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Dermoscopic Findings Of Topical Steroid Damaged Face: An Observational Study

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Abstract

Topical steroid-dependant/damaged face (TSDF) is the semi-permanent or permanent damage to the facial skin precipitated by the prolonged use of topical corticosteroid (TCS), resulting in various cutaneous signs and symptoms and psychological dependence on the drug. Dermoscopy can help in the early detection of subclinical signs of TSDF by depicting characteristic features.

Objective

To observe the various dermoscopic features of TSDF patients for early and accurate diagnosis.

Materials and methods

It is an observational cross-sectional study involving 50 patients of TSDF aged 18-60 years of either gender who attended the dermatology OPD in a tertiary health center over six months. The patients were evaluated dermoscopically, and observations were evaluated for a conclusion.

Results

Female to male ratio was 7.3:1. Mean age of TCS abuse was 32.1±7.9 years. The duration of TCS usage ranged from one month to more than ten years. The clinical findings were hyperpigmentation (96%), erythema (92%), telangiectasia (74%), hypertrichosis (42%), wrinkling (40%), hypopigmentation (36%), atrophy (30%), pustules (30%), white hair (20%), scaling (10%), tinea (6%). Dermoscopic findings were brown globules (100%), diffuse red area (84%), hypertrichosis (54%), breaking of pseudoreticular network (52%), white structureless area (46%), white hair (36%), pustules (34%), Demodex tail (22%), follicular plugging (18%), comedones (10%). Vessels of different morphologies were observed, such as serpentine (56%), linear (46%), fine (50%), polygonal (34%), branched (30%), and globular (4%)

Conclusion

Dermoscopy is a noninvasive and minimally time-consuming method. It is easier to perform and helps in accurately and early diagnosing TSDF and guiding further management.

Keywords: Topical Corticosteroids, Dermoscopy, TSDF, Vessel morphology

Introduction

1952 saw the dawn of topical corticosteroids (TCS) with the introduction of topical hydrocortisone (compound F) [1]. Since then, these drugs have been used extensively in various inflammatory skin disorders. TCS offers quick relief of symptoms in almost all inflammatory dermatoses due to their antipruritic, immunosuppressive, and anti-inflammatory properties [2]. In addition, corticosteroids also suppress biosynthetic and secretory functions of melanocytes and consecutively melanin production, leading to an early response in facial pigmentation, and hence are frequently used as over-the-counter (OTC) brightening agents on facial skin [3]. However, these drugs have been misused to varying extents at all levels of the drug delivery chain -from the manufacturers to the consumers.

The face is the most visible part of the human body, making it the most common site for topical steroid application in the hopes of achieving the apparent beautifying effect of these drugs. Also, facial skin is thinner than the rest, showing increased percutaneous absorption of the drug, leading to an increased risk of cutaneous adverse effects. It was in 2008 that topical steroid damaged/dependent face (TSDF) was first described. TSDF is the semi-permanent or permanent damage to the facial skin caused by the senseless, unsupervised, or extended use of TCS, resulting in many cutaneous signs and symptoms and psychological dependence on the drug [4].

Dermoscopy is a noninvasive diagnostic complementary tool in dermatology and helps examine surface and subsurface structures of the skin and accurately identify a variety of inflammatory dermatoses [5]. Thus, dermoscopy can help detect subclinical signs of TSDF by depicting characteristic features such as polygonal vessels and telangiectasia, structureless white areas (atrophy), hypertrichosis, scales, and erythema [6].

This study aims to observe the various dermoscopic features of TSDF patients, which helps in differentiation from various other entities and aid in an early and accurate diagnosis of TSDF, especially in patients with a history of TSDF use not forthcoming.

Material and methods

In this cross-sectional study, two hundred patients with facial dermatosis who attended the Dermatology OPD in a tertiary health center over six months, from May 2022 to October 2022, were screened, of which 50 were suspected or diagnosed with TSDF. Informed written consent was taken from the participants.

Inclusion criteria: Patients aged 18-60 of either gender were included in the study. TSDF was diagnosed on the history of TCS use for more than one month and clinical features of TSDF (sensitive skin, photosensitivity, wrinkled skin, atrophy, depigmented areas, gross hypertrichosis, acne).

Exclusion criteria: Patients with a history of rosacea were excluded. Patients with ongoing treatment with oral corticosteroids and those with comorbidity that can cause alterations similar to TSDF (like polycystic ovaries, thyroid disorders, and Cushing's syndrome) were also excluded.

The patient's skin was evaluated dermoscopically with Dermlite IV in polarised mode. Images were captured and stored in iPhone 11.

Features evaluated were erythema, vessels, and their shape, white depigmented area, hypertrichosis, desquamation, pustules, brown globules, disruption of the pseudo-reticular network, and comedones.

The observations were tabulated and evaluated for a conclusion.

Results

Two hundred patients with facial dermatosis were screened, of which 50 were using TCS. Females significantly outnumbered men (7.3:1). The mean age of patients was 32.1±7.9 years, ranging from 22 to 51 years. The most common cause of TCS use was melasma, followed by its use as a brightening agent. The duration of TCS usage ranged from one month to more than ten years. Most patients started using TCS on the recommendation of a pharmacist. Several patients had used an assortment of TCS of varying potencies. Amongst these patients, the ratio of literate to illiterate is 37:13.

The most common clinical findings noted in the patients were hyperpigmentation (96%), erythema (92%), and telangiectasia (74%). Other findings noted were hypertrichosis (42%), wrinkling (40%), hypopigmentation (36%), atrophy (30%), pustules (30%), white hair (20%), scaling (10%), and tinea (6%). Clinical findings are depicted in Table 1 and Figure1,2 and 3.

Dermoscopic findings noted were brown globules (100%), diffuse red area (84%), hypertrichosis (54%), breaking of the pseudo-reticular network (52%), white structureless area (46%), white hair (36%), pustules (34%), Demodex tail (22%), follicular plugging (18%), comedones (10%). In addition, vessels of different morphologies were observed, such as serpentine (56%), linear (46%), fine (50%), polygonal (34%), and branched (30%). Dermoscopic findings are depicted in Table 2 and Figures 4,5,6, and 7.

Comparing dermoscopic findings with their corresponding clinical features revealed that patients

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showed more characteristic dermoscopic results with increasing duration and potency of TCS use.

Table 1: Clinical findings due to topical corticosteroids

Clinical findings	Male (%) n=6	Female (%) n=44	Total (%) n=50
Hyperpigmentation	6 (100)	42 (95.5)	96%
Erythema	6 (100)	40 (86.8)	92%
Telangiectasia	3 (50)	34 (72.3)	74%
Hypertrichosis	0 (0)	21 (47.2)	42%
Wrinkling	3(50)	17 (38.6)	40%
Hypopigmentation	2 (33.3)	16 (36.3)	36%
Pustules	3 (50)	12 (27.3)	30%
Atrophy	1 (16.7)	14 (31.8)	30%
White hair	0 (0)	10 (22.7)	20%
Scaling	1 (16.7)	4 (9.1)	10%
Tinea	2 (33.3)	1 (2.3)	6%

Table 2: Dermoscopic findings due to topical corticosteroids

Dermoscopic features	Male (%) n=6	Female (%) n=44	Total (%) n=50
Brown globules	6 (100)	44 (100)	100%
Red diffuse area	6 (100)	37 (84.1)	86%
Hypertrichosis	0 (0)	27 (61.4)	54%
White structureless area	3 (50)	20 (45.5)	46%
White hair	2 (33.3)	16 (36.4)	36%
Pustule	3 (50)	14 (31.8)	34%

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Table 2: Dermoscopic findings due to topical corticosteroids

Demodex tail	0 (0)	11 (25)	22%
Follicular plugging	2 (33.3)	7(15.9)	18%
Scaling	2 (33.3)	6 (13.6)	16%
Comedones	2 (33.3)	3 (30.1)	10%
Serpentine vessels	3 (50)	25 (56.2)	56%
Fine vessels	3 (50)	22 (50)	50%
Y shaped vessels	3 (50)	20 (45.5)	46%
Linear vessels	0 (0)	23 (52.3)	34%
Polygonal vessels	4 (66.7)	13 (29.5)	30%
Branched vessels	2 (33.3)	13 (29.5)	30%
Globular vessels	0 (0)	1 (2.3)	4%

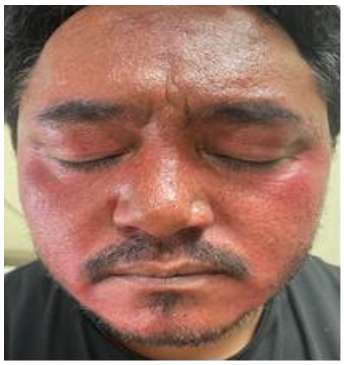


Figure 1

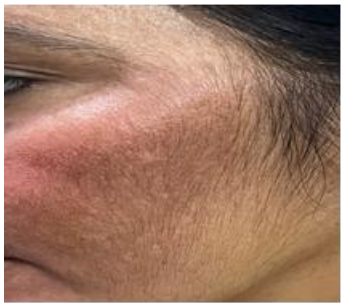
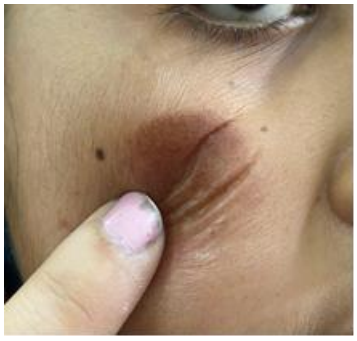


Figure 2



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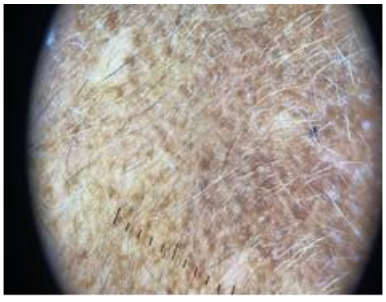

Figure 4

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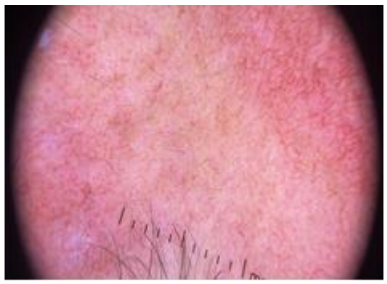

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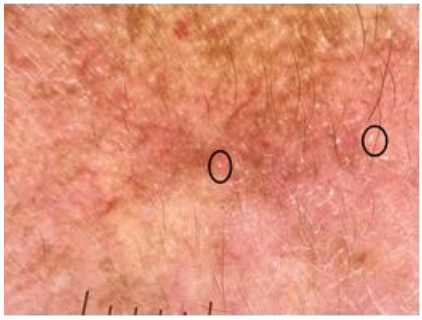
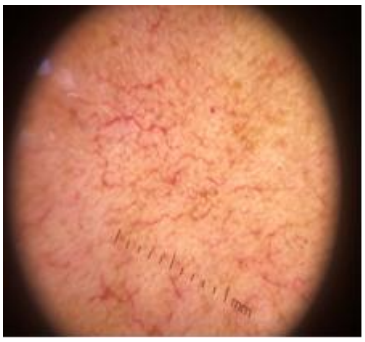


Figure 6



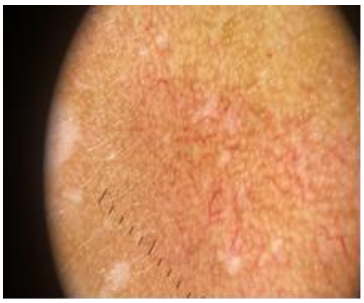
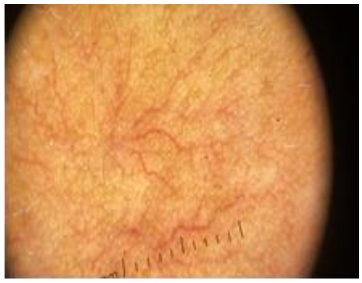


Figure 7a

Figure 7b



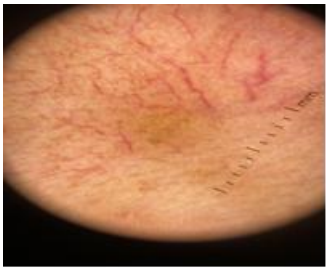
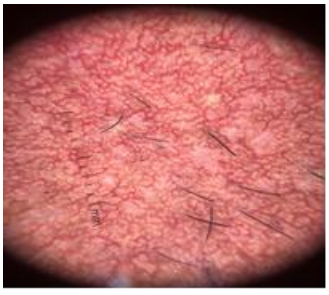
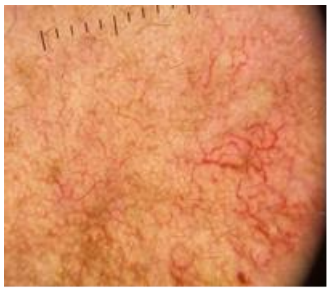


Figure 7c

Figure 7d





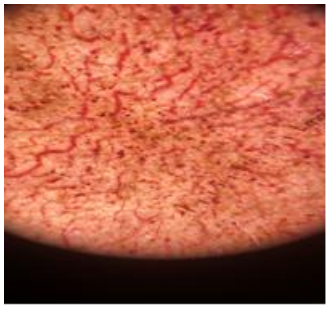


Figure 7e

Figure 7f

Figure 7g

Discussion

TCS misuse on the face was first reported in India in 2006 [7]. Unsanctioned and rampant use of steroids of varying and various potencies from mild to the super-potent for prolonged periods has resulted in an epidemic of facial dermatoses which resemble side effects of corticosteroids [4].

Two hundred patients with facial dermatosis were screened, of which 50 were using TCS. Similar to other studies, females significantly outnumbered men

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(7.3:1); this is because women are more concerned or rather anxious about the appearance of their skin. Most patients who abused TCS were around 32.1±7.9 years of age ranging from 22 to 51 years; this was the most common age group in other studies. The most typical indication of TCS use was melasma and as a brightening agent; these indications were similar to a survey by Hammed AF [8]. The duration of TCS usage ranged from one month to more than ten years. Several patients had used an assortment of TCS of varying potencies. Most patients started using TCS on the recommendation of a pharmacist; this was similar to a study by Pal D *et al.* [9]. Amongst these patients, the ratio of literate to illiterate is 37:13. It is probably due to a lack of general awareness, a belief that pharmacists are educated to treat common skin conditions, and a lack of easy accessibility to a dermatologist.

Hyperpigmentation was the most common clinical complaint in our study (96%), followed by erythema (92%), telangiectasia (74%), and hypertrichosis (42%); this is because melasma was the most common indication in our study for which patients used TCS. While in a study by Pal D *et al.*, features like erythema and telangiectasia resembling rosacea were most common [9]. Withdrawal of TCS results in the termination of the vasoconstrictive effect of TCS; this causes fixed vasodilatation, the release of pro-inflammatory cytokines, and accumulation of nitric oxide, which is responsible for the flare seen upon stopping the use of TCS [8]. The erythema is further aggravated by TCS-induced dermal atrophy resulting in loss of support to the vasculature. Withdrawal of the TCS results in erythema for about a few weeks, followed by desquamation. If the patient does not use the TCS again, the flare resolves but reappears within a few more weeks [10]. Further discontinuation results in a cycle of flare and resolution, which continues with decreasing intensity and duration of each episode. The duration of resolution becomes progressively prolonged till the patient becomes completely cured.

Dermoscopy is a noninvasive, minimally time-consuming, and easy-to-use tool to evaluate the subtle and earliest changes in skin damage. In addition, it can be beneficial in patients of TSDF with subclinical features and unforthcoming history [6,11]. Owing to all these advantages, dermoscopy is immensely helpful in controlling further damage from TCS.

The most common dermoscopic findings in our study were brown globules (100%), diffuse red area (84%), hypertrichosis (54%), and breaking of the pseudo-reticular network (52%). These were similar to a study by Sethi S *et al.* [6]. and Sonthalia *et al.* [12]. In addition, white structureless area (46%), white hair (36%), pustules (34%), Demodex tail (22%), follicular plugging (18%), and comedones (10%) were other dermoscopic findings of importance. White structureless areas correspond to steroid-induced cutaneous atrophy, which is the due inhibitory effect of TCS on keratinocyte proliferation and collagen synthesis [13]. The normal cutaneous immune response is subdued by TCS, resulting in features like pustules, an increased population of Demodex mites, and fungal infections (tinea) while also modifying the clinical picture [13].

In addition, vessels of different morphologies were observed. Serpentine vessels (56 %) were the most common. Other vessel patterns observed were fine (50%), linear (46%), polygonal (34%), and branched (30%). Those using TCS for longer durations predominantly had polygonal vascular patterns, as seen in studies by Seth S *et al.* [6] and Ankad B. S *et al.* [5]. Globular vessels and micro-hemorrhages were a feature in one of our patients and were not observed in the previous studies. This vascular pattern could be due to trauma induced by facial massaging in our patient with skin atrophy.

All the features of TSDF were more prominent in women than men, although significance could not be established due to the small sample size ($p > 0.05\%$). The lesser frequency of these features in men can be because of high androgen levels in males, which stimulate significantly higher sebum production, thus diluting the TCS effect, whereas oestrogens exert an opposite effect through the down-regulation of sebaceous gland function. Also, a man's skin is about 10-20% thicker than a woman's, which could be the reason for increased tortuosity and arborisation of vessels in females [6].

Longer duration of TCS application results in an accentuation of many dermoscopic findings, such as white structureless area, brown globules, white hair, hypertrichosis, polygonal vessels, and atrophy. Thus, by visualising these findings, we can assess even the

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approximate duration of the application of TCS by the patient if the history is not forthcoming [6].

Limitation

The lack of histopathological correlation and small sample size are limitations of our study. Also, some dermoscopic findings might be overestimated in our study because of the underlying skin condition for which the steroid was used.

Conclusion

Dermoscopy is a noninvasive diagnostic method that helps diagnose TSDF and differentiates it from other causes of the red face, like lupus erythematosus, rosacea, contact dermatitis, and tinea faciei, amongst others. Dermoscopy aids not just in diagnosing TSDF but also in deciding further treatment by selecting an appropriate medication. Furthermore, dermoscopy also aids in counselling the patient about the seriousness of the skin condition and hence helps control further damage done by topical steroids.

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Figure legends

Table 1: Clinical findings due to topical corticosteroids.

Table 2: Clinical findings due to topical corticosteroids.

Figure 1: Clinical image of the topical steroid-damaged face showing diffuse erythema

Figure 2: Clinical image of the topical steroid-damaged face showing telangiectasia and hypertrichosis

Figure 3: Clinical image of the topical steroid-damaged face showing cutaneous atrophy and erythema

Figure 4: Dermoscopic image of the topical steroid-damaged face showing brown globules, hypertrichosis, and white hair

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Figure 5: Dermoscopic image of the topical steroid-damaged face showing a red diffuse area

Figure 6: Dermoscopic image of the topical steroid-damaged face showing Demodex mite (black circle) and perifollicular scaling

Figure 7a: Dermoscopic image of the topical steroid-damaged face showing serpentine vessels

Figure 7b: Dermoscopic image of the topical steroid-damaged face showing fine vessels

Figure 7:c Dermoscopic image of the topical steroid-damaged face showing Y-shaped vessels

Figure 7d: Dermoscopic image of the topical steroid-damaged face showing linear vessels

Figure 7e: Dermoscopic image of the topical steroid-damaged face showing polygonal vessels

Figure 7f: Dermoscopic image of the topical steroid-damaged face showing branched vessels

Figure 7g: Dermoscopic image of the topical steroid-damaged face showing globular vessels and micro haemorrhages

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