Dermatology Practical & Conceptual

Dermoscopy of Inflammatory Dermatoses (Inflammoscopy) in Skin of Color – A Systematic Review by the International Dermoscopy Society "Imaging in Skin of Color" Task Force

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ABSTRACT Dermoscopic patterns of inflammatory dermatoses (inflammoscopy) have been extensively studied in the recent years, though data on patients with darker phototypes (IV-VI) are sparse. The aims of this systematic review were to summarize the current state of knowledge on inflammoscopy applied to skin of color and provide a standardized nomenclature of reported findings. Besides dermoscopic features, type of setting and magnification, number of cases, and histopathological correlation were analyzed. Eighty-five papers addressing 78 different dermatoses (25 papulosquamous dermatoses, 19 hyperpigmented dermatoses, eight hypopigmented dermatoses, four granulomatous dermatoses, two sclerotic dermatoses, five facial inflammatory dermatoses, and 15 miscellaneous conditions) for a total of 2073 instances were retrieved. Only one study showed a level of evidence of III (cross-sectional study), whereas 10 and 74 displayed a level of evidence of IV (case-control studies) and V (case-series and case-reports), respectively. Moreover, our analysis also highlighted that most of papers focalized on a limited number of dermatoses, with several conditions having only single dermoscopic descriptions. Additionally, few studies compared findings among phototypes belonging to the "skin of color" spectrum. Further studies designed according to a systematic approach and considering the above-mentioned issues are therefore needed.

Introduction

Dermoscopic patterns of inflammatory dermatoses have been widely studied in recent years, thereby providing the clinician with clues facilitating the non-invasive diagnosis of several entities with a consequent reduction of number of cases requiring biopsy. However, most of structured evidence available from the literature concerns fair-skinned patients, with data on darker phototypes (Fitzpatrick's phototypes IV-VI) being sparse. This is a relevant issue as inflammatory diseases in skin of color tend to differ under dermoscopy due to the darker background color, usually making vascular findings less evident, as well as a higher prevalence of pigmentary, follicular and fibrotic structures, that may cover features considered to be peculiar in fair-skinned patients. Hence, data on lighter phototypes may not be always applicable to subjects with dark skin tones.

Although previous attempts have been done to summarize knowledge on dermoscopic patterns of inflammatory dermatoses in skin of color, no systematic review on this topic does exist [1, 2]. Therefore, the *International Dermoscopy Society* (IDS) Task Force on "Imaging in Skin of Color" promoted the present analysis in order to provide a structured overview on the current state of knowledge about dermoscopy of inflammatory diseases (inflammoscopy) in dark phototypes and align dermoscopic terminology of described findings based on a standardized methodology in order to identify possible gaps and show directions of future studies.

Materials and Methods

A comprehensive search of the literature through the PubMed electronic database using the following key words was performed from inception to 30th June 2022: "dermoscopy" OR "epiluminescence" OR "dermatoscopy" AND "skin of color" OR "dark skin" OR "black skin" OR "ethnic skin" OR "dark phototype" OR "african skin" OR "indian skin". After performing the initial search, two authors independently screened titles and abstracts for inclusion and exclusion criteria. Based on title and abstract analysis we included articles concerning dermoscopic features of inflammatory, non-infectious dermatoses. Records not related to the topic, non-English manuscripts, review articles, personal opinions/editorials and duplicates were not considered. Additionally, reports regarding inflammatory disorders of oral mucosa, nails and hair have been excluded as they were out of the aim of the present review. The remaining articles were qualified as eligible for full-text reading.

After reading the full manuscript, some papers were excluded (not relevant, not providing frequency of dermoscopic structures according to specific dermatosis/number of patients with particular dermoscopic structures). We included articles concerning Fitzpatrick's phototypes IV-VI. If the information on the skin phototype was not provided, decision on inclusion was made based on a title/abstract/full text showing that the manuscript concerned "dark skin" or "skin of color" and for single cases also based on the attached figures; additionally, we included papers concerning dermoscopy of inflammatory

diseases from African, Indian subcontinent, and Caribbean countries as majority of inhabitants of these regions have IV-VI skin phototype. Of note, papers concerning phototype IV-VI together with lighter skin phototypes were excluded unless fair-skinned patients represented less than 20% of the total. Additional relevant, eligible records identified through references search were also included.

All of the retrieved studies were classified based on standard definitions for diagnostic accuracy studies, and their level of evidence was assigned according to *The Oxford 2011 Levels of Evidence* [3]. Dermoscopic findings, corresponding histopathological features (if specified), dermoscopic setting (polarized versus nonpolarized/magnification degree), and number of cases were assessed and summarized. Importantly, for studies assessing dermoscopic changes after therapies, we considered for the analysis only features before the treatment (if available) to avoid therapies-induced variation. Finally, standardized terminology according to the IDS dermoscopic criteria for non-neoplastic dermatoses validated for skin of color was specified for each dermoscopic finding retrieved from the review [4].

Results

The initial PubMed search and the additional extensive reference search yielded 1287 and 53 publications, respectively, with a total of 163 items being included for full-text reading after title and abstract screening and excluding duplicates. Of these, 78 papers were ruled out according to exclusion criteria, with 85 articles being eventually admitted to the review procedure. Figure 1 shows the flow chart summarizing the study selection process.

Regarding the type of the study, we included 1 cross-sectional study, 10 case-control studies, 33 case series, and 41 case reports, with a level of evidence being as follows: I – 0; II – 0; III – 1; IV – 10; V – 74. Seventy-eight different dermatoses (also taking into account relevant disease variants typified by clinical/dermoscopic peculiarities) were assessed, including 25 papulosquamous dermatoses, 19 hyperpigmented dermatoses, eight hypopigmented dermatoses, four granulomatous dermatoses, two sclerotic dermatoses, five facial inflammatory dermatoses, and 15 miscellaneous conditions; a total of 2073 instances were retrieved. Table 1 displays all the disorders analyzed with the number of studies and total number of included patients for each condition.

Specific data on skin phototype was provided in 31/85 (36.5%) of records, while dermoscopic setting (polarized *vs* nonpolarized) was mentioned in 51/85 (60%) records (40/85 polarized; 4/85 non-polarized; and 7/85 both), magnification degree in 56/85 (65.9%) records (46/85 x10 magnification; 7/85 x20 magnification; 4/85 > 20x magnification), and dermoscopic-pathological correlation in 33/85 (38.8%) records. All the above-mentioned data are summarized in Supplemental Table, along with analytical description of each study evaluated in the review (number of patients, type of study, and level of evidence), dermoscopic features, and corresponding terminology according to the IDS dermoscopic criteria for non-neoplastic dermatoses validated for skin of color. Table 1 also displays the general prevalence of trichoscopic findings for each condition calculated considering all the data available from the literature. Relevant findings for each dermatosis are reported as follows; for practical purpose,

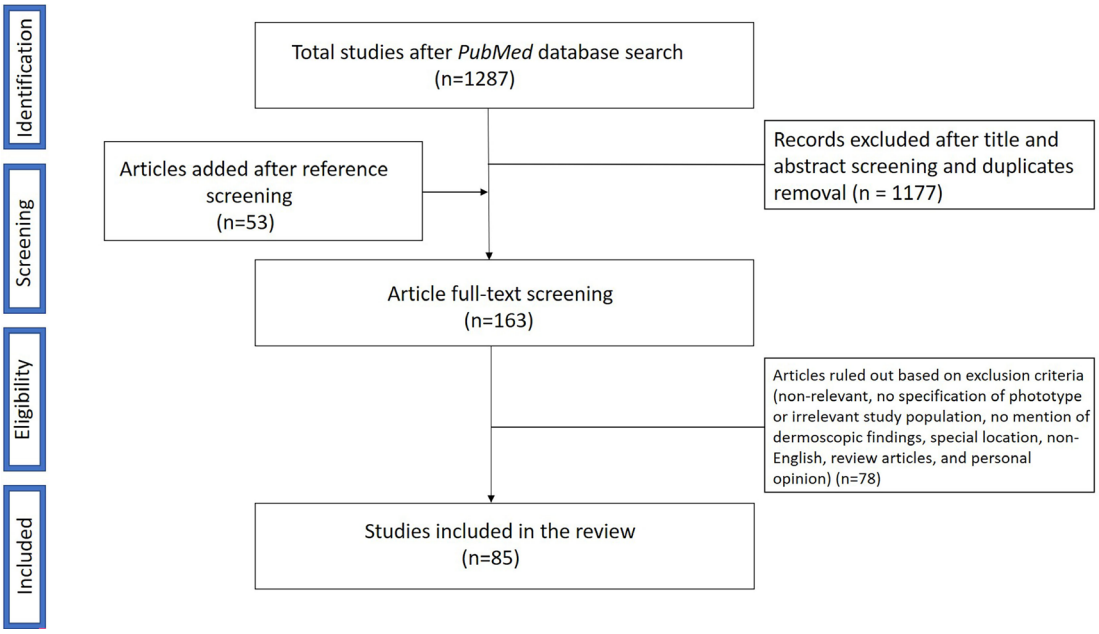

Figure 1. PRISMA flowchart displaying the selection process for study inclusion in the systematic review.

Table 1. Total number of studies, instances and prevalence of standardized dermoscopic findings of inflammatory/pigmentary dermatoses in skin of color

Dermatosis	Total number of studies	Total number of instances [instances with dermoscopy prevalence data]	Dermoscopic findings* (total prevalence)**
Papulosquamous dermatoses			
Acquired perforating dermatosis *Non-specified subtype*	1	19 [19]	*Common findings:* Central crust (100%); Peripheral pigmented structureless area (94%) Three-zone concentric pattern (92%); White structureless area (92%) *Less common findings:* Pigmented dots (42%); Peripheral pigmented reticular lines (40%); Follicular plugs (34%); Dotted vessels (23%); Peripheral linear-curved vessels (21%); Purple structureless areas (14%); Two-zone concentric pattern (8%); Pigmented reticular lines (7%); Peripheral dotted vessels (7%); Peripheral lines (4%); Linear vessels with branches (1%)
Kyrle disease	2	2 [2]	*Common findings:* Central white/brown crust (50%); Structureless whitish-grey area around the crust (50%); Peripheral brown structureless area (50%); Central white globules (50%); Peripheral grey structureless areas and reticular brown lines (50%) *Less common findings:* -
Acrokeratosis verruciformis of Hopf	1	1 [0]	*Common findings:* - *Less common findings:* -
Darier's disease	1	1 [1]	*Common findings:* Dark brown polygonal to round structures surrounded by peripheral grey- white halo (100%); White scales (100%) *Less common findings:* -
Dermatitis (eczema) *Non-specified subtype*	2	39 [39]	*Common findings:* - *Less common findings:* Dotted vessels (46%); Patchy white scales (39%); Patchy yellow scales/crusts (36%); Patchy scales distribution (36%); Purple dots (36%); Brown dots (33%); Patchy brown scales/crusts (31%); Fabric fibers (31%); Brown focal structureless areas (28%); Yellow scales (26%); Erosions (26%); Diffuse brown structureless areas (23%); White focal structureless areas (23%); Purple focal structureless areas (18%); Unspecific vessel distribution (18%); Clustered dotted vessels (15%); White-yellow scales (8%); Perifollicular white scales (8%); White scales (5%); White diffuse structureless areas (5%); Grey focal structureless areas (5%); Unspecific vessel distribution (5%); Diffuse white scales (3%); Central white scales (3%); Peripheral scales distribution (3%)
Follicular eczema	1	11 [11]	*Common findings:* Follicular plugs with perifollicular white color (100%) *Less common findings:* -
Keratosis pilaris	1	1 [1]	*Common findings:* Twisted hairs forming loops and irregular coils (100%); Perifollicular scales (100%); Scattered pigmented globules (100%) *Less common findings:* -
Lichen amyloidosis	3	48 [48]	*Common findings;* Brown, grey-brown, grey, blue-grey dots (63%); Two-zone pattern (52%)

Dermatosis	Total number of studies	Total number of instances [instances with dermoscopy prevalence data]	Dermoscopic findings* (total prevalence)**
			Less common findings: Brown dots (29%); Central brown/white dot/globule with peripheral pigmentation (23%); White scales (23%); White structureless areas (17%); Dotted vessels (15%); Blue-grey globules (11%); Central brown/white globule with peripheral pigmentation (10%); Scattered brown dots (8%); Perieccrine brown dots (6%); Scales distribution: central (6%); Scales distribution: peripheral (6%); Brown structureless areas (6%); Clustered brown dots (6%); Central globule (6%); Follicular plugs (2%); White globules (2%); Brown globules (2%); Clustered and scattered brown dots (2%)
Lichen nitidus	3	22 [22]	*Common findings:* White globules with sharp margins and lack of skin creases (59%)
			Less common findings: Lack of dermatoglyphics (36%); Ill-defined white structureless areas (36%); Radial ridges (32%); Central depression (27%); Linear vessels (23%); Peripheral scales (14%); White globules (5%); Central brown structureless area (5%)
Lichen planus (LP)			
Classic LP	13	293[293]	*Common findings:* Wickham striae (60%) *Less common findings:* Follicular plugs (39%); Blue globules (37%); White structureless areas (29%); Diffuse grey-blue structureless area (11%); Yellow structureless areas (11%); Peripheral lines (10%); Dotted vessels (8%); Diffuse brown structureless areas (8%); Brown dots (8%); Peripheral white lines (8%); Brown globules (8%); Scales (7%); Grey-blue dots (6%); White scales (6%); Patchy scales distribution (6%); Vessels (5%); Brown and grey structureless areas (5%); Blue-grey globules (4%); Peripheral dotted vessels (3%); Grey dots (3%); Peripheral vessels distribution (3%); Grey-blue structureless areas (3%); Yellow- brown dots (2%); Grey dots and structureless areas (2%); Brown dots and structureless areas (2%); Focal brown structureless areas (2%); Patchy white scales (2%); Peripheral linear vessels (2%); Central white scales (2%); Focal purple structureless areas (1%); Purple dots (1%); Diffuse yellow structureless area (1%); Linear vessels (1%); Unspecific vessels distribution (1%); Grey and brown areas (1%); Brown structureless areas (1%); Brown reticular lines (1%); Crusts (1%); Diffuse scales distribution (1%); Peripheral scales distribution (1%); Yellow dots (0.3%); Linear and dotted vessels (0.3%); Peripheral dotted and linear vessels (0.3%); Peripheral pigmented dots (0.3%); White globules (0.3%); Follicular openings obliteration (0.3%); Diffuse white scales (0.3%); Perifollicular white scales (0.3%)
Hypertrophic LP	5	36 [36]	*Common findings:* Follicular plugs (64%) *Less common findings:* Dotted vessels (central and peripheral) (36%); Wickham striae (31%); White structureless areas (28%); Yellow reticular lines (25%); Central white scales (19%); Focal brown structureless areas (19%); Patchy white scales (17%); Grey-blue globules (17%); Brown globules (8%); Peripheral dotted vessels (8%); Dotted vessels (8%); Diffuse brown structureless areas (8%); Dotted vessels of unspecific distribution (3%); Diffuse white scales (3%); Focal white structureless areas (3%); Grey-blue dots (3%); Brown dots (3%)

Table1 continues

Table 1. Total number of studies, instances and prevalence of standardized dermoscopic findings of inflammatory/pigmentary dermatoses in skin of color. *(continued)*

Dermatosis	Total number of studies	Total number of instances [instances with dermoscopy prevalence data]	Dermoscopic findings* (total prevalence)**
Palmo-plantar LP	1	1 [1]	*Common findings:* Brown lines along the ridges of dermatoglyphics (100%) *Less common findings:* -
Lichen simplex chronicus	1	1 [1]	*Common findings:* Dotted vessels (100%); White structureless areas (100%); Grey-blue structureless areas (100%) *Less common findings:* -
Pityriasis lichenoides			
PLEVA	1	14 [14]	*Common findings:* Central crust with peripheral white structureless area (86%); Blue-grey structureless areas (71%); Yellow globules or structureless areas (71%); Dotted vessels (71%); Scales (57%); *Less common findings:* Purple structureless areas (29%); Brown structureless areas (14%); White structureless areas (14%)
Pityriasis lichenoides chronica	1	15 [15]	*Common findings:* Peripheral white scales (smooth inner free edge) (80%) *Less common findings:* Brown dots (40%); Focal brown structureless areas (27%); Diffuse brown structureless areas (27%); Central (mica-like) white scales (20%); Dotted vessels of unspecific distribution (20%); Purple dots (13%); Diffuse structureless areas (7%); Focal purple structureless areas (7%)
Pityriasis rosea	5	86 [86]	*Common findings:* - *Less common findings:* White scale (30%); Scales (28%); Brown dots (26%); Peripheral white scales (jagged inner free edge) (23%); Peripheral scales (21%); Diffuse brown structureless areas (19%); Patchy scales (15%); Brown scales (10%); Central scales (8%); Unspecifically distributed dotted vessels (7%); Peripheral brown scales/crusts (7%); Focal brown structureless areas (6%); Uniform dotted vessels (6%); Focal grey structureless areas (5%); Perifollicular white scales (5%); Peripheral white scales (jagged mixed free edge) (2%); Diffuse scales (2%); Peripheral dotted vessels (1%); Diffuse brown scales/crusts (1%); Diffuse white structureless areas (1%); Diffuse yellow structureless area (1%)
Pityriasis rubra pilaris	1	4 [4]	*Common findings:* Follicular plugs (100%); Perifollicular yellow halo (75%) *Less common findings:* -
Porokeratosis			
Non-specified subtype	1	10 [10]	*Common findings:* Brown/white peripheral keratotic tract with a double free edge (100%) *Less common findings:* Focal white structureless areas (30%); Diffuse brown structureless areas (30%); Focal brown structureless areas (20%); Brown dots (20%); Central white scales (20%); Patchy white scales (20%); Uniform dotted vessels (10%); Clustered dotted vessels (10%); Follicular plugs (10%)
Superficial pigmented disseminated	1	3 [0]	*Common findings:* - *Less common findings:* -
Superficial disseminated	1	1 [1]	*Common findings:* Peripheral brown dots and peripheral white keratotic tract with double free edge (100%); Central dotted vessels and brown structureless areas (100%) *Less common findings:* -

Dermatosis	Total number of studies	Total number of instances [instances with dermoscopy prevalence data]	Dermoscopic findings* (total prevalence)**
Porokeratosis of Mibelli	1	1 [1]	*Common findings:* Brown dots/globules/lines (100%); Brown/white peripheral keratotic tract with a double free edge (100%) *Less common findings:* -
Prurigo nodularis	3	60 [60]	*Common findings:* Dotted vessels (62%) *Less common findings:* Peripheral lines (42%); White structureless areas (40%); Peripheral- radiating white lines (28%); Diffuse white structureless areas (23%); Crusts (20%); Scales (17%); Central white structureless areas with peripheral-radiating white lines (17%); Follicular plugs (13%); Brown globules (12%); Purple globules (12%); White globules (10%); Central white scales (8%); Patchy white scales (8%); Purple dots (8%); Dotted vessels (peripheral and central) (8%); Dotted vessels of unspecific distribution (5%); Focal purple structureless areas (5%); Peripheral linear vessels (3%); Peripheral white scales (3%); Yellow structureless areas (3%); Focal white structureless areas (3%); Diffuse brown structureless areas (3%); Focal brown structureless areas (2%); Uniform dotted vessels (2%); Brown dots (2%); Fabric fibers (2%)
Psoriasis			
Non-specified subtype	3	89 [89]	*Common findings:* - *Less common findings:* Dotted vessels (48%); Scales (39%); Red globules (30%); Diffuse white scales (29%); Uniform dotted vessels (26%); Focal brown structureless areas (18%); Uniform vessels distribution (17%); Scales (patchy distribution) (13%); White scales (12%); Focal white structureless areas (12%); Brown dots (12%); Diffuse brown structureless areas (12%); Diffuse grey-blue structureless area (11%); Linear-curved vessels (6%); White- yellow scales (5%); Perifollicular white scales (5%); Purple dots (5%); Peripheral vessels distribution (3%); Grey-blue dots (3%); Focal purple structureless areas (3%); Clustered dotted vessels (2%); Peripheral white scales (2%); Patchy white scales (2%); Focal grey structureless areas (2%); Fabric fibers (2%); Central white scales (2%)
Follicular Psoriasis	1	1 [1]	*Common findings:* Diffuse white-brown structureless area (100); Perifollicular scaling (100); Dotted vessels (100); Linear-curved vessels (100) *Less common findings:* -
Guttate psoriasis	2	85 [85]	*Common findings:* White scales (80%); Dotted vessels (69%) *Less common findings:* Diffuse scales distribution (44%); Patchy scales distribution (39%); Uniform vessels distribution (31%); Brown-grey structureless areas (19%); Brown dots/structureless areas (16%); Unspecific vessels distribution (15%); Grey dots/structureless areas (13%); Perifollicular white color (7%); Perifollicular pigmentation (5%); Follicular plugs (4%); Peripheral scales distribution (2%)
Hyperpigmented dermatoses			
Acanthosis nigricans (facial)	2	41 [40]	*Common findings:* Crista cutis (100%); Sulcus cutis (100%); Brown dots (100%) *Less common findings:* -

Table1 continues

Table 1. Total number of studies, instances and prevalence of standardized dermoscopic findings of inflammatory/pigmentary dermatoses in skin of color. *(continued)*

Dermatosis	Total number of studies	Total number of instances [instances with dermoscopy prevalence data]	Dermoscopic findings* (total prevalence)**
Acquired dermal macular hyperpigmentation	1	51 [51]	*Common findings:* Brown and blue-grey color: dots (82%), globules (67%), structureless areas (57%) *Less common findings:* Vessels (82%); Color arrangement: lines (41%), structureless (33%), reticular lines (33%)
Ashy dermatosis			
Facial	1	11 [11]	*Common findings:* Periostial blue dots (90%); Periostial grey dots (73%) *Less common findings:* Blue structureless areas (27%); Blue globules (27%); Brown dots (18%); Grey globules (9%)
Extra-facial	1	13 [13]	*Common findings:* Grey dots (92%); Blue dots (77%) *Less common findings:* Blue globules (31%); Grey globules (15%); White structureless areas (8%); Brown structureless areas (8%); Grey structureless areas (8%); Blue structureless areas (8%); Brown dots (8%)
Not specified	1	4 [4]	*Common findings:* Dotted vessels (75%), uniform (50%); Brown dots (50%) *Less common findings:* Grey-blue dots (25%); Structureless pigmented areas (25%)
Dermatosis neglecta	1	1 [1]	*Common findings:* Polygonal plate-like brown scales arranged in a mosaic-like pattern (100%); Smaller cornflakes-like scales (peripherally) (100%); Background erythema (100%) *Less common findings:* -
Exogenous ochronosis	5	22 [22]	*Common findings:* - *Less common findings:* Grey semicircles/circles (interostial) (41%); Focal white structureless areas (32%); Focal brown (ostial sparing) structureless areas (32%); Focal brown (ostial obliteration) structureless areas (32%); Interostial brown globules (32%); Interostial grey globules (27%); Focal grey (ostial obliteration) structureless areas (18%); Brown semicircles (interostial) (18%); Blue-grey structureless areas with focal ostial obliteration (18%); Brown structureless areas (14%); White dots (9%); Interostial grey dots (5%); Greyish structureless areas (5%); Semicircles (5%); Blue-brown dots/globules (5%); Scales (5%); Brown-grey dots/globules + semicircles/circles (interfollicular and perifollicular) (5%)
Facial pigmentary demarcation lines	1	20 [20]	*Common findings:* Pigmented structureless areas (90%); Vessels (65%); Pigmented dots (60%) *Less common findings:* -
Frictional melanosis	2	11 [11]	*Common findings:* Perifollicular white color (73%) *Less common findings:* Focal white structureless areas (45%); Reticular (network) brown lines (45%); Focal brown structureless areas (27%); White globules (27%); Brown dots and globules (18%); Hyperpigmented globules (10%)
Gougerot-Carteaud syndrome	1	3 [3]	*Common findings:* Polygonal brown areas (cobblestone pattern) (67%) *Less common findings:* Sulci and gyri (33%)

Dermatosis	Total number of studies	Total number of instances [instances with dermoscopy prevalence data]	Dermoscopic findings* (total prevalence)**
Lichen planus pigmentosus Facial	3	104 [104]	*Common findings:* Dots/globules (54%) *Less common findings:* Brown pigmentation with ostial sparing (pseudonetwork) (23%) Loss of vellus hair (23%); Vessels (17%); Dots (16%); Dots/globules + brown pigmentation with ostial sparing (pseudonetwork) (16%); Globules (13%); Periostial brown dots (12%); Blue-grey dots (12%); Perifollicular pigmentation (9%); Periostial brown-grey dots (7%); Periostial grey dots (7%); Focal brown (ostial sparing) structureless areas (4%); Follicular/eccrine ostia obliteration (2%); Diffuse brown structureless area (1%)
Extra-facial	2	15 [15]	*Common findings:* Diffuse brown structureless areas (93%); Brown dots (87%) *Less common findings:* Grey dots (40%); Brown globules (40%); Grey globules (20%)
Not specified	1	7 [7]	*Common findings:* White globules (57%) *Less common findings:* Brown dots (43%); Brown structureless areas (29%); Blue-black structureless areas (29%); Grey-blue structureless areas (14%)
Macular amyloidosis	3	65 [65]	*Common findings:* Brown dots (57%) *Less common findings:* Clustered brown dots (38%); Central brown/white globule with peripheral pigmentation (35%); Scattered brown dots (32%); Pigmented (brown, grey-brown, grey, or blue-grey) dots and globules (28%); Blue-grey globules (20%); Clustered and scattered brown dots (15%); Perieccrine brown dots (11%); Focal white structureless areas (11%); Central globule (10%); Linear dots (8%); Brown globules (6%); Brown structureless areas (3%); Grey dots (2%)
Maturational hyperpigmentation	1	1 [1]	*Common findings:* Brown structureless area with ostial sparing (100%); Brown globules (100%); Brown structureless areas (100%); Perifollicular pigmentation (100%) *Less common findings:* -
Melasma	7	150 [150]	*Common findings:* Ostial sparing (65%) *Less common findings:* Brown reticular lines (focal) (42%); Brown reticular lines (diffuse) (25%); Diffuse/focal brown structureless areas (with ostial sparing) (13%); Focal brown structureless areas (12%); Brown dots (9%); Interostial brown dots (5%); Diffuse brown structureless areas with ostial sparing (4%); Vessels (3%); Brown structureless areas (3%) Perifollicular/perieccrine pigmentation (3%); Focal grey (with ostial obliteration) structureless areas (1%); White dots (1%); Blue-grey structureless areas (1%); Brown dots/ globules (1%)
Photomelanosis	1	1 [1]	*Common findings:* Hyperpigmented dots and globules (100%) *Less common findings:* -
Riehl melanosis	1	17 [17]	*Common findings:* Intraostial brown dots (100%) *Less common findings:* Interostial grey dots (35%); Periostial grey dots (29%); Periostial brown dots (12%); Diffuse brown structureless areas (6%); Blue dots (6%)

Table1 continues

Table 1. Total number of studies, instances and prevalence of standardized dermoscopic findings of inflammatory/pigmentary dermatoses in skin of color. *(continued)*

Dermatosis	Total number of studies	Total number of instances [instances with dermoscopy prevalence data]	Dermoscopic findings* (total prevalence)**
Seborrheic melanosis	1	12 [12]	*Common findings:* White-yellow gelatinous protruding follicular plugs (100%); Diffuse brown area with ostial sparing (80%); Yellow scales (50%) *Less common findings:* Linear vessels (30%)
Hypopigmented dermatoses			
Idiopathic guttate hypomelanosis	2	42 [42]	*Common findings:* White structureless areas with peripheral projections (91%) *Less common findings:* Perifollicular/perieccrine pigmentation (26%); Peripheral white projections (24%); Well-defined diffuse bright white structureless areas (21%); Reticular (intralesional) brown lines (10%); Ill-defined diffuse bright white structureless areas (7%); White structureless areas with ill-defined margins (2%)
Pityriasis alba	1	12 [12]	*Common findings:* Diffuse dull white structureless areas with blurred margins (100%) *Less common findings:* Incomplete perieccrine brown pigmentation (42%); Brown dots (42%); White scales (42%): patchy (25%), in skin furrows (17%); Incomplete perifollicular brown pigmentation (8%)
Progressive macular hypomelanosis	1	2 [2]	*Common findings:* (Smooth, ill-defined) diffuse white structureless area (100%) *Less common findings:* -
Vitiligo *Unstable*	3	75 [75]	*Common findings:* Perifollicular pigmentation (53%) *Less common findings:* Perifollicular white color (10%); Brown reticular lines (10%); Marginal brown areas (5%); Peripheral white lines (4%); Linear white structureless area (4%); Perilesional multiple white globules (4%)
Stable	3	37 [37]	*Common findings:* - *Less common findings:* Perifollicular pigmentation (43%); Marginal brown areas (43%); Perifollicular white color (41%); Brown reticular lines (35%); White hair (32%); White structureless areas (3%)
Repigmenting	1	18 [18]	*Common findings:* Perifollicular pigmentation (66%); Perilesional brown structureless area (66%); Vessels (66%) *Less common findings:* Perifollicular white color (22%)
Not specified	3	119 [119]	*Common findings:* Brown reticular lines (51%) *Less common findings:* Perifollicular pigmentation (47%); Marginal brown areas (20%); Diffuse bright white areas with sharp margins (13%); Peripheral white lines (10%); White hairs (7%); Reticular brown lines (intralesional) (3%); Perifollicular/ perieccrine pigmentation (3%); Perifollicular white color (2%); Diffuse bright white areas with blurred margins (2%); Linear white structureless area (2%); Brown dots (1%); Reticular white lines/areas (1%)
Blue vitiligo	1	1 [1]	Scattered blue dots on the side of the white area (100%); Pigmented hairs with perifollicular pigment (100%)

Dermatosis	Total number of studies	Total number of instances [instances with dermoscopy prevalence data]	Dermoscopic findings* (total prevalence)**
Granulomatous dermatoses			
Granuloma annulare	1	4 [4]	*Common findings:* Diffuse white-yellow structureless area (50%); White structureless areas (50%) *Less common findings:* Diffuse white structureless area (25%); Brown reticular lines (25%)
Necrobiosis lipoidica	1	2 [2]	*Common findings:* Diffuse white-yellow structureless area (100%); Linear vessels with branches (100%); Linear vessels (100%); Brown reticular lines (100%) *Less common findings:* -
Sarcoidosis	5	32 [32]	*Common findings:* - *Less common findings:* Orange structureless areas (38%); Linear vessels (31%); Diffuse orange structureless area (28%); White scales (28%); Bright white structureless areas (22%); Linear vessels with branches (19%); White globules (16%); Orange globule (13%); Linear vessels with branches of unspecific distribution (13%); Focal orange structureless areas (9%) Focal bright white structureless areas (6%); Yellow globules (6%); Brown reticular lines (3%); Focal brown structureless areas (3%); Uniform linear vessels with branches (3%); Patchy white scales (3%); Peripheral-radiating white lines (3%); Linear vessels and linear vessels with branches (3%); Yellow-orange globules (3%); White structureless areas (3%); Orange-yellow structureless areas (3%); Pale orange globules (3%); Bright white lines (3%); Dotted vessels (3%)
Rheumatoid nodules	1	5 [5]	*Common findings:* - *Less common findings:* White structureless areas (20%); Linear vessels with branches (20%); Linear vessels (20%); Brown reticular lines (20%)
Sclerotic dermatoses			
Cutaneous lichen sclerosus	1	11 [11]	*Common findings:* Focal/diffuse bright white structureless areas (100%); Follicular plugs (82%) *Less common findings:* Perifollicular white color (bright) (27%); Brown dots (27%); Patchy white scales (18%); Perpendicular white lines (18%); Patchy brown scales/crusts (9%); Peripheral linear vessels with branches (9%)
Morphea	3	16 [16]	*Common findings:* Focal dull white structureless areas (62%) *Less common findings:* Perifollicular white color (dull) (31%); Brown dots (25%); Focal and diffuse bright white structureless areas (19%); Patchy brown scales (13%); Peripheral linear vessels with branches (8%); Perpendicular white lines (6%); Parallel white lines (6%); Unspecifically arranged white lines (6%); Focal white structureless areas (6%); Linear vessels with branches (6%); Yellow-white globules (6%)
Facial inflammatory dermatoses			
Discoid lupus erythematosus	5	146 [146]	*Common findings:* Follicular plugs (81%) *Less common findings:* Perifollicular white color (44%); White scales (37%); Structureless white areas (36%); Brown dots (31%); Blue-grey dots (10%); Unspecifically distributed vessels (6%); Diffuse brown structureless area (5%); Dotted vessels (5%); Focal brown structureless areas with ostial obliteration (5%);

Table1 continues

Table 1. Total number of studies, instances and prevalence of standardized dermoscopic findings of inflammatory/pigmentary dermatoses in skin of color. *(continued)*

Dermatosis	Total number of studies	Total number of instances [instances with dermoscopy prevalence data]	Dermoscopic findings* (total prevalence)**
			Periostial brown pigmentation (3%); Focal bright white structureless areas (3%); Patchy scale distribution (3%); Central white scale (3%); Clustered dotted vessels (2%); Patchy white scales (2%); Linear vessels of unspecific distribution (1%); Brown structureless areas with ostial sparing (1%); Periostial brown dots (1%); White lines (1%); Peripheral-radiating brown lines (1%); Interostial brown dots (1%); Linear vessels with branches of unspecific distribution (1%); Peripheral white scales (1%); White-yellow scales (1%); Peripheral brown structureless areas (1%); Blue-grey globules (1%); Central brown structureless areas (1%); Peripheral white lines (1%); Peripheral-radial red lines with white halo ("red starburst" pattern) (1%)
Lichen actinicus	2	12 [12]	*Common findings:* Focal/diffuse brown structureless areas with ostial sparing (67%); Wickham striae (67%) *Less common findings:* Periostial brown dots (33%); Follicular plugs (25%); Interostial brown dots (17%); Greyish-blue (17%) and brown structureless areas (17%); Peripheral white scale (8%); Interostial brown globules (8%); White globules (8%)
Perioral dermatitis	1	1 [1]	*Common findings:* Brown reticular lines (100%) *Less common findings:* -
Rosacea	2	12 [12]	*Common findings:* Perifollicular/perieccrine pigmentation (67%)*;* Linear vessels in a reticular arrangement (67%) *Less common findings:* Periostial brown globules (17%)
Seborrheic dermatitis	1	10 [10]	*Common findings:* Focal dull white structureless areas (70%); Patchy white scales (70%); Patchy yellow scales/crusts (60%) *Less common findings:* Patchy brown scales/crusts (40%); Protruding follicular plugs (30%); Dotted clustered vessels (10%); Linear clustered vessels (10%)
Miscellaneous			
Capillaritis	1	13 [13]	*Common findings:* Brown reticular lines (100%); Purple globules (67%) *Less common findings:* Purple structureless areas (27%)
Cutaneous lupus erythematosus (CLE) *Acute CLE Malar rash*	1	9 [9]	*Common findings:* White structureless areas (78%); Follicular plugs (67%) *Less common findings:* Brown dots and globules (45%); Scales (45%); Linear vessels (45%); Linear vessels with branches (45%); Crusts (22%); Bright white structureless areas (22%); Brown structureless areas (11%)
Generalized rash	2	21 [21]	*Common findings:* White structureless areas (76%); Brown dots and globules (62%) *Less common findings:* Follicular plugs (43%); Scales (43%); Brown structureless areas (33%); Linear vessels (33%); Linear vessels with branches (19%); Dotted vessels (19%); Blue-gray dots (14%); Linear-curved vessels (14%); Crusts (14%); Bright white structureless areas (14%); Two-zone targetoid pattern (10%); Three zone targetoid pattern (10%); Brown dots (5%)

Dermatosis	Total number of studies	Total number of instances [instances with dermoscopy prevalence data]	Dermoscopic findings* (total prevalence)**
Subacute CLE	2	2 [2]	*Common findings:* White structureless area (100%); Brown to blue-gray dots (100%); Follicular plugs (50%); Linear, linear-curved (comma), and dotted vessels (50%); Scales (50%); Patchy to diffuse white scales (50%); Bright white structures (structureless area, globules, and lines) (50%); Mixed vascular pattern comprised of linear, linear-curved and dotted vessels (50%) *Less common findings:* -
Cutaneous mastocytosis Mastocytoma	1	1 [1]	*Common findings:* Central white structureless area (100%); Diffuse yellow structureless area (100%); Peripheral brown reticular lines (100%) *Less common findings:* -
Telangiectasia macularis eruptiva perstans	1	1 [1]	*Common findings:* Linear vessels with branches arranged in a reticular pattern (100%); White dots (100%); Diffuse brown structureless area (100%) *Less common findings:* -
Urticaria pigmentosa	2	3 [3]	*Common findings:* Dark brown reticular lines (67%); Light brown reticular lines (67%) *Less common findings:* Brown reticular lines (33%)
Dermatomyositis	1	2 [2]	*Common findings:* Brown reticular lines (100%); Grey dots/ globules (100%); Linear vessels (unfocused) (100%); White-pink structureless areas (100%); Brown/grey dots/ globules (100%); Linear vessels (100%) *Less common findings:* -
Fixed drug eruption	1	1 [1]	*Common findings:* Brown, grey and blue dots (100%); Perifollicular white color (100%) *Less common findings:* -
Fox-Fordyce disease	1	1 [1]	*Common findings:* Loss of dermatoglyphics (100%); Follicular plugs (100%); Perifollicular pigmentation (100%) *Less common findings:* -
Hailey-Hailey disease	1	1 [1]	*Common findings:* White areas + pink furrows (100%); White structureless areas (100%); Dotted vessels (100%); Brown/grey structureless areas (100%) *Less common findings:* -
Juvenile xanthogranuloma	1	25 [25]	*Common findings:* Yellow-white or yellow-brown structureless areas (92%); Yellow orange background with surrounding erythema (56%); Scales (52%); Linear vessels (52%) *Less common findings:* White structureless areas/lines (44%); Purple structureless areas (36%); Linear-curved vessels (20%); Perilesional structureless brown area (16%); Perifollicular pigmentation (12%); Brown reticular lines (12%)

Table1 continues

Table 1. Total number of studies, instances and prevalence of standardized dermoscopic findings of inflammatory/pigmentary dermatoses in skin of color. *(continued)*

Dermatosis	Total number of studies	Total number of instances [instances with dermoscopy prevalence data]	Dermoscopic findings* (total prevalence)**
Langerhans cell histiocytosis	3	5 [5]	*Common findings:* Brown structureless area (60%) *Less common findings:* White structureless area (40%); Central brown dots (20%); Crust (20%); Perifollicular white homogenous area (20%); Purple structureless areas (20%); Brown dots (20%); Irregular vascular blotches (20%); Pale pinkish background (20%)
Perniosis (idiopathic)	1	36 [36]	*Common findings:* Orange structureless areas (64%) *Less common findings:* Linear-curved vessels (44%); White dots/globules (39%); Diffuse orange structureless area (28%); Brown dots/globules (22%); Diffuse brown-orange structureless area (19%); White lines (11%); Dotted vessels (11%); Diffuse purple structureless area (8%); Purple dots/globules (6%)
Sweat dermatitis	1	2 [2]	*Common findings:* Yellow-white structureless areas (50%); Increased cutaneous markings along (clue) + brown structureless areas + brown scales (50%) *Less common findings:* -

*Dermoscopic findings for which a standardized terminology was available; these are divided into common (prevalence ≥ 50%) and less common (prevalence < 50%)

**Total prevalence is calculated only considering studies for which prevalence data of dermoscopic findings was available

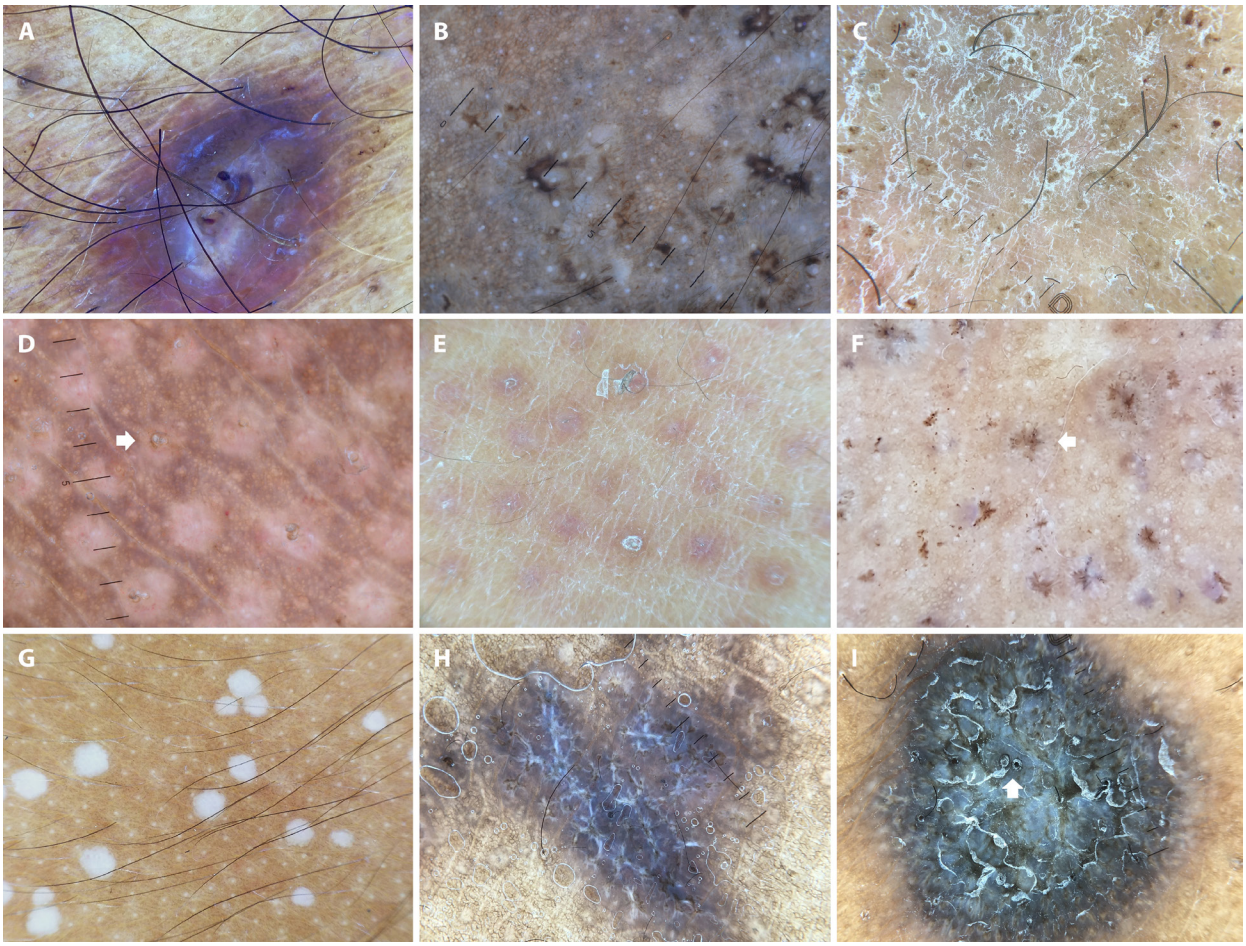

Figure 2. Examples of dermoscopic clues of papulosquamous dermatoses in dark-skinned patients: Three-zone concentric pattern (central white/brown crust surrounded by structureless whitish-grey area with a peripheral brown structureless area in acquired perforating dermatosis (Kyrle disease) (A); Central brown star-like areas with peripheral white halo in Darier's disease (B); Diffuse white scales and patchy brown scales in dermatitis (eczema) (C); Follicular plugs surrounded by white color in follicular eczema (arrow) (D); Twisted hairs forming loops and irregular coils with perifollicular scales in keratosis pilaris (E); Pigmentary structures typified by central brown dots and peripheral pigmentation (arrow) in lichen amyloidosis (F); Well-defined white globule devoid of skin markings in lichen nitidus (G); Blue crossing lines (Wickham striae) over a diffuse brown structureless area in lichen planus (H); White and grey-brown structureless area along with scales and follicular plugs (arrow) in hypertrophic lichen planus (I).

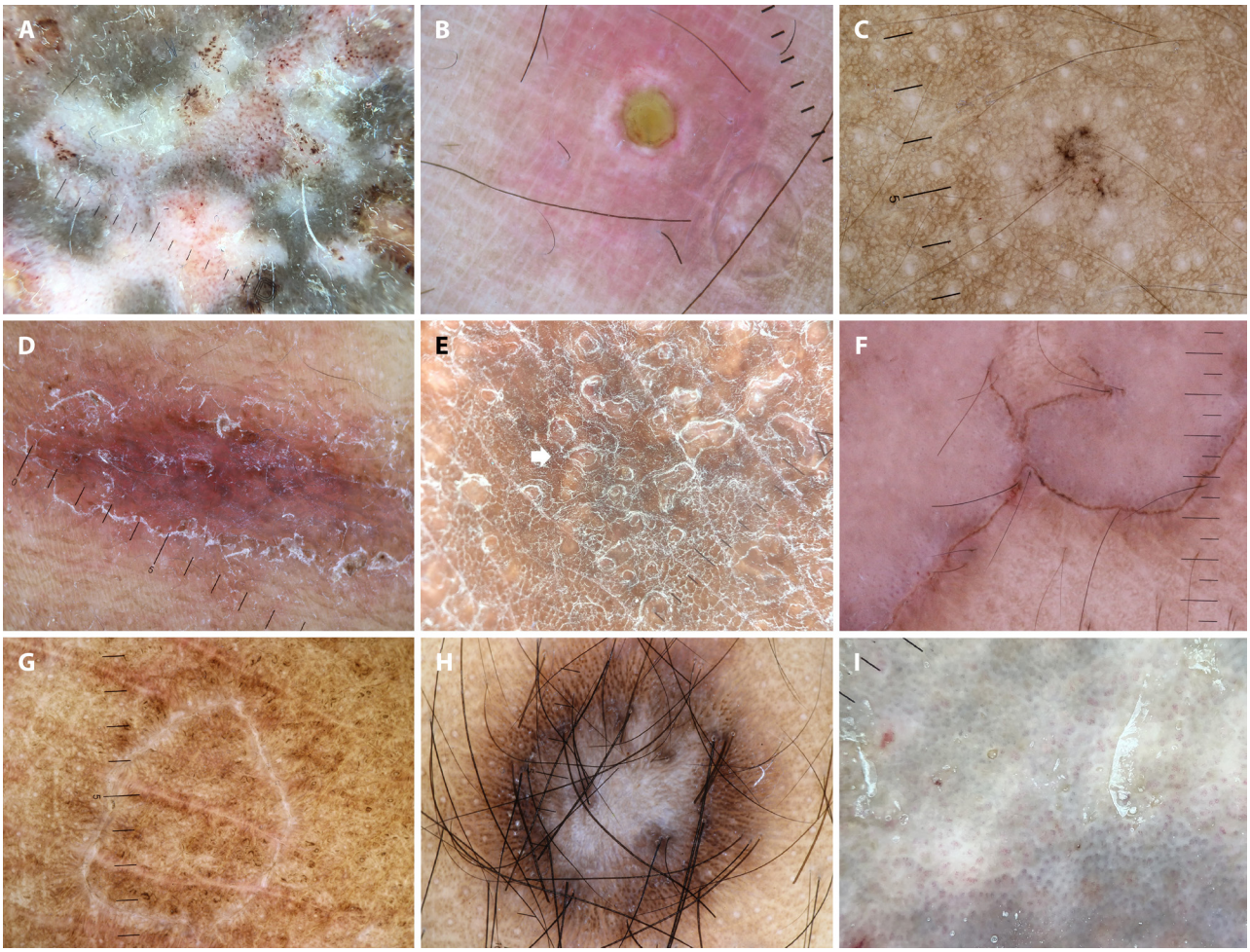

Figure 3. Examples of dermoscopic clues of papulosquamous dermatoses in dark-skinned patients: Multiple brown-black and white structureless areas along with uniform dotted vessels with white halo and purple dots in lichen simplex chronicus (A); Central crust with peripheral white structureless area in PLEVA (B); Brown dots over an ill-defined white area in pityriasis lichenoides chronica (healing stage) (C); Peripheral white scaling collarette with jagged inner free edge along with diffuse brown area in pityriasis rosea (D); Follicular orange-yellow areas with perifollicular scaling (arrow) in pityriasis rubra pilaris (E); Brown peripheral keratotic tract with double free edge in porokeratosis (F); White peripheral keratotic tract with double free edge in porokeratosis (G); White structureless areas with peripheral white projections surrounded by a peripheral brown area (H); Uniform dotted vessels along with brown and white structureless areas and white scales in psoriasis (I).

we have grouped them according to the clinical presentation. Figures 2-8 show dermoscopic clues of such conditions.

Papulosquamous Dermatoses

Acquired Perforating Dermatoses

Data on acquired perforating dermatoses mainly comes from a case series by Behera *et al.* [5], with either "three-zone concentric" pattern (central keratotic plug, middle white homogenous area, and outer-zone of hyperpigmentation) or "two-zone" pattern (white homogenous area around central keratotic plaque, also called by the authors "white collar sign") being the main presentations.

Acrokeratosis Verruciformis of Hopf

A single dermoscopic description of acrokeratosis verruciformis of Hopf is available from the literature [6], with whitish cerebriform lesions along with network pattern

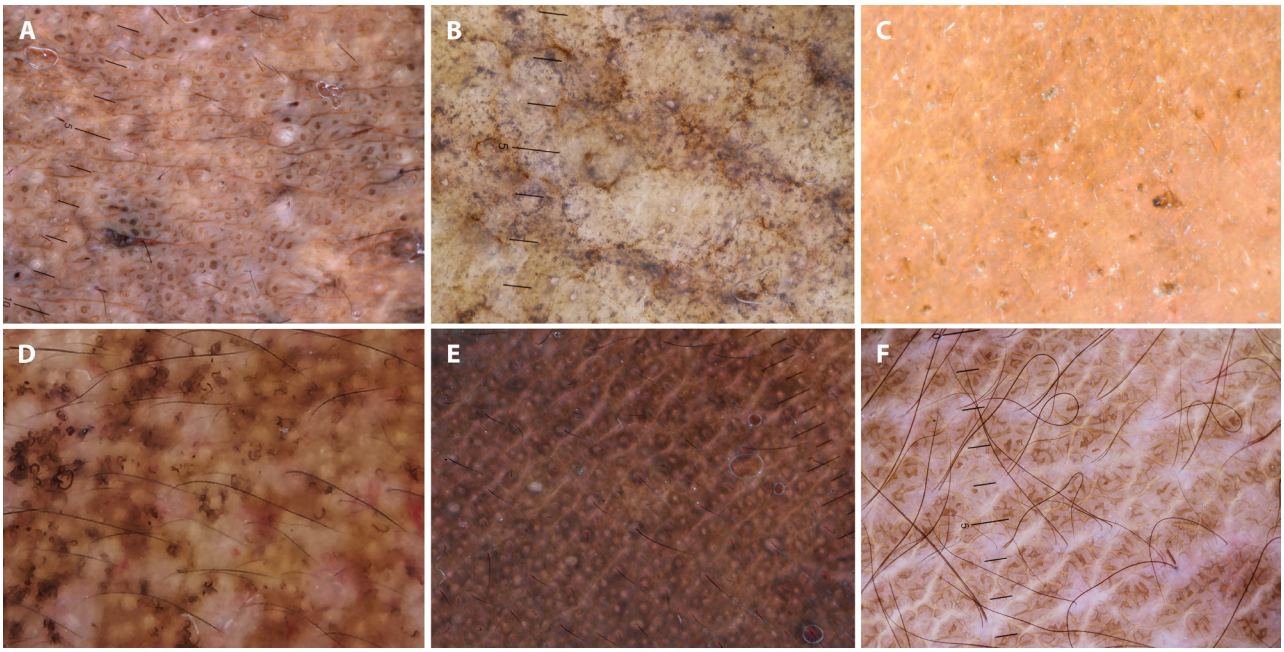

Figure 4. Examples of dermoscopic clues of hyperpigmented dermatoses in dark-skinned patients: "Crista and sulcus cutis" pattern along with follicular plugs in facial acanthosis nigricans (A); Grey, brown and blue dots in ashy dermatosis (B); Irregular cornflakes-like scales in dermatosis neglecta (C); Brown circles and semicircles in exogenous ochronosis (D); Perifollicular pigmentation and perifollicular white color in frictional melanosis (E); "Sulci and gyri" pattern in Gougerot-Carteaud syndrome (F).

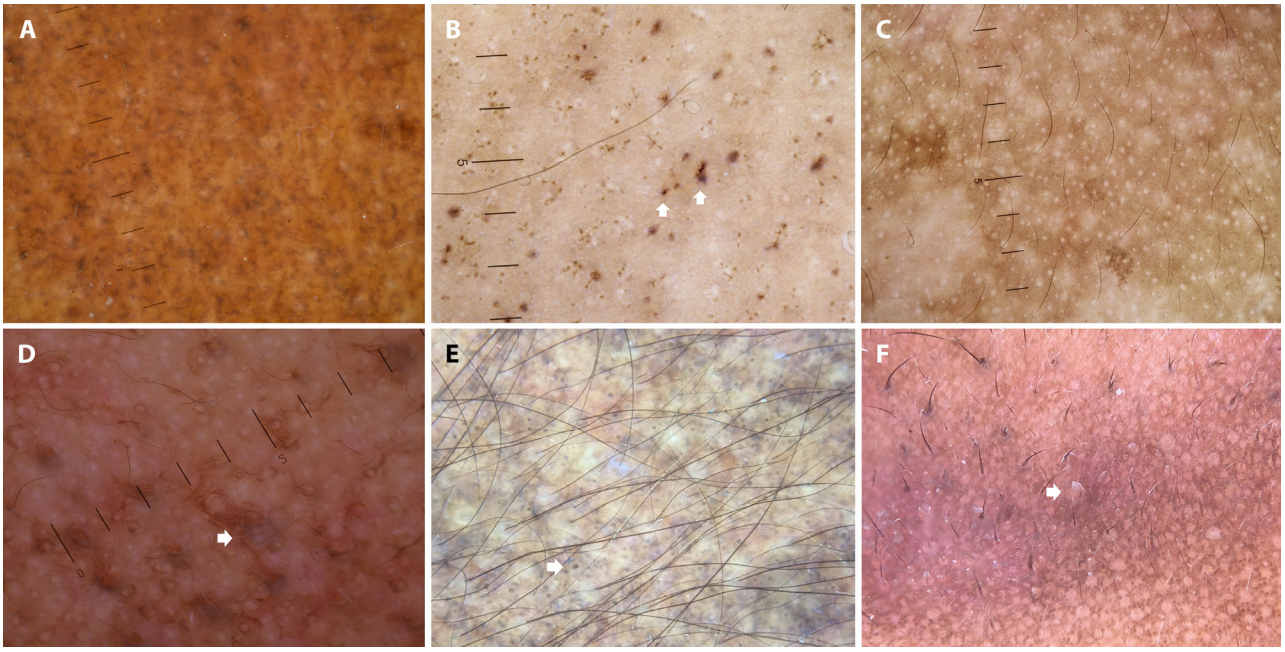

Figure 5. Examples of dermoscopic clues of hyperpigmented dermatoses in dark-skinned patients: Grey and brown dots in lichen pigmentosus (A); Pigmentary structures typified by central brown dots and peripheral pigmentation (arrows) in macular amyloidosis (B); Diffuse brown structureless areas with ostial sparing (pseudonetwork) in melasma (epidermal type) (C); Diffuse brown structureless areas with ostial sparing (pseudonetwork) and focal blue-grey structureless areas (arrow) in melasma (mixed type) (D); Intraostial brown dots (arrow) in Riehl melanosis (E); Brown diffuse brown structureless areas with ostial sparing (pseudonetwork) as well as protruding yellow follicular plugs (arrow) in seborrheic melanosis (F).

composed of yellowish-white septa delimiting holes with dotted vessels inside being described.

Darier's Disease

Only a single dermoscopic report on Darier's disease has been published [7], with dark brown globule and peripheral whitish halo described as the main clues; other findings

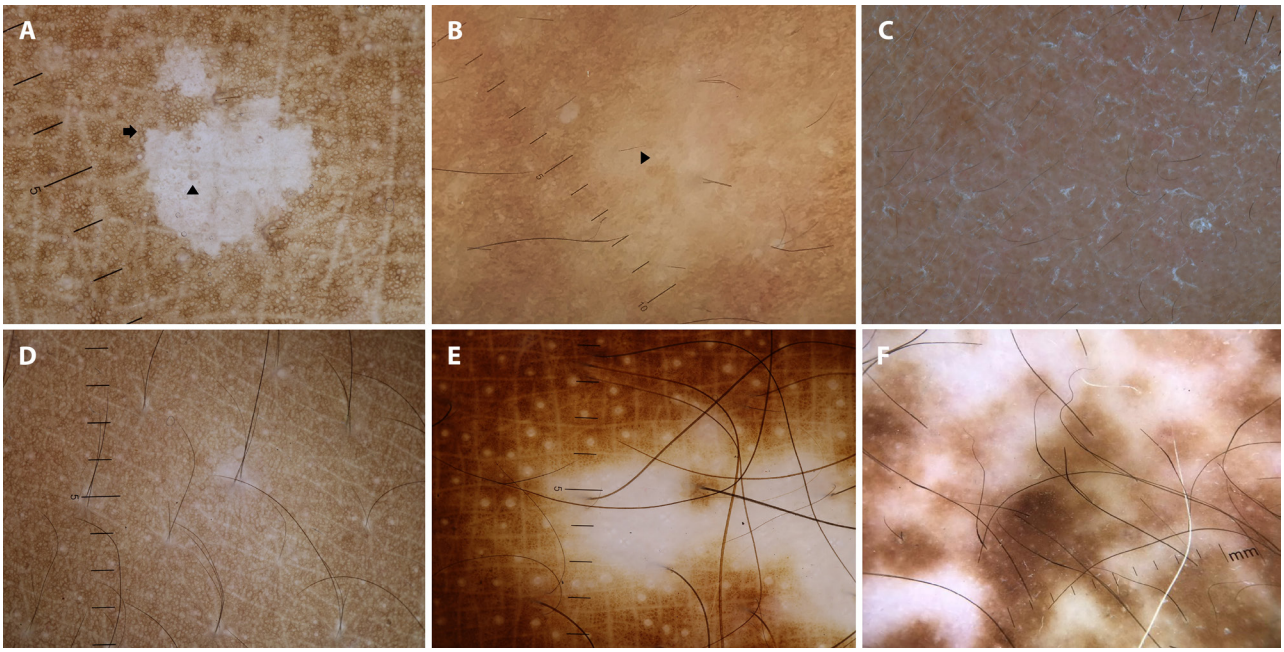

Figure 6. Examples of dermoscopic clues of hypopigmented dermatoses in dark-skinned patients: Well-defined white structureless area with peripheral projections (arrow) along with perieccrine pigmentation (arrowhead) in idiopathic guttate hypomelanosis (A); Ill-defined white structureless area with incomplete perieccrine pigmentation (arrowhead) in pityriasis alba (B); Ill-defined white structureless area with diffuse white scales in pityriasis alba (C); Ill-defined white area in progressive macular hypomelanosis (D); Well-defined bright white area with perifollicular pigmentation in vitiligo (E); Well-defined bright white area along with perifollicular pigmentation and white hairs (leukotrichia) in vitiligo (F).

included central light-brown follicular opening, brown lines (exaggerated pseudo-network) and white scale.

Dermatitis (eczema)/Follicular Eczema

Most of the evidence for dermatitis comes from two case-control studies (Errichetti *et al.* [8] and Nayak *et al.* [9]). Both found patchy scales, especially yellow but also brown and white, to be most characteristic feature. Additional common findings (prevalence ≥50%) found by Errichetti *et al.* included purple dots and fabric fibers, while Nayak *et al.* also observed brown-black dots/background and erosions.

When it comes to follicular eczema, it presented a repetitive pattern consisting of follicular plugs with perifollicular white color [8].

Keratosis Pilaris

A single report on keratosis pilaris showed twisted hairs forming loops and irregular coils, vellus hairs, peripilar focal casts, and brown structureless areas and dots [10].

Lichen Amyloidosis

Three studies have investigated dermoscopy of lichen amyloidosis, with a two-zone pattern (central brown/white dot/globule and peripheral pigmentation) and pigmented dots/globules (brown, grey, blue) being the typical features [8, 11, 12]. Brown structureless areas and white dots/globules were observed in one-fifth of described cases, while other findings were less common.

Lichen Nitidus

The main study on lichen nitidus is by Errichetti *et al.* (case-control analysis) [8], who found a constant pattern consisting of white globules with sharp margins and lack of skin creases in 13 instances. This is consistent with other two studies, one of them also reporting a central brown area [13, 14].

Lichen Planus

Most data on classic lichen planus (LP) comes from a study by Jose *et al.* on 108 patients [15] which showed blue globules and Wickham striae (WS) as predominant features, being found in 100% and 92.6% of cases, respectively. Similarly, Errichetti *et al.* [8] confirmed the high prevalence (>90%) of WS in a case-control analysis involving 32 instances. This finding is in line with further studies including smaller samples of patients. Of note, WS have been reported to show a white, yellow, or bluish hue. Unlike lighter phototypes, vessels displayed a relatively low prevalence.

Moving to LP variants, data are available for hypertrophic LP, actinic LP, and palmoplantar LP. In detail, follicular plugs (sometimes referred to as comedo-like openings) are the main finding of the hypertrophic LP, whereas actinic LP and palmoplantar LP have been reported to show focal/

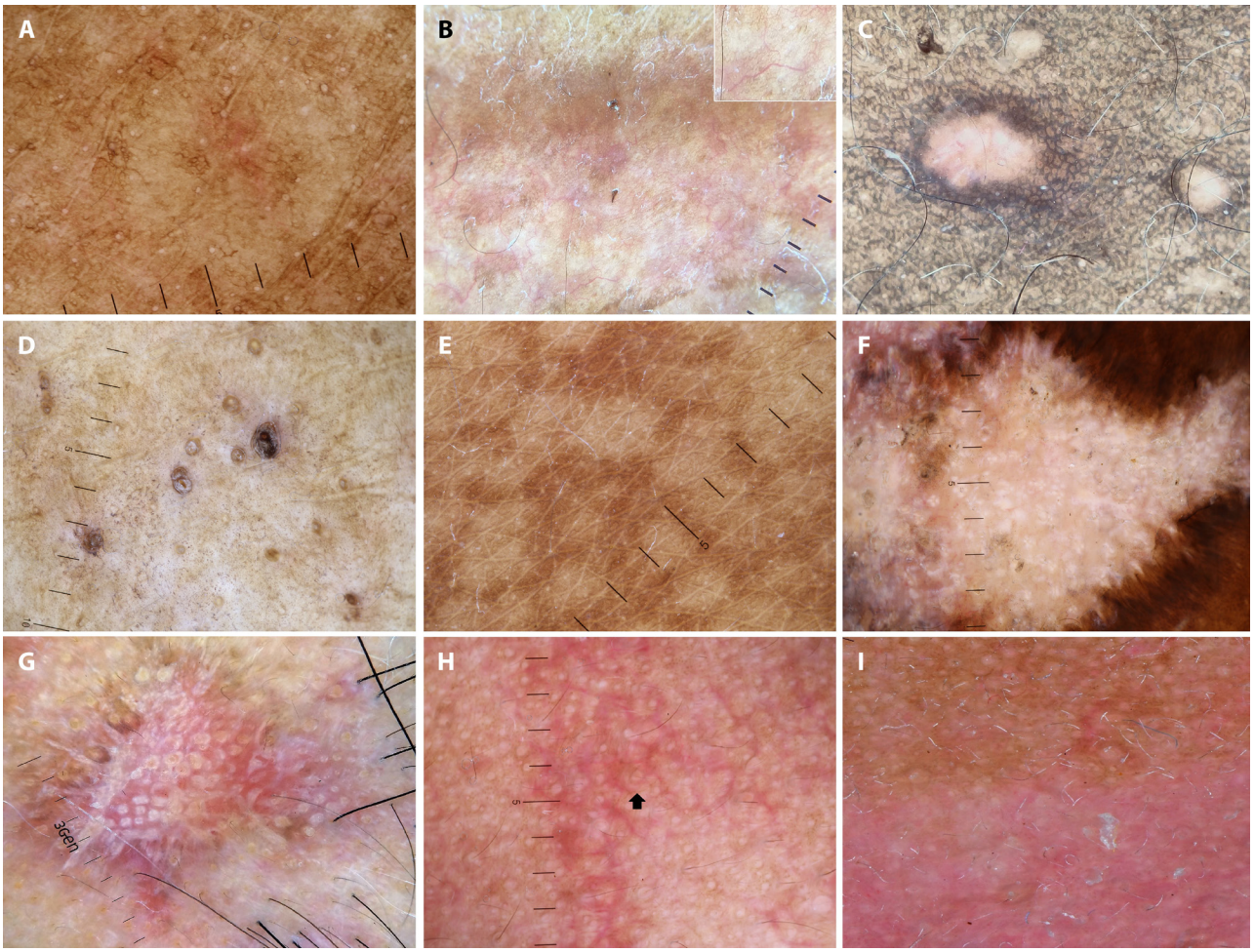

Figure 7. Examples of dermoscopic clues of granulomatous and facial inflammatory dermatoses in dark-skinned patients: Ill-defined white structureless areas in granuloma annulare (interstitial variant) (A); Orange-yellow structureless areas along with sharp linear vessels with branches (better seen in the inset) in necrobiosis lipoidica (adapted from *Dermoscopy in General Dermatology for Skin of Color*, Errichetti E, Lallas A, eds. CRC Press 2021) (B); Yellow structureless area with peripheral brown reticular lines in sarcoidosis (Courtesy of Emilio Dognini, MD – *Brescia, Italy*) (C); Brown follicular plugs over bright white areas in cutaneous lichen sclerosus (D); Ill-defined dull white areas in morphea (E); Follicular plugs/rosettes along with bright white areas in discoid lupus erythematosus (scarring stage) (F); Follicular plugs/rosetted as well as crossing white lines (Wickham striae) in lichen actinicus (G); Blurred purple linear vessels arranged in a reticular pattern along with perieccrine/perifollicular pigmentation (arrow) in rosacea (H); Ill-defined dull white areas and patchy white scales in seborrheic dermatitis (I).

diffuse brown structureless areas with ostial sparing along with WS and a peculiar "hem-like" pattern of brown pigment distribution along the ridges of the dermatoglyphics, respectively.

Lichen Simplex Chronicus

A single case analyzed in a case-control study showed dotted vessels with unspecified distribution and grey/blue structureless areas [16].

Pityriasis Lichenoides

Dermoscopy of pityriasis lichenoides et varioliformis acuta was investigated only by a case series by Ankad *et al.* [17] is available, with brown structureless area, central scaling rim and peripheral dotted vessels found in early lesions and white structureless areas, central crust, peripheral dotted vessels, white rim of scaling and focal bluish-greyish areas/centrifugal strands irregularly distributed at the periphery observed in late stages.

With regard to pityriasis lichenoides chronica, the only available study is the case-control study by Errichetti *et al.* [8], who reported peripheral white scaling with a smooth inner free edge as the peculiar pattern. Pigmentary structures were also quite common (26.7%-40.0%), including brown dots and focal or diffuse brown structureless areas.

Pityriasis Rosea

The main study on pityriasis rosea is a case-control analysis by Errichetti *et al.* [8], who found peripheral white scales (jagged inner free edge) to be the typical pattern. This was in line with other studies, that also observed other common but less specific findings, especially dotted vessels.

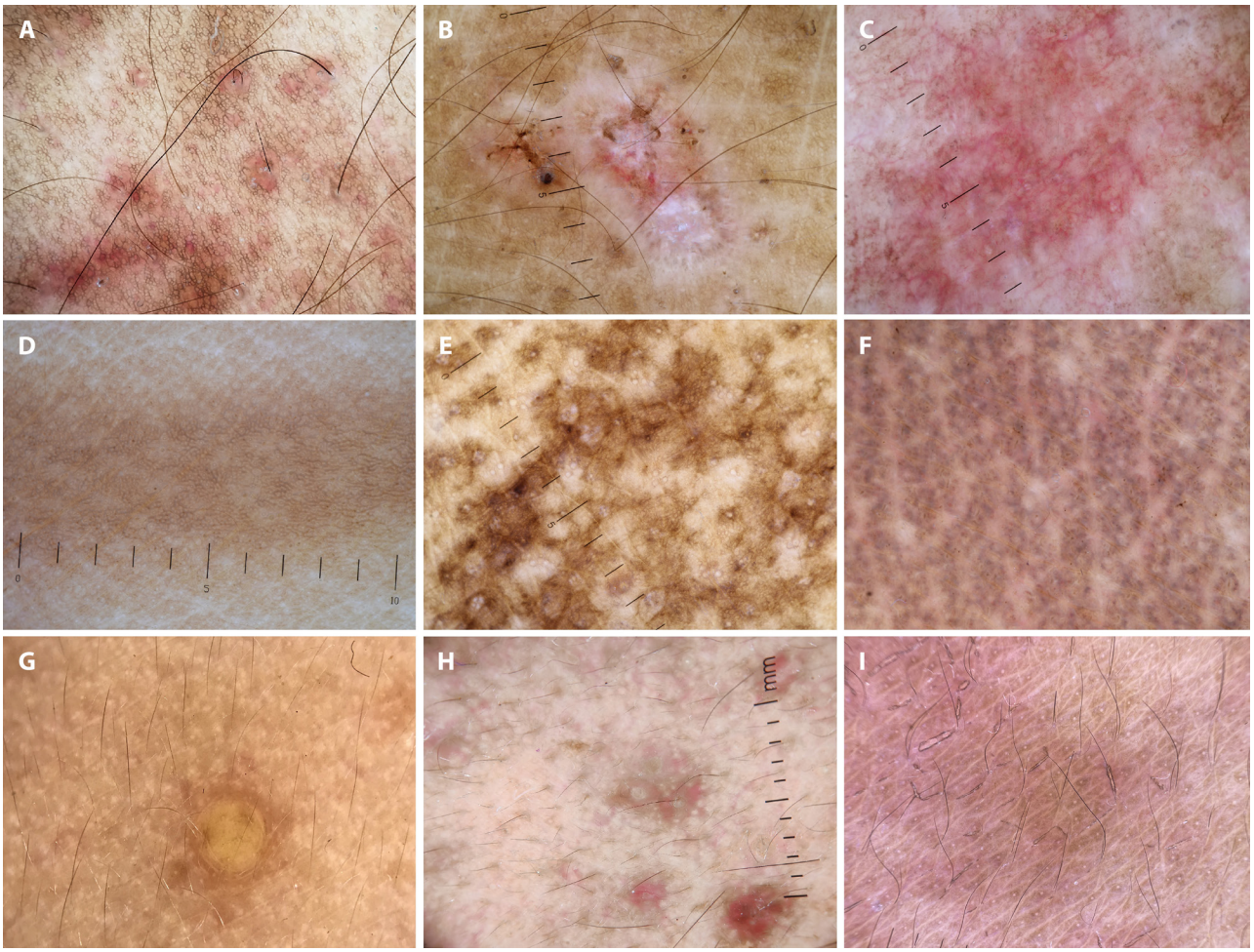

Figure 8. Examples of dermoscopic clues of miscellaneous inflammatory conditions in dark-skinned patients: Purple globules/spots along with reticular brown lines in capillaritis (A); White structureless areas along with brown structureless areas, dots and globules in acute cutaneous lupus erythematosus (generalized rash) (B); Brown dots and mixed vascular pattern (linear, linear-curved, and dotted vessels) in subacute cutaneous lupus erythematosus (C); Reticular brown lines in urticaria pigmentosa (D); Brown reticular lines and dots/globules in dermatomyositis (E); Pigmented dots of variable color (brown, grey and blue) and size in fixed drug eruption (F); Diffuse yellow structureless area with perilesional brown area (halo) in juvenile xanthogranuloma (G); Brown and purple structureless areas in langerhans cell histiocytosis (H); Increased cutaneous markings along with brown scales (I).

Pityriasis Rubra Pilaris

The only study on dermoscopy of pityriasis rubra pilaris is the analysis by Errichetti *et al.* [8] investigating four instances, that found follicular plugs being a constant finding, followed by perifollicular yellow halo seen in three cases.

Porokeratosis

Most data comes from the case-control analysis by Errichetti *et al.* [8] involving 10 patients, that showed a constant pattern consisting of brown/white peripheral keratotic tract with a double free edge. Other studies confirmed this finding, regardless clinical subtype (superficial disseminated porokeratosis and porokeratosis of Mibelli). Pigmentary structures (e.g., brown dots/areas) may also be observed.

Prurigo Nodularis

Three studies are available (two case-control and a cross-sectional study) [8, 18, 19]. All of them reported peripheral-radiating white lines to be the hallmark of prurigo nodularis; other common findings included erosions and dotted vessels with unspecific distribution.

Psoriasis

Psoriasis is one of the inflammatory dermatoses with the highest degree of evidence regarding the usefulness of dermoscopy in its diagnosis, with four case-control and one case series study [8, 9, 20-22] available from the literature besides a single case report [23]. The main dermoscopic feature of psoriasis for all analyzed clinical variants (plaque-type, follicular, and guttate) was the presence of dotted vessels (60-100% of cases) with unspecific or uniform distribution, that were often found along with white scales (around

three-fourths of cases) showing patchy or, most commonly, diffuse arrangement. Other relevant findings included pigmented structures (brown, grey, blue structureless areas, dots or globules).

Hyperpigmented Dermatoses

Ashy Dermatosis

The main analysis on ashy dermatosis is the case-control study by Errichetti *et al.*, [8] who found the presence of grey/blue dots to be the most typical finding, with a characteristic periostial arrangement in facial lesions. Brownish or grey-blue dots were also reported by a smaller analysis on four patients [16].

Dermatosis Neglecta

Only a single dermoscopic case report does exist [24]; the authors observed brown scale with unspecific distribution.

Exogenous Ochronosis

Most of data on dermoscopy of exogenous ochronosis (EO) comes from the case-control study by Errichetti *et al.* [8], that found the following findings to be characteristic of EO over other facial pigmentary dermatoses: interostial brown/grey semicircles and circles, interostial brown/grey globules, focal brown structureless areas with ostial obliteration, and focal white structureless areas. Other case series [25, 26] were in line with such observations, especially with regard to semicircles/circles and ostial obliteration.

Frictional Melanosis

Two studies investigating dermoscopy of frictional melanosis (FM) have been retrieved, including a case-control study [8] and a single case report [27]. Although several findings have been described (i.e., focal white structureless areas, reticular brown lines, focal brown structureless areas, white globules, brown dots and globules), only the presence of perifollicular white color has been reported to be characteristic of FM.

Gougerot-Carteaud Syndrome

Three instances with dermoscopic descriptions have been reported by Errichetti *et al.* [8]. The most common finding was the presence of polygonal brown areas (cobblestone pattern), followed by "sulci and gyri" pattern.

Lichen Planus Pigmentosus

Current knowledge on dermoscopy of lichen planus pigmentosus (LPP) beyond the face mainly comes from two case series by Sharma *et al.* [28] and Pirmez *et al.* [29], with brown dots/globules being described as the most characteristic feature in both of them, consistently with other minor studies. Notably, brown dots have been reported also in facial LPP, with a periosteal distribution found to be specific compared to other common facial pigmentary diseases by Errichetti *et al.* [8].

Macular Amyloidosis

Dermoscopy of macular amyloidosis has been assessed in three studies (two case-control [8, 12] and case series [11]). Two main presentations have been reported, i.e., (I) central brown/white dot/globule with peripheral pigmentation with/without focal white structureless areas and (II) pigmented (black, brown, grey or blue-grey) dots arranged in a clustered pattern, with/without rippled pigmentation (alternating parallel hyperpigmentation and hypopigmentation), or "jigsaw puzzle" pattern.

Melasma

Melasma is one of the most investigated pigmentary dermatoses from a dermoscopic point of view, with seven studies being retrieved (one case-control study [8], four case series [25, 30-32], and two case reports [26, 33]). The most common feature was the presence of brown structureless areas with ostial sparing (pseudonetwork). Of note, diffuse distribution of such areas turned out to be indicative of melasma over other facial pigmentary dermatoses according to the case-control study by Errichetti *et al.* [8]. Other less common/less specific findings are also possible (Supplemental Table), with grey structureless areas with ostial sparing (pseudonetwork) and interostial brown dots possible related to dermal variants.

Riehl Melanosis

The only study on Riehl melanosis is the case-control analysis by Errichetti *et al.* [8], who evaluated a total of 17 subjects and observed brown dots showing either inter- or intra-ostial distribution, with only the last arrangement found to be specific.

Other Less Common Hyperpigmented Dermatoses

Dermoscopic features of acanthosis nigricans, acquired dermal macular hyperpigmentation, facial pigmentary demarcation lines, maturational hyperpigmentation, photomelanosis, and seborrheic melanosis in skin of color patients have been also described. Most of the evidence comes from case reports/series and data are shown in Table 1 and Supplemental table.

Hypopigmented Dermatoses

Idiopathic Guttate Hypomelanosis

A total of 42 instances of idiopathic guttate hypomelanosis have been investigated by two studies, including a case series [34] and a case-control analysis [8]. The most frequent finding was the presence of well-defined white structureless areas, perifollicular/perieccrine pigmentation, and peripheral white projections, with only the last two features being found significantly more common over other common hypopigmented dermatoses.

Pityriasis Alba

Knowledge on pityriasis alba comes from the case-control study by Errichetti *et al.* [8], that showed ill-defined white structureless areas and incomplete perieccrine brown pigmentation (semi-circles) as main findings.

Progressive Macular Hypomelanosis

Only two instances of progressive macular hypomelanosis with dermoscopic description have been retrieved [8], with smooth, ill-defined, diffuse white structureless area being the only reported finding.

Vitiligo

Vitiligo is the pigmentary disorder with the highest number of published dermoscopic studies (2 case series [35, 36], 2 case-control [8, 37], and 3 case-reports [38-40]). Bright white structureless areas (with sharp and convex margins), intralesional pigmentation (structureless or network-like), and perifollicular pigmentation were the commonest features; other possible clues included white hairs (leukotrichia), perifollicular depigmentation, marginal pigmentation, and reversed pigmentary network. In a single report, the so-called "blue vitiligo" was found to show scattered blue dots on the side of the hypopigmented macule along with pigmented hairs with perifollicular pigment [39].

Differences have been described based on disease activity: unstable lesions have been reported to show less defined margins giving rise to specific patterns (i.e. trichrome, "starburst" and "comet tail"), small white globules in perilesional skin (described as satellites, confetti-like pattern and "tapioca sago" appearance) and/or micro-Koebner's phenomenon (i.e. depigmented streaks along the line of trauma around the main vitiligo patch), while sharp borders and perilesional pigmentation were considered signs of stability.

Granulomatous Dermatoses

Granuloma Annulare

A dermoscopic case-control study by Ramadan *et al.* [41] involving four patients with granuloma annulare showed white and yellow structureless areas along with brown lines in a reticular distribution as the main findings.

Necrobiosis Lipoidica

According to the study by Ramadan *et al.* [41] on two subjects with necrobiosis lipoidica, the most indicative dermoscopic features were short linear vessels/linear vessels with branches (unspecific distribution) along with white/yellow structureless areas and brown reticular lines.

Sarcoidosis

Several studies have investigated dermoscopic findings of sarcoidosis, with most of them showing a repetitive pattern consisting of yellow to orange structureless areas (mainly diffuse). Several additional findings have been reported, with white structureless areas, focused vessels (linear or linear vessels with branches of unspecific distribution) and white scale being the most common ones [8, 41-44].

Rheumatoid Nodules

Based on the case-control study by Ramadan *et al.* [41] including five subjects with rheumatoid nodules, white structureless areas, linear vessels or linear vessels with branches (of unspecific distribution), and brown lines (in reticular distribution) were the most common features.

Sclerotic Dermatoses

Cutaneous Lichen Sclerosus

Only the case-control study by Errichetti *et al.* [8] investigated dermoscopy of cutaneous lichen sclerosus (11 patients), with focal/diffuse bright white areas and follicular plugs being the main clues.

Morphea

Most of evidence on morphea comes from the case-control study by Errichetti *et al.* [8] involving 14 subjects, that found focal dull white areas to be the main clue. Linear vessels with branches (unspecific distribution) and white or yellow dots/globules have been described less commonly.

Facial Inflammatory Dermatoses

Discoid Lupus Erythematosus

Most data on dermoscopy of discoid lupus erythematosus (DLE) comes from the case series by Ankad *et al.* on 110 patients [45], with follicular plugs and perifollicular white color being the most common features (>50% of cases). Such findings have been reported regardless localization (facial *vs* extra-facial). The importance of follicular plugs as diagnostic clue of facial DLE has also been underlined by Errichetti *et al.* [8]. Several other minor dermoscopic structures have been described in these and other studies.

Lichen Actinicus

See lichen planus section.

Perioral Dermatitis

A single dermoscopic report on perioral dermatitis has been found in the literature search [46], with dark-brown pigment network being the only described feature.

Rosacea

The main description about dermoscopy of rosacea results from the analysis of 11 patients by Errichetti *et al.* [8], with linear vessels in reticular distribution being found its hallmark, in line with a single report [47]. Additionally,

perieccrine/perifollicular pigmentation was also commonly observed (8/11).

Seborrheic Dermatitis

Based on the case-control study by Errichetti *et al.* including 10 subjects [8], focal dull white structureless areas and patchy yellow/brown scales/crusts are the main dermoscpic clues of seborrheic dermatitis.

Miscellaneous

Such a group encompasses other inflammatory dermatoses retrieved in the review analysis that are not classifiable in the previous clinical patterns, including capillaritis, cutaneous lupus erythematosus (acute and subacute), cutaneous mastocytosis, dermatomyositis, fixed drug eruption, Fox-Fordyce disease, Hailey-Hailey disease, juvenile xanthogranuloma, Langerhans cell histiocytosis, perniosis (idiopathic), and sweat dermatitis. Most of data about such entities comes from single case reports and described dermoscopic findings are showed in Table 1/Supplemental Table.

Conclusions

Literature data on dermoscopic patterns of inflammatory dermatoses in skin of color is significantly growing, with many articles being published in recent years. However, the majority of the papers focalized on a limited number of dermatoses (e.g., psoriasis, lichen planus, pityriasis rosea, DLE, sarcoidosis, and vitiligo), with several conditions having only single dermoscopic descriptions. Notably, apart from few studies, most of published data shows a low level of evidence, thereby preventing an evaluation of diagnostic accuracy of reported dermoscopic findings. Additionally, some studies investigated the entire spectrum of "skin of color" without subanalyses comparing the different phototypes (IV-VI), with consequent potential biases as possible differences between dark (phototype IV) and very dark (V/VI) skin tones may exist. Finally, our review highlighted a remarkable variability in the terminology used in published studies. Therefore, future studies designed with a systematic approach are needed to increase the value of inflammoscopy in dark-skinned patients.

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