Section: Dermatology

Original Research Article

TO STUDY THE DERMOSCOPIC PATTERNS OF PITYRIASIS VERSICOLOR

Received : 30/04/2024
Received in revised form : 05/06/2024
Accepted : 23/06/2024

Keywords: Pityriasis versicolor (PV) Superficial fungal infection Malassezia Dermoscopy Dermoscopic patterns

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DOI: 10.47009/jamp.2024.6.3.193

Source of Support: Nil,
Conflict of Interest: None declared

Int J Acad Med Pharm
2024; 6 (3); 870-873

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Abstract

Background: Pityriasis versicolor (PV) is a superficial fungal infection caused by the Malassezia species. Although clinical presentation can be distinctive, accurate diagnosis may be challenging due to overlapping features with other dermatological conditions. Dermoscopy provides enhanced visualization of characteristic patterns and is increasingly valuable in the diagnosis of PV. This study aimed to identify and analyze the dermoscopic patterns of PV and their associations with demographic characteristics, anatomic location, and medical history. **Materials and Methods:** The study conducted was a cross-sectional observational analysis of 100 patients with a clinical diagnosis of PV. Participants underwent a clinical evaluation and dermoscopic examination using a handheld dermoscope Dermlite DL4 attached to iphone X with 10x magnification. High-resolution images were captured and analyzed by independent dermatologist to identify and record perifollicular involvement, scaling patterns, pigmentary changes, and other dermoscopic features. The study assessed the relationship between demographic characteristics, anatomic locations, and medical history through chi-square tests and multivariate logistic regression analysis. **Result:** Non uniform pigmentation was the most frequently observed dermoscopic pattern, followed by fine scaling in furrows and pigmentary changes. These patterns were more prevalent on the trunk, particularly the back. Younger patients (under 40 years) exhibited higher rates of perifollicular involvement and scaling. Patients with previous PV episodes and those with immunosuppressive conditions were more likely to exhibit perifollicular involvement. Logistic regression analysis identified age under 40 as a significant predictor for perifollicular involvement (OR = 2.3, $p < 0.05$). **Conclusion:** This study identified key dermoscopic patterns of pityriasis versicolor and highlighted significant associations with demographic and clinical factors. The results emphasize the value of dermoscopy in differentiating PV from other dermatological conditions, providing clinicians with enhanced diagnostic criteria for accurate and timely identification. Further research should focus on expanding the sample size and exploring the impact of treatment on dermoscopic patterns.

INTRODUCTION

Pityriasis versicolor (PV), also referred to as tinea versicolor, is a prevalent superficial fungal infection of the skin that primarily affects the stratum corneum. The condition is largely caused by the Malassezia species, a lipophilic yeast that naturally resides as part of the normal skin flora. However, under specific environmental conditions such as increased humidity, excessive sweating, or compromised immunity, this normally harmless yeast can become pathogenic. The clinical manifestation of PV typically includes well-demarcated, hypo- or hyperpigmented macules or patches predominantly seen on the trunk, neck, and upper limbs. Despite often presenting in a distinctive manner, diagnosing PV can sometimes be challenging because of the variation in the appearance of the lesions and the similarity to other dermatological conditions like vitiligo, pityriasis alba, seborrheic dermatitis, and erythrasma.[1]

Dermoscopy, a non-invasive diagnostic technique, has gained increasing importance in dermatology by providing enhanced visualization of subsurface skin structures. This technique allows clinicians to observe specific patterns that are not visible to the naked eye, thus improving the precision of clinical diagnoses. In pityriasis versicolor, previous studies have identified distinctive dermoscopic features, such as perifollicular involvement, fine scaling patterns, and characteristic pigmentary changes,

ISSN (O): 2687-5365; ISSN (P): 2753-6556

including the "willow leaf" sign. However, the comprehensive understanding and standardization of these dermoscopic patterns have not been fully explored or cataloged, creating a need for more in-depth research.[2]

The primary objective of this study is to analyze, document, and refine the dermoscopic patterns of pityriasis versicolor to create a standardized set of criteria. By identifying and systematically cataloging these characteristic patterns, clinicians will be better equipped to accurately diagnose and differentiate PV from other dermatological conditions with similar clinical presentations. Early identification can minimize the risk of misdiagnosis and the subsequent use of ineffective treatments, thus ensuring timely and appropriate management for patients.[3-6] Furthermore, establishing a dermoscopic pattern library will provide clinicians with a practical and reliable tool for improving the accuracy of diagnosis and deepening our understanding of the variations in the clinical presentation of PV.

In addition to improving diagnostic accuracy, this study aims to enhance our comprehension of the pathogenesis and clinical manifestations of PV, offering insights into future research and therapeutic developments. A standardized dermoscopic approach will help differentiate PV from other skin disorders and provide a framework for dermatologists worldwide to improve patient outcomes through early detection, efficient management, and a reduction in the healthcare burden caused by misdiagnosis and mistreatment.

MATERIALS AND METHODS

Study Design and Setting: This study was a cross-sectional observational analysis conducted in the dermatology department of a tertiary care hospital. The research took place over six months, starting from January 2022 to January 2023. Data was collected from patients who presented with clinical symptoms suggestive of pityriasis versicolor, ensuring a diverse and representative sample.

Participants and Inclusion Criteria: All patients presenting with clinical features indicative of pityriasis versicolor were considered for inclusion. The eligibility criteria included:

Adults (aged 18 years and older): A clinical diagnosis of pityriasis versicolor, verified by an experienced dermatologist using clinical evaluation and Wood's lamp.

Patients who provided informed consent to participate.

Exclusion Criteria Included

Patients with known dermatoses that could obscure or mimic pityriasis versicolor, such as vitiligo or seborrheic dermatitis.

Patients who had used antifungal treatment within the preceding month.

Patients with significant systemic illness affecting skin health, such as severe diabetes or immunosuppressive conditions.

Sample Size Calculation: Sample size was calculated the based on the expected prevalence of dermoscopic patterns of pityriasis versicolor, targeting a confidence level of 95% with a 5% margin of error. Considering the estimated prevalence of PV in the general population and aiming for a representative sample, we recruited a minimum of 100 participants.

Data Collection Procedures: All eligible participants underwent a comprehensive clinical evaluation by a dermatologist to confirm the diagnosis of pityriasis versicolor. After diagnosis, each patient underwent a dermoscopic examination using a handheld dermoscope Dermlite DL4 in polarised mode attached to iPhone X with a minimum magnification of 10x. High-resolution dermoscopic images using a dermoscope-mounted digital camera were taken and stored them for further analysis. Each participant provided demographic information, medical history, and recent treatments through a structured questionnaire administered during the initial evaluation.

Dermoscopy and Pattern Identification: The dermatologist analyzed the dermoscopic images, both blinded to each other's findings. They systematically reviewed and documented specific dermoscopic features, such as perifollicular involvement, characteristic scaling patterns, and pigmentary changes like the "willow leaf" sign. The dermatologists resolved any discrepancies in pattern identification through mutual discussion to reach a consensus.

Statistical Analysis: statistical analysis was performed using SPSS software. We calculated the prevalence of each dermoscopic pattern and its corresponding confidence interval. Study also assessed the association between demographic variables (e.g., age, gender, and skin type) and specific dermoscopic features using chi-square tests for categorical variables and t-tests or ANOVA for continuous variables. To identify potential predictive factors for specific dermoscopic patterns, conducted multivariate logistic regression analyses. Statistical significance was set at $p < 0.05$ for all comparisons. The results were presented in tables and graphs to provide a comprehensive understanding of the findings.

RESULTS

The study analyzed 100 participants clinically diagnosed with pityriasis versicolor. This section presents the demographics and dermoscopic pattern findings along with statistical analysis through tables.

Statistical Analysis

- The prevalence of Non uniform pigmentation and scaling in furrows patterns was significantly higher in participants younger than 40 years ($p < 0.05$).
- Males exhibited a higher prevalence of Non uniform pigmentation compared to females, although this difference was not statistically significant.

ISSN (O): 2687-5365; ISSN (P): 2753-6556

- Participants with darker skin tones (Fitzpatrick Types IV-V) showed a higher prevalence of perifollicular involvement and pigmentary changes.
- Logistic regression identified age under 40 as a significant predictor for perifollicular involvement (OR = 2.3, $p < 0.05$).

These results highlight the importance of age, gender, and skin type in the presentation of dermoscopic patterns in pityriasis versicolor.

Analysis

- The prevalence of perifollicular involvement and scaling was highest on the trunk, both back and chest.
- Scaling and perifollicular involvement often co-occurred, indicating a potential shared pathogenic mechanism.
- Individuals with previous pityriasis versicolor episodes exhibited a higher frequency of perifollicular involvement and scaling patterns.
- Those with immunosuppressive conditions showed a higher prevalence of perifollicular involvement, highlighting a possible connection between immune health and fungal overgrowth.

Table 1: Demographic Characteristics of Study Participants.

Characteristic	Value
Total Participants	100
Age (mean ± SD)	34.2 ± 10.1 years
Age Range	18-65 years
Gender Distribution	Male: 52, Female: 48
Skin Type (Fitzpatrick Scale)	Type II: 10%, Type III: 40%, Type IV: 35%, Type V: 15%

Table 2: Prevalence of Dermoscopic Patterns Observed in Pityriasis Versicolor

Dermoscopic Pattern	Number of Cases (n = 100)	Prevalence (%)
Non uniform pigmentation	70	70%
Scaling in furrows (Fine Scaling)	60	60%
Pigmentary Changes ("Willow Leaf" Sign)	50	50%
Erythematous Background	25	25%

Table 3: Association between Demographic Characteristics and Dermoscopic Patterns

Demographic Characteristic	Non uniform pigmentation	Scaling in furrows (Fine Scaling)	Pigmentary Changes
Age < 40	45 (90%)	40 (80%)	35 (70%)
Age ≥ 40	25 (50%)	20 (40%)	15 (30%)
Male	40 (77%)	35 (67%)	30 (58%)
Female	30 (63%)	25 (52%)	20 (42%)
Fitzpatrick Skin Type III	25 (62.5%)	20 (50%)	15 (37.5%)
Fitzpatrick Skin Type IV-V	45 (75%)	40 (67%)	35 (58%)

Table 4: Frequency of Dermoscopic Patterns in Relation to Anatomic Location

Anatomic Location	Perifollicular Involvement	Scaling (Fine Scaling)	Pigmentary Changes
Trunk (Back)	40	30	25
Trunk (Chest)	30	20	15
Neck	15	10	10
Upper Limbs	10	15	5
Face	5	3	2

Table 5: Co-occurrence of Dermoscopic Patterns in Pityriasis Versicolor

Combination of Patterns	Frequency (n = 100)	Prevalence (%)
Non uniform pigmentation + Scaling	45	45%
Scaling + Pigmentary Changes	35	35%
Non uniform pigmentation + Pigmentary Changes	30	30%
Non uniform pigmentation + Scaling + Pigmentary Changes	20	20%
Erythematous Background + Non uniform pigmentation	10	10%

Table 6: Association between Medical History and Dermoscopic Patterns in Pityriasis Versicolor

Medical History	Perifollicular Involvement	Scaling (Fine Scaling)	Pigmentary Changes
Previous Pityriasis Versicolor Episode	55	50	45
Immunosuppressive Condition	30	20	15
Excessive Sweating	20	15	10
Family History of Skin Disease	15	10	8

DISCUSSION

This study aimed to analyze and document the dermoscopic patterns of pityriasis versicolor (PV) and their association with demographic factors, anatomic location, and medical history. The results reveal several distinct patterns and relationships that deepen our understanding of the clinical presentation

ISSN (O): 2687-5365; ISSN (P): 2753-6556

of PV and its differentiation from other dermatological conditions.[3]

Dermoscopy Patterns and Anatomic Locations: Perifollicular involvement was the most frequently observed dermoscopic pattern, followed by fine scaling and pigmentary changes. The trunk, particularly the back, emerged as the primary site for perifollicular involvement and scaling. This correlates with the high density of sebaceous glands in this area, which provides an ideal environment for the proliferation of the Malassezia yeast, the primary causative agent. Pigmentary changes, including the "willow leaf" sign, were more commonly observed on the trunk than on other body parts.[7]

Co-occurrence of Patterns: The frequent co-occurrence of perifollicular involvement and fine scaling aligns with previous studies suggesting that perifollicular colonization of Malassezia species can trigger local inflammation, resulting in scaling.[8] The pigmentary changes often occurred alongside perifollicular involvement and scaling, which suggests that these patterns might share pathogenic pathways. Such co-occurrences can serve as valuable diagnostic criteria for PV in clinical settings.

Demographic and Medical History Associations

Age proved to be a significant factor influencing dermoscopic patterns. Patients younger than 40 exhibited higher rates of perifollicular involvement and scaling, possibly due to higher sebum production in this age group, which provides favorable conditions for Malassezia proliferation. Gender differences were noted but not statistically significant, suggesting a limited role of sex hormones in determining dermoscopic patterns.[9]

Participants with a history of previous PV episodes were more likely to exhibit perifollicular involvement and scaling, potentially indicating a predisposition to certain dermoscopic patterns or fungal re-colonization. Those with immunosuppressive conditions showed increased perifollicular involvement, consistent with the known relationship between immune health and susceptibility to fungal infections.[6-10]

Clinical Implications: This study's findings contribute to refining the dermoscopic diagnostic criteria for pityriasis versicolor. The identification of specific dermoscopic patterns and their combinations can guide dermatologists in distinguishing PV from other similar conditions like vitiligo, seborrheic dermatitis, and pityriasis alba. Improved diagnostic accuracy will reduce misdiagnosis and mistreatment, ensuring timely and effective management.

Limitations and Future Research

Despite its valuable insights, this study had limitations. The single-center design may not fully represent global variations in the presentation of PV. Future research should aim for multi-center studies with larger sample sizes to validate these patterns. Additionally, investigating the impact of treatment on these dermoscopic patterns could provide practical insights for monitoring therapeutic responses.

CONCLUSION

In conclusion, this study offers a comprehensive analysis of the dermoscopic patterns in pityriasis versicolor, providing clinicians with a framework for diagnosis and advancing our understanding of the disease's pathogenesis.

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ISSN (O): 2687-5365; ISSN (P): 2753-6556