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Original Research Article

A cross-sectional assessment of the dermoscopic features of TSDF and to correlate them with potency and duration of application of the TCS

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Abstract

Aim: This study was undertaken to characterize dermoscopic features of TSDF and to correlate them with potency and duration of application of the TCS.

Methods: The present study was conducted in the department of skin. Sample size of 100 cases was included in the study. Patients (18 years or above) with clinical symptoms and signs suggestive of TSDF (redness, itching, acne, burning, swelling, photosensitivity, pigmentation and atrophy) and with history of application of TCS on the face for a period of more than one month were included in the study after obtaining written informed consent.

Results: In the present study, Females (80, 80%) constituted the majority as compared to males. Most of the patients belonged to the age group of 18–30 years (50, 50%) with a mean age of 32.8 ± 8.2 years. Seventy Five (75%) patients had received some form of formal education, while 25 (25%) patients were illiterate. Presenting complaints of the patients were redness in 80 (80%), itching in 70 (70%), pigmentation in 60 (60%), burning in 64 (64%) and acne in 35 (35%) patients. Duration of TCS application ranged from one month to 25 years with 50 (50%) patients having applied TCS for over one year.

Conclusion: Dermoscopy in TSDF can help dermatologists in a multitude of ways from confirming the diagnosis to differentiating from other causes of red face and predicting the approximate duration of TCS abuse.

Keywords: Dermoscopy, steroids, face

Introduction

Steroids were first used topically by Sulzberger and Witten in 1951 [1]. Steroids are commonly prescribed drugs by dermatologists and most commonly used drugs by general population [2]. Steroids are indicated in management of diseases such as dermatitis, dry skin, insect bite, intertrigo, lichen planus, Polymorphic light eruptions, alopecia areata, discoid lupus erythematosus, psoriasis and eczema. These drugs are prescribed by the dermatologists for a specific required duration and frequency. The patients tend to continue application of steroids for longer periods due to rapid relief of symptoms. Due to easy availability over the counter and being available at nominal price, they tend to misuse/overuse the topical steroids. The most common reasons being for lightening of skin, melasma, sun tan and mild acne [3, 4]. In an attempt of financial benefit, pharmaceutical companies market drugs containing steroids to boost sales (Modified Klingman's formula is prime example) [4].

The trust showed by laymen on chemists and salesmen resulted in unprecedented increase in sale of steroids and thus its overuse/misuse [5, 6]. Patients also apply steroid creams on recommendations of friends, relatives and neighbours. The various fairness creams available in the market which are in high demand are steroid combinations. Prescriptions by doctors

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may be improperly written in aspects of duration, frequency and amount. Patients tend to self-medicate or continue usage of the steroids for longer periods due to the relief experienced by the patients. This overuse/misuse of steroids results in plethora of cutaneous symptoms (adverse effects) known as "Topical Steroid Damaged Face".

Dermoscopy is also known as "epiluminoscopy". Dermoscopy is a non-invasive method that allows assessment of microstructures of epidermis, dermo-epidermal junction and papillary dermis which are not visible to naked eye. The main use is to evaluate pigmented skin lesions. It is composed of superior magnifying lens and strong lighting system. The light emitted from the dermoscope is either reflected, refracted, diffracted or absorbed depending upon the physical property of the skin examined. Dermoscopy can help us to identify features of steroid damaged face and help in confirming the same without any invasion. The dermoscopic features of Topical steroid damaged face which helps in its diagnosis are small dilated blood vessels(telangiectasias), ivory white-to-strawberry-coloured patches and increased hair width and thickness of affected area (lesionalhypertrichosis) [7].

Steroid induced small skin blood vessels dilation(telangiectasia) is due to stimulation of release of nitric oxide from endothelial cells of dermal blood vessels leading to abnormal dilatation of capillaries. Inhibition of keratinocyte proliferation, collagen I and III synthesis by steroids results in skin atrophy [8].

There is a need for early, identification of the signs of TSDF before they become irreversible. Dermoscopy can act as the modernday instrument for early detection of subclinical signs of TSDF by delineating characteristic features such as polygonal vessels and telengiectasias, structureless white areas (atrophy), hypertrichosis, scales, and erythema [9].

This study was undertaken to characterize dermoscopic features of TSDF and to correlate them with potency and duration of application of the TCS.

Methods

The present study was conducted in the department of skin. Sample size of 100 cases was included in the study. Patients (18 years or above) with clinical symptoms and signs suggestive of TSDF (redness, itching, acne, burning, swelling, photosensitivity, pigmentation and atrophy) and with history of application of TCS on the face for a period of more than one month were included in the study after obtaining written informed consent. Institutional Ethics Committee approval was obtained before the commencement of the study (SRHU/Reg/ Int/2019-76). History of rosacea, pre-existing comorbidities (e.g., Cushing's syndrome, polycystic ovaries, and thyroid disorders), pregnancy, and ongoing treatment with oral corticosteroids were the exclusion criteria.

Sample size of 100 cases was included in the study. A patient was labeled literate if he was able to read and write with understanding in any language. In patients with a history of using multiple topical steroids of various potencies, the preparation with the highest potency used was considered for statistical analysis. However, when a more potent steroid was applied for less than one month, the preparation used beyond one month was considered for analysis. Patients were subjected to dermoscopic evaluation with both polarized and non-polarized modes. Dermoscopic images were captured with iPhone X (12-megapixel camera; Apple Inc., Cupertino, California) attached to Dermlite DL200 hybrid, ×10 magnification (3Gen, San Juan Capistrano, California). Patients were later counseled about the harmful effects of TCS abuse.

Statistical analysis was carried out using statistical package for social sciences version 20. Comparison of dermoscopic findings with clinical examination, gender, and potency of TCS was done using Chi-square test and Fisher's exact test with a "P" < 0.05 considered significant. Comparison of dermoscopic findings on the basis of duration of TCS applied was done using one-tailed Z-test for sample proportion.

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Results

Table 1: Demographic characteristics of study subjects (n=100)

Characteristic	Number (%)
Age group (years)	
18–30	50 (50)
31–40	35 (35)
>40	15 (15)
Gender	
Male	20 (20)
Female	80 (80)
Education	
Illiterate	25 (25)
Literate	75 (75)
Duration of TCS application (years)	
≤1	46 (46)
1-10	46 (46)
>10	8 (8)

Females (80, 80%) constituted the majority as compared to males. Most of the patients belonged to the age group of 18–30 years (50, 50%) with a mean age of 32.8±8.2 years. Seventy Five (75%) patients had received some form of formal education, while 25 (25%) patients were illiterate. Presenting complaints of the patients were redness in 80 (80%), itching in 70 (70%), pigmentation in 60 (60%), burning in 64 (64%) and acne in 35 (35%) patients. Duration of TCS application ranged from one month to 25 years with 50 (50%) patients having applied TCS for over one year.

Table 2: Comparison of clinical and dermoscopic findings in patients using topical steroids (n=100)

Clinical findings	Number of patients (%)	Dermoscopy findings	Number of patients (%)	P-value
Erythema	80 (80)	Red diffuse areas	90 (90)	0.40
Telangiectasia	45 (45)	Vessels (Linear, serpentine, polygonal, fine, branched, Y-shaped)	85 (85)	0.001
Hypertrichosis	65 (65)	Hypertrichosis	80 (80)	0.001
Hyperpigmentation	80 (80)	Brown globules	95 (95)	0.030
Atrophy	1 (1)	White structureless areas	80 (80)	0.007
White hair	15 (15)	White hair	60 (60)	0.001
Scaling	18 (18)	Desquamation	35 (35)	0.001
Pustules	4 (4)	Pustules	30 (20)	0.001
Other findings				
Wrinkles	35 (35)	Demodex tails	25 (25)	
Hypopigmentation	10 (10)	Breaking of pseudoreticular network	75 (75)	
		Follicular plugging	12 (12)	
		Comedones	10 (10)	

Clinical findings noted in the patients were erythema in 80 (80%), hyperpigmentation in 80 (80%), and hypertrichosis in 65 (65%) followed by telangiectasia in 45 (45%) and wrinkles in 35 (35%). Polygonal and Y-shaped vessels, though, are categorized under linear vessels with branches, the term Y-shaped vessel was used when only one lateral branch was visible and polygonal vessel was used if multiple branches forming a network were seen. Comparison of dermoscopy findings with their corresponding clinical finding revealed that red diffuse areas, vessels, brown globules, white structureless areas, desquamation, hypertrichosis and white hair were observed in a statistically higher proportion of cases dermoscopically.

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Discussion

Corticosteroids are a type of anti-inflammatory drug that can be prescribed in a systemic or topical form. In 1951, topical corticosteroids (TCs) were used for the first time by American dermatologist Marion Baldur Sulzberger [9]. In modern dermatological practice, TCs have become one of the most widely used treatment methods [10].

Regarding the prevalence of using facial TCs among the Saudi population, this study shows that 279 (45%) participants used facial topical steroids, while 332 (54%) did not use facial topical steroids. Topical steroids usage is more popular among females than the male population, which is similar to what was reported in previous studies [11, 12].

At first, patients may initiate using TCS for some minor dermatosis such as acne or melasma upon suggestion by friends and relatives [13]. Ab initio, the anti-inflammatory and vasoconstrictive effects of steroids result in what appears to be from redness, itching, photosensitivity to pigmentation, and acne. Mechanisms such as rebound dilatation of blood vessels, cytokine release, and nitric oxide accumulation are considered responsible for the development of pruritus, erythema, and burning sensation [14].

Many of our patients used double or triple combination creams containing an antibiotic, antifungal, and TCS. These so-called cocktail creams pose the greatest challenge due to their low cost and easy availability. Most reported indications for TCS abuse include melasma and acne. Another prevalent reason appears to be the false belief of TCS being a fairness product. Many consider TCS to be a panacea and use them for any rash on skin without consultation. This may be due to the cost-effective accessibility of creams containing such formulations. Erythema, dyspigmentation, and papulopustular lesions are the common clinical signs seen in patients with TSDF [11, 14, 15]. We, in addition, also observed hypertrichosis (65%) in a high percentage of patients.

Dermoscopy has emerged as an excellent tool to evaluate the subtle changes in skin and can be especially useful in patients of TSDF. It can help in identifying various findings suggestive of TCS abuse that cannot be appreciated with naked eye examination. Studies on dermoscopy in TSDF are scarce, with most being anecdotal case reports. Dermoscopy may aid in early identification of features suggestive of TSDF before their clinical appearance. In the present study, significantly higher number of patients dermoscopically revealed white structureless areas (P= 0.007), vessels (P = 0.001), desquamation (P = 0.001), white hair (P = 0.001), and hypertrichosis (P = 0.001). Jakhar and Kaur also appreciated irregularly dilated, branched serpentine vessels, almost interconnecting, giving a polygonal pattern along with white structureless areas and hypertrichosis in a young female [16].

Appearance of fine vessels and pustules were significantly associated with male gender, and branched vessels with female gender. Androgens in males stimulate sebaceous gland proliferation, especially over face, chest, and upper back. Production of sebum is significantly higher among males, mainly influenced by androgens which can dilute the TCS effect, whereas estrogens exert opposing effect through down-regulation of sebaceous gland function [17]. Older term of “steroid dermatitis resembling rosacea” suggests that TSDF can mimic rosacea with or without demodecidosis, especially in the absence of a supportive history of TCS application. However, the absence of hypertrichosis, white hair, and atrophy favors TSDF over rosacea. Dermoscopy not only non-invasively confirms the suspicion but also aids in patient’s understanding of the seriousness of topical steroid abuse through the demonstration of pictures explained in patient-friendly language. This also can prevent further steroid abuse and improves treatment compliance.

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Conclusion

Thus, dermoscopy in TSDF can help in a multitude of ways, from confirming the diagnosis to differentiating from other causes of red face and predicting the approximate duration of TCS abuse. Further, it can also help in predicting disease severity and prognosis. An additional advantage could be in counseling the patients and monitoring response to treatment. With effective treatment, a decrease in vessels, scaling, hypertrichosis, white hair, and red diffuse areas is expected; however, future research supporting the same is warranted.

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