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Original Research Article

Study of Clinical and Dermoscopic Features of Hypopigmented Lesions: An Observational Study

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Abstract:

Background: Dermoscopy is a relatively new diagnostic modality which has gained importance in diagnosing various skin disorders. Recent studies have suggested its utility in diagnosing hypopigmentary disorders.

Objectives: To study the clinical and dermoscopic features of hypopigmented lesions.

Materials and Methods: Patients who presented to us during the study period with hypopigmented lesions were enrolled in the study according to inclusion and exclusion criteria. Detailed clinical examination of hypopigmented lesions was done. Dermoscopic examination with a handheld dermoscope having 10x magnification using both polarized and non-polarized modes was done. Dermoscopic features studied were pigment patterns, vascular patterns, scales, follicular findings and specific clues.

Results: In this study patients with the following diseases were enrolled: Pityriasis Versicolor, Idiopathic Guttate Hypomelanosis, Vitilgo, Pityriasis Alba, Polymorphous Light Eruption, Nevus Depigmentosus, Hansen's Disease, Pityriasis Lichenoides Chronica and Dyschromatosis Universalis Hereditaria. Reduced pigment network was seen in all the above conditions while absent pigment network was seen only in vitiligo. Scaling was seen mostly in Pityriasis Versicolor, Pityriasis Alba, Polymorphous Light Eruption and Pityriasis Lichenoides Chronica. Well defined margins were seen in Pityriasis Versicolor, Nevus Depigmentosus, Idiopathic Guttate Hypomelanosis while ill-defined margins were seen in Hansen's disease, Pityriasis Lichenoides Chronica, Vitilgo, Pityriasis Alba and Polymorphous Light Eruption.

Conclusion: Dermoscopy can be used as a useful adjunctive tool for the diagnosis for hypopigmented lesions especially where invasive procedures such as biopsy are not desired.

Keywords: Dermoscopy, Dermatoscopy, Surface Microsopy, Hypopigmented lesion, Pigmentary network.

Introduction

A vast and diverse set of dermatological diseases known as "hypopigmentary disorders" are clinically observed as hypopigmented macules. They considerably distress the patient. There is huge social stigma attached to these disorders.[1] Therefore, proper diagnosis and timely management is needed to overcome this problem.

Hypopigmented disorders can be broadly classified into three types, melanocytopenic, which occur due to decreased number of melanocytes in the lesion, melanopenic, which occur due to decreased melanin content in the lesion, and non-melanotic, which are not melanin related.[2] Common disorders which present as hypopigmented lesions over the skin include Pityriasis Versicolor, Idiopathic Guttate Hypomelanosis, Progressive Vitiligo, Pityriasis Alba, Polymorphous Light Eruption, Nevus Depigmentosus, and Hansen's Disease. Rare disorders like Dyschromatosis Universalis Hereditaria, and Hypomelanosis of Ito also present as hypopigmented lesions.

Pityriasis Versicolor is a mild chronic superficial fungal infection caused by Malassezia yeasts. Clinically, it presents as well defined, hyperpigmented, skin-coloured or hypopigmented confluent macules usually over trunk with surface showing fine scaling.[3] Idiopathic guttate hypomelanosis (IGH) is a benign, asymptomatic, leucodermic dermatosis

with an unknown origin that is typically found in older, fair-skinned people.[4]Vitiligo is a common disorder characterized by the presence of hypopigmented and depigmented macules and patches occurring due to destruction of melanocytes.[5] Pityriasis alba is a common, benign skin disorder occurring predominantly on the face (especially the cheeks), arms, and upper trunk, in children and adolescents.[6]

Dermoscopy, also known as dermatoscopy, epiluminescence microscopy, or skin surface microscopy is a technique that is a quick, non-invasive, in-vivo tool to reach a proper diagnosis. So, we conducted this study to describe dermoscopic features of various hypopigmented lesions.

Material & Methods

The study was conducted in a tertiary care centre from April 2021 to September 2022.All age group patients with hypopigmented disorders presenting to skin OPD were included in this observational study. Patients who did not give consent for study, patients who had been previously treated within last 1 month were excluded from this study. After obtaining ethical clearance and consent from the patient, clinically diagnosed hypopigmented disorders were enrolled in the study.

Detailed history including age, sex, duration and number of skin lesion, associated comorbidities and previous treatment history, personal history, family history were obtained. Dermoscopy was done and in case of any dilemma in diagnosis KOH mount and biopsy were conducted.

Methodology: The procedure was explained to the patient in local language. Suspected lesion was thoroughly cleaned with acetone/spirit to remove debris, dirt or external applications. Dermoscopic examination was performed using Dermlite DL 4 [Figure-1] with 10x magnification avoiding any undue pressure by the patient or the examiner.

[Figure-1: Dermlite DL4 and its components]

Instrument was moved back and forth, as well as transversally, to visualize all parts. Initial examination is a "dry examination" (without any interface medium) though later a "wet examination" (using an interface medium) was done using ultrasound gel for better visualization of dermoscopic features. Examination was done in both polarized and non-polarized mode.

All the lesions were examined under the following parameters: pigment network pattern, perilesional hyperpigmentation, perifollicular pigmentation, edges, scaling, vascular network, leukotrichia. Photographs were taken after obtaining informed consent. Dermoscopy findings were correlated with clinical findings. Statistical analysis was done using SPSS software. All data were compiled, tabulated, compared and analysed using standard statistical methods.

Observation and Results

A total of 277 patients were included in the study out of which 174(62.8%) patients were male and 103(37.2%) patients were female. Male to female ratio was 1.68:1.

Most patients were in the 0-14 yr age group i.e., 108 (38.98%) while least patients were in the 30-44 year age group i.e. 28(10.1%). The most common Fitzpatrick skin type observed was Type-IV (168) followed by Type-III (71) and Type-V (38). Pityriasis Versicolor was the most common disease observed (105 cases) followed by Idiopathic Guttate Hypomelanosis (45 cases) and Vitilgo (36 cas-

es).Table-1 showing frequency, mean age, mean Duration and Fitzpatrick skin type of various Hypopigmented disorders.

Table 1: Frequency, Mean age, Mean Duration and Fitzpatrick skin type of various Hypopigmented disorders

Disease	Frequency	Percentage	Mean Age	Mean Duration	Fitzpatrick Skin Type (Most Common)
Pityriasis Versicolor	105	37.9%	24.7	3.14month	TYPE-IV
Idiopathic Guttate Hypomelanosis	45	16.2%	62.5	4year	TYPE-IV
Vitilgo	36	12.9%	26	11.2	TYPE-IV
Polymorphous Light Eruption	24	8.6%	7.5	1.25	TYPE-IV
Pityriasis Alba	24	8.6%	8.25	2.6	TYPE-III
Nevus Depigmentosus	18	6.4%	13.8	Since birth	TYPE-III
Hansen's Disease	12	4.3%	39.7	16.3month	TYPE-IV
Pityriasis Lichenoides Chronica	10	3.6%	8.8	2.8month	TYPE-IV
Dyschromatosis Universalis Hereditaria	2	0.7%	46.5	Since birth	-
Hypomelanosis of Ito	1	0.3%	9	Since birth	-
Total	277				

The most common Pigmentary changes observed on dermoscopy among Pityriasis Versicolor patients was reduced pigmentation, that was seen in all 105 cases followed by scaling in 103 cases (98.09%), perilesional hyperpigmentation in 35 cases(33.3%) and brown globules in 30 cases(28.5%). Out of the observed Pigmentary changes significant association with disease duration was observed in case of brown dots (p=0.0001), perilesional pigmentation (0.005) and perifollicular pigmentation (0.0001).[Table-2][Figure-2(a),(b)]

Table 2: Pigmentary changes of Pityriasis Versicolor observed on Dermoscopy.

Dermoscopic findings	1-3m	4-6m	10-12m	Total	Percentage	p-value
Reduced pigmentation	80	20	5	105	100%	_
Brown dots	5	5	5	15	14.2%	0.0001*
Brown globules	25	5	0	30	28.5%	0.3
Perlesional Hyperpigmentaton	25	5	5	35	33.3%	0.005*
Perifollicular Hyperpigmentation	5	0	5	10	9.5%	0.0001*
Scaling	78	20	5	103	98.09%	0.727

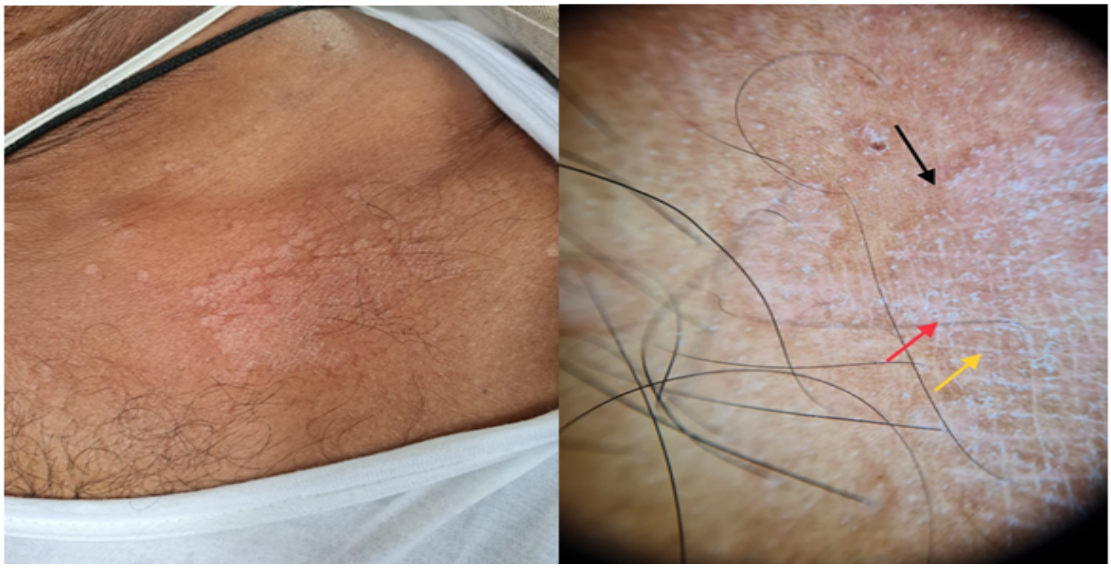

Figure 2: (a) Pityriasis Versicolor(clinical)(b) Pityriasis Versicolor(dermoscopy) showing brown globules (yellow arrow) and scaling (red arrow) and perilesional hyperpigmentation (black arrow), DL4,10x

Out of the 45 cases of Idiopathic Guttate Hypomelanosis observed, the most common finding seen was reduced pigment network in 40 cases (88.8%) followed by well-defined edges in 32 cases (82.7%). Statistically significant association was found between disease duration and all the observed findings. Out of 45 cases of Idiopathic Guttate Hypomelanosis, most common pattern ob-

served was ameboid pattern in 21 cases (46.6%) followed by feathery pattern and petaloid pattern in 14 cases (31.1%) and 7 cases (15.5%) respectively[Figure-3,4(a),(b)].

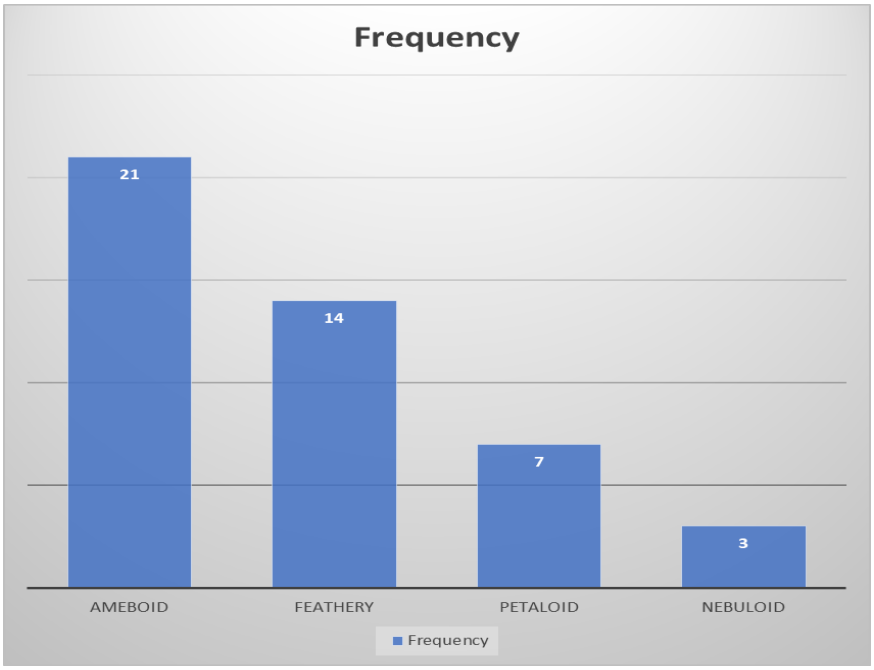

Figure 3: Frequency of specific patterns of Idiopathic Guttate Hypomelanosis observed in dermoscopy.

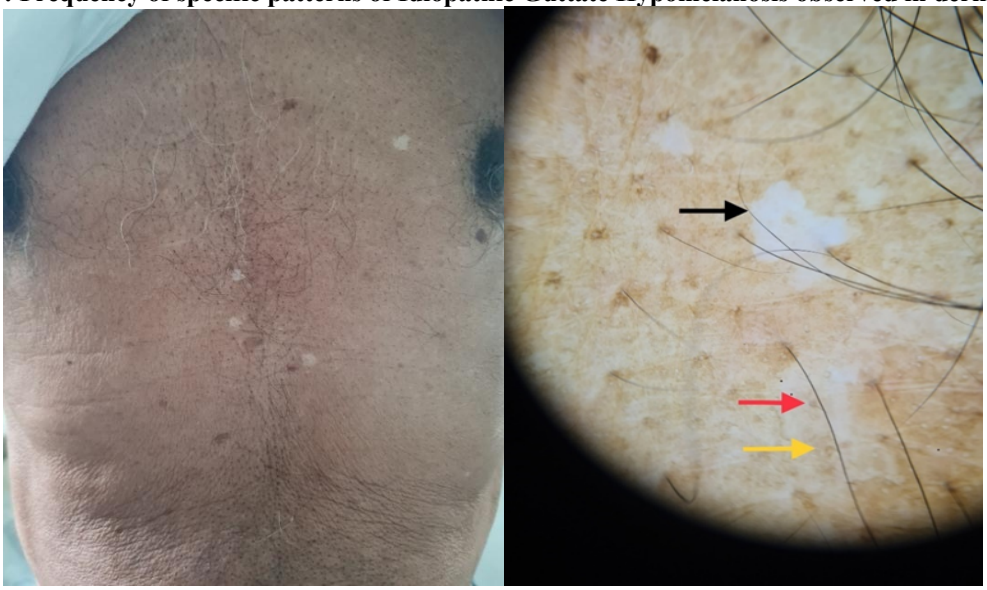

Figure 4: (a) IGH (clinical) (b) IGH (dermoscopy) showing well defined margins (black arrow) and perifollicular hyperpigmentation (red and yellow arrow), DL4,10X

The association between duration of lesions and observed pattern was not statistically significant (p-value= 0.159). [Table-3]

Table 3: Dermoscopic Features of Idiopathic Guttate Hypomelanosis

Dermoscopic Features	1-2 YR	2-3 YR	3-4 YR	4-5 YR	5-6 YR	Total	Percentage	p-value
Reduced Pigment Network	5	10	15	10	0	40	88.8%	<0.0001
Absent Pigment Network	0	0	5	0	5	10	22.2%	<0.0001
Perilesional Hyperpigmentation	5	10	10	5	0	30	66.6%	0.001
Perifollicular Pigmentation	0	5	0	0	0	5	11.1%	0.001
Brown Dots	0	0	0	5	0	5	11.1%	0.001
Brown Globules	5	5	5	10	5	30	66.6%	0.001
Well defined Edges	5	10	14	3	5	37	82.7%	<0.0001

Out of 36 patients of Vitiligo ,most common dermoscopic findings were Reduced Pigmentation and Absent Pigmentation seen in all 36 cases followed by Well Defined edges seen in 15 cases (41,6%) and Brown Globules seen in 13 cases (36.1%).[Table-4][Figure-5(a),(b),(c),(d)]

Table 4: Dermoscopic Features of Vitiligo

Dermoscopic findings	Duration(months)								Total	Percentage	p-value
	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24			
Reduced Pigmentation	1	6	10	8	2	2	1	6	36	100%	-
Absent Pigmentation	1	6	10	8	2	2	1	6	36	100%	-
Brown Dots	0	0	0	4	2	0	0	0	6	16.6%	0.003
Brown Globules	1	5	5	0	0	1	0	1	13	36.1%	0.027
Well Defined Edges	0	2	5	0	0	1	1	6	15	41.6%	0.011
Perilesional Hyperpigmentation	1	5	2	0	0	0	0	0	8	22.2%	0.003
Perifollicular Hyperpigmentation	1	5	0	0	0	1	0	0	7	19.4%	<0.0001
Vasculature	0	0	1	1	0	0	1	5	8	22.2%	0.004

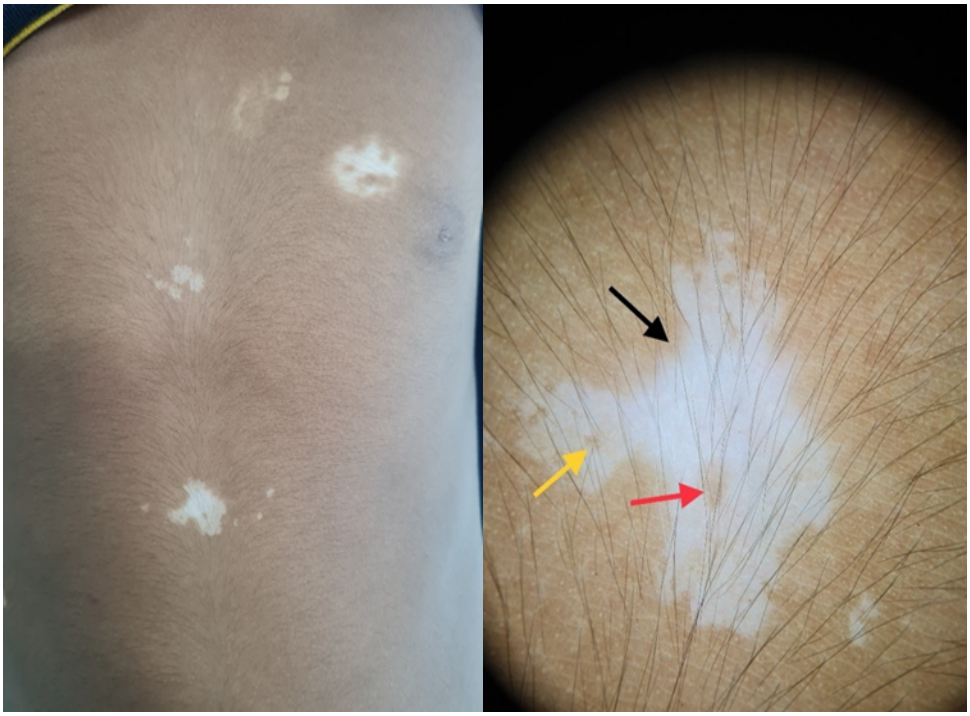

Figure 5: (a) vitiligo (clinical) (b) Vitiligo (dermoscopy) showing brown globules (red arrow), perifollicular hyperpigmentation (yellow arrow) and ill-defined margins (black arrowDL4,10X).

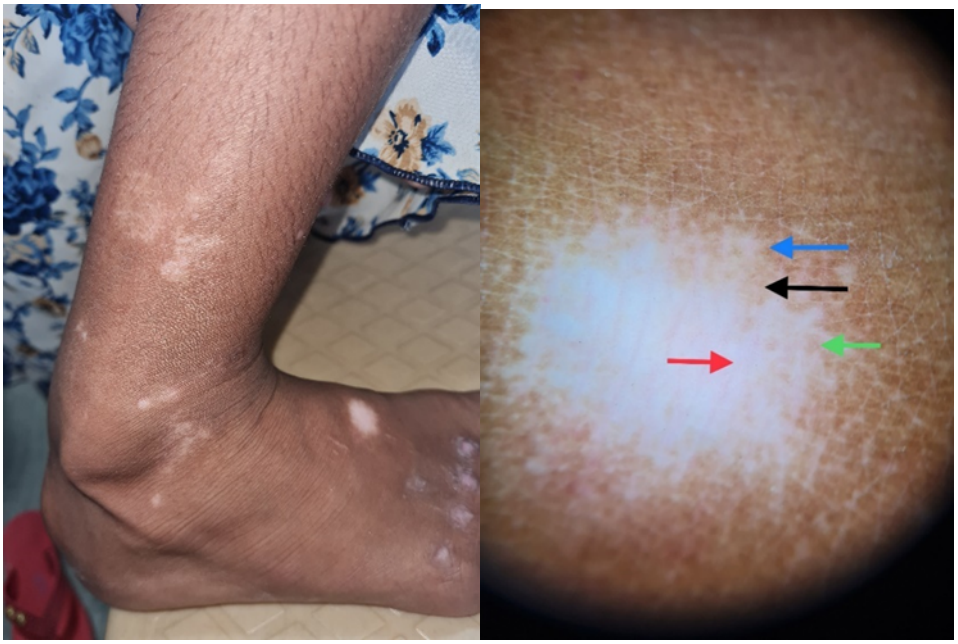

Figure 5: (c) vitiligo (clinical) (d) Vitiligo(dermoscopy) showing brown globules (green arrow), ill-defined margins (blue arrow) and areas of reduced (black arrow) and absent pigmentation (red arrow) DL4,10X.

The association between the observed dermoscopic findings and disease duration was found to be statistically significant (p value < 0.05). Out of the 24 patients Polymorphous Light Eruption , Reduced pigment Network was observed in all cases followed by Ill-defined edges and scaling, both seen in 21 cases (87.5%).[Table-5 and Figure-6(b),(d)]Statistically significant association was observed between disease duration and Brown Globules(p-value=0.014).

Table 5: Dermoscopic Features of PMLE

Dermoscopy findings	Duration(months)			Total	Percentage	P- value
	1	2	3			
Reduced Pigmentation	13	8	3	24	100%	-
Brown Dots	5	3	1	9	37.5%	0.986
Brown Globules	5	8	1	14	58.3%	0.014
Ill-defined edges	13	6	2	21	87.5%	0.123
Scaling	10	8	3	21	87.5%	0.234

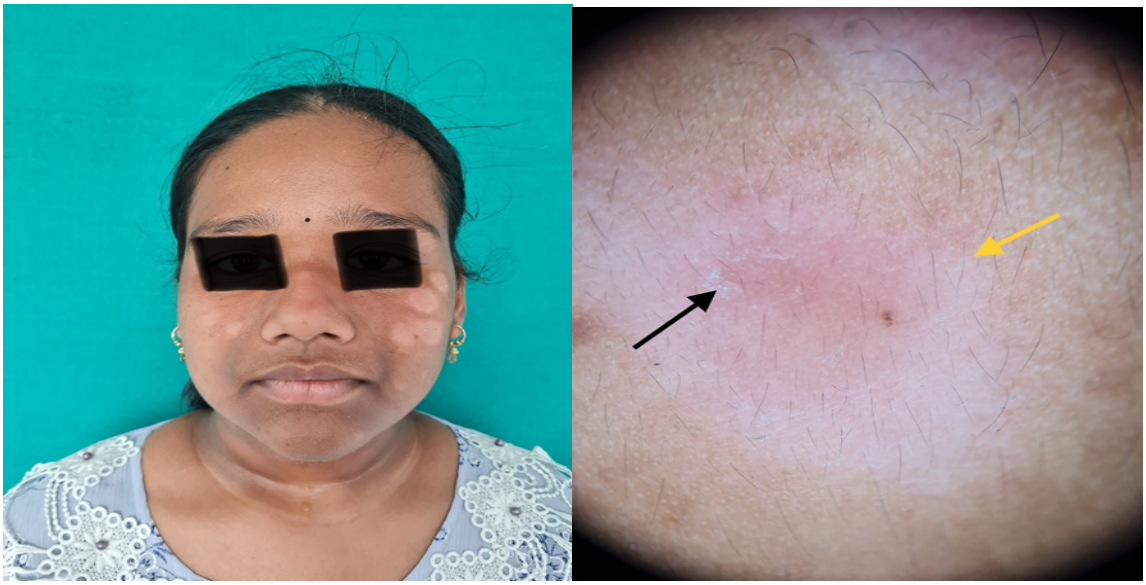

Figure 6: (a) clinical PMLE (b) PMLE (dermoscopy) showing ill-defined borders (yellow arrow) and fine scaling (black arrow, DL4,10X).

In our study, 24 patients of Pityriasis Alba were documented and the most common dermoscopic features observed were Reduced Pigmentation and Ill-defined edges seen in all cases (100%) followed by scaling seen in 19 cases (79.1%). Brown Dots and Brown Globules were seen in 9 cases (37.5%).[Table-6 and Figure-7(b),(d)]Among the dermoscopic features, statistically significant association with disease duration was seen with Brown Dots(p-value=0.006) and Brown globules(p-value=0.025).

Table 6: Dermoscopic Features of Pityriasis Alba

Dermoscopic Findings	Duration (months)			Total	Percentage	p-value
	1	2	3			
Reduced Pigmentation	3	6	15	24	100%	-
Brown Dots	2	5	2	9	37.5%	0.006
Brown Globules	1	5	3	9	37.5%	0.025
Ill-defined Edges	3	6	15	24	100%	-
Scaling	3	5	11	19	79.1%	0.559

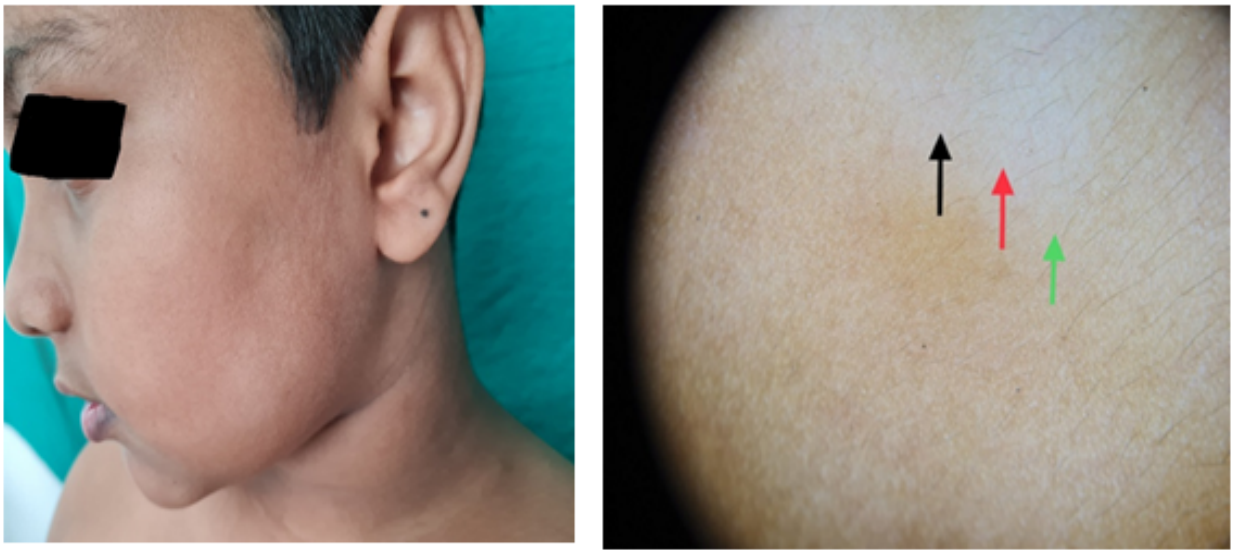

Figure 7: (a)clinical Pityriasis Alba(b) Pityriasis Alba (dermoscopy) showing ill-defined borders (green arrow), fine scaling (red arrow) and reduced pigment network (black arrowDL4,10X)

Out of the 18 patients of Nevus Depigmentosus included in our study, the most common finding observed was Reduced Pigmentation observed in all 18 cases (100%), followed by Well Defined edges and Pseudopod like Extension seen in 9 cases (50%).[Table-7,Figure-8(a),(b)]Out of the observed findings, the association between perifollicular hyperpigmentation and gender was statistically significant(p-value=0.017).

Table 7: Dermoscopic Features of Nevus Depigmentosus

Dermoscopic Findings	Male	Female	Total	Percentage	p-value
Reduced Pigmentation	7	11	18	100%	-
Absent Pigmentation	0	3	3	16.66%	0.130
Brown Dots	4	4	8	44.4%	0.387
Brown Globules	1	3	4	22.2%	0.518
Pseudopod-like extensions	3	6	9	50%	0.629
Well-defined edges	3	6	9	50%	0.629
Perifollicular Hyperpigmentation	3	0	3	16.66%	0.017

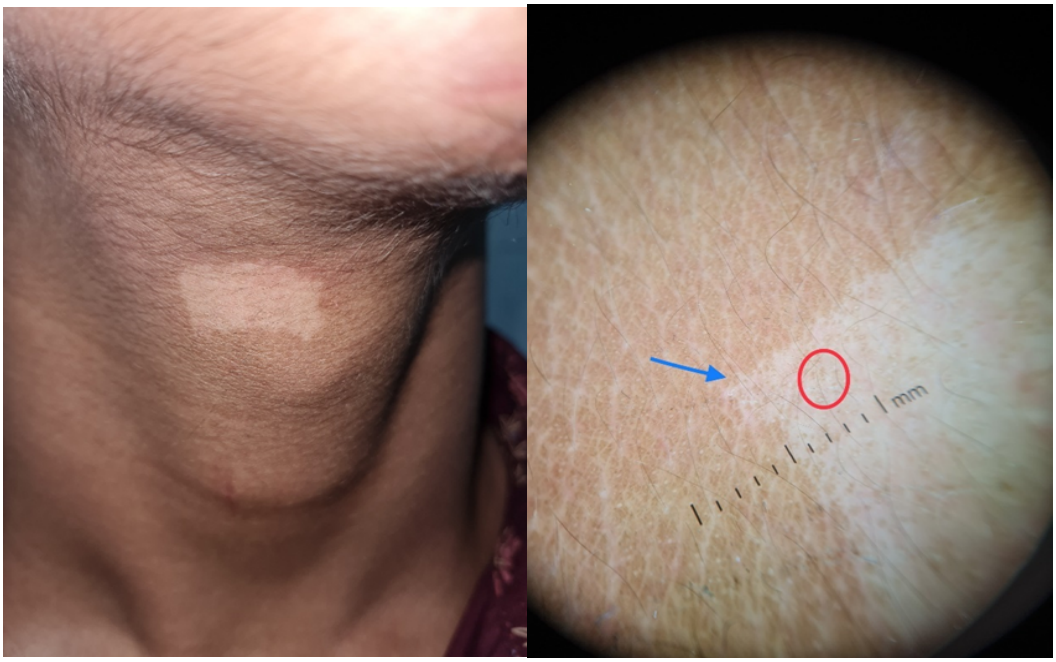

Figure 8: (a) clinical Nevus Depigmentosus (b) Nevus Depigmentosus (dermoscopy) showing well-defined borders (blue arrow) and brown globules (red circle), DL4,10X

In Hansen's Disease patients the most common findings observed in our study were Reduced Pigmentation and Ill-defined edges seen in all 12 cases (100%), followed by scaling seen in 10 cases (83.3%) and Brown Globules seen in 7 cases (58.3%).[Table-8,Figure-9(a),(b)].The association between Brown globules and disease duration was found to be statistically significant(p-value=0.026).

Table 8: Dermoscopic Features of Hansen's disease

Dermoscopic Findings	Duration(months)				Total	Percentage	P-value
	1-6	7-12	13-18	19-24			
Reduced Pigmentation	1	3	3	5	12	100%	-
Brown Dots	1	1	0	1	3	25%	0.243
Brown Globules	1	0	1	5	7	58.3%	0.026
Ill-defined Edges	1	3	3	5	12	100%	-
Perifollicular Hyperpigmentation	0	0	1	4	5	41.6%	0.113
Scaling	1	2	2	5	10	83.3%	0.494

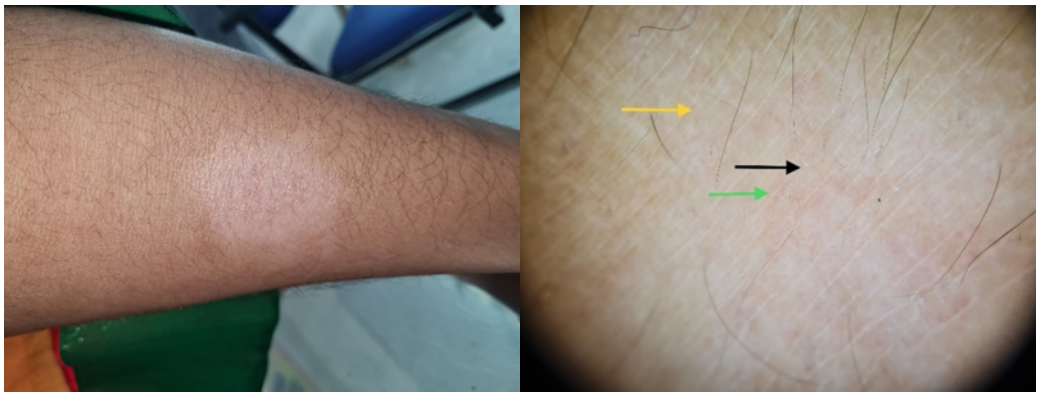

Figure 9: (a)Clinical Hansen's Disease(b) Hansen's Disease(dermoscopy) showing ill-defined borders (yellow arrow), scaling (black arrow) and reduced pigmentation (green arrow)DL4,10X

Out of 10 patients of Pityriasis Lichenoides Chronica included in our study, the most common dermoscopic findings observed were Reduced Pigmentation in all 10 cases (100%) followed by scaling in 7 cases (70%) and Well defined edges observed in 5 cases (50%).[Table-9,Figure-10(a),(b)]

Table 9: Dermoscopic Features of Pityriasis Lichenoides Chronica

Dermoscopic Findings	Duration				Total	Percentage	p-value
	1 month	2 months	3 months	4 months			
Reduced Pigmentation	2	2	2	4	10	100%	-
Brown Dots	2	0	0	1	3	33%	0.093
Well defined edges	2	0	1	2	5	50%	0.261
Scaling	2	0	2	3	7	70%	0.093
Perilesional Hyperpigmentation	0	1	0	2	4	40%	0.414

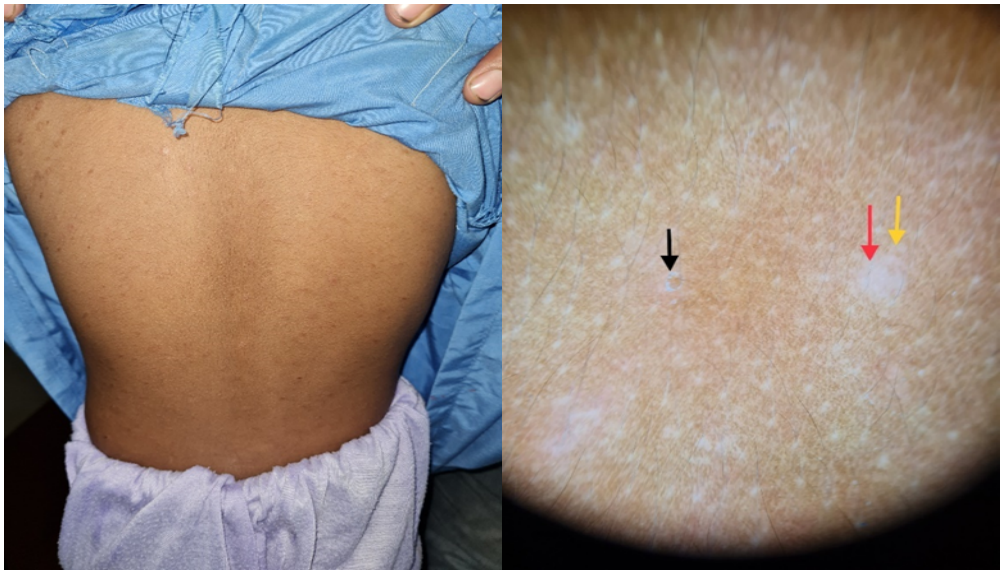

Figure 10: (a) Pityriasis lichenoides Chronica-PLC (b) PLC (dermoscopy) showing scaling (black arrow), brown globules (yellow arrow) and ill-defined edges (red arrow) DL4,10X

In our study, we observed 2 cases of Dyschromatosis Universalis Hereditaria. Both were males, one was 32 years old and the other was 61 years old. Both had a positive family history and presented with multiple hypopigmented macules over trunk and limbs since birth[Figure-11(a)].In both cases we observed a Reduced Pigment Network and brown globules on dermoscopy and in 1 case we observed Perifollicular Hyperpigmentation.[Figure-11(a),(b)]

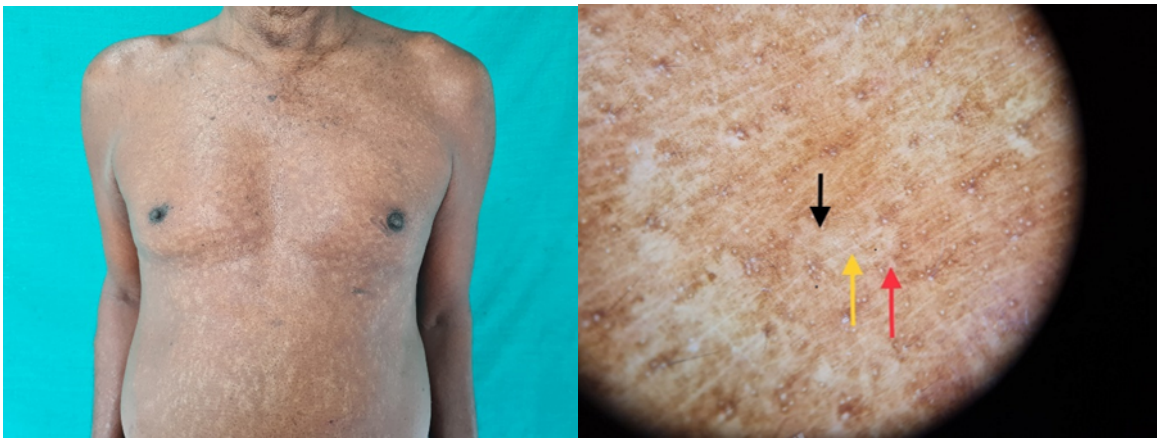

Figure 11: (a) Dyschromatosis universalis hereditaria (b) DUH (dermoscopy) showing brown globules (yellow arrow), well-defined edges (black arrow) and perifollicular pigmentation (red arrow) DL4,10X.

We found 1 case of Hypomelanosis of Ito, who was a 9-year-old male child who presented with multiple discrete to confluent hypopigmented macules over right side of upper back and right limb in a linear distribution[Figure-12(a)].On dermoscopy we observed Reduced pigment network, brown globules and ill-defined edges[Figure-12(b)]. There were no associated systemic features.

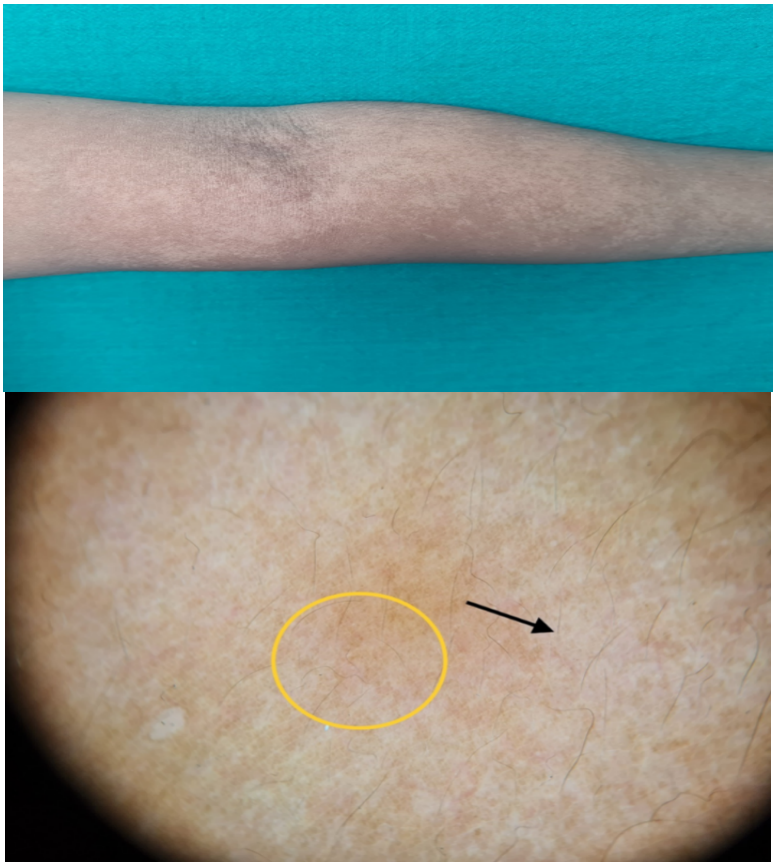

Figure 12: (a)Hypomelanosis of ito(b) Hypomelanosis of ito-clinical(c) Hypomelnosis of Ito (dermoscopy) showing brown dots and globules (yellow circle) and reduced pigmentation (black arrow)DL4,10X.

Discussion

A total of 277 cases of hypopigmented disorders were included in the study. Most common disease documented was pityriasis versicolor (105 cases-37.9%) in contrast to Al-Refu K [7] whose most commonly observed case was vitiligo(48 cases).

The most common pigmentary change observed on dermoscopy among pityriasis versicolor patients in our study was reduced pigmentation seen in all 105 cases similar to Kaur et al.[9] and Mahajabeen et al.[10]Scaling seen in 103 cases (98.09%) whereas Al-Refu K[7]., Mathur et al.[8], Kaur et al.[9] and Mahajabeen et al.[10] reported scaling in 85%, 80%, 88.33% and 42% respectively. Perilesional hyperpigmentation in 35 cases (33.3%) and brown globules in 30 cases (28.5%) were noted.

We found 45 cases of Idiopathic Guttate Hypomelanosis, whereas Al rafu k [7]., Ankad et al.[12] and Harish et al.[11] found 11, 30 and 100 cases respectively.. The most common finding observed was reduced pigment network in 40 cases (88.8%) followed by well-defined edges in 32 cases(82.7%).In our study, perilesional and perifollicular hyperpigmentation was observed in 66.6% and 11.1% cases respectively whereas Harish et al.[11] it was 24% and 15% cases respectively. In our study, most common pattern observed was ameboid pattern in 21 cases (46.6%) followed by feathery pattern and petaloid pattern in 14 cases (31.1%) and 7 cases (15.5%) respectively which is comparable to Ankad et al.[12] who observed ameboid, feathery, petaloid and nebuloid pattern in 46.6%,40%, 23.3% and 3.3% and Harish et al.[11] who observed it in 58.2%, 19.1%, 14.5% and 8.2% respectively.

In our study the most common dermoscopic findings were reduced pigmentation and absent pigmentation in all 36 cases followed by well-defined edges in 15 cases (41.6%) and brown globules in 13 cases (36.1%) which is comparable to Al-Refu K[7].Perilesional Hyperpigmentation in our study was observed in 22.2% cases whereas Al-Refu K[7], Awal et al[13], Jha et al.[14] and Verma et al.[15] observed it in 30%, 28%, 15.4% and 50% cases respectively.

Perifollicular Hyperpigmentation was observed in 19.4% cases whereas Al-Refu K[7], Awal et al[13] , Jha et al.[14] and Verma et al.[15] observed it in 75%, 40%, 43.6% and 44% cases respectively .Vasculature was observed in 22.2% cases whereas Al-Refu K[7], Awal et al[13] , Jha et al.[14] and Verma et al.[15] observed it in 8%, 4%, 11.5% and 86% cases respectively .

Out of the 24 patients polymorphous light eruption included in the study, reduced pigment network was observed in all cases followed by Ill-defined

edges and scaling, both seen in 21 cases (87.5%) which was comparable to Ankad et al.[16] who observed scaling and ill-defined edges in 75% and 70% cases respectively.

In our study, 24 patients of pityriasis alba were documented whereas Al Refu K [7] documented 16 cases. The most common dermoscopic features observed were reduced pigmentation and Ill-defined edges seen in all cases (100%) which is comparable to Al-Refu K [7] and Ankad et al. [16] who observed ill-defined edges in 100% and 86% of cases respectively. Scaling seen in 19 cases (79.1%) which is comparable to Ankad et al.[16] who observed scaling in 83.3% cases while Al-Refu K[7] observed scaling in all cases(100%).

Out of the 18 patients of Nevus Depigmentosus found in the study which was comparable to Sharma et al found 16 cases where as Al-Refu K[7] found 8 cases. The most common finding observed was reduced pigmentation observed in all 18 cases (100%), followed by well-defined edges and pseudopod like extension seen in 9 cases (50%).

Total 12 patients of Hansen's Disease were recorded in our study whereas, Mohta et al.[17] and Chopra et al.[18] found 73 and 50 cases respectively.

Most common dermoscopic findings observed in our study were reduced pigmentation and ill-defined edges in all 12 cases (100%), followed by scaling in 10 cases (83.3%) and Brown Globules in 7 cases (58.3%).

In our study, 10 patients of pityriasis lichenoides chronica presenting with hypopigmented lesions were included. Common dermoscopic findings observed were reduced pigmentation observed in all 10 cases (100%) followed by scaling seen in 7 cases (70%) and well defined edges observed in 5 cases (50%).

2 cases of dyschromatosis universalis hereditaria and 1 case of hypomelanosis of ito were documented.

Limitation: More number of patients (sample size) are required to see the different dermoscopic features. If histopathological examination could have done than specific dermoscopic picture of hypopigmented lesions can be documented. Another limitation is that lesions could not be observed at higher magnifications due to handheld dermoscope. Follow-up of dermoscopy of these lesions that is prospective studies are needed.

Conclusion

Dermoscopy may assist in the diagnosis while avoiding invasive and frequently disfiguring procedures like biopsy. From this study we conclude certain dermoscopic characteristics which are specific to certain hypopigmented macular disorders. However, some of the dermoscopic findings in these hypopigmented diseases were non-specific. Therefore, these dermoscopic findings should always be evaluated in conjunction with data obtained from the history and detailed clinical examination of the patient. More number of cohort studies are needed to know detailed dermoscopic pattern of various hypopigmented disorders.

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