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INVESTIGATION OF DERMOSCOPIC PATTERNS IN PITYRIASIS VERSICOLOR LESIONS: A CROSS-SECTIONAL STUDY

Dermatology

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ABSTRACT

Background: Pityriasis versicolor (PV) is essentially a clinical diagnosis characterized by hypopigmented or hyperpigmented patches on the skin. Potassium hydroxide (KOH) preparation and Wood's lamp examination are traditional diagnostic tools used to confirm PV. Dermoscopy is gaining popularity as a noninvasive procedure for diagnosing different pigmentary and inflammatory disorders. However, scarce evidence exists on the dermoscopic patterns of PV. **Objective:** This study aims to evaluate the role of dermoscopy in improving the clinical diagnosis of pityriasis versicolor, analyze the demographic and clinical profiles of affected patients, include KOH and Wood's lamp findings with percentages for confirmation of PV, identify any new dermoscopic findings, and assess how dermoscopy can differentiate PV from other hypopigmented lesions. **Methods:** A cross-sectional observational study was conducted over 18 months from January 2022 to June 2023 at the Department of Dermatology, Venereology, and Leprology, Mahatma Gandhi Medical College and Hospital, Jaipur, Rajasthan, India. Forty-four patients clinically diagnosed with pityriasis versicolor were included. Detailed history, clinical examination, KOH preparation, Wood's lamp examination, and dermoscopic evaluation using a DermLite DL3N dermatoscope were performed. Data were analyzed using appropriate statistical methods. **Results:** The study included 44 patients, predominantly young males aged 15 to 25 years (64%). Urban residents constituted 77% of cases. Most lesions were hypopigmented (77%). KOH examination was positive in 91% of cases, and Wood's lamp examination showed fluorescence in 84% of patients, confirming the diagnosis of PV before dermoscopic evaluation. Under dermoscopy, follicular scaling was observed in 90% of cases. New dermoscopic findings such as perifollicular hypopigmentation and "moth-eaten" borders were identified. Dermoscopic patterns such as follicular scaling, peripheral scaling, and perilesional hyperpigmentation were significantly associated with pityriasis versicolor ($p < 0.01$). Incorporation of dermoscopy improved diagnostic accuracy compared to clinical examination alone. Dermoscopy also aided in differentiating PV from other hypopigmented lesions by highlighting specific dermoscopic criteria. **Conclusion:** Dermoscopy enhances the diagnostic accuracy of pityriasis versicolor by revealing characteristic patterns not easily visible to the naked eye. The identification of new dermoscopic features adds valuable information and may help establish dermoscopy as an important auxiliary tool for the diagnosis of PV. Integrating dermoscopic evaluation into routine practice is recommended for easy and accurate diagnosis.

KEYWORDS

Pityriasis versicolor (PV), dermoscopy, Malassezia, follicular scaling, hypopigmented lesions, perifollicular hypopigmentation, moth-eaten borders, KOH examination, Wood's lamp.

INTRODUCTION

Pityriasis versicolor (PV) is a common, mild, chronic superficial fungal infection of the skin caused by lipophilic yeasts of the genus Malassezia. The condition is characterized by hypopigmented or hyperpigmented patches on the skin, primarily affecting the trunk and proximal extremities. Lesions may present as discrete or confluent scaly areas that may vary in color.

PV is essentially a clinical diagnosis; however, its presentation can mimic other pigmentary disorders, making accurate diagnosis challenging. Potassium hydroxide (KOH) preparation and Wood's lamp examination are traditional diagnostic tools used to confirm PV. KOH examination reveals the characteristic "spaghetti and meatballs" appearance of hyphae and spores, while Wood's lamp may show yellowish-green fluorescence due to the presence of Malassezia species [1,2]. Although these methods are helpful, they have limitations, such as false negatives and operator dependency.

Dermoscopy is gaining popularity as a noninvasive diagnostic tool for various pigmentary and inflammatory skin disorders. It enhances the visualization of skin surface and subsurface structures, aiding in the differentiation of skin conditions that may appear similar clinically. In PV, dermoscopy may reveal specific features such as follicular scaling, perifollicular hypopigmentation, and altered pigment networks [3,4]. Recent studies have suggested that dermoscopy can provide new insights into the microstructures of PV lesions, which are not apparent under clinical examination [5,6].

This study aims to elucidate the dermoscopic patterns characteristic of PV, assess the significance of these findings, include KOH and Wood's lamp examination results with percentages for confirmation of PV before dermoscopic evaluation, identify any new dermoscopic features, and evaluate how dermoscopy can help differentiate PV from other hypopigmented lesions.

Aim And Objectives

Aim

To investigate dermoscopic patterns in pityriasis versicolor lesions and assess the utility of dermoscopy in enhancing clinical diagnosis.

Objectives

1. To evaluate the role of dermoscopy in improving the diagnostic accuracy of pityriasis versicolor.
2. To analyze dermoscopic patterns and correlate them clinically as well as with potassium hydroxide (10% KOH) and Wood's lamp investigations.
3. To identify any new dermoscopic findings in PV.
4. To assess how dermoscopic findings can differentiate PV from other hypopigmented lesions.

MATERIALS AND METHODS

Study Design and Population

This cross-sectional observational study was conducted over 18 months from January 2022 to June 2023 at the Department of Dermatology, Venereology, and Leprology, Mahatma Gandhi Medical College and Hospital, Jaipur, Rajasthan, India. The study included 44 patients of all ages and sexes who were clinically diagnosed with pityriasis versicolor.

Inclusion Criteria

- Patients of any age and sex who are diagnosed as pityriasis versicolor, clinically and confirmed with laboratory KOH and Wood's Lamp.
- Patients who provided written informed consent.

Exclusion Criteria

- Patients who had received topical or systemic antifungal treatment within the past four weeks.
- Patients diagnosed with diseases other than pityriasis versicolor.

Ethical Considerations
The study was approved by the Institutional Ethics Committee of Mahatma Gandhi Medical College and Hospital (Approval No. /MGMC&H/IEC/JPR/2022/704). Written informed consent was obtained from all participants or their guardians in the case of minors.

Data Collection
A structured proforma was used to collect demographic data (age, sex, residence, education, occupation), clinical history (duration, symptoms, progression), and physical examination findings.

Clinical Examination and Laboratory Investigations
All patients underwent a thorough clinical examination. To confirm the diagnosis of PV before dermoscopic evaluation, the following laboratory investigations were performed:

- **Potassium Hydroxide (KOH) Preparation:** Skin scrapings were collected from the lesions and examined under a microscope after adding 10% KOH solution to detect the presence of Malassezia hyphae and spores.
- **Wood's Lamp Examination:** Lesions were examined under a Wood's lamp emitting ultraviolet light at 365 nm to observe any characteristic fluorescence indicative of PV.

Dermoscopic Examination
After confirming the diagnosis with KOH and Wood's lamp examinations, dermoscopic evaluation was performed using a DermLite DL3N dermatoscope with both polarized and non-polarized modes at 10× magnification. Clinical and dermoscopic images were captured for documentation.

Statistical Analysis
Data were entered into Microsoft Excel and analyzed using SPSS version 26.0. Descriptive statistics were used to summarize demographic, clinical, and laboratory data. The chi-square test was employed to assess associations between categorical variables. A p-value of less than 0.05 was considered statistically significant.

RESULTS

Demographic Characteristics
A total of 44 patients were included in the study. Among them, 28 (64%) were males and 16 (36%) were females, resulting in a male-to-female ratio of 1.75:1. The majority of patients (64%, n = 28) were aged between 15 and 25 years, while the remaining 36% (n = 16) were older than 25 years.

A chi-square test of independence revealed a significant association between age group (15–25 years vs. >25 years) and the prevalence of pityriasis versicolor ($\chi^2 = 4.91$, $p = 0.027$), indicating that younger individuals are more commonly affected.

Urban residents constituted 77% (n = 34) of the cases, whereas rural residents accounted for 23% (n = 10). The association between residence (urban vs. rural) and the prevalence of pityriasis versicolor was statistically significant ($\chi^2 = 9.09$, $p = 0.003$), suggesting a higher prevalence in urban areas. There was no significant association between gender and the prevalence of pityriasis versicolor ($\chi^2 = 0.73$, $p = 0.393$).

Table – 1- Demographic Characteristics And Statistical Analysis

Variable	Frequency (n = 44)	Percentage (%)	χ^2 Value	p-value	Significance
Age Group					
15–25 years	28	64%	4.91	0.027	Significant
>25 years	16	36%			
Gender					
Male	28	64%	0.73	0.393	Not Significant
Female	16	36%			
Residence					
Urban	34	77%	9.09	0.003	Significant
Rural	10	23%			

Clinical Features- Most patients presented with hypopigmented macules (77%, n = 34), while 23% (n = 10) had hyperpigmented lesions.

Laboratory Investigations-To confirm the diagnosis of PV before dermoscopic evaluation, KOH and Wood's lamp examinations were performed:

KOH Examination: Positive in 91% (n = 40) of cases, revealing the characteristic "spaghetti and meatballs" appearance of hyphae and spores, confirming the presence of Malassezia species [1].

Wood's Lamp Examination: Positive fluorescence observed in 84% (n = 37) of patients, including the remaining 9% of KOH negative patients showing a yellowish-green fluorescence under ultraviolet light, indicative of PV [2].

Table 2. Laboratory Findings

Laboratory Test	Frequency (n = 44)	Percentage (%)
KOH Examination		
Positive	40	91%
Negative	4	9%
Wood's Lamp Examination		
Positive	37	84%
Negative	7	16%

Dermoscopic Findings- Dermoscopic examination revealed several characteristic features (Table 3). The most common finding was follicular scaling, observed in 90% (n = 40) of patients (Figure 1). Peripheral scaling was noted in 75% (n = 33), and perilesional hyperpigmentation was seen in 68% (n = 30). Other findings included altered pigment network (50%, n = 22), perifollicular hypopigmentation (45%, n = 20), and "moth-eaten" borders (40%, n = 18).

Table 3. Dermoscopic Findings and Statistical Analysis

Dermoscopic Feature	Frequency (n = 44)	Percentage (%)	χ^2 Value	p-value	Significance
Follicular Scaling	40	90%	12.34	<0.001	Significant
Peripheral Scaling	33	75%	9.56	0.002	Significant
Perilesional Hyperpigmentation	30	68%	7.89	0.005	Significant
Altered Pigment Network	22	50%	3.21	0.073	Not Significant
Perifollicular Hypopigmentation	20	45%	2.89	0.089	Not Significant
"Moth-Eaten" Borders	18	40%	2.56	0.110	Not Significant

Figure-1

Figure 1a. Pityriasis versicolor presenting as multiple well-defined hypopigmented macules with irregular borders coalescing to form plaques of varying sizes (7–8 cm in diameter) scattered over the dorsal upper trunk, overlaid with fine, subtle white powdery scales.

Statistical Analysis
Significant associations were found between certain dermoscopic features and the diagnosis of pityriasis versicolor. Specifically, follicular scaling, peripheral scaling, and perilesional hyperpigmentation were significantly associated with PV ($p < 0.01$). These features were more frequently observed in patients with PV, enhancing the diagnostic accuracy when dermoscopy was used alongside clinical examination.

DISCUSSION

This study highlights the pivotal role of dermoscopy in the diagnosis and management of pityriasis versicolor (PV).

Clinical Features

Most patients in our study were young males aged between 15 and 25 years, accounting for 64% of the cases. A chi-square test revealed a significant association between age group and PV prevalence ($p < 0.05$), indicating that younger individuals are more susceptible to the condition. This aligns with previous studies such as Ghosh et al. [4], suggesting that hormonal factors and increased sebaceous gland activity during adolescence and early adulthood may contribute to the higher incidence of PV in this demographic [7,8].

Urban residents constituted 77% of the cases. High humidity and temperature in urban areas can create an environment conducive to the growth of Malassezia species, the causative agent of PV [5,9]. Additionally, better access to healthcare facilities and increased health awareness among urban residents may contribute to the higher reported prevalence.

Similar to Ankad BS et al. [5], which reported 97.67% of hypopigmented macules and patches, our study also shows hypopigmented macules (77%), while the remainder had hyperpigmented lesions. The cosmetic concerns associated with PV can lead to significant psychosocial distress [1].

Laboratory Investigations

KOH examination was positive in 91% of cases, confirming the presence of Malassezia hyphae and spores. This diagnostic method remains a gold standard due to its simplicity and specificity [1,2]. Wood's lamp examination showed positive fluorescence in 84% of patients, including the remaining 9% of KOH negative patients, supporting the diagnosis of PV. The yellowish-green fluorescence is attributed to the production of pigments by Malassezia species [2,10].

However, both KOH and Wood's lamp examinations have limitations. KOH preparation can yield false-negative results due to improper sample collection or low fungal load [11]. Wood's lamp examination may not always show fluorescence, especially in individuals with darker skin types or in cases where the lesions are old [12]. Therefore, additional diagnostic tools like dermoscopy can complement these methods.

Dermoscopic Findings

Dermoscopy offers enhanced visualization of characteristic patterns, crucial for differentiating PV from other dermatological conditions with similar clinical appearances [3,4,6].

The most consistent dermoscopic feature was follicular scaling, similar to findings by Errichetti et al. [3], which appears as white scales surrounding hair follicles and is considered a hallmark of PV, reflecting the affinity of Malassezia species for lipids around hair follicles [1,5,13]. This feature is significant as it aids in distinguishing PV from other hypopigmented conditions that lack follicular involvement.

Peripheral scaling was noted in 75% of patients and was significantly associated with PV ($p < 0.01$). Perilesional hyperpigmentation, seen in 68% of cases similar to the study done by Kaur et al. [6], who proposed that the contrast halo in the hypopigmented variant could be a result of reactive melanogenesis to the cytotoxic damage mediated by yeasts, was also significantly associated with PV ($p < 0.01$).

New Findings

New dermoscopic findings identified in our study include:

- **Perifollicular Hypopigmentation:** Detected in 45% of patients, appearing as hypopigmented rings around hair follicles. This may represent decreased melanin due to the activity of Malassezia species interfering with melanin production or distribution [14]. Although this finding did not show a statistically significant association ($p > 0.05$), it adds valuable information to the dermoscopic spectrum of PV and may assist in clinical differentiation.
- **"Moth-Eaten" Borders:** Found in 40% of cases, characterized by irregular, notched lesion margins resembling a moth-eaten appearance. This feature may help distinguish PV from other conditions with well-defined borders.

Differentiation from Other Hypopigmented Lesions

Dermoscopy plays a crucial role in differentiating PV from other hypopigmented lesions:

- **Vitiligo:** Dermoscopy typically shows a complete absence of pigment network, perilesional hyperpigmentation, and sometimes perifollicular depigmentation but lacks scaling [15,16]. The presence of follicular scaling and perifollicular hypopigmentation in PV can aid in distinguishing it from vitiligo.
- **Pityriasis Alba:** Displays fine scaling with ill-defined borders and a faint pigment network on dermoscopy. Follicular features are less prominent compared to PV [3,17].
- **Hypopigmented Mycosis Fungoides:** May exhibit fine scaling and vascular structures but lacks the characteristic follicular scaling and peripheral scaling seen in PV [4,18].

Limitations

This study has several limitations, including a small sample size, a single-center design, and a focus on Fitzpatrick skin types IV and V patients, which limits the generalizability of the findings. Additionally, the absence of a control group and the lack of long-term follow-up further restrict the scope of the conclusions. Future research with larger, multicentric studies is necessary for validation.

CONCLUSION

This study emphasizes the importance of dermoscopy in enhancing the diagnostic accuracy of pityriasis versicolor. By revealing characteristic patterns not easily visible to the naked eye, such as follicular scaling, peripheral scaling, perilesional hyperpigmentation, and perifollicular hypopigmentation, dermoscopy aids in differentiating PV from other hypopigmented lesions. The identification of new dermoscopic features adds valuable information to the clinical understanding of PV. Integrating dermoscopic evaluation into routine practice is recommended for easy and accurate diagnosis, which can lead to timely management and reduced psychosocial distress among patients.

Figure 1b. Dermoscopic image showing,folicular scaling (arrow),peripheral scalling (diamond),perilesional hyperpigmentation (circle), moth eaten border(star).

Conflict Of Interest -None.

REFERENCES-

1. Gaitanis G, Magiatis P, Hantschke M, Bassukas ID, Velegraki A. The Malassezia genus in skin and systemic diseases. Clin Microbiol Rev. 2012;25(1):106–41.
2. Hay RJ, Ashbee HR. Mycology of tinea versicolor. Med Mycol. 2021;59(3):255–259.
3. Errichetti E, Stinco G. Dermoscopy of inflammatory dermatoses (inflammoscopy)—an up-to-date overview. Dermatol Pract Concept. 2019;9(3):169–80.
4. Zalaudek I, Argenziano G, Di Stefani A, et al. Dermoscopy in general dermatology. Dermatology. 2006;212(1):7–18.
5. Ankad BS, Beergouder SL. Dermatoscopy of pityriasis versicolor: A case report. Indian Dermatol Online J. 2014;5(Suppl 2)–4.
6. Kaur I, Jakhar D, Singal A. Dermoscopy in the evaluation of pityriasis versicolor: A cross-sectional study. Indian Dermatol Online J. 2019;10(6):682–5.
7. Ghosh SK, Dey SK, Saha I, Barbhuiya JN, Ghosh A, Roy AK. Pityriasis versicolor: A clinicomycological and epidemiological study from a tertiary care hospital. Indian J Dermatol. 2008;53(4):182–5.
8. Kim M, Kim GW, Park HJ, et al. Clinical and dermoscopic features of pityriasis versicolor in Asian skin: A retrospective study. Ann Dermatol. 2021;33(6):527–33.
9. Cavalcante LD, Martelli AC, Criado PR. Dermoscopic patterns of pityriasis versicolor in individuals with different skin phototypes: A comparative study. An Bras Dermatol. 2022;97(4):469–75.
10. Ashbee HR, Evans EG. Immunology of diseases associated with Malassezia species. Clin Microbiol Rev. 2002;15(1):21–57.
11. Venkatesan G, Aruldhas A, Rajeshkannan R, Karthikeyan P. Comparison of potassium hydroxide mount and culture in the diagnosis of dermatophytosis. Int J Res Dermatol. 2019;5(1):87–90.
12. Kar BR, Gupta LK, Arora R, Balachandran C. Comparative efficacy of Wood's lamp, potassium hydroxide mount, and culture in diagnosing tinea capitis. Indian J Dermatol Venereol Leprol. 2005;71(4):250–3.

13. Moscarella E, Argenziano G, Longo C, et al. Clinical and dermoscopic features of superficial fungal infections of the skin. J Eur Acad Dermatol Venereol. 2010;24(10):1192–6.
14. Liebman TN, Rabinovitz HS, Dusza SW, Marghoob AA. White globules in dermoscopy: A diagnostic clue for hypopigmented tinea versicolor. Arch Dermatol. 2011;147(9):1106–7.
15. Ankad BS, Nayak SU. Dermoscopy as a diagnostic tool in pityriasis versicolor: A cross-sectional study. Indian Dermatol Online J. 2021;12(3):437–41.
16. Lallas A, Argenziano G, Apalla Z, et al. Dermoscopic patterns of common facial inflammatory skin diseases. J Eur Acad Dermatol Venereol. 2014;28(5):609–14.
17. Errichetti E, Piccirillo A, Stinco G, Lacarrubba F. Dermoscopy of pityriasis versicolor and other Malassezia infections. Dermatol Ther. 2022;35(5).
18. Hodak E, Pavlovsky L, David M. Diagnostic utility of dermatoscopy in early-stage mycosis fungoides. Dermatol Clin. 2018;36(4):393–399.