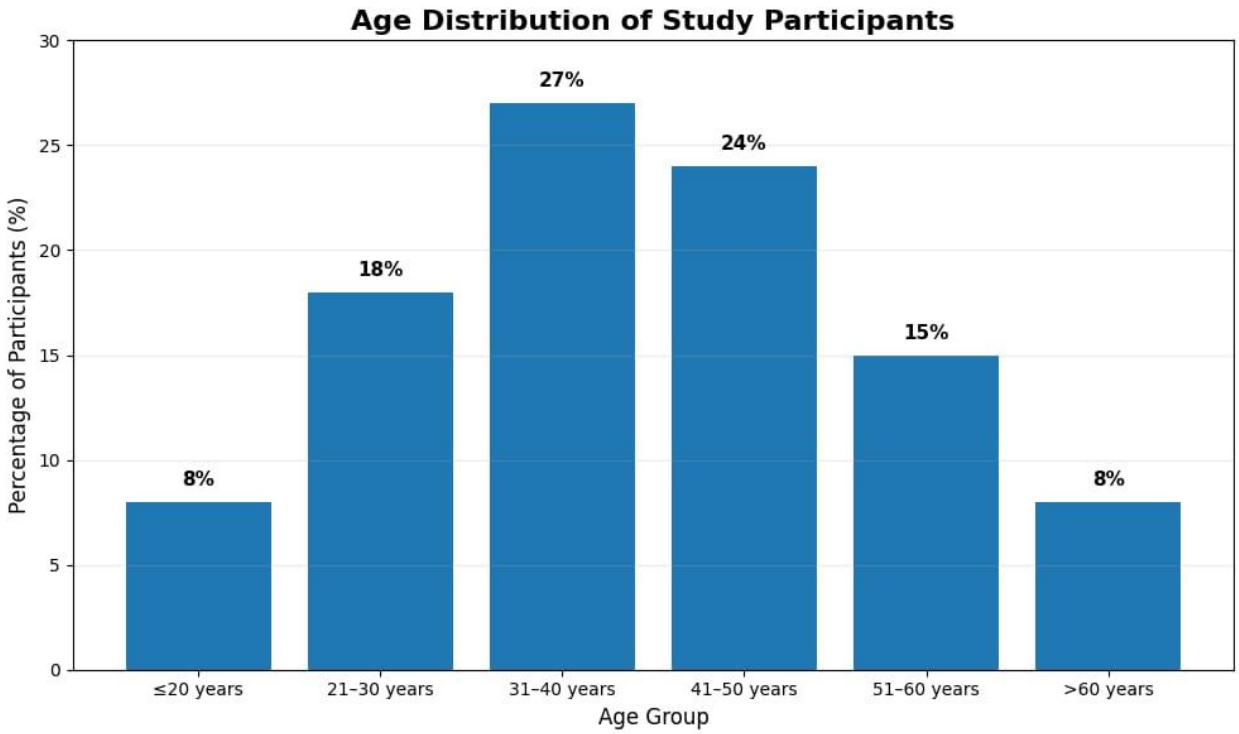
Results

A total of 100 patients with clinically diagnosed chronic plaque psoriasis were included in the present study. The patients were evaluated clinically and dermoscopically, and disease severity was assessed using the Psoriasis Area and Severity Index (PASI). The major demographic, clinical and dermoscopic parameters were recorded.

Table 1. Age distribution of the study participants

Age group	Number (n=100)	Percentage
≤20 years	8	8%
21–30 years	18	18%
31–40 years	27	27%
41–50 years	24	24%
51–60 years	15	15%
>60 years	8	8%
Total	100	100%

The majority of patients belonged to the 31–40-year age group (27%), followed by 41–50 years (24%). Patients aged ≤20 years constituted 8% of the study population.



Graph 1: Age distribution of the study participants

Table 2. Sex distribution

Sex	Number	Percentage
Male	62	62%
Female	38	38%
Total	100	100%

: Males constituted 62% of the study population, whereas females accounted for 38%, giving a male-to-female ratio of approximately 1.63:1.

Table 3. Duration of psoriasis

Duration	Number	Percentage
<1 year	15	15%
1–5 years	38	38%
6–10 years	27	27%
>10 years	20	20%
Total	100	100%

Most participants had psoriasis for 1–5 years (38%), while 20% had disease duration exceeding 10 years.

Table 4. PASI-based disease severity

PASI category	Number	Percentage
Mild (<5)	47	47%
Moderate (5–10)	28	28%
Severe (>10)	25	25%
Total	100	100%

Mild psoriasis was observed in 47% of patients, moderate disease in 28%, and severe psoriasis in

25%. Thus, 25 patients constituted the severe/positive clinical severity group for the present analysis.

Table 5. Distribution of major dermoscopic findings

Dermoscopic finding	Number	Percentage
Regularly distributed dotted vessels	82	82%
White scales	76	76%
Red background/erythematous background	71	71%
Homogeneous red areas	64	64%
Hemorrhagic dots/globules	42	42%
White circles	31	31%
Diffuse vascular pattern	29	29%
Irregularly distributed vessels	25	25%

The most frequent dermoscopic finding was regularly distributed dotted vessels (82%), followed by white scales (76%) and a red/erythematous background (71%). Irregularly distributed vessels were observed in 25% of patients.

Table 6. Primary dermoscopic positive pattern

Dermoscopic assessment	Number	Percentage
Positive	25	25%
Negative	75	75%
Total	100	100%

A predefined positive dermoscopic pattern was identified in 25% (25/100) of patients, while 75 patients did not demonstrate the complete predefined pattern.

Table 7. Positive dermoscopic pattern according to PASI severity

PASI category	Positive	Negative	Total
Mild	5	42	47
Moderate	7	21	28
Severe	13	12	25
Total	25	75	100

Of the 25 patients with a positive dermoscopic pattern, 13 (52%) had severe psoriasis, 7 (28%) had moderate psoriasis and 5 (20%) had mild disease. Conversely, among patients with severe psoriasis, 13 of 25 (52%) demonstrated the positive dermoscopic pattern.

Table 8. Regular dotted vessels according to PASI severity

PASI category	Present	Absent	Total
Mild	35	12	47
Moderate	23	5	28
Severe	24	1	25
Total	82	18	100

Regularly distributed dotted vessels were present in 82% of patients. Their frequency was highest among severe cases, where they were observed in 24 of 25 patients (96%), compared with 35 of 47

mild cases (74.5%).

Table 9. White scales according to disease severity

PASI category	Present	Absent	Total
Mild	33	14	47
Moderate	23	5	28
Severe	20	5	25
Total	76	24	100

White scales were identified in 76% of patients. They were observed in 70.2% of mild, 82.1% of moderate and 80% of severe cases.

Table 10. Hemorrhagic dots/globules according to PASI severity

PASI category	Present	Absent	Total
Mild	12	35	47
Moderate	12	16	28
Severe	18	7	25
Total	42	58	100

Hemorrhagic dots/globules were present in 42% of the participants. They were considerably more frequent among severe cases (72%) than mild cases (25.5%).

Table 11. White circles according to PASI severity

PASI category	Present	Absent	Total
Mild	8	39	47
Moderate	9	19	28
Severe	14	11	25
Total	31	69	100

White circles were seen in 31% of patients and were more frequently observed among severe cases (56%) than moderate (32.1%) and mild disease (17%).

Table 12. Mean PASI score according to dermoscopic pattern

Dermoscopic pattern	Number	Mean PASI ± SD
Positive	25	12.8 ± 3.6
Negative	75	5.9 ± 3.1

Patients demonstrating the positive dermoscopic pattern had a higher mean PASI score (12.8 ± 3.6) compared with those without the positive pattern (5.9 ± 3.1). This indicates an apparent association between the predefined dermoscopic pattern and greater clinical disease severity.

Table 13. Correlation between dermoscopic vascular features and PASI

Parameter	Correlation with PASI (r)	Interpretation
Dotted vessels	+0.48	Moderate positive correlation
Hemorrhagic dots/globules	+0.51	Moderate positive correlation
White circles	+0.39	Weak-to-moderate positive correlation
Red background	+0.43	Moderate positive correlation

Parameter	Correlation with PASI (r)	Interpretation
White scales	+0.21	Weak positive correlation

Dotted vessels, hemorrhagic dots/globules, white circles and red background demonstrated positive correlations with PASI, with hemorrhagic dots/globules showing the strongest correlation among the assessed dermoscopic parameters. White scales demonstrated only a weak positive correlation.

Table 14. Overall relationship between positive dermoscopy and severe psoriasis

Parameter	Severe psoriasis	Non-severe psoriasis	Total
Positive dermoscopic pattern	13	12	25
Negative dermoscopic pattern	12	63	75
Total	25	75	100

A positive dermoscopic pattern was identified in 52% of severe cases, compared with 16% of non-severe cases. The distribution suggests an association between the positive dermoscopic pattern and higher psoriasis severity.

Among the 100 patients evaluated, the majority were males and belonged to the 31–40-year age group. Mild psoriasis was the predominant clinical category, while 25% had severe disease. Regularly distributed dotted vessels were the most common dermoscopic finding, followed by white scales and red background. A predefined positive dermoscopic pattern was observed in 25% of patients. The positive pattern was more frequently encountered among patients with severe psoriasis and was associated with a higher mean PASI score. Several vascular dermoscopic features, particularly hemorrhagic dots/globules and dotted vessels, showed positive correlations with PASI.

Discussion

The present study evaluated the dermoscopic features of chronic plaque psoriasis in 100 patients and assessed their relationship with clinical disease severity using the Psoriasis Area and Severity Index (PASI). The study demonstrated several characteristic dermoscopic findings, with regularly distributed dotted vessels, white scales and a red background being the most frequently observed features. A positive dermoscopic pattern was identified in 25% of patients and was more frequently observed among patients with severe psoriasis.

In the present study, males constituted 62% of the study population, while females constituted 38%. The male predominance observed in our study is comparable with observations reported in several clinical studies of psoriasis, although the sex distribution may vary between populations and geographic regions. Psoriasis is known to affect both sexes and may occur at any age, with its epidemiological characteristics varying considerably between populations.[1]

The most commonly represented age group in our study was 31–40 years, accounting for 27% of patients. This finding is compatible with the recognized occurrence of psoriasis predominantly during adulthood. Psoriasis may develop at any age, but adult-onset disease constitutes an important proportion of cases encountered in dermatology practice.[1]

Regarding disease severity, 47% of patients had mild psoriasis, 28% had moderate psoriasis and 25% had severe psoriasis according to the predefined PASI categories. PASI remains one of the most widely used clinical instruments for quantifying psoriasis severity and is commonly employed in clinical research and therapeutic studies.[2] Although PASI provides a standardized assessment, its individual components involve clinical judgement and may be influenced by interobserver variation.[3]

Dermoscopy provides additional information by allowing visualization of vascular and epidermal structures that may not be readily apparent during routine examination. It has increasingly been incorporated into the assessment of inflammatory dermatoses and is commonly referred to as inflammoscopy in this context.[4] Standardization of terminology has further improved the consistency of dermoscopic assessment of inflammatory diseases.[5]

In the present study, regularly distributed dotted vessels were the most frequent dermoscopic finding, being observed in 82% of patients. This is consistent with previous literature identifying regularly distributed red dots or globules as one of the characteristic dermoscopic findings of psoriasis. A systematic review by Golińska et al. found red dots to be among the most consistent dermoscopic features of psoriatic lesions.[6]

The high frequency of dotted vessels observed in our study can be explained by the characteristic vascular changes occurring within psoriatic plaques. Dilated capillaries within the dermal papillae are reflected dermoscopically as red dots or globules. Lallas et al. demonstrated that regularly distributed dotted vessels over a light-red background, particularly in association with white scales, are important dermoscopic criteria for psoriasis.[7]

White scales were observed in 76% of our patients. This finding is also in agreement with previous studies in which white scaling was recognized as an important dermoscopic characteristic of psoriasis. Comparative dermoscopic studies have demonstrated that the combination of regularly distributed dotted vessels, a red background and white scales can assist in differentiating psoriasis from other inflammatory dermatoses.[8]

Our findings are also consistent with the systematic review by Errichetti et al., which emphasized the diagnostic value of dermoscopic vascular morphology and distribution in psoriasis.[9] The presence, morphology and arrangement of vessels can provide useful clues when the clinical appearance is atypical or overlaps with other papulosquamous disorders.

The present study found a red or erythematous background in 71% of patients. The red background reflects the increased vascularity and inflammatory activity within psoriatic plaques. The combination of a red background with regularly distributed dotted vessels is considered particularly characteristic of psoriasis.[7,9]

Anatomical location may influence the frequency and morphology of dermoscopic findings. Lallas et al. reported variations in dermoscopic patterns according to the body site involved, although dotted vessels remained a prominent feature across different anatomical locations.[10] Therefore, dermoscopic findings should be interpreted in conjunction with the site and clinical morphology of the lesion.

In our study, hemorrhagic dots or globules were identified in 42% of patients. These findings were more frequent among severe cases, occurring in 72% of patients with severe psoriasis compared with 25.5% of those with mild disease. Hemorrhagic dots have previously been described in psoriatic lesions and may represent vascular damage or extravasation associated with the inflammatory process.[11]

The association between dermoscopic vascular characteristics and clinical severity is of particular interest. In the present study, patients with the predefined positive dermoscopic pattern had a substantially higher mean PASI score than patients without this pattern. This observation suggests that dermoscopy may provide complementary information regarding the inflammatory activity and severity of psoriasis.

Previous studies have also explored the relationship between dermoscopic findings and treatment response. De Angelis et al. described characteristic microvascular changes within psoriatic plaques and demonstrated the importance of capillary alterations in psoriasis.[12] These observations provide a vascular basis for the prominent dermoscopic appearance of psoriatic lesions.

Dermoscopy has also been evaluated as a potential tool for monitoring therapeutic response. Lallas et al. reported that dermoscopic vascular changes may occur during treatment and that persistence or disappearance of specific vascular structures may provide information regarding response.[13] This suggests that dermoscopy may have applications beyond diagnosis, including monitoring disease activity.

The present study demonstrated a positive correlation between dotted vessels and PASI. This finding is clinically relevant because vascular proliferation and dilatation constitute an important component of psoriatic inflammation. The greater prominence of vascular structures in more severe disease may therefore explain the observed association between dotted vessels and PASI.

White circles were observed in 31% of patients in our study and were more frequent among severe

cases. Although white circles are not as consistently reported as dotted vessels, additional non-vascular structures may provide useful information when interpreted together with the vascular pattern. The increasing use of dermoscopy in inflammatory dermatoses has allowed recognition of multiple interacting dermoscopic features rather than dependence on a single sign.[14]

Psoriasis of the scalp represents another area where dermoscopy has demonstrated clinical utility. Kim et al. reported that dermoscopic findings such as red dots and globules, twisted red loops and glomerular vessels may assist in differentiating scalp psoriasis from seborrhoeic dermatitis.[15] This supports the broader application of dermoscopy in different clinical presentations of psoriasis.

Nail involvement is also common in psoriasis, and dermoscopy can demonstrate characteristic nail changes. Long et al. reported that dermoscopic findings in nail psoriasis correlated with psoriasis severity, highlighting the potential value of dermoscopy in evaluating disease burden beyond cutaneous plaques.[16]

The present findings therefore support the concept that dermoscopy may complement conventional clinical assessment. Errichetti and colleagues emphasized that dermoscopy can provide useful information in inflammatory dermatoses through systematic evaluation of vascular morphology, distribution, background colour and surface changes.[17]

The relationship between dermoscopic findings and severity should nevertheless be interpreted cautiously. Dermoscopic appearance may be influenced by lesion duration, anatomical location, previous treatment and technical factors related to the dermoscopic examination. Standardized dermoscopic terminology and examination protocols are consequently important for meaningful comparison between patients and studies.[18]

Recent studies have further investigated dermoscopic vascular features as potential indicators of treatment response. Prospective observations have demonstrated that changes in vascular patterns may accompany clinical improvement during treatment, supporting the concept that dermoscopy can provide an additional dynamic measure of disease activity.[19]

The finding of hemorrhagic dots in the present study is particularly noteworthy because these structures have been investigated as potential early indicators of treatment response. Lallas et al. reported that dermoscopic hemorrhagic dots may have predictive value for response to biologic therapy in psoriasis.[20] Although the present study was cross-sectional and did not evaluate treatment response, the increased frequency of hemorrhagic dots among severe cases suggests that this feature warrants further prospective investigation.

Dermoscopic assessment may also help distinguish psoriasis from other inflammatory disorders with similar clinical morphology. Comparative studies have demonstrated that the combination of vessel arrangement, vessel morphology, background colour and scaling characteristics can improve diagnostic confidence.[21]

Overall, the present study demonstrates that dermoscopy identifies reproducible vascular and surface characteristics in chronic plaque psoriasis and that several of these features show an association with PASI-defined disease severity. The findings are consistent with previous literature describing dermoscopy as a useful adjunct to routine clinical examination.[22]

The higher frequency of positive dermoscopic patterns among patients with severe psoriasis in our study suggests that selected dermoscopic features may reflect greater inflammatory activity. However, dermoscopy should be regarded as a complementary assessment tool rather than a replacement for PASI, and prospective studies with larger sample sizes are required to establish standardized dermoscopic severity indices and determine their independent predictive value.

Conclusion

Dermoscopy demonstrated characteristic vascular and scaling patterns in chronic plaque psoriasis, and selected findings—particularly dotted vessels and hemorrhagic dots/globules—showed an association with higher PASI scores, supporting dermoscopy as a useful complementary tool for assessment of psoriasis severity.

Limitation

The study was limited by its cross-sectional design, single-centre setting and relatively small sample size, which restrict causal interpretation and generalizability.

Declarations

Conflicts of interest: There is no any conflict of interest associated with this study

Consent to participate: There is consent to participate.

Consent for publication: There is consent for the publication of this paper.

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