Dermoscopy for differentiation of palmoplantar psoriasis and hyperkeratotic hand-foot eczema: a descriptive study

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Background: Palmoplantar psoriasis (PPP) and hyperkeratotic eczema (HPKE) are common and troublesome entities affecting the palms and soles. The diagnosis is made clinically, but differentiation is difficult; histopathology helps but is often impossible in daily practice. Dermoscopy is increasingly utilized to diagnose inflammatory disorders and has been used to differentiate PPP from HPKE. The present study was carried out to evaluate the role of dermoscopy in the differentiation of PPP and HPKE in a tertiary care center of eastern India.

Methods: This hospital-based observational study included 20 patients with each of clinically diagnosed PPP and HPKE. Dermoscopy examinations were done, and the results were tabulated and summarized. Fisher's exact test was employed to assess statistical significances in differences.

Results: Diffuse white and yellow scales were found in both PPP and HPKE without any significant difference. Brown orange globules, clustered dotted vessels, yellow, orange crusts, and perilesional scaling were found more in HPKE ($P < 0.05$). On the other hand, uniformly dotted vessels and background erythema were more characteristic of PPP ($P < 0.05$). The results of the current study had deviations from the results of studies done abroad, which can be ascribed to differences in skin color.

Conclusion: Dermoscopy is a valuable tool to sort out diagnostic dilemmas in cases of PPP and HPKE. It should be used more commonly to gain more experience and information in the diagnosis of inflammatory dermatoses.

Keywords: palmoplantar psoriasis, hyperkeratotic eczema, dermoscopy, India

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INTRODUCTION

The hands and feet are essential parts of the body, mediating our interactions with the external environment. Consequently, involvement of these areas in chronic disease results in serious difficulties in daily activity.

Palmoplantar psoriasis (PPP) is a form of psoriasis that may present alone or in the presence of psoriatic lesions elsewhere. Typically, psoriasis lesions are well defined, scaly, and come with the frequent presence of fissures [1]. The diffuse hyperkeratotic variety is of primary interest in the present study.

On the other hand, hyperkeratotic eczema (HPKE)/tylotic eczema is another chronic condition affecting the hands and feet [2]. Clinical findings include well-defined hyperkeratotic plaques on the palms and on the palmar aspects of the fingers,

easily confused with PPP. The incidence of atopy or psoriasis in these patients is not increased as compared to the general population [3].

Both these conditions are recurring in nature and interfere with daily activities. Histological examination is often indicated to reach a definitive diagnosis but is not possible routinely [4]. Differentiation between these two entities is challenging in clinical practice but is necessary because of differences in prognosis, preventive measures, and therapy [1].

The utility of dermoscopy (dermatoscopy) has been expanding and has received recognition in the field of inflammatory skin disorders (inflammoscopy) [5-8]. Dermoscopy has been utilized as a handy tool in the differentiation of PPP from HPKE [9,10] and may serve to reduce the need for biopsies [11,12].

There is a dearth of data regarding the application of dermoscopy in cases of inflammatory dermatoses, especially in its utility in the differentiation of PPP from HPKE. Thus, a study in this regard was found necessary. The aims and objectives of the study were to evaluate the diagnostic utility of dermoscopy in cases of PPP and HPKE of the palms and soles.

MATERIALS AND METHODS

The present study was hospital-based and observational in nature. Subjects were selected randomly from those patients attending the hospital clinic after being diagnosed clinically with PPP or HPKE over a period of one year. Exclusion criteria consisted of topical or systemic therapy within the last month. The study was conducted according to the Helsinki Declaration, and verbal consent was obtained from the patients after being thoroughly informed about the study.

For examination, a dry digital polarized self-illuminating dermatoscope (Dino-Lite®) with 1.3 Megapixel resolution and magnification of 20x, 50x, and 200x was used. The dermatoscope was connected to the USB port of the computer and switched on. It was held on the center of the lesion and adjusted into focus. We used the non-polarized mode to visualize surface findings, while the polarized mode was used to note deeper findings. The images were captured and transferred to a computer via a USB cable. The dermoscopy findings and photography were examined and compared by an investigator (AA) blinded to the clinical diagnosis.

The information from each patient was recorded into individual case record sheets before being compiled in a Microsoft Excel 2013 spreadsheet. Data were analyzed using descriptive statistics. Fisher's exact test was employed to assess statistical significance. A P-value < 0.05 was considered to be significant.

RESULTS

The current study was conducted with 40 clinically diagnosed patients, including 20 PPP cases and 20 HPKE cases. The mean age of the PPP group was 35 years (range: 25-65 years), while that of the HPKE group was 46 years (range: 35-67 years). Males outnumbered females in both groups; there were 12 males in the PPP group and 13 males patients in the HPKE group. The duration of disease was 19 months and 14 months in the PPP and HPKE groups, respectively (Table 1).

Each patient was subjected to dermoscopy by one of the authors (AA), who was kept unaware of the clinical diagnosis. The findings of dermoscopy were tabulated on individual case sheets; the results are presented in Table 2.

The dermoscopy features most commonly found in PPP (Figure 1) were background erythema and diffuse white scales (both present in 80% of patients), followed by the appearance of uniform dotted vessels (60%). The most prevalent dermoscopy features of HPKE (Figure 2) were perilesional skin scaling (100%), followed by clusters of dotted vessels (70%) and brown-orange globules (65%). Diffuse white scaling was present in both PPP and HPKE (in 80% and 50% of patients, respectively). Brown-orange globules were absent in PPP, while uniform dotted vessels were absent in HPKE. Also, while uniform dotted vessels were exclusively found in

Table 1. Age and sex characteristics of the patients

	PPP (n = 20)	HPKE (n = 20)
Age range (year)	25 - 65	35 - 65
Average age (year)	35	46
Male to female ratio	12:8	13:7
Duration of disease (month)	19	14

Abbreviations: HPK, hyperkeratotic eczema; PPP, palmoplantar psoriasis.

Table 2. Dermoscopy findings of the patients

Dermoscopy findings	PPP (n = 20) n (%)	HPKE (n = 20) n (%)	*P*-value
Diffuse white scales	16 (80)	10 (50)	0.0958
Yellowish scales	4 (20)	10 (50)	0.0958
Brown-orange globules	0 (0)	13 (65)	<0.05
Uniform dotted vessels	12 (60)	0 (0)	<0.05
Clusters of dotted vessels	2 (10)	14 (70)	<0.05
Background erythema	16 (80)	4 (20)	<0.05
Yellow-orange crusts	1 (5)	9 (45)	<0.05
Increased scaling in surrounding skin	1 (5)	20 (100)	<0.05

Abbreviations: HPK, hyperkeratotic eczema; PPP, palmoplantar psoriasis.

PPP, clusters of dotted vessels were found more in HPKE (70%) patients.

Statistically, the presence of white/whitish scales was not significantly different between the groups ($P > 0.05$). The same was true regarding yellow scales ($P > 0.05$). The dermoscopy features that favored the diagnosis of PPP rather than HPKE were uniform dotted vessels ($P < 0.05$) and background erythema ($P < 0.05$). On the other hand, findings like brown-orange globules ($P < 0.05$), dotted vessels

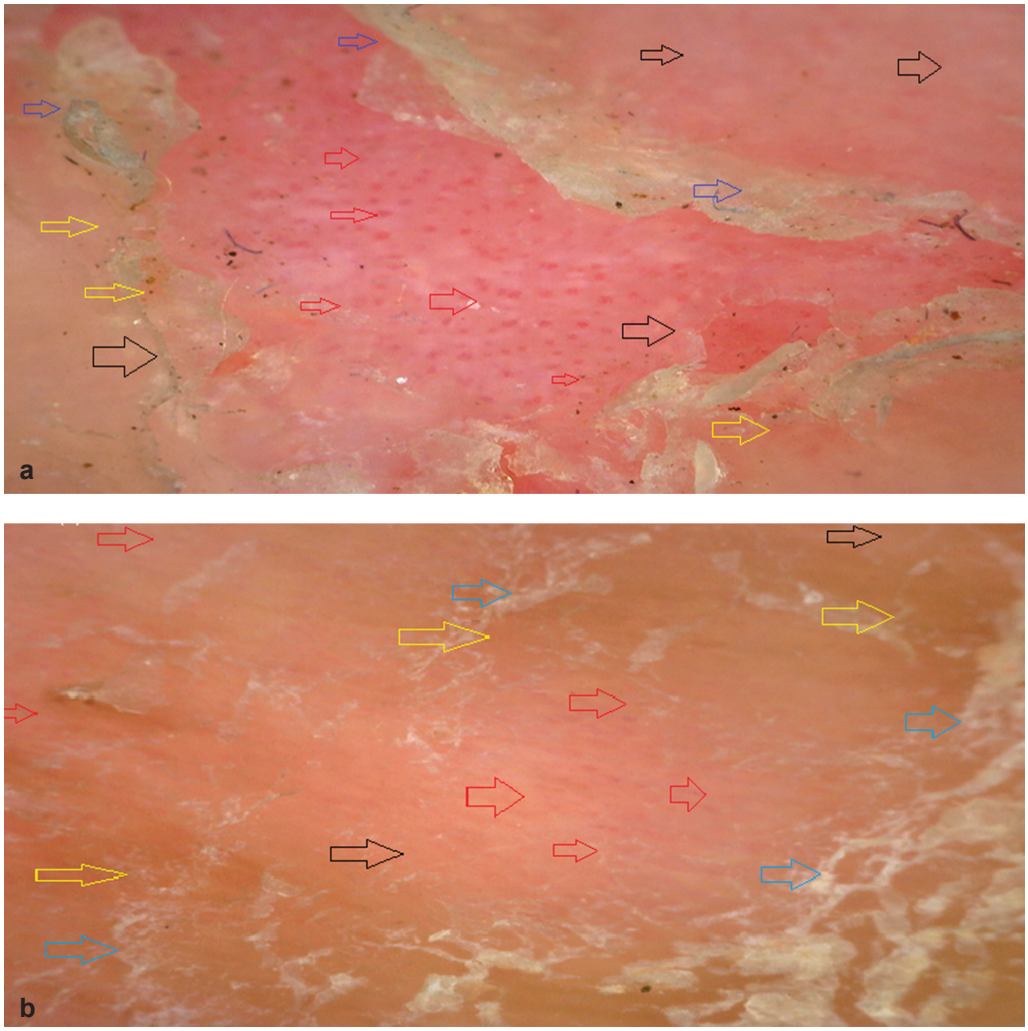

Figure 1. (a, b). Dermatoscopic image of chronic plaque psoriasis. Red arrows represent uniformly distributed dotted vessels. Blue arrows represent white scales distributed all over the lesion. Black arrows point out diffuse background erythema. Yellow arrows depict yellowish scales and crusts.

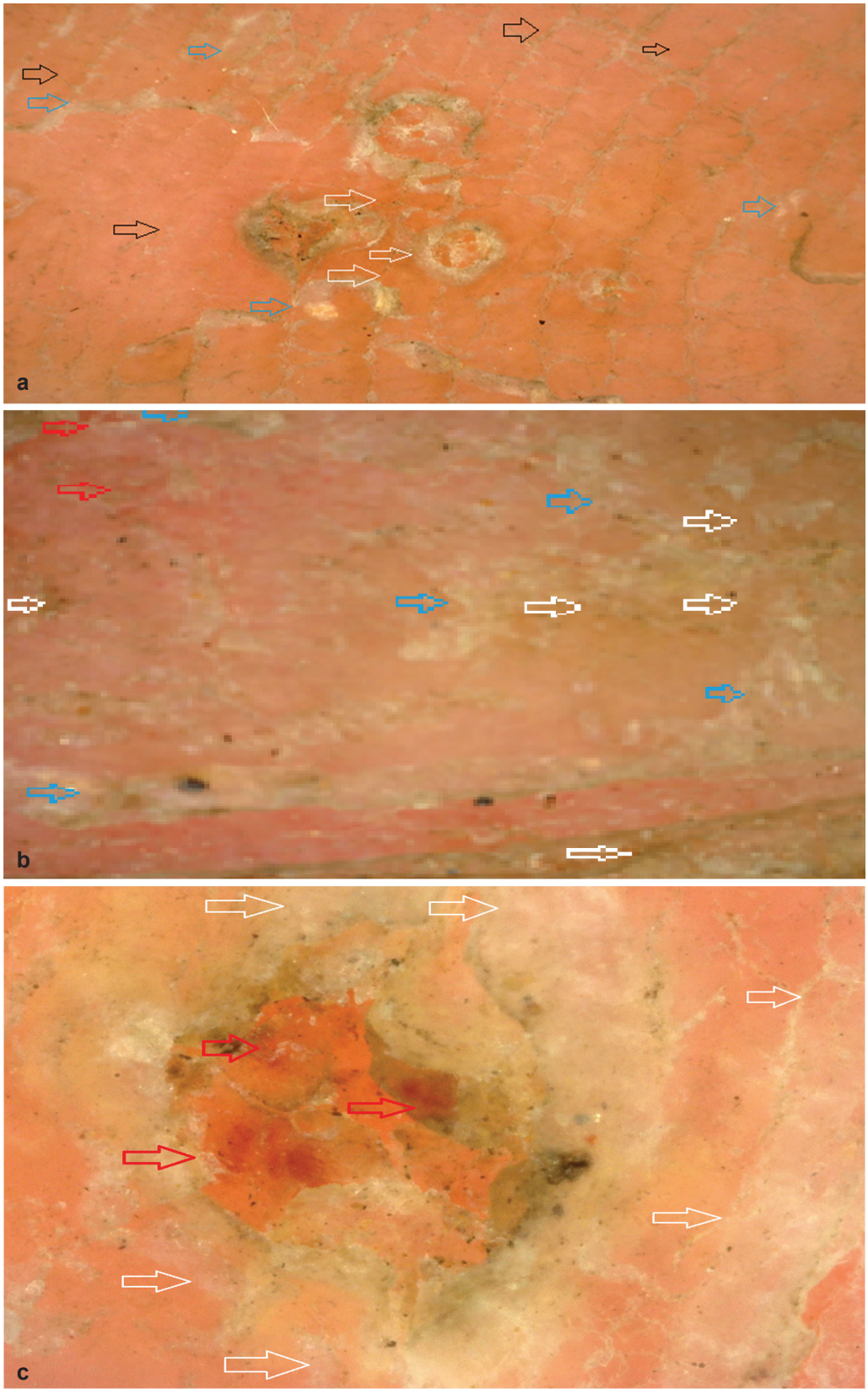

Figure 2. (a, b, c). Dermatoscopic pictures of chronic hand and foot eczema. Blue arrows point at white scales throughout the lesion and around the lesion. Black arrows represent erythema in the background. White arrows point at brown-orange globules. Red arrows point at dotted vessels more prominent in (c).

in clusters ($P < 0.05$), yellow-orange crusts, and increased scaling in surrounding skin were more suggestive of HPKE rather than PPP ($P < 0.05$).

DISCUSSION

This study was conducted to assess the utility of dermoscopy in differentiating between two often confused entities involving the palms and soles, namely PPP and HPKE.

Diffuse white scaling was found at a similar rate in both study groups (PPP and HPKE). The scales in PPP were white in color while they were yellow-orange in HPKE. This finding corroborates with the findings of Errichetti and Stinco [9], who found diffuse scaling in both conditions. Lallas [8] also observed white scales in PPP and yellowish scales in HPKE in diffuse distribution. Thus, the scales' color can be considered a useful dermoscopic variable for differentiating between the two conditions.

Dotted vessels were found in a uniform distribution in our study in PPP, while they were seen in clusters in HPKE. This former finding agrees with the results of Errichetti and Stinco [9] and Lallas *et al.* [8], both of whom found dotted vessels in 40% and 100% of cases, respectively. The latter finding in the current study is corroborative with the findings of Lallas *et al.* [8], who found vessels in the patchy distribution in 59% of cases. Errichetti and Stinco [9], however, did not comment about the vessels or their pattern in HPKE. It may hence be safely inferred that the finding of dotted vessels is fairly specific for PPP.

Background erythema was another common feature (80%) found only in PPP cases in our study. This feature was also noted by Lallas *et al.* [8], who found a 'light red color' in the background in 41% of PPP cases. This was not noted in HPKE either by Lallas *et al.* [8] or by us. Thus, this may be considered another reliable diagnostic feature present in PPP but not in HPKE.

The Errichetti and Stinco [9] study also revealed brownish-orange globules and yellowish scales to be present more in chronic eczema, and the difference was significant ($P < 0.001$). The current study holds a similar observation and corroborates well with its predecessor. Thus, it may be speculated that the presence of yellow-orange crusts and yellow scales are dermoscopic features in favor of HPKE.

To the best of our knowledge, the present study is among the first studies to assess the utility of dermoscopy in differentiating PPP from chronic palmoplantar eczema (HPKE). The presence of surrounding scales merging imperceptibly into normal skin is a feature that the present study strongly suggests to indicate HPKE. This is a reflection of the rather ill-defined boundary of HPKE that we find clinically. The presence of background erythema along with uniform dotted vessels (the basis of the Auspitz sign) is suggestive of PPP. The presence of diffuse scale smay indicate PPP or HPKE, but yellowish scales support the diagnosis of HPKE while white scales support PPP. The detection of abundant white scales in dermoscopy is a reflection of the micaceous scales classically seen in psoriasis. The presence of yellowish scales, brown-orange globules, and dotted vessels in clusters supports the diagnosis of HPKE. These features are a reflection of the combination of hyperkeratosis and spongiosis seen histopathologically. A comparison of current study findings with available literature is presented in Table 3. The limitations of the investigation are that video-dermoscopy was not done and histopathologic confirmation of diagnoses was not made.

Table 3. Comparison of current study findings with previous research

Author	Findings in PPP	Findings in HPKE
Errichetti & Stinco, 2016 [9]	White scales (100%) Dotted vessels (40%)	Yellow scales (90%) Yellow-orange crusts (63.6%) White scales in patches (45.5%)
Lallas et al., 2014 [8]	White diffuse scales (70%) Regular vessel pattern (88%) Dotted vessels (100%) Background light-red color (41%)	Patchy scale distribution (66%) Yellow scales (20%) Patchy pattern of vessels (59%)
Current study	Diffuse white scales (80%) Uniform dotted vessels (60%) Background erythema (80%)	Scaly surrounding skin (100%) Dotted vessels in clusters (70%) Yellow-orange crusts and yellow scale (50%)

Abbreviations: HPK, hyperkeratotic eczema; PPP, palmoplantar psoriasis.

CONCLUSION

Regardless of the confinements of the current investigation, it may be concluded that dermoscopy is a valuable and convenient apparatus for distinguishing between instances of PPP and HPKE in the clinic. It should be used more often to make confident diagnoses and gain experience in the diagnosis of inflammatory dermatoses (inflammoscopy).

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Author contributions

Study design & conceptualization: AA, LG, SB. Data collection: AA, LG, SC, Formal analysis: SB. Manuscript drafting: AA, LG, SC. Review & final editing: AA, LG, SB.

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