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Report

International Dermoscopy Society criteria for non-neoplastic dermatoses (general dermatology): validation for skin of color through a Delphi expert consensus

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Abstract

Background The International Dermoscopy Society (IDS) recently released a set of five basic dermoscopic parameters (vessels, scales, follicular findings, "other structures," and specific clues) encompassing a total of 31 subitems to standardize the use of dermoscopy in non-neoplastic dermatoses, yet they have been developed taking into account Caucasian/Asian skin, with consequent possible limitations if used in dark skin.

Objectives To validate the abovementioned criteria for the use in dark-skinned patients (phototypes IV–VI) through an expert consensus.

Methods The two-round Delphi method was adopted, with an iterative process consisting of two rounds of email questionnaires. Potential panelists were recruited via e-mail from all over the world based on their expertise on dermoscopy of non-neoplastic dermatoses in skin of color.

Results Twenty-two panelists took part in the validation process. All of the five originally proposed parameters and subitems reached agreement during the first round, aside from "follicular red dots." Additionally, during round 1, five new subitems were proposed (perifollicular scales distribution, follicular openings obliteration, broken hairs, eccrine pigmentation, and eccrine ostia obliteration), along with the possibility to change the denomination of parameter 3 (from "follicular findings" to "follicular/eccrine findings") and split it into two subparameters ("follicular findings" and "eccrine findings"). All such proposals reached agreement during the second round and therefore were included in the final list, for a total of 37 items.

Conclusions Although nearly all the dermoscopic criteria originally proposed by the IDS are applicable even to darker phototypes, several additional variables need to be assessed.

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Introduction

Dermoscopy has gained significant appreciation in the field of non-neoplastic skin disorders (general dermatology), including inflammatory, infectious, and infiltrative dermatoses, with many published studies over the last few years.[1] However, dermoscopic descriptions reported in the literature are often heterogeneous, metaphoric, and poorly comprehensible due to the lack of a systematic terminology and methodology of analysis.[1] To address this limitation, the International Dermoscopy Society (IDS) released a modified Delphi-based expert consensus document to be used as a guide for studies on dermoscopy in general dermatology. This consensus proposed a set of five basic dermoscopic parameters (with a total of 31 standardized subitems)[1]: (I) vessels (including morphology and distribution); (II) scales (including color and distribution); (III) follicular findings; (IV) "other structures" (structures other than vessels/scales; including color and morphology); and (V) "specific clues" (features that, when present, are strongly suggestive of only one diagnosis because of a strict dermoscopic–pathological correlation).

Notably, the above-mentioned consensus document was developed by experts dealing with Caucasian or Asian patients (generally with phototype up to IV),[1] with consequent possible

limitations if used in darker-skinned patients.[2] Indeed, it has been demonstrated that dermoscopic patterns of dermatological diseases in skin of color (especially phototypes V/VI) may significantly differ due to the diverse color background, specific reaction patterns in darker phototypes (e.g., lability of pigment and greater tendency for follicular or sclerotic reactions), and peculiar disorders exclusively or predominantly seen in dark skin.[2,3] This becomes even more relevant because the use of dermoscopy for the evaluation of non-neoplastic dermatoses is significantly expanding in dark-skinned populations, for which it has been classically used less due to the lower incidence of skin tumors.[2]

The aim of this study was to validate the dermoscopic criteria provided by the IDS for the use in skin of color by a consensus process involving a panel of experts routinely dealing with dark-skinned patients (phototypes IV, V, and VI).

Materials and methods

The consensus was performed based on the two-round Delphi method, with an iterative process consisting of two rounds of email questionnaires starting from a list of preselected items (i.e., dermoscopic criteria provided by the IDS).[1] Such a procedure was chosen over the three-step modified Delphi method used in the original IDS consensus[1] as the face-to-face meeting was not feasible because of the global COVID-19 pandemic restrictions. Indeed, the Delphi process allows to gain expert consensus on variable issues by using at least two rounds of questionnaires and involving at least 5–10 participants, without the need for an in-person discussion, unlike the modified Delphi method.[4–6] Of note, whereas the lack of a face-to-face meeting does not allow discussion among experts to argue/justify personal viewpoints, it reduces decisional biases because of group interaction.[4–6]

Panel selection

The panel of experts was selected via e-mail from all over the world based on expertise in the field of dermoscopy (in general and applied to non-neoplastic dermatoses) in skin of color (phototypes IV, V, and VI), as justified by published studies, books, and active roles in scientific societies and congresses. Specifically, researchers who had published at least five peer-reviewed articles or book chapters on such a topic were asked to join the panel. Overall, 26 international experts were invited as panel members. Panelists' assessments remained anonymous and blinded during the whole consensus process.

Round 1

The complete list of criteria provided by the IDS consensus document on dermoscopy in general dermatology (Table 1) was circulated via e-mail to all participants, along with a detailed description of the aims and instructions of the consensus process.

Panelists were asked to judge on a 5-point scale the level of agreement on the relevance of each variable for the use in dark-skinned patients (1, no agreement; 2, low agreement; 3, moderate agreement; 4, agreement; and 5, strong agreement). In case of disagreement/poor agreement (score 1–3) on any of the items, participants were invited to justify their choice and (optional) provide suggestions to improve them. Experts were also given the opportunity to propose additional variables not included in the original list. Each item was considered as appropriate for the use in skin of color if more than 80% of the experts rated it with a score of 4 or 5 out of 5. Notably, the agreement threshold of 80% was chosen according to the literature recommendation on Delphi consensus.[5]

Variables not reaching 80% agreement would be modified according to the provided feedback (if any) and redistributed, along with new proposed items, to the panel of experts for round 2.

Round 2

In the second round, the panel of experts had to assess new proposed items as well as variables not reaching agreement in the first round that had been modified according to the feedback provided during the first step of the consensus process (if any). The same methods used in the first round were followed even in this step.

Results

Twenty-two panelists took part in both the rounds of the consensus. All five originally proposed parameters and subitems reached agreement during the first round, aside from "follicular red dots," which received a mean score of 3.82 with 73% of experts giving approval (score of 4 or 5). Additionally, during round 1, five new subitems were proposed, including (I) perifollicular distribution for parameter 2 ("scales"); (II) follicular openings obliteration and (III) broken hairs for parameter 3 ("follicular findings"); (IV) eccrine pigmentation; and (V) eccrine ostia obliteration as a part of a new proposed subparameter ("eccrine findings"). Notably, this last proposal was coupled with a suggested change in the denomination of parameter 3, that is, from "follicular findings" to "follicular/eccrine findings," in order to include the new proposed subparameter.

All proposals (five new subitems, one new subparameter, and the change of the third parameter denomination) were rated during the second round, with all of them reaching agreement and therefore being included in the final list. Consequently, at the end of the consensus, a total of five parameters encompassing 37 items (30 out of the 31 proposed by the IDS plus seven added in the course of the consensus procedure) were identified. Details on agreement rates and mean scores for rounds 1 and 2 are shown in Table 1.

Table 2 summarizes all the parameters and subitems validated in the present consensus for the use in dark-skinned

patients, along with corresponding histological background and main dermatoses characterized by each subitem.[7–18] Schematic diagrams of the newly identified subitems are shown in Figures 1 and 2; Figures 3–10 display common examples of the IDS dermoscopic parameters validated for skin of color.

Table 1 Results of the validation process for the use of the IDS dermoscopic criteria for nontumoral dermatoses in skin of color with corresponding agreement rates (percentage of experts giving a score of 4 or 5) and mean scores for each round

Dermoscopic parameter[a]	First round[b]	Second round[b]
1 Vessels	100 (5.00)	–
1.1 Vessel morphology	100 (4.95)	–
Dotted	91 (4.64)	–
Linear (without bends or branches)	95 (4.64)	–
Linear with branches	91 (4.59)	–
Linear curved	91 (4.55)	–
1.2 Vessel distribution	100 (5.00)	–
Uniform	100 (4.91)	–
Clustered	100 (4.77)	–
Peripheral	95 (4.77)	–
Reticular	95 (4.64)	–
Unspecific	100 (4.77)	–
2 Scales	100 (5.00)	–
2.1 Scale color	100 (5.00)	–
White	95 (4.82)	–
Yellow (scales and crusts)	100 (4.82)	–
Brown	82 (4.23)	–
2.2 Scale distribution	100 (5.00)	–
Diffuse	100 (4.91)	–
Central	100 (4.91)	–
Peripheral	100 (4.95)	–
Patchy	100 (4.82)	–
Perifollicular	–	100 (4.86)
3 Follicular/eccrine findings	–	100 (4.82)
3.1 Follicular findings	100 (5.00)	–
Follicular plugs	100 (4.91)	–
Follicular red dots	73 (3.82)	–
Follicular openings obliteration	–	100 (4.68)
Perifollicular white color	100 (4.77)	–
Perifollicular pigmentation	95 (4.64)	–
Broken hairs	–	91 (4.50)
3.2 Eccrine findings	–	95 (4.64)
Perieccrine pigmentation	–	82 (4.14)
Eccrine ostia obliteration	–	82 (4.14)
4 Other structures[c]	100 (4.95)	–
4.1 Color	100 (5.00)	–
White	100 (4.91)	–
Brown	86 (4.45)	–
Grey	91 (4.55)	–
Blue	91 (4.41)	–
Orange	86 (4.36)	–
Yellow	86 (4.50)	–
Purple	82 (4.05)	–
4.2 Morphology	100 (5.00)	–
Structureless[d]	95 (4.82)	–
Dots or globules	100 (4.82)	–
Lines[e]	100 (4.77)	–
Circles	95 (4.59)	–
5 Specific clues[f]	100 (5.00)	–

[a]The consensus allows to specify further details for each parameter if found to be relevant to characterize and differentiate one or more conditions due to strict correspondence with specific histological features (e.g., "bright" white structures in lichen sclerosus as the dermal fibrosis gives rise to shiny white shade).
[b]Agreement rate (mean score) – Agreement rate is measured from 0% to 100%, mean score is measured from 0 to 5.
[c]Structures other than vessels, scales, and follicular findings.
[d]Diffuse (as a background) or focal.
[e]Parallel, reticular, perpendicular, angulated, or unspecifically arranged.
[f]Features that, when present, are strongly suggestive of only one diagnosis (in general or among a limited number of differential diagnoses) as they are related to highly specific or sensitive histological findings.

Discussion

According to the present expert consensus, all the dermoscopic criteria proposed by the IDS for the assessment of non-neoplastic dermatoses may be applied to dark-skinned patients, except for "follicular red dots" (histologically related to perifollicular inflammation and often observed in Caucasians in early stages of discoid lupus erythematosus and, less frequently, follicular mucinosis and follicular mycosis fungoides).[1] The exclusion of this subitem is easily explained by its scarce visualization in skin of color due to the pigmented background.[2] Importantly, despite all the other dermoscopic variables reaching agreement for use in ethnic skin, there was a variability in terms of rating. In particular, some of the colors of "other structures" (structures other than vessels, scales, and follicular findings), including brown, blue, orange, yellow, and purple, as well as brown scales reached a mean score lower than 4.5. This is possibly because of the lower contrast between colors and dark skin, yet it is well known that many of them are diagnostically relevant for some dermatoses in skin of color, viz. brown and blue dots in lichen pigmentosus and ashy dermatoses, respectively, or orange/yellow structureless areas in granulomatous dermatoses.[2] Additionally, it is important to consider that the lesions' background of many inflammatory conditions in darker phototypes is lighter than surrounding healthy skin due to histological changes (epidermal hyperplasia, melanin content reduction, fibrosis, etc.), thereby making visible colors/features otherwise difficult to see (e.g., brown scales in eczematous dermatitis or purple globules in prurigo nodularis).[2]

Table 2 Dermoscopic criteria validated in the expert consensus, with corresponding histological findings and main related dermatoses in skin of color

Dermoscopic parameter*	Corresponding histological findings	Main dermatoses**
1. Vessels		
1.1 Vessels morphology		
Dotted	Dilated vessels in elongated dermal papillae	Psoriasis,[2,7,8] dermatitis,[2] lichen planus,[2] pityriasis rosea,[2,7,8] lichen simplex chronicus,[PO] secondary lichenification,[PO] tinea corporis,[2] PLEVA,[9] pityriasis lichenoides chronica,[9] impetigo,[PO] molluscum contagiosum,[2] and plane/common warts[2]
Linear (without bends or branches)	Dilated dermal vessels located in parallel to the skin surface	Mycosis fungoides,[PO] rosacea,[2] lichen planus,[2] granulomatous dermatoses,[2,10] discoid lupus erythematosus,[2] and atrophic skin[11]
Linear with branches	Branching dermal vessels	Granuloma faciale,[12] granulomatous dermatoses,[2,10] molluscum contagiosum,[2] and telangiectasia macularis eruptive perstans[13]
Linear curved	Convoluted dermal vessels	Zoon's balanitis,[14] capillaritis,[PO] common/genital warts,[15] and discoid lupus erythematosus[2]
1.2 Vessels distribution		
Uniform	–	Psoriasis,[2,7,8] lichen simplex chronicus,[PO] secondary lichenification,[PO] and plane warts[25]
Clustered	–	Dermatitis[2]
Peripheral	–	Lichen planus,[2] discoid lupus erythematosus,[2] pityriasis rosea,[2,7,8] tinea corporis,[2] PLEVA,[9] pityriasis lichenoides chronica,[9] molluscum contagiosum[2]
Reticular	–	Rosacea,[2] atrophic skin,[11] psoriasis,[PO] annular elastolytic giant cell granuloma,[10] and necrobiosis lipoidica[2,10]
Unspecific	–	PLEVA,[9] pityriasis lichenoides chronica,[2] impetigo,[PO] and common/genital warts[2]
2. Scales		
2.1 Scales color		
White	Hyperkeratosis (especially parakeratosis)	Psoriasis,[2,7,8] hypertrophic lichen planus,[2] discoid lupus erythematosus,[2] pityriasis rosea,[2,7,8] pityriasis lichenoides chronica[2,9] pityriasis alba,[2] erythema annulare centrifugum,[PO] subacute lupus erythematosus,[PO] pityriasis versicolor,[2] and tinea corposis[2]
Yellow (scales and crusts)	Serum ± hyperkeratosis	Dermatitis,[2] lupus vulgaris,[2] pemphigus vulgaris,[PO] Hailey-Hailey,[PO] and Darier's disease[9]
Brown	Keratin + melanin or exogenous pigment (e.g., dirt)	Dermatitis,[2] tinea corporis,[2] pityriasis rosea,[2] pityriasis lichenoides chronica,[7] terra firma-forme dermatosis,[16] and dermatosis neglecta[16]
2.2 Scales distribution		
Diffuse	–	Psoriasis,[2] terra firma-forme dermatosis,[16] and lichen simplex chronicus[PO]
Central	–	Hypertrophic lichen planus,[2] discoid lupus erythematosus,[2] and pityriasis lichenoides chronica[2]
Peripheral	–	Pityriasis rosea,[2,7,8] tinea corporis,[2] erythema annulare centrifugum,[PO] subacute lupus erythematosus,[PO] and pityriasis lichenoides chronica[2]
Patchy	–	Dermatitis,[2] mycosis fungoides,[PO] pityriasis alba,[2] lichen simplex chronicus,[PO] lichen amyloidosus,[2] lupus vulgaris,[2] leprosy,[2] dermatosis neglecta,[16] and leishmaniasis[2]
Perifollicular	–	Pityriasis versicolor,[2] tinea corporis,[2] seborrheic dermatitis,[2] follicular psoriasis,[2] and keratotis pilaris[2]
3. Follicular/eccrine findings		
3.1 Follicular findings		
Follicular plugs	Follicular hyperkeratosis alone (white plugs) or combined with serum (yellow plugs) or melanin (brown plugs)	Hypertrophic lichen planus,[2] discoid lupus erythematosus,[2] follicular eczema,[2] lupus miliaris disseminatus faciei,[10] pityriasis rubra pilaris,[2] leishmaniasis,[2] demodicosis,[2] sporotrichosis,[10] lichen scrofulosorum,[10] lichen actinicus,[2] and lichen sclerosus[2]
Follicular openings obliteration	Follicular pigment deposit	Discoid lupus erythematosus,[2] exogenous ochronosis,[2] and nevus of Ota[2]
Perifollicular white color	Perifollicular fibrosis or epidermal hyperplasia and perifollicular depigmentation	Discoid lupus erythematosus,[17] follicular eczema,[2] friction melanosis,[2] pityriasis versicolor,[2] morphea,[2] cutaneous lichen sclerosus,[2] lichen scrofulosorum,[10] hypopigmented leprosy, disseminated and recurrent infundibulofolliculitis,[PO] and vitiligo[2]

Table 2 Continued

Dermoscopic parameter*	Corresponding histological findings	Main dermatoses**
Perifollicular pigmentation	Perifollicular pigment sparing or increase in perifollicular pigmentation	Vitiligo,[2] rosacea,[2] discoid lupus erythematosus,[2] and melasma[2]
Broken hairs	Hairs damage	Tinea corporis,[2] prurigo nodularis,[2] lichen simplex chronicus,[2] secondary lichenification,[PO] discoid lupus erythematosus,[18] and lichen amyloidosus[2]
3.2 Eccrine findings		
Perieccrine pigmentation	Perieccrine pigment sparing or increase in perieccrine pigmentation	Idiopathic guttate hypomelanosis,[2] pityriasis alba,[2] rosacea,[2] discoid lupus erythematosus,[2] and melasma[2]
Eccrine ostia obliteration	Eccrine pigment deposit	Discoid lupus erythematosus,[2] exogenous ochronosis,[2] and nevus of Ota[2]
4. Other structures		
4.1 Color		
White	Fibrosis, reduction of melanocytes or melanin, epidermal hyperplasia (acanthosis or hypergranulosis), or calcium deposits	Lichen sclerosus,[2] morphea,[2] necrobiosis lipoidica,[2,10] vitiligo,[2,17] idiopathic guttate hypomelanosis,[2,17] achromic pityriasis versicolor,[2,17] pityriasis alba,[2,17] leprosy,[2,17] nevus depigmentosus,[2,17] progressive macular hypomelanosis,[2] seborrheic dermatitis,[2] lupus vulgaris,[2] discoid lupus erythematosus,[2,17] lichen nitidus,[2] molluscum contagiosum,[2] calcifications,[PO] and prurigo nodularis[2]
Brown	Melanin in the basal layer of the epidermis or superficial dermis	Melasma,[2,17] tinea nigra,[PO] friction melanosis,[2,17] urticaria pigmentosa,[2,17] mastocytoma,[PO] pityriasis versicolor,[2] lichen amyloidosus,[2] lichen planus,[2] discoid lupus erythematosus,[2,17] Riehl melanosis,[2] nevus of Ota,[2] and macular amyloidosis[2]
Grey	Melanin or ochronotic pigment in the papillary dermis	Lichen pigmentosus,[2,17] lichen planus,[2] melasma,[2] nevus of Ota,[2] and exogenous ochronosis[2,17]
Blue	Melanin or ochronotic pigment in reticular dermis	Ashy dermatosis[2,17] and exogenous ochronosis[2,17]
Orange	Dermal granulomas and other dense cellular infiltrations, or hemosiderin deposits in the dermis	Granulomatous dermatoses,[2,10] xanthogranuloma,[PO] Zoon's balanitis,[14] and capillaritis[2]
Yellow	Lipid deposits in the dermis and pustules	Granulomatous dermatoses,[2,10] xanthomas,[PO] and xanthogranuloma[PO]
Purple	Extravasation of erythrocytes (purpura) or thrombosed vessels	Capillaritis,[2] vasculitis,[9] PLEVA,[9] and common/plantar warts[2]
4.2 Morphology		
Structureless (diffuse – as a background – or focal)	–	Noninfectious granulomatous dermatoses,[2,10] leprosy,[2] lupus vulgaris,[2] lichen sclerosus,[2] Zoon's balanitis,[14] xanthogranuloma,[PO] xanthomas,[PO] vasculitis,[9] and pityriasis versicolor[2]
Dots/globules	–	Lichen planus,[2,17] lichen pigmentosus,[2,17] ashy dermatosis,[2,17] Riehl melanosis,[2] exogenous ochronosis,[2] molluscum contagiosum,[2] lichen amyloidosis,[2] macular amyloidosis,[2] and capillaritis[3]
Lines (parallel, reticular, perpendicular, angulated, or unspecifically arranged)	–	Tinea nigra,[PO] friction melanosis,[2] pityriasis versicolor,[2] urticaria pigmentosa,[PO] mastocytoma,[PO] prurigo nodularis,[2] nevus depigmentosus,[2] and leishmaniasis[2]
Circles	–	Lupus vulgaris[2] and exogenous ochronosis[2]
5. Specific clues***	Variable but highly specific and sensitive	Lichen planus,[2] porokeratosis,[2] leprosy,[2] scabies,[2] pediculosis,[2] lichen nitidus,[2] vitiligo,[2] etc.

PO, personal observation.

*Further details for each subitem may be specified if found to be relevant to characterize and differentiate one or more conditions due to a strict correspondence with specific histological features.

**According to available literature data for skin of color and panelists' experience.

***Features that, when present, are strongly suggestive of only one diagnosis (in general or among a limited number of differential diagnoses) as they are related to highly specific/sensitive histological findings.

Figure 1 Schematic diagrams of the newly identified follicular findings: Perifollicular scaling (a); follicular openings obliteration (b); and broken hairs (c)

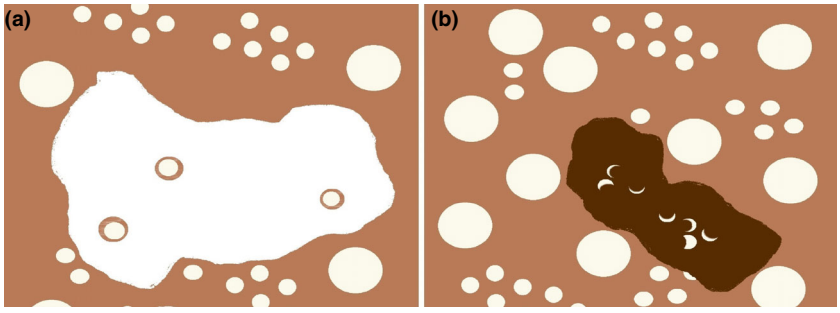

Figure 2 Schematic diagrams of the newly identified eccrine findings: Perieccrine pigmentation (a); and eccrine ostia obliteration (b)

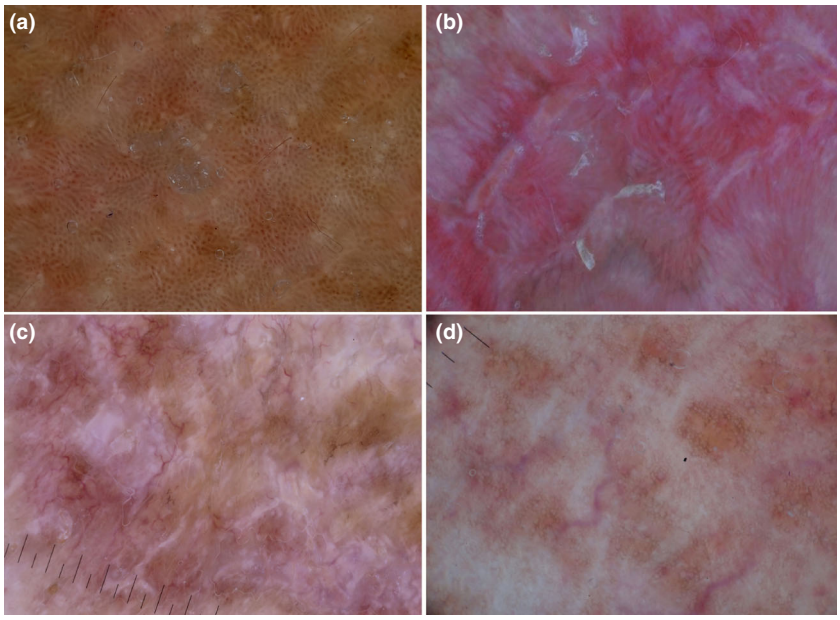

Figure 3 Vessels – Examples of the four morphologies (x10 magnification – polarized light). Dotted vessels in psoriasis (a); linear vessels in lichen planus (b); linear vessels with branches in necrobiosis lipoidica (c); and linear curved vessels in capillaritis (d)

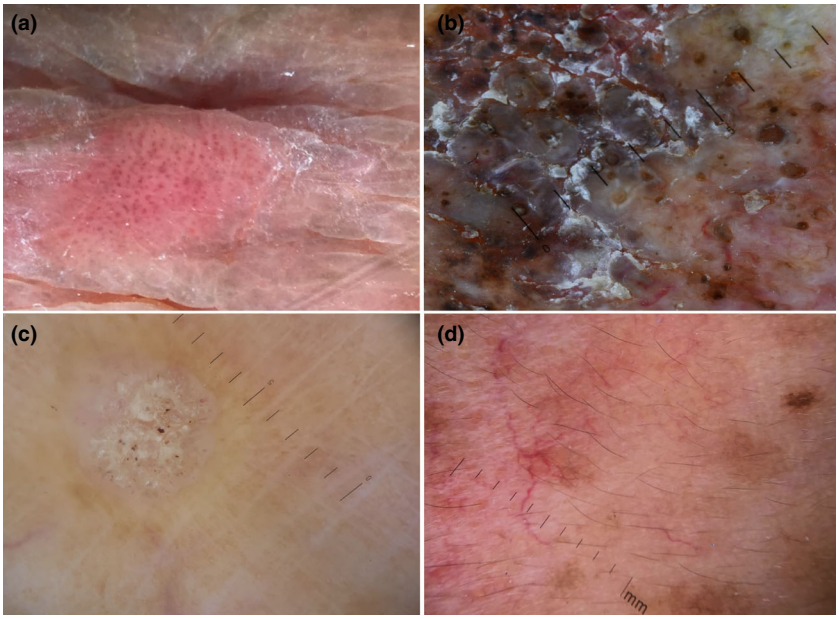

Figure 4 Vessels – Examples of distribution patterns (x10 magnification – polarized light). Uniform dotted vessels in psoriatic balanitis; peripheral linear/linear-curved vessels in discoid lupus erythematosus (b); dotted and linear vessels with unspecific distribution in a common wart (c); and reticular linear vessels in rosacea (d)

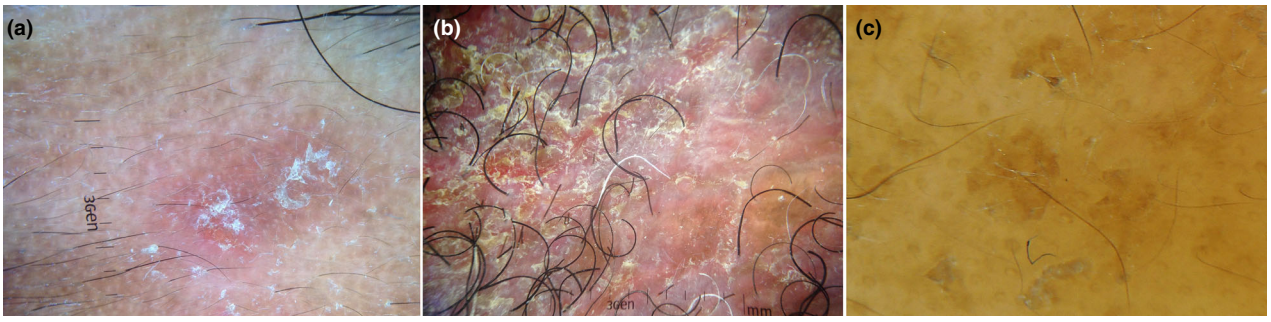

Figure 5 Scales – Possible colors (x10 magnification – polarized light). White in discoid lupus erythematosus (a); yellow in Hailey-Hailey disease (b); and brown in terra firma-forme dermatosis (c)

On the other hand, scaling, follicular findings, vascular structures, and "specific clues" turned out to be the highest rated items (>4.5). This result is related to the high prevalence of scales and follicular changes in nontumoral dermatoses affecting dark-skinned patients as epidermal and follicular reaction patterns are common in this population.[2]

Vascular structures are generally less frequently seen in skin of color,[2] but their relevance remains significant, as they may be the main dermoscopic feature of several dermatoses, including clustered dotted vessels in eczematous dermatitis, peripheral dotted vessels in lichen planus, and uniform dotted vessels in psoriasis.[2] Of note, the visualization of vascular structures in these conditions is often facilitated by the presence of epidermal changes (i.e., acanthosis and hypergranulosis) that make the skin background lighter, thus enhancing the optical contrast of vessels.[2] Finally, several "specific clues" have been reported in non-neoplastic dermatoses involving darker phototypes,[2] such as Wickham striae in lichen planus, brown/white peripheral keratotic tract with a double free edge in porokeratosis, "jet with contrail" sign in scabies, reduced appendages in leprosy, white hairs in vitiligo, and central brown/white dot/globule with peripheral pigmentation in lichen amyloidosis/macular amyloidosis.

Besides dermoscopic criteria originally proposed by the IDS, the present consensus process also identified new variables that should be part of the items evaluated when dealing with nontumoral dermatoses in skin of color, including perifollicular scaling, follicular openings obliteration, broken hairs, perieccrine pigmentation, and eccrine ostia obliteration, thereby emphasizing the

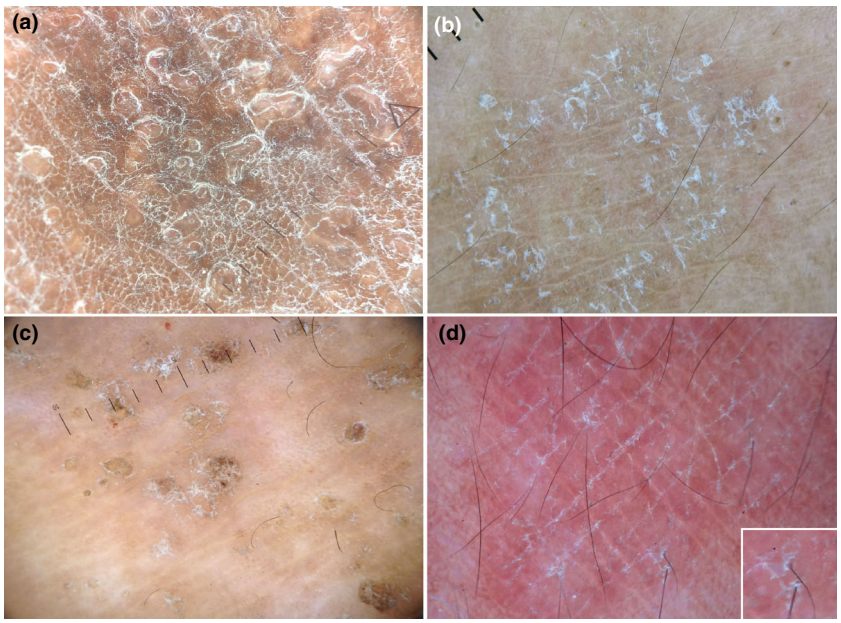

Figure 6 Scales – Examples of distribution patterns (x10 magnification – polarized light). Diffuse in psoriasis (a); peripheral in tinea corporis (b); patchy in eczematous dermatitis (c); and perifollicular in pityriasis versicolor (better seen in the inset) (d)

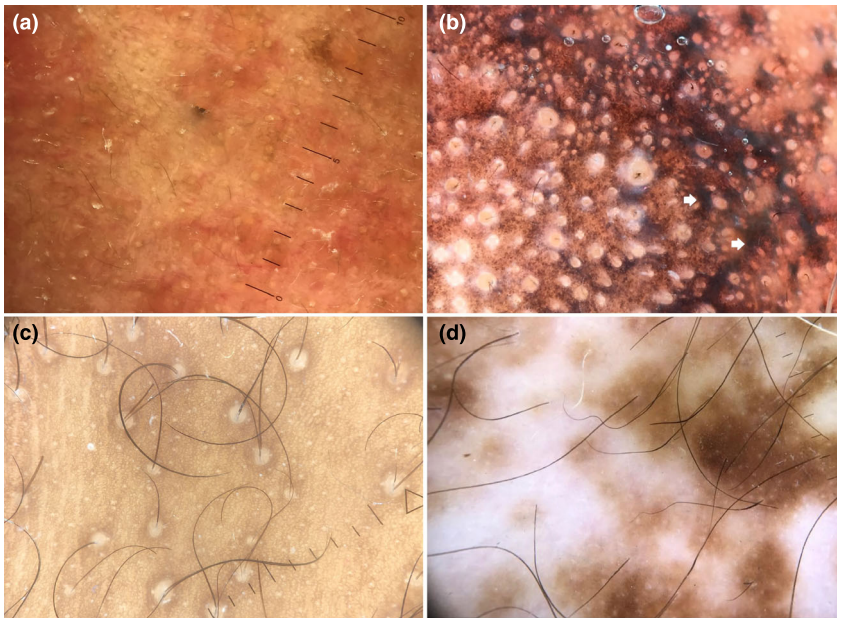

Figure 7 Follicular findings (x10 magnification – polarized light). Protruding follicular plugs in demodicosis (a); follicular openings obliteration (arrows) in discoid lupus erythematosus (b); perifollicular white color in disseminate and recurrent infundibulofolliculitis (c); perifollicular pigmentation in vitiligo (d)

importance of skin adnexal-related dermoscopic findings in dark phototypes. Indeed, perifollicular scaling is commonly encountered in pityriasis versicolor but also in tinea corporis and seborrheic dermatitis, due to the tropism of both *Malassezia* species and dermatophytes for the follicle, while broken hairs are often seen in conditions typified by a hair damage resulting from scratching or structural weakness (e.g., tinea corporis).[2] On the other hand, pigmentary obliteration of follicular openings and

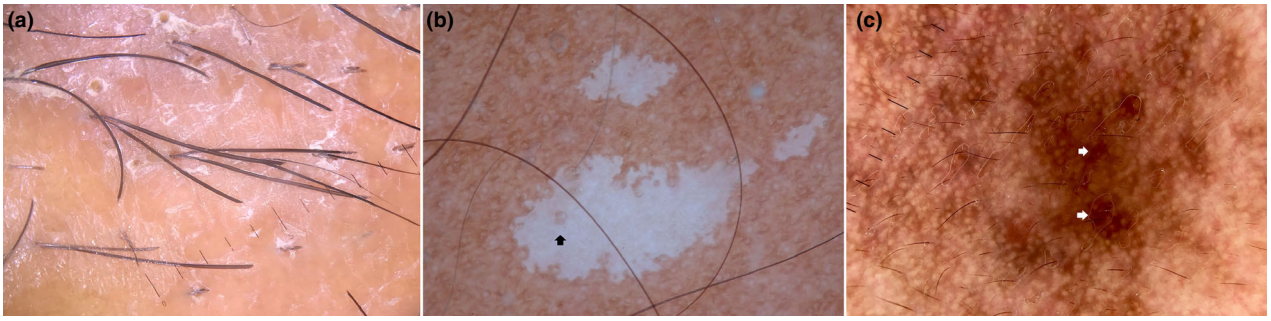

Figure 8 Follicular/eccrine findings (x10 magnification – polarized light). Broken hairs in tinea corporis (a); perieccrine pigmentation in idiopathic guttate hypomelanosis (arrow) (b); and eccrine ostia obliteration in nevus of Ota (arrows) (c)

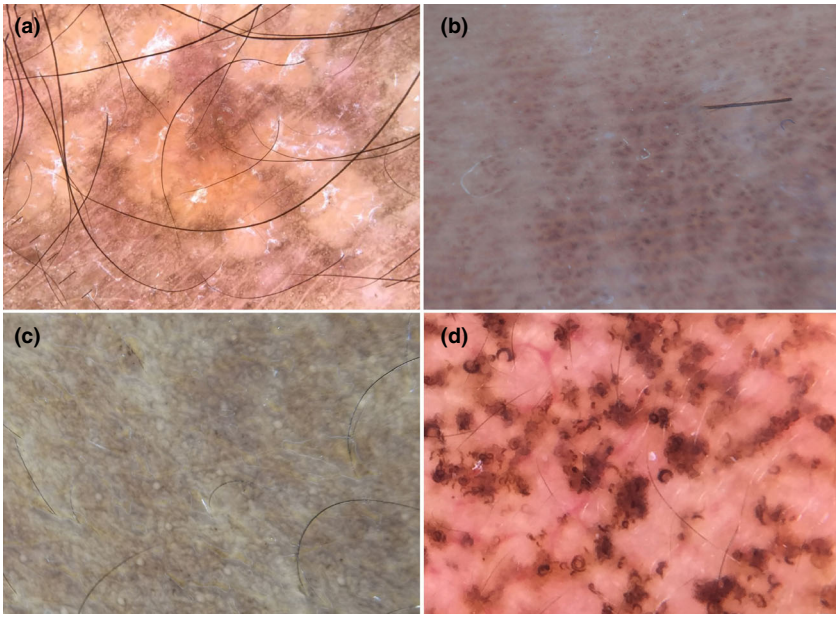

Figure 9 "Other structures" (x10 magnification – polarized light). Focal orange-yellow structureless areas in sarcoidosis (a); grey-brown dots/globules in lichen pigmentosus (b); brown lines arranged in a network-like structure in friction melanosis (c); and brown circles in exogenous ochronosis (d)

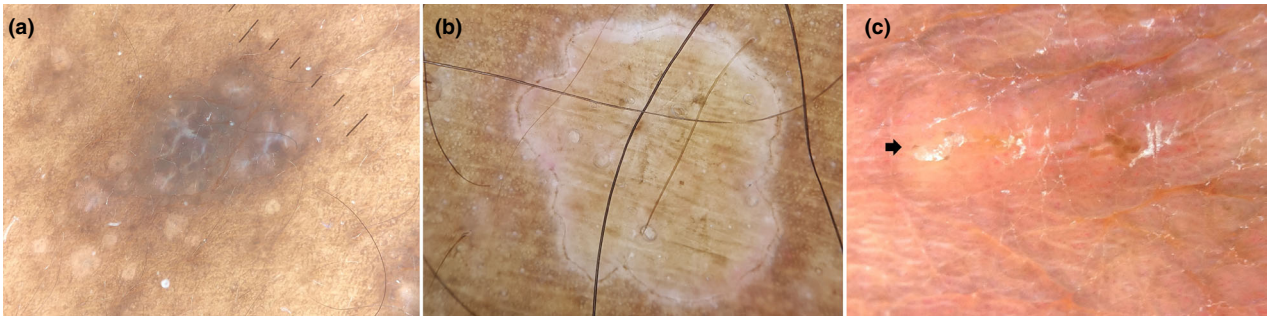

Figure 10 Three examples of specific dermoscopic clues (x10 magnification – polarized light). Bluish Wickham striae in lichen planus (a); brown keratotic rim with double free edge in porokeratosis (b); and "jet with contrail" in scabies (arrow indicates the anterior part of the mite) (c)

eccrine ostia as well as perieccrine pigmentation are findings of utmost importance when assessing pigmentary disorders in skin of color, with the first two features frequently observed in exogenous ochronosis and nevus of Ota, and the last finding being commonly found in some hypopigmented dermatoses (e.g., idiopathic guttate hypomelanosis and pityriasis alba).[2]

Conclusions

In conclusion, the present expert consensus provides a structured validation of IDS dermoscopic criteria for non-neoplastic dermatoses for the use in skin of color. Although nearly all the items originally proposed by the IDS are applicable even to darker phototypes, several additional variables need to be assessed when dealing with such patients. The use of a standardized and uniform basic approach in the field of inflammatory, infiltrative, and infectious dermatoses may facilitate the interpretation of their dermoscopic patterns and allow comparisons among different studies, thereby opening the way for a structured use of dermoscopy in general dermatology in skin of color.

References

1 Errichetti E, Zalaudek I, Kittler H, *et al*. Standardization of dermoscopic terminology and basic dermoscopic parameters to evaluate in general dermatology (non-neoplastic dermatoses): an expert consensus on behalf of the International Dermoscopy Society. *Br J Dermatol* 2020; **182**: 454–467.
2 Errichetti E, Ankad BS, Sonthalia S, *et al*. Dermoscopy in general dermatology (non-neoplastic dermatoses) of skin of colour: a comparative retrospective study by the International Dermoscopy Society. *Eur J Dermatol* 2020; **30**: 688–698.
3 Errichetti E. Dermoscopy of common papulosquamous dermatoses varies between dark (III and IV) and very dark (V and VI) skin phototypes. *Dermatol Ther* 2021; **34**(2): e14757. https://doi.org/10.1111/dth.14757.
4 Hasson F, Keeney S, McKenna H. Research guidelines for the Delphi survey technique. *J Adv Nurs* 2000; **32**: 1008–1015.
5 Lynn MR. Determination and quantification of content validity. *Nurs Res* 1986; **35**: 382–385.
6 Graefe A, Armstrong JS. Comparing face-to-face meetings, nominal groups, Delphi and prediction markets on an estimation task. *Int J Forecasting* 2016; **27**: 183–195.
7 Jindal R, Chauhan P, Sethi S. Dermoscopic characterization of guttate psoriasis, pityriasis rosea, and pityriasis lichenoides chronica in dark skin phototypes: an observational study. *Dermatol Ther* 2021; **34**: e14631.
8 Makhecha M, Singh T, Khatib Y. Dermoscopy Differentiates Guttate Psoriasis from a Mimicker-Pityriasis Rosea. *Dermatol Pract Concept* 2021; **11**: e2021138.
9 Bhat YJ, Jha AK. Dermatoscopy of inflammatory diseases in skin of color. *Indian Dermatol Online J* 2021; **12**: 45–57.
10 Chauhan P, Adya KA. Dermatoscopy of cutaneous granulomatous disorders. *Indian Dermatol Online J* 2021; **12**: 34–44.
11 Sonthalia S, Jha AK, Sharma R. The role of dermoscopy in a topical steroid-damaged face. *Dermatol Pract Concept* 2018; **8**: 166–167.
12 Jardim MML, Uchiyama J, Kakizaki P, Valente NYS. Dermoscopy of granuloma faciale: a description of a new finding. *An Bras Dermatol* 2018; **93**: 587–589.
13 Kumar S, Jakhar D, Misri R. Dermoscopy of telangiectasia macularis eruptiva perstans. *Indian Dermatol Online J* 2019; **11**: 131–132.
14 Kamat D, Vinay K. Dermatoscopy of nonvenereal genital dermatoses: a brief review. *Indian J Sex Transm Dis* 2019; **40**: 13–19.
15 Chatterjee M, Neema S. Dermatoscopy of infections and infestations. *Indian Dermatol Online J* 2021; **12**: 14–23.
16 Vinay K, Ankad BS. Dermatoscopic features of pigmentary diseases in ethnic skin. *Indian Dermatol Online J* 2021; **12**: 24–33.
17 Chatterjee M, Neema S. Dermoscopy of pigmentary disorders in brown skin. *Dermatol Clin* 2018; **36**: 473–485.
18 Ankad BS, Shah SD, Adya KA. White rosettes in discoid lupus erythematosus: a new dermoscopic observation. *Dermatol Pract Concept* 2017; **7**: 9–11.

