

ROLE OF DERMOSCOPY IN TOPICAL STEROID DEPENDENT/DAMAGED FACIES

**Dr Joseph Jenson J¹, Dr Saranya M², Dr Arishta Bala^{3*}, Dr Nithya Priyadharshini S⁴,
Dr Gokul R⁵, Dr Roshini R⁶**

¹Associate Professor, Department of Dermatology, Venereology and Leprosy, Shri Sathya Sai Medical College and Research Institute-603108, Sri Balaji Vidyapeeth (Deemed to be University)

ORCID ID: 0000-0002-1109-6445

²Associate Professor, Department of Dermatology, Venereology and Leprosy, Shri Sathya Sai Medical College and Research Institute-603108, Sri Balaji Vidyapeeth (Deemed to be University)

ORCID ID: 0000-0002-8396-9356

^{3*}Assistant Professor, Department of Dermatology, Venereology and Leprosy, Shri Sathya Sai Medical College and Research Institute-603108, Sri Balaji Vidyapeeth (Deemed to be University) (Corresponding Author)

ORCID ID: 0009-0009-0769-2461

⁴Professor, Department of Dermatology, Venereology and Leprosy, Shri Sathya Sai Medical College and Research Institute-603108, Sri Balaji Vidyapeeth (Deemed to be University)

ORCID ID: 0000-0002-0565-8931

⁵Assistant Professor, Department of Dermatology, Venereology and Leprosy, Shri Sathya Sai Medical College and Research Institute-603108, Sri Balaji Vidyapeeth (Deemed to be University)

ORCID ID: 0009-0000-9882-7580

⁶Senior Resident, Department of Dermatology, Venereology and Leprosy, Shri Sathya Sai Medical College and Research Institute-603108, Sri Balaji Vidyapeeth (Deemed to be University)

ORCID ID: 0009-0007-6648-0309

ABSTRACT:

Background: Topical Steroid Dependent Facies (TSDF) is defined as perpetual usage of topical corticosteroids causing irreparable damage to skin which is long lasting. A novel way of detecting these changes can be through Dermoscopy as its a non invasive diagnostic tool.

Objectiv: To compare the clinical and dermoscopic characteristics of TSDF and thereby identify the correlation between potency and duration of topical corticosteroid application.

Methods: Two hundred and twenty patients (n=220) above 18 years with history and clinical features suggestive of TSDF for more than three weeks were included in this study. Using a structured proforma, demographic details, clinical and dermoscopic details were noticed.

Results: Among 220 people, 68 patients (30.90%) were males and 152 patients (69.10%) were female. Hyperpigmentation was seen in 164 patients (74.54%), scaling with desquamation of skin in 89 patients (40.45%), erythema in 82 patients (37.27 %) were the most common clinical findings. Among the dermoscopic findings, Brown globules and dots were seen in 193 patients (78.64%), Desquamation in 128 patients (58.18%), Red diffuse areas in 102 patients (46.36%) followed by hypertrichosis in 98 patients (44.54%).

Conclusion: TSDF can be useful in differentiating this from other causes of red face. Dermoscopy can predict the warning signs earlier that can hamper the appearance of irreversible changes caused

How to cite this article: Jenson JJ, Saranya M, Arishta B, Priyadharshini SN, Gokul R, Roshini R, ROLE OF DERMOSCOPY IN TOPICAL STEROID DEPENDENT/DAMAGED FACIES. Int J Drug Deliv Technol. 2026;16(4s): 335-343; DOI: 10.25258/ijddt.16.4s.44

INTRODUCTION:

Dermatology has a wide range of therapeutics in which Topical Corticosteroids play a pivotal role in treating miscellaneous conditions. Since its inception in 1952, by Sulzberger¹ as compound F it has ranged from various potencies that include super potent to mild. The usage of corticosteroids increased when they used to produce hypopigmentation in a shorter period of time compared to other depigmenting agents. So topical

corticosteroids have always been a double edged sword in therapeutics adding to its anti pruritic, anti inflammatory and its tussle in the alteration of pigmentation^{2,3}. The Indian market has around eighteen different molecules of topical corticosteroids. They are easily available over the counter. The menace is that it is used for a longer duration which results in variety of cutaneous changes that results in the face becoming markedly red⁴. Dermatologists face a mammoth task in

treating these patients as a variety of clinical features are encountered. The clinical features include hyperpigmentation, acneiform eruptions, atrophy, wrinkling, steroid rosacea, hypertrichosis, dermatitis rosaceaformis steroidica⁵. In order to prevent these complications, one needs to intervene at an early stage. Dermoscopy in the current era is really useful as it can foreshadow various findings such as Brown globules, Red diffuse areas, white structureless areas, scaling and atrophy⁶. This study was undertaken to compare the clinical and dermoscopic features of TSDF. Along with this the duration of usage and potency of steroids were compared with the clinical and dermoscopic findings.

MATERIALS AND METHODS:

In this study, patients who were 18 years and above who presented to Dermatology OPD at Shri Sathya Sai Medical College and Referral Institute with symptoms and signs indicative of TSDF(itching, acne, redness, burning, photosensitivity, atrophy) along with those patients who were using topical corticosteroids more than 3 weeks were included. Written informed consent was acquired. Those patients who were on treatment with oral corticosteroids, endocrinological conditions such as PCOS ,Cushings syndrome and Polycystic Ovaries were excluded from the study. IEC approval was obtained before commencing the study. Sample size of 110 were calculated by z^2pq/d^2 in which $z= 1.96$ with 95% confidence interval, $p=82\%(0.82)$, $q=0.18$, $d=6.2$. Using a structured proforma, data collected comprised of demographics, duration of topical steroid used along with the prescription were noted. In this study, literacy factor was taken into account and a person was termed literate when they were able to read and write in any language they knew. In patients who were using multiple steroids, the steroid with highest potency was considered. But when accountable for duration, the steroid which was used for more than 3 weeks was included rather than the potency. Dermoscopy was done in patients after obtaining consent. Both polarised and non polarised modes were used. The images were captured with I phone 12 and the dermoscopy used was Dermlite DL-200 in 10x magnification. Data collected were analysed using SPSS 21 software.

RESULTS:

220 patients were included in this study, out of which 68 patients(30.90%) were male and 152 patients(69.10%) were female with the ratio of 1:2.2 . Among the age groups, 104 patients(47.27%) belonged to 18 to 27 years old followed by 72 patients(32.72 %) who belonged to 28 to 37 years old. The mean age group in the study was 29.2 years. Among the literacy

, 184 patients(83.63%) were literate and 36 patients(17.37%) have not received any form of education. Among the presenting complaints, hyperpigmentation was present in 164 patients(74.54%), itching accountable to 152 patients(69.09%), acne were noticed in 124 patients(56.36%), redness in 96 patients(43.63%) and hypopigmentation in 33 patients (15%). Duration of topical corticosteroids applied ranged from 3 weeks to 5 years with 52 patients(23.63%) were using topical corticosteroids for more than six months. Among the source of suggestions 72 patients(32.7%) were recommended by the pharmacist, 62 patients(28.2%) were by their friends/ relatives recommendation, 38 patients(17.2%) were recommended by the people working at parlour , 20 patients(9.1%) were using based on prescriptions from doctors of other specialities, 20(9.1%) patients were from prescriptions from practitioners of alternative medicine. 8 patients (3.6%) were using topical steroids which were prescribed by dermatologists beyond their time of advise. Among the potency of steroid, they were divided into two classes, one group using superpotent/ potent steroids were 84 patients (38.18%) and those using mid potent steroids were 136 patients(61.81%). The data are included in Table 1

Table 1
DEMOGRAPHIC DATA

PARAMETER	VARIABLES	NUMBER(PERCENTAGE)
AGE IN YEARS	18-27	104(47.27%)
	28-37	72(32.73%)
	38-47	36(16.36%)
	48-57	8(3.64%)
GENDER	MALE	68(30.90%)
	FEMALE	152(69.10%)
LITERACY STATUS	LITERATE	184(83.63%)
	ILLITERATE	36(17.67%)
STATUS OF APPLICATION OF TOPICAL STEROIDS	TOPICAL APPLICATION MORE THAN 3 WEEKS AND LESS THAN THREE MONTHS	30(13.63%)

	TOPICAL APPLICATION MORE THAN THREE MONTHS AND LESS THAN SIX MONTHS	138(62.74%)
	TOPICAL APPLICATION MORE THAN SIX MONTHS	52(23.63%)
SOURCE	PHARMACISTS	72(32.7%)
	FRIENDS/RELATIVES	62(28.2%)
	BEAUTICIAN	38(17.3%)
	PRESCRIPTION FROM OTHER SPECIALISTS	20(9.1%)
	ALTERNATIVE MEDICINE PRACTITIONERS	20(9.1%)
	DERMATOLOGISTS	8(3.6%)



Figure 1: reveals exaggeration of wrinkles with hypertrichosis with erythematous papules over the cheek



Figure 2: Multiple comedones with an erythematous hue present over the face with mild scaling present over the papules

On clinical examination, Facial melanoses including melasma was noticed in 54 patients (24.5%) and Acne was noticed in 52 patients (23.63%). The underlying reasons for which the patients used topical steroids encompassed people who used fairness creams were 124 patients (56.36%), regular night creams were 54 patients (24.54%). Further 20 patients(9.09%) were using topical corticosteroids for tinea involving the face. Out of various clinical findings, hyperpigmentation(164 patients 74.54 %), acneiform eruption(), erythema(), hypopigmentation in 66 patients, 30%) were the most common clinical findings. Other essential clinical findings included telengectasia in 46 patients(20.90%), hypertrichosis in 28 patients(12.72%) and wrinkles in 12 patients (5.45%). The clinical pictures are encompassed in figures 1 to 5.



Figure 3: Diffuse hyperpigmentation involving malar, perioral, nasal and periorbital area



Figure 4: Atrophic scarring with desquamation of skin with crusting and hypertrichosis noticed



Figure 5: Desquamation with atrophy noticed over the hyperpigmented scaly plaque over the face

The dermoscopic findings were classified based on few variables such as pigmentation, vascularity and adnexal changes. Pigmentary changes included Brown pigmentation which includes both globules and dots in 193 patients (78.64%), White structureless areas in 92 patients (41.81%), Desquamation in 128 patients (58.18%). Vascular changes included Linear vessels in 41 patients (18.63%) and Branching vessels in 29 patients (13.18%). Adnexal structures findings included Hypertrichosis in 98 patients (44.54%), Follicular plugging in 21 patients (9.54%). Other miscellaneous findings comprised of comedones in 23 patients (10.45%), papules in 55 patients (25%) and pustules in 31 patients (14.1%). The dermoscopic pictures are attached in figures 6 to 11.

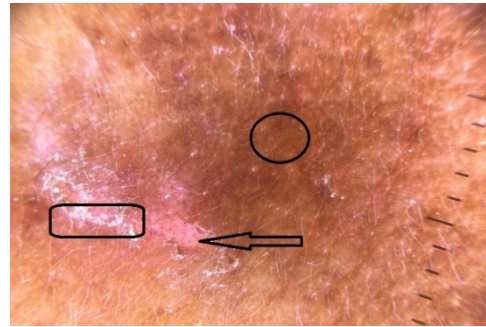


Figure 6: Black circle reveals brown globules and dots in a dark brown background
Black rectangle revealing areas of desquamation
Black arrow represents diffuse red areas with vessels interspersed within

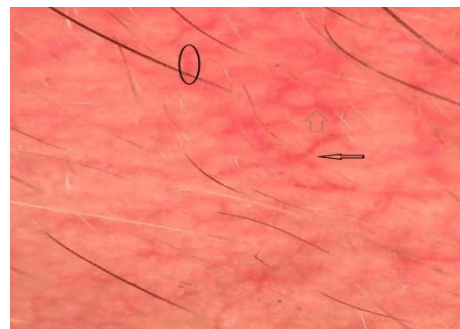
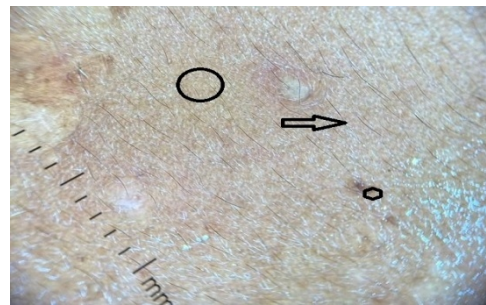


Figure 7: Black oval indicates linear vessel without branching
Black arrow reveals transverse branching vessel
Brown arrow reveals branching interconnected vessel



reveals brown dots and globules
Black arrow reveals hypertrichosis
Black heptagon reveals follicular plugging

Figure 8:
Black circle

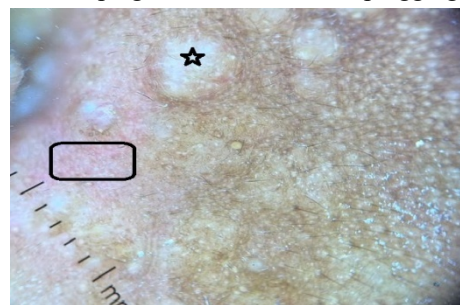


Figure 9- Black star reveals white structureless areas
Black rectangle reveals diffuse red areas

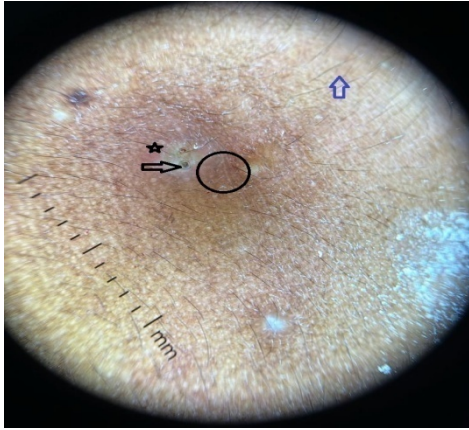


Figure 10- Black arrow indicates comedones
 Black star reveals diffuse red areas
 Blue arrow represents hypertrichosis
 Black circle represents brown unpatterned pigmentation

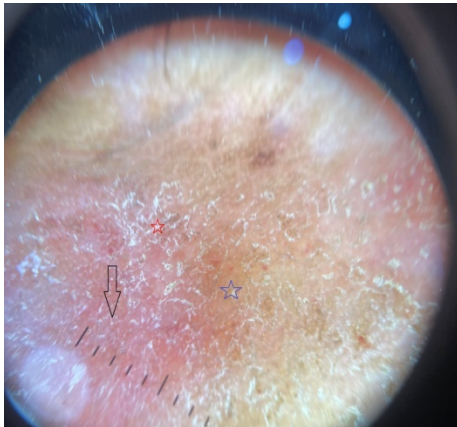


Figure 11- Black arrow represents areas of erythema
 Red star indicates areas of desquamation and scaling
 Blue star reveals focal globules of brown pigmentation

Clinical findings along with dermatoscopic findings were compared through various parameters such as duration of topical corticosteroids used, potency of the topical steroid and age of the patient using statistical tests such as Fishers exact test and Chi square test. Among the association of duration of topical corticosteroid and dermatoscopic findings, brown pigmentation which corresponded to hyperpigmentation in dermoscopy(p value-0.0063), atrophy which was analogous to white structureless areas in dermoscopy(p value-0.0023) and erythema which represented red diffuse areas(p value-0.0199) dermatoscopically were significant. Among the potency of topical corticosteroids, Desquamation had a positive correlation to both mid potent and super potent steroids(p value-0.018).When the clinico-dermoscopic correlation were assessed, positive correlation was

evident for all except to papular, pustular and comedonal lesions. The details are attached in Table 2

Table 2
ASSOCIATION OF DURATION OF APPLICATION OF TOPICAL CORTICOSTEROIDS WITH DERMOSCOPY FINDINGS IN PATIENTS(n=220)

VARIABLES	DURATION UPTO THREE MONTHS(n=30)	DURATION MORE THAN THREE MONTHS AND LESS THAN SIX MONTHS (n=138)	DURATION MORE THAN SIX MONTHS (n=52)	Pvalue
PIGMENTARY ALTERATION				
Brown pigmentation(globular and unpatterned)	21(70%)	125(90.57%)	47(90.38%)	0.0063
White structureless areas	8(26.7%)	52(37.68%)	32(61.53%)	0.0023
Desquamation	23(76.67%)	77(55.79%)	28(53.84%)	0.0199
VASCULARITY				
Red diffuse areas	7(23.33%)	67(48.55%)	28(53.84%)	0.0199
Linear pattern	2(6.66%)	17(12.31%)	22(42.30%)	<0.001
Branched pattern	1(3.33%)	12(8.69%)	16(30.76%)	<0.001
ADNEXAL FINDINGS				

Hypertrichosis	11(36.67%)	59(42.75%)	28(53.84%)	0.2523
Follicular plugging	2(6.66%)	12(8.69%)	7(13.46%)	0.5151
Demodex tails	1(3.33%)	2(1.44%)	2(3.84%)	0.5619
Comedones	3(10%)	15(10.86%)	5(9.61%)	0.9651
MISCELLANEOUS				
Papules	6(20%)	41(29.71%)	8(15.38%)	0.1004
Pustules	4(13.33%)	21(15.21%)	6(11.53%)	0.8030

DISCUSSION:

In India the availability of topical corticosteroids is at ease over the counter. In the quest of attaining a glowing and flawless skin , people use topical steroids where faster results are obtained⁷. Saraswathi et al, published that constant use of topical corticosteroids for a longer period resulted in symptoms such as burning, itching, redness, photosensitivity and pigmentation which paved the way for terming TSDF and the symptoms mentioned above were signified as their typical traits⁸.Owing to its important action as an anti inflammatory agent, topical steroids were used to treat many common dermatoses in face. However, its rampant usage resulted in thinning of epidermis, with considerable damage to the reticular dermis and collagen⁹

In our study the common age group involved were 18 to 27 years that accounted to 104 patients(47.27%). This finding is similar to other studies in which half of the study participants were in the age group of 18-30^{4,7,8}.Similar to other studies female predominance (152 patients,69.10%) was noticed in our study^{7,8,10,11,12}.Females have a higher concern for cosmetics. Adding to the societal pressure, their eagerness to become more fair results in inadvertent utilisation . Regarding to educational status, we perceive that illiterates may abuse topical corticosteroids compared to literates. However on contrary, similar to other studies, people who were educated(184 patients,83.64%) abused these products more^{10,11,12}This misconception is due to the fact that educated people are oblivious and get entangled in the usage of topical corticosteroids.

The symptoms noted in this study are due to dilation of blood vessels coupled with cytokine release which results in burning sensation, pruritus. There is agglomeration of nitric oxide with longer usage

resulting in erythema and telengectasia⁴. In our study, the source of recommendation were most by the pharmacists(72 patients, 32.7%) which was similar to Mamatha et al¹³. With regards to potency of topical steroids, triple combinations which contain potent steroids with retinoids and hydroquinone are the most commonly misused products leading to overdependence of steroids.Lu et al^{14,15} and few other studies reported that the most common topical corticosteroid abused were superpotent topical preparations.20 patients(9.1%) were using topical steroids based on prescription from other specialists which were given for other sites in body. When the beneficial effect of steroids were noticed, patients themselves started using over the face.

Clinical examination revealed Hyperpigmentation(164 patients,74.54%) was the most common finding, followed by scaling and desquamation(89 patients,37.37%). These were in contrast to Sethi et al¹¹who revealed erythema(81%), hypertrichosis(68%) and telengectasia(47%). In our study clinically erythema accounted to 82 patients(37.77%) and hypertrichosis was noticed in 66 patients(30%). Tatu et al⁶revealed telengiectasia was their most common finding.

Dermoscopy acts as an excellent tool in diagnosing minor changes in the skin even before when they are clinically evident. The early signs that were detectable before the appearance of clinical signs included white structureless areas(41.81%), vessel patterns that encompassed both linear and branching vessels(31.81%) and desquamation(58.18%). These features could be reversed easily with early identification of topical steroid and thereby preventing the complications associated with it.

The analysis of the association of the duration of the topical corticosteroid application with dermoscopic findings clearly demonstrates important insights, especially in the field of pigmentary alterations and vascular changes. Among the pigmentary alterations, brown pigmentation(78.64%) correlates significantly with the duration of corticosteroid usage.(p=0.0063). This implies, that with increased utilisation for more than three months,brown dots and globules predominate. Since brown globules in a light to dark brown background are dermoscopic features of melasma, the lack of vascular components differentiate melasma from TSDF¹⁶. Under vascular findings, the p-value is 0.0199, which is quite significant for red diffuse areas, thereby indicating a strong association with the duration of application more than three months. Even stronger is the

association with linear and branched vascular patterns, which indicate highly significant p-values (both less than 0.0001). Sethi et al¹¹, demonstrated the presence of brown globules(96.2%), red diffuse areas(92.4%) with vascular patterns showing linear and branched vessels that accounts to 87.17%.Due to the thickness of male skin and androgenic effects, the effects of topical corticosteroids get diluted resulting in fine vessels. Females on the other hand revealed branching pattern of vessels^{17,18}. However in our study, there was no vessel pattern discrepancy amidst gender. Nevertheless in our study, linear vessels were observed in patients using mid potent steroids and branching vessels were noticed in patients using more than 6 months of steroid usage. But there was no statistical correlation. Significant positive correlation (p = 0.0004) was seen between hyperpigmentation in the patient and brown pigmentation via dermoscopy, inferring that the later could identify subclinical pigmentation. Similarly, strong association was noted between the clinical telangiectasia and vessel patterns on dermoscopy (p = 0.0022),implying that early vessel changes can be identified using dermoscopy. Also statistical significance was obtained for hypertrichosis(p=0.0016) and desquamation(p=0.0002), in which dermoscopy could diagnose these features much before their clinical appearances. Table 3 includes the association of topical steroid potency with dermoscopic findings.

Table 3
ASSOCIATION OF POTENCY OF TOPICAL CORTICOSTEROIDS WITH DERMOSCOPY FINDINGS IN PATIENTS(n=220)

VARIABLES	MID POTENCY STEROIDS USAGE(n=136)	SUPERPOTENT/HIGH POTENCY STEROID USAGE(n=84)	P value
PIGMENTARY ALTERATION			
Brown pigmentation(globular and unpatterned)	117(86.02%)	76(90.47%)	0.444

White structureless areas	50(36.76%)	42(50%)	0.073
Desquamation	88(64.70%)	40(47.61%)	0.018*
VASCULARITY			
Diffuse red areas	62(45.58%)	40(47.61%)	0.877
Linear pattern	30(22.05%)	11(13.09%)	0.139
Branched pattern	13(9.55%)	16(19.04%)	0.139
ADNEXAL FINDINGS			
Hypertrichosis	64(47.05%)	34(40.47%)	0.415
Follicular plugging	16(11.76%)	5(5.95%)	0.234
Demodex tails	4(2.94%)	1(1.19%)	0.703
Comedones	16(11.76%)	7(8.33%)	0.561
MISCELLANEOUS			
Papules	36(26.47%)	19(22.61%)	0.631
Pustules	21(15.44%)	10(11.91%)	0.594

Patients presenting with features of itching, pigmentation and redness should be differentiated from other causes of red face such as seborrheic dermatitis, contact dermatitis and tinea faciei. Since their clinical presentation is similar, dermoscopy can help in differentiating from other causes. The non invasive nature of dermoscopy can provide explanation regarding the alarming nature of topical steroids. One limitation of study is the deficiency of histopathological correlation. Chinmoy et al, in his study mentioned that 62.5% patients avoided chemical sunscreens, owing to additional damage induced on an altered skin. Thereby, patients were advised bland emollients which are less prone to cause contact dermatitis. Comparison of clinical and dermoscopic findings were quite important since dermoscopic findings

could precede clinical signs. In our study, significant positive correlation ($p = 0.0004$) was seen between hyperpigmentation in the patient and brown pigmentation via dermoscopy, inferring that dermoscopy captures even subclinical alterations in pigmentation. Use of hybrid dermoscopes involving both polarised and non polarised modes can help in detecting both superficial and deeper pigmentary changes can aid in early diagnosis¹⁹. Similarly, strong association was noted between the clinical telangiectasia and vessel patterns on dermoscopy ($p = 0.0022$), thereby suggesting that vascular changes not often apparent under routine clinical examination can also be identified using dermoscopy. Clinical and dermoscopic hypertrichosis also demonstrated a significant correlation ($p = 0.0016$), highlighting dermoscopy's utility in detecting subtle hair growth abnormalities. Likewise, scaling and dermoscopic desquamation showed a strong correlation ($p = 0.0002$). A strong association between pustular eruptions and dermoscopic pustules ($p = 0.0042$) was noticed. Finally, a high correlation of $p < 0.0001$ was also found between clinical atrophy and dermoscopic white structureless areas, which correlates that dermoscopy can detect atrophy at an early stage before clinical presentation. The clinic-dermoscopic findings are mentioned in Table 4

Table 4
CORRELATION OF CLINICO DERMOSCOPIIC FINDINGS

S. No	CLINICAL FINDINGS	Number of patients with percentage n=220	DERMOSCOPIIC FINDINGS	Number of patients with percentage n=220	P value
1	Hyperpigmentation	164(74.54%)	Brown pigmentation	193(87.73%)	0.0004
2	Erythema	82(37.27%)	Red diffuse areas	102(46.36%)	0.0532
3	Telangiectasia	42(19.09%)	Vessel pattern (linear and branched)	70(31.81%)	0.0022

4	Hypertrichosis	66(30%)	Hypertrichosis	98(44.54%)	0.0016
5	Scaling	89(40.45%)	Desquamation	128(58.18%)	0.0002
6	Papular eruptions	52(23.63%)	Papules	55(25%)	0.7389
7	Pustular eruption	13(5.90%)	Pustules	31(14.09%)	0.0042
8	Comedones	21(9.54%)	Comedones	23(10.45%)	0.7506
9	Atrophy	2(0.90%)	White Structureless areas	92(41.81%)	<0.0001

One of the closer differentials for TSDF is rosacea. Clinically both are indistinguishable. However, dermoscopy differentiates from rosacea by the presence of hypertrichosis, atrophy, white structureless areas and white hairs in TSDF. Thus, dermoscopy not only increases the suspicion, but also its pictorial representation can make patient understand the threats of topical steroid abuse.

CONCLUSION:

TSDF has diverse clinical manifestation that range from mild desquamation to severe atrophy. In the journey of attaining fairer complexion, ruthless use of topical steroids have resulted in clinical adversities. Since the clinical presentation has closer resemblance to many dermatological conditions that involve red face, dermoscopy can aid in diagnosing both pigmentary and vascular alterations establishing its firmness in diagnosis. However, lack of histopathological evidence is the one of the self limiting factor in this study which is cross sectional in nature. Dermoscopy also has been helpful in determining the severity and prognosis, thereby educating the patient the warning signs of topical steroid abuse.

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