Original Research Article

An observational analytical study about the dermoscopic findings of cutaneous pigmentary lesions

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Abstract

Introduction : Several studies have shown dermoscopy as an easily accessible tool for assisting the noninvasive diagnosis of various general dermatological disorders. The present study was conducted to evaluate the use of dermoscopy for diagnosis of pigmented skin lesions as meagre studies have been done in this area.**Methods**:In this Observational & Analytical study after Multi-staged Random sampling 100 study subjects /Patients were selected having various pigmentary lesions which were later evaluated by dermoscope. All the photographs were captured using android mobile camera and dermlite DL4 hybrid dermoscope (both polarised and nonpolarized).**Results:** Among the 100 patients /participants studied, 45% were males & 55 % were females with the range of age between 5 to 56 years . The most common pigmentary lesions found were melasma (9%), Lichen planus pigmentosus (8%), Vitiligo (7%) , Fixed drug eruptions (5%) & Idiopathic guttate hypomelanosis (5%) among other 26 types. **Conclusion:** Dermoscopy may result in confirmation of clinical diagnosis, oftenavoiding the need for a skin biopsy. Appreciation of the post-treatment effect via dermoscopy oftenprecedes clinical improvement; this is especially true of chronic relapsing, recalcitrant dermatoses like melasma, lichen planus pigmentosus (LPP), vitiligo, alopecias, etc.Explaining the nature of the disorder becomes easier by patients showing the lesional dermoscopic image to the patient.

Keywords: Dermoscopy , Pigmentory lesions , Melasma , Vitiligo , LPP

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Introduction

Dermoscopy is a non-invasive technique which utilizes digital photography and light microscopy for in vivo examination and diagnosis of various pigmented skin lesions. Over the last few years, several studies have shown dermoscopy as an easily accessible tool for assisting the noninvasive diagnosis of various general dermatological disorders [1–6], Indeed, such a technique provides additional information at a submacroscopic level that may help the dermatologist to differentiate between two or more conditions that are hardly distinguishable with the naked eye [3]. The most important criteria to be considered while using dermoscopy in general dermatology are: (a) the morphology/arrangement of vascular structures, (b) scaling patterns,(c) colors, (d) follicular abnormalities and (e) specific features(clues)[2,3]. Obviously, dermoscopic findings must be interpreted within the overall clinical context of the patient (personal/ family history, number, location, morphology and distribution of the lesions, etc.) because only the combination between such data can really enhance the diagnostic accuracy in the field of general dermatological disorders[3–6].In particular, polarised light noncontact dermoscopy is usually preferred over conventional nonpolarised light contact dermoscopy as the latter may reduce the vessels (due to pressure) and/or scaling (when using a liquid interface) visibility, even though some clues are better seen with non-polarised light devices (i.e. more superficial findings, such as comedo-like structures) [3,4].Very few studies reporting efficacy of dermoscopy in dark skin for pigmentary lesions have been performed.Giorgi et al. [7] conducted dermoscopic examination of pigmentary lesions in dark skinned patients and concluded that though examination of pigmentary lesions with naked eye is more difficult in dark skin, but dermoscopy significantly reduced this difficulty since the dermoscopic features remained the same as white skin. However, while using dermoscopy in case of dark skin, stronger source of light may be required as darker skins tend to absorb larger amounts of light rays [7].As reported in a recent systematic review, dermoscopy has been proved to allow 10-27% higher sensitivity than clinical diagnosis by naked eyes [8]. The technique consists of placing mineral oil, alcohol or even water on the skin lesion that is subsequently investigated using a hand-held lens,a hand-held scope (also called dermatoscope), a stereomicroscope, a camera, or a digital imaging system. The magnifications of these various instruments range from 6X to 40X and even up to 100X. Most widely used dermatoscope has a 10-fold magnification permitting a sufficient evaluation of pigmented skin lesions in daily routine. The fluid placed on the lesion eliminates surface reflection and renders the cornified layer translucent, thereby allowing a better visualization of pigmented structures within the epidermis,

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dermoepidermal junction and superficial dermis. Moreover, size and shape of vessels of the superficial vascular plexus can be easily appreciated by this procedure.

The present study was conducted with the following objectives -

1.To evaluate the use of dermoscopy for diagnosis of pigmented skin lesions as meagre studies have been done in this area.

2.To study the correlation of clinical and dermoscopic features of pigmented skin lesions.

3.To differentiate melanocytic from non-melanocytic lesions

Methodology

This Epidemiological / Observational & analytical study involved Informed written consent of the participating patients. Place & Location of study was Dermatology , Venereology & Leprosy Departmental OPD Units of a Tertiary Medical Care Centre in Meerut (U.P) The study group included 100 patients affected with pigmented skin lesions presented to the above mentioned OPD unit in between June 2018 to July 2019.After Multi-staged Random sampling 100 study subjects / Patients were selected having

Inclusion Criteria:

•Patients of all age and sex with pigmented skin lesions.

•Patients willing to give written informed consent by self/guardian.

Exclusion Criteria:

•Pigmented lesions more than 10 x 14 mm. This is a basic prerequisite to evaluate the entire surface of the lesion.

•Invasive or non-invasive procedure over the lesion in the past 6 weeks.

•Use of depigmenting agent.

•Pregnant and lactating women.

•Any keloidal tendency.

Data collection tools : Data was collected by using a pre- designed structured interview questionnaire. An interview had questions related to past history of Presenting Cutaneous Pigmentary lesions.A detailed clinical/dermatological examination was be carried using a hybrid Dermatoscope. In undiagnosed cases, Skin biopsy was performed & histopathological examination was done in excised lesions.All the photographs were captured using android mobile camera and dermlite DL4 hybrid dermoscope (both polarised and nonpolarized).

The salient features of the proforma were -

1.Disease history- age of onset of pigmentation, duration of pigmentation, Number of pigmentary lesions and any other associated systemic disorder.

•Treatment history

•Family history

•Past Medical & surgical history

2.Surgical and dermatological examination

A.General examination was done to exclude associated systemic diseases

B.Cutaneous examination was done

1.To diagnose pigmentary disorder with emphasis on number, distribution

2.To diagnose its congenital or acquired To diagnose its inflammatory, Infectious or Benign/Malignant nature

3.To rule out its association with sun exposure, topical application or drug exposure.

4.Laboratory investigations

1. Skin Biopsy
2. Skin Photo type-Type I,II,III,IV,V,VI
3. Family History Melasma / Photo sensitivity / Other
4. Personal History-Smoking / H/o progression / Alcoholic / Nonveg / Veg.
5. Photosensitivity
6. Drug Intake
7. Previous treatment - Treatment Duration Oral /Topical
8. Drug History: Photoallergic or phototoxic response with doxycyline/ demecyclocycline / Amiodarone, quinolone /Thiazide, NSAID
9. Dermatologic history : Family or Personal H/o pigmented skin lesions
10. Protocol of dermoscopic examination
11. Preparation of pigmentary site by cleaning with normal saline Photograph of clinical lesion followed by dermoscopic examination in polarised and non polarised mode.

Statistical Analysis: The collected data was depicted in tabular form and interpreted statistically and analyzed. The collected data was statistically analyzed by using the standard tests to ascertain the clinical relevance of the present study.P < 0.05 was considered statistically significant. Statistical analysis was done using SPSS version 21.0.Continuous data were expressed as mean ± standard deviation (SD) . Appropriate statistical tests of significance like Chi square were applied wherever necessary. Quality assurance measures were taken appropriately.

Results

Among the 100 patients / participants studied, 45% were males & 55 % were females with the range of age between 5 to 56 years . All those patients without previous history of topical application were included and their dermoscopic patterns were evaluated. A variety of lesions were found the Percentage of different pigmentary disorders among study cases are given in Fig 1 & Table 1

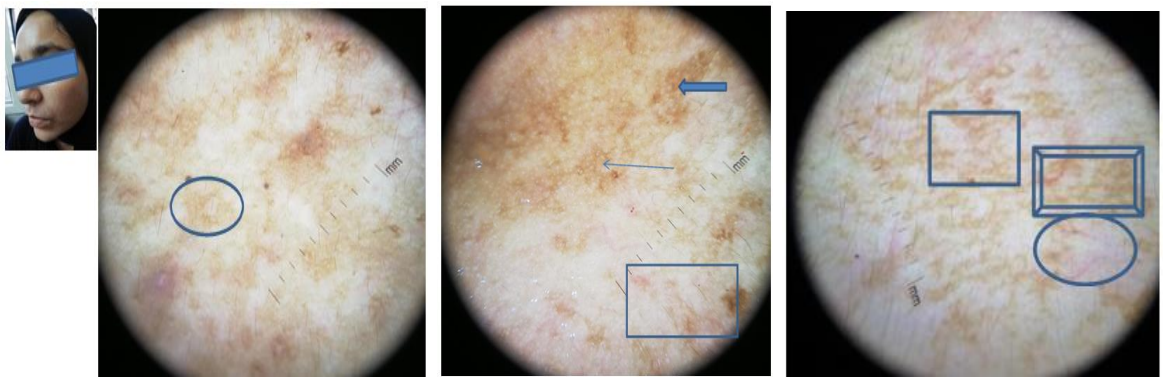

Fig 1a:Bar Chart Diagram of Different Pigmentory lesions found in numbers among patients

Fig 1b Melasma

Fig 1c: Melasma

Fig 1d: Brown granules (blue arrow) and globules (bold blue arrow); increased vascularity and telangiectasia were also well visualized (in rectangle).

Table 1: Percentage of different pigmentary disorders among study cases

Disease	Total No. of cases			
	Male	Female	Male-Female	Age group studied in years
Melasma	9	2	7	25-45
Exogenous ochronosis	4	1	3	25-45
Lichen planus pigmentosus	8	2	6	25-45
Riehl's melanosis/PCD	4	2	2	25-45
Pigmentary demarcation line	2	0	2	25-45
Nevus of Ota	3	1	2	15-30
Fixed drug eruption	5	3	2	10-50
Macular amyloidosis	3	1	2	25-35
Lichen amyloidosis	2	1	1	45-55
Lentigines	4	2	2	15-35
Vitiligo	7	3	4	25-45
hypomelanosis	5	3	2	45-55
Nevus depigmentosus	4	2	2	5-10
Lichen striatus	2	1	1	5-15
Becker˝s nevus	4	3	1	15-25
Congenital melanocytic nevus	2	1	1	5-15
Halo nevus	2	1	1	25-35
Verrucous epidermal nevus	2	1	1	5-15
Cutaneous metastasis	1	1	0	55
DLE	5	2	3	35-50
Seborrheic keratosis	2	1	1	45-55
Café-au-lait-macule	3	2	1	15-25
Pityriasis rosea	3	2	1	15-25
Pigmentary purpuric dermatosis	4	2	2	35-45
Lichen planus hypertrophicus	7	4	3	25-50
Morphea	3	1	2	15-35

The most common pigmentary lesions found were melasma (9%), we observed a pseudoreticular pigment network (in eclipse , Fig 1a , 1b & 1c,d) with diffuse light to dark brown background with sparing of the peri-appendageal region (follicular and sweat gland openings), brown granules (blue arrow), and globules (bold blue arrow) as well as increased vascularity and telangiectasia are also well visualized (in rectangle).

2.Lichen planus pigmentosus (LPP) was found in 8% , In our dermoscopic examination of patients suffering from LPP, we had noticed diffuse brown color and pseudoreticular pigment network (Fig 2a ,blue arrow), peri- appendageal pigment deposition (Fig 2b , in circle) and brown to gray dots and globules (Fig 2b ,in rectangle).

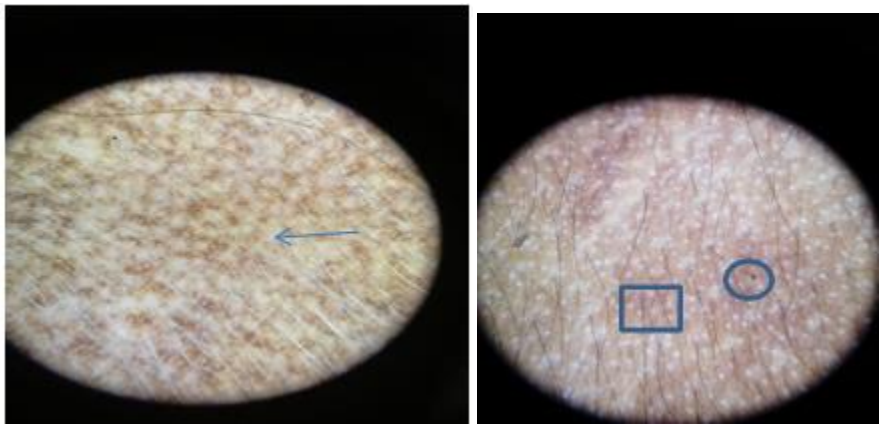

Fig 2a:Diffuse brown color and pseudoreticular pigment network b: Diffuse brown color and pseudoreticular pigment

3.Vitiligo was found in 7% , In stable lesions of vitiligo (Fig.3a), Dermoscopic examination had found well defined diffuse white area without scaling appeared along with perifollicular pigmentation and leukotrichia (bold blue arrow).

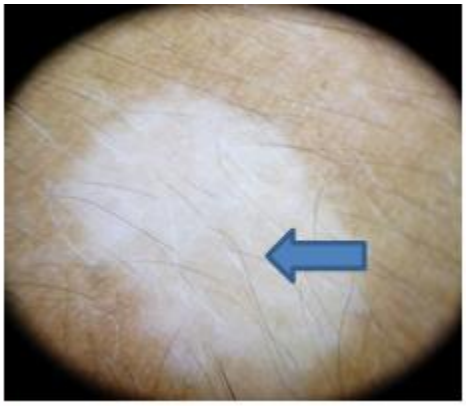

Fig 3a: Lesions of vitiligo

Fig 3b:Unstable or progressive lesions of vitiligo

In unstable or progressive lesions of vitiligo (Fig.3 b), we had observed starburst shape (blue circle) of lesions enclosed by small round tapioca or sago grain like pattern (red circle) were detected in nearby skin

4.Hypertrophic lichen planus (LPH) was found in 7 % , On dermoscopic examination of patients suffering from LPH (Fig.4 a & Fig 4b), we noticed features such as peripheral striations (blue arrow), bluish-grey globules (bold blue arrow), comedo-like openings (red eclipse) and wickham structures (bold green arrow).

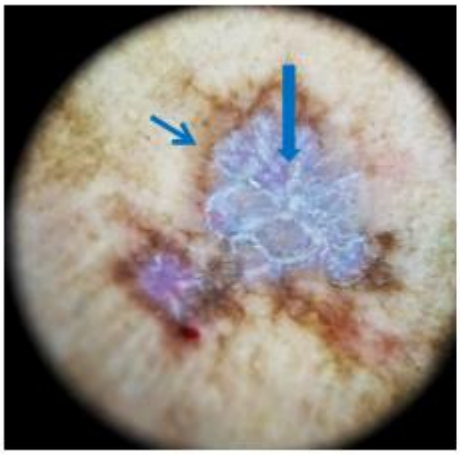

Fig 4a:Peripheral striations (blue arrow), bluish-grey globules (bold blue arrow)

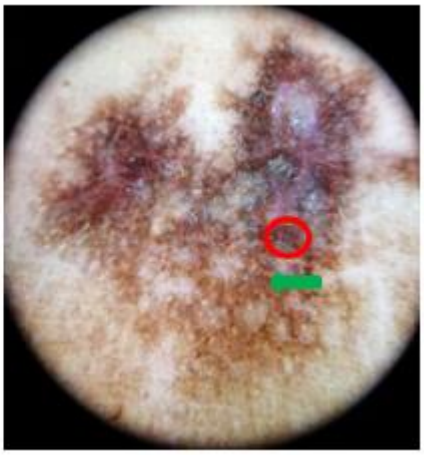

Fig 4b:Comedo-like openings (red eclipse) and wickham structures (bold green arrow).

5.Fixed Drug Eruption was found in 5 % cases - On dermoscopic examination of patients affected with FDE, we had found that dermoscopic features were grouped as brown, grey and steel blue dots with perifollicular hypopigmentation, which suggests pigmentary incontinence at various levels (Fig.5a and 5b).

Fig 5a,b: Perifollicular hypopigmentation

6.Idiopathic guttate hypomelanosis (IGH) was found in 5 %: Dermoscopic examination of patients with IGH disclosed amoeboid pattern, well depigmented area with peripheries resembling pseudopods (Fig 6a &b , bold blue arrow) of amoeba.

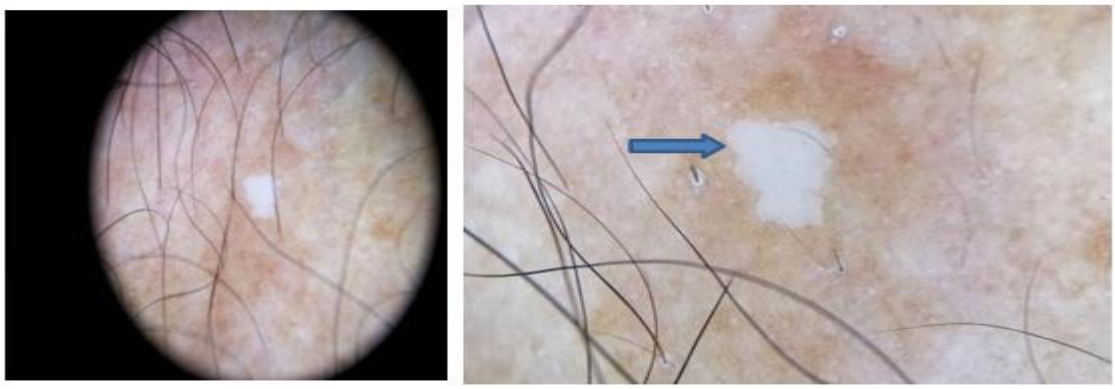

Fig 6a,b: Well depigmented area with peripheries resembling pseudopods of amoeba

7. Discoid lupus erythematosus (DLE) was found in 5 %, Dermoscopic examination of patients with DLE of the scalp (Fig.7 a , b , c). we had disclosed loss of follicular ostia (blue star), follicular keratotic plugs (in red circle), white-brown dyschromia (in blue square) and follicular red dots (in blue eclipse).

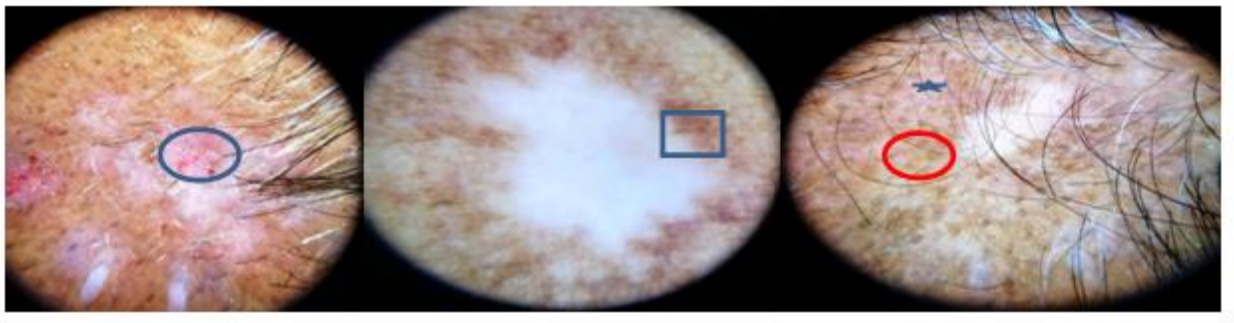

Fig 7 a , b , c : Loss of follicular ostia (blue star), follicular keratotic plugs (in red circle), white-brown dyschromia (in blue square) and follicular red dots (in blue eclipse).

8Exogenous ochronosis: In our dermoscopic examination of patients with exogenous ochronosis, we had found that dermoscopic features of ochronosis showing dark brown globules, elongated and curvilinear-worm like structures abutted together in a reticulate pattern.

9.Pigmented contact dermatitis/riehl's melanosis: In our dermoscopic examination of patients with riehl"s melanosis we had observed that dermoscopy shows diffuse brown color and pseudoreticular network , dots were brown to grey, smaller & more uniformly distributed.

10.Pigmentary demarcation line (PDL): In our dermoscopic examination of PDL over face, we had found exaggerated pseudoreticular network in lesion which was uniform throughout lesions

11.Nevus of ota (NOO): In our dermoscopic examination of patients having NOO, we had detected grey to blue color pigmented lines causing its dermal involvement

12.Macular amyloidosis: Dermoscopic examination of patients with macular amyloidosis showed white central hub surrounded by peripheral brown dots and granules .
13. Lichen amyloidosis: On dermoscopic examination of patients with LA , we had found linearly arranged brown granules , white central hub and grey dots .
14.Lentigines: While performing dermoscopic examination of patients affected with solar lentigines, we had noticed uniform pigment network of light brown color spread throughout the lesion with clear cut demarcation from surrounding skin.
15.Nevus depigmentosus (ND): Dermoscopic examination of patients suffering from ND showed uniform faint reticulate pigmentary network pattern with feathery margin.
16.Lichen striatus (LS): On dermoscopic examination of patient with LS, we had found grey granular pigmentations and a white scar-like line with mild scales on the flesh-colored background.
17.Becker's Nevus: In our dermoscopic examination of patients with Becker's nevus had exposed well-defined pigment network, uniform thickness of lines and perifollicular hypopigmentation.
18.Congenital melanocytic nevus (CMN): We observed following features on dermoscopic examination of patients with CMN such as terminal hairs cobblestone/globular or homogenous pattern or multicomponent pattern, black or brown dots and globules, milia-like cysts crypts and fissures and central hyperpigmentation.
19.Halo nevus: In our dermoscopic examination of patients affected with halo nevus , a regular globular reticular pattern surrounded by a hypopigmented rim was seen.
20.Verrucous epidermal nevus (VEN): While performing dermoscopic examination of patients with VEN we noticed thick brown circles, thick brown branched lines, terminal hairs , brown globules, white and brown exophytic papillary structures and fine scale as well as thick adherent scale.
21.Cutaneous metastatis: On dermoscopic examination of patient with cutaneous metastasis , we have observed white structureless area and bluish white veil more in favor of malignant structure.
22.Seborrheic keratosis: On dermoscopic examination of patients with seborrheic keratosis, we saw dermoscopic features like comedo like openings and milia like cysts.
23.Café-au lait macule (CALM): Dermoscopic examination of patients with CALM.We had revealed uniform thickening of pigment network with lighter brown pigmentation of central rounded areas
24.Pityriasis rosea (PR): On our dermoscopic examination of patients with PR,a number of striking features were observed such as dull red background,white scale color,patchy and peripheral scale distribution and mix of brown and grey pigmentation .
25.Hypertrophic lichen planus (LPH): On dermoscopic examination of patients suffering from LPH ,we noticed features such as peripheral striations, bluish-grey globules ,comedo-like openings and wickham structures.
26.On dermoscopic examination of patients with morphea (Fig.26), we observed whitish fibrotic beams with linear branching vessels crossing the beams.

Discussion

Regarding the most common common pigmentary lesions found in our study.Melasma is an acquired and chronic facial pigmentation, occurring typically on sun-exposed areas, particularly common in females. In dermoscopic examination of total 9 patients (n=9, M:F=2:7) of age group 25-45 years with melasma as shown in figure 1a and 1b, we had observed following features:

A pseudoreticular pigment network (in eclipse) in all 9 patients with diffuse light brown background present in 4 patients (M:F=1:3), while 5 patients (M:F=1:4) showed dark brown background, (Fig 1a , b,c) with sparing of the peri-appendageal region (follicular and sweat gland openings) present in all 9 patients, brown granules (blue arrow) in 4 patients , and globules (bold blue arrow) were present in 5 patients as well as increased vascularity and telangiectasia‟s also well visualized (in rectangle) in 2 patients. These observations were as per the study of Chatterjee and Neema (2018) [9]. While there was perifollicular pigment accentuation present in LPP, and clustering of dots obliterating openings was feature of riehl‟s melanosis. LICHEN PLANUS PIGMENTOSUS (LPP) lesions develop symmetrically over the body, particularly on sun-exposed areas such as head and neck portion. Sometimes, lesions also occur on unexposed parts. Close differentials were riehl‟s melanosis and exogenous ochronosis.In our dermoscopic examination of total 8 patients (n=8, M:F= 2:6) of 25-45 years age group suffering from LPP, we had noticed diffuse brown color (Fig 2 a , b) and pseudoreticular pigment network (blue arrow), peri- appendageal pigment deposition (in circle) and brown to gray dots and globules (in rectangle). Chatterjee and Neema (2018) performed dermoscopic examination of patients with LPP and observed following features: Absence of Wickham striae, diffuse brown color and pseudoreticular pigment network, slate-gray to blue dots and globules, perifollicular and peri-eccrine gray to brown/gray blue pigment deposition, hem like pigment pattern [9].VITILIGO is marked by destruction and absence of melanocytes which is characterized by depigmented macules. It is basically categorized as segmental vitiligo or non-segmental vitiligo/ vitiligo vulgaris. Dermoscopy plays a significant role in the diagnosis of various stages of vitiligo; several dermoscopic features have been considered for evolving vitiligo, a fully evolved vitiligo patch, and repigmenting vitiligo. Dermoscopic features of stable and unstable vitiligo had also been described.In our dermoscopic examinations of total 7 patients (n=7, M:F=3:4) of 25-45 years age group with vitiligo of different stages involving stable as well as unstable vitiligo dermoscopy of progressive or unstable vitiligo studied by Jha et al. (2017) showed a polka dot or confetti like pattern, trichrome pattern, comet-tail pattern and star burst/feathery pattern tapioca or sago grain pattern in normal skin adjacent to a vitiligo lesion had also been recently described in progressive vitiligo which was very much similar to the observations made in our study [10,11].Also, Chatterjee and Neema (2018) reported the occurrence of marginal hyperpigmentation and reticular pigmentation in repigmenting or stable vitiligo perifollicular pigmentation [9].Lichen Planus Hypertrophicus (LPH) usually develops on the extremities, mainly the shins and interphalangeal joints, and tends to be the most pruritic variant. It has close differential with prurigo nodularis and healed lesion with lichen simplex chronicus.Our dermoscopic examination of total 7 patients (n=7, M:F=4:3) of 25-50 years age group suffering from LPH , we noticed features (Fig 4 a , b) such as peripheral striations (blue arrow), bluish-grey globules (bold blue arrow), comedo-like openings (red eclipse) and wickham structures (bold green arrow). Comedo like openings and wickham structures were not present in prurigo nodularis.

Also, the dermoscopic findings obtained from the study of Hanumaiah and Joseph (2019) corroborated with our findings. They carried out dermoscopic examination of 30 cases of LPH, out of which 21 patients were male and 9 patients were female. The mean age of the study group was 43 years (range 10–76 years). The most important dermoscopic finding reported was peripheral striations (in 29 patients; 96.7%) which appear as whitish lines with pearly white areas arranged in a radial fashion. Other most frequent dermoscopic findings were comedo- like openings (26 cases; 86.7%), yellowish structures (16 cases; 53.3%), follicular plugging (16 cases; 53.3%), and blue-grey globules (12 cases; 40%) [12].In Fixed drug eruption , On dermoscopic examination of total 5 patients (n=5, M:F=3:2) of 10-50 years age group affected with FDE, we had found that dermoscopic features were grouped as brown, grey and steel blue dots with perifollicular hypopigmentation, which suggests pigmentary incontinence at various levels (Fig 5 a , b). Some workers (Valdebran et al. 2013) studied FDE and observed that lesions of FDE exhibited black, light-to- dark brown, and steel blue colored dots. All these images when grouped together in a pattern, mimics the image of white dots in the surface of a whale shark [13].Likewise Dermoscopy helped in distinguishing lentigines from freckles and

treatment response. In hypopigmented lesions like vitiligo and Idiopathic guttate hypomelanosis (IGH), dermoscopy was quite useful not only in making diagnosis but also assure clinicians as well as patients. It also provides us a clear idea regarding stage of vitiligo and its treatment response and prognosis. In darker skin phototypes, it helps to differentiate between nevus depigmentosus and vitiligo. In cases of nevi, dermoscopy easily differentiate between becker's nevus and congenital melanocytic nevus and gave remarkable indications about depth of pigmentation. Halo nevus and verrucous epidermal nevus were also well characterized by its dermoscopic patterns and it helps to rule out them from its close differentials. Dermoscopic patterns in cases of cutaneous metastasis were helpful to separate it from common dermatoses and guide patients for its timely management. Moreover, in cases of Discoid lupus erythematosus (DLE), dermoscopy not only discriminate it from close differentials like Squamous cell carcinoma (SCC), but also points about stage of disease and its response to the treatment. In seborrheic keratosis, dermoscopy was quite useful in differentiating it from melanoma and assures both clinicians as well as patients. Additionally, dermoscopy was useful in differentiating Café-au-lait macules (CALM) from other hyperpigmented macular lesions and its syndromic associations. Pityriasis rosea was diagnosed clinically but sometimes when herald patch was at hidden area of body or presentation was atypical, at that time dermoscopy was useful in diagnosis and treatment as well. Pigmentary purpuric disorders with variable presentations were diagnosed with dermoscopy especially in darker skin phototypes. In lichen planus hypertrophicus (LPH), dermoscopy assisted in visualizing not only wickham‟s striae but also its response to treatment and differentiate it from its closest differentials like prurigo nodularis and Lichen Simplex Chronicus. Dermoscopy was also useful in early stages of morphea and its timely management. Therefore, dermoscopy is not only an aid to the provisional diagnosis, it also rules out close differential by its characteristics dermoscopic patterns and specific features, but it has its limits and sometimes we need biopsy to confirm our diagnosis.

Conclusion

Conclusions can be summarized as -

•Dermoscopy may result in confirmation of clinical diagnosis, often avoiding the need for a skin biopsy.

•Dermoscopy can confidently predict disease activity, such as alopecia areata, DLE. Dermoscopy has similarly been found useful for assessing vitiligo stability, which is an essential criterion for surgical intervention.

•Appreciation of the post-treatment effect via dermoscopy often precedes clinical improvement; this is especially true of chronic relapsing, recalcitrant dermatoses like melasma, lichen planus pigmentosus (LPP), vitiligo, alopecias, etc.

•Dermoscopy improves the doctor-patient communication regarding all aspects of skin disease. Explaining the nature of the disorder becomes easier by patients showing the lesional dermoscopic image to the patient.

Conflict of Interest: Nil
Source of support:Nil

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