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Original Research Article

A Cross-Sectional Study to Characterize 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 and V.D and 100 cases were 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

Results: Females (70%) constituted the majority as compared to males. Most of the patients belonged to the age group of 18–30 years (56%) with a mean age of 34.6 ± 8.2 years. Duration of TCS application ranged less than one year and 1-10 years was 45% patients each. 80 (80%) patients had received some form of formal education, while 20 (20%) patients were illiterate. Presenting complaints of the patients were redness in 75 (75%), itching in 70 (70%), pigmentation in 58 (58%), burning in 64 (64%) and acne in 42 (42%) patients. Clinical findings noted in the patients were erythema in 86 (86%), hyperpigmentation in 85 (85%), and hypertrichosis in 60 (60%) followed by telangiectasia in 50 (50%) and wrinkles in 36 (36%). 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.

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

The introduction of the first topical corticosteroid (TCS) in 1952 marked the beginning of a new era in therapeutic dermatology. Since then, a range of steroid molecules with different levels of potency, ranging from very powerful to minimally potent, have been created. This has made it possible to effectively treat several inflammatory skin conditions.1 Corticosteroids possess anti-inflammatory, immunosuppressive, anti-itch, and melanin-reducing properties. [2] Despite their significant advantages, TCS have shown their potential for both positive and negative consequences. Pharmacies, pharmaceutical firms, non-medical prescribers, dermatologists, and the general populace have all to some degree abused them. [1]

The face is often the area where this overuse occurs, resulting in an addiction to steroids known as "topical steroid dependent or damaged face" (TSDF). [3] TCS, or topical cosmetic solutions, are applied to the face with the notion that they possess remarkable properties to rectify any blemish or imperfection. However, they cause facial redness that lasts for different lengths of time, making it a challenging issue for both patients and dermatologists to manage. [4] The responsibility of

combating this threat lies with the dermatologists. Early detection of the symptoms of TSDF is necessary to prevent irreparable consequences. Dermoscopy serves as a contemporary tool for early identification of preclinical manifestations of TSDF by highlighting distinctive attributes such as polygonal arteries and telangiectasias, structureless white regions (atrophy), hypertrichosis, scales, and erythema. [5]

Steroids are used for the treatment of several conditions including dermatitis, xerosis, insect bites, intertrigo, lichen planus, polymorphic light eruptions, alopecia areata, discoid lupus erythematosus, psoriasis, and eczema. Dermatologists administer these medications for a specified length and frequency as needed. Patients often prolong the use of steroids because they get quick symptom alleviation. Because topical steroids are readily accessible without a prescription and are sold at a low cost, individuals often abuse or excessively utilise them. The primary causes include skin whitening, melasma, sun tan, and minor acne. [6,7] Pharmaceutical corporations promote medications that include steroids, such as the Modified Klingman's formula, in order to increase their profits. [7] The unwavering confidence placed by non-experts in chemists and salespeople led to an unparalleled surge in the sales of steroids, thus leading to their excessive and improper use. [8,9] Patients also use topical corticosteroid creams based on suggestions from acquaintances, family members, and neighbours. The fairness creams now in great demand on the market are formulated with mixtures of steroids. Doctors may write prescriptions with errors in terms of length, frequency, and dosage. Patients often engage in self-medication or prolong the use of steroids because they perceive alleviation from their symptoms. The excessive or incorrect use of steroids leads to a wide range of skin complaints, which are referred to as "Topical Steroid Damaged Face".

The purpose of this research was to analyse and describe the dermoscopic characteristics of TSDF (topical corticosteroid-induced dermal atrophy) and examine their relationship with the strength and duration of administration of the topical corticosteroid (TCS).

Methods

The present study was conducted in the Department of Skin & V.D, Lord Buddha Koshi Medical College and Hospital, Saharsa, Bihar, India and 100 cases were 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. 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.

Results

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

Characteristic	Number (%)
Age group (years)	
18–30	56 (56)
31–40	30 (30)
>40	14 (14)
Gender	
Male	30 (30)
Female	70 (70)
Education	
Illiterate	35 (35)

Literate	65 (65)
Duration of TCS application (years)	
≤1	45 (45)
1-10	45 (45)
>10	10 (10)
Education	
Illiterate	20 (20)
Primary	50 (50)
Secondary	20 (20)
Graduate	10 (10)
Symptoms	
Redness	75 (75)
Itching	70 (70)
Pigmentation	58 (58)
Burning	64 (64)
Acne	42 (42)

Females (70%) constituted the majority as compared to males. Most of the patients belonged to the age group of 18–30 years (56%) with a mean age of 34.6 ± 8.2 years. Duration of TCS application ranged less than one year and 1-10 years was 45% patients each. 80 (80%) patients had received some form of formal education, while 20 (20%) patients were illiterate. Presenting complaints of the patients were redness in 75 (75%), itching in 70 (70%), pigmentation in 58 (58%), burning in 64 (64%) and acne in 42 (42%) patients.

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	86 (86)	Red diffuse areas	90 (90)	0.34
Telangiectasia	50 (50)	Vessels (Linear, serpentine, polygonal, fine, branched, Y‑shaped)	80 (80)	0.001
Hypertrichosis	60 (60)	Hypertrichosis	80 (80)	0.001
Hyperpigmentation	84 (84)	Brown globules	90 (90)	0.036
Atrophy	1 (1)	White structureless areas	80 (80)	0.007
White hair	15 (15)	White hair	60 (60)	0.001
Scaling	20 (20)	Desquamation	30 (30)	0.001
Pustules	7 (7)	Pustules	18 (18)	0.001
Other findings				
Wrinkles	36 (36)	Demodex tails	25 (25)	
Hypopigmentation	12 (12)	Breaking of pseudoreticular network	75 (75)	
		Follicular plugging	12 (12)	
		Comedones	10 (10)	

Clinical findings noted in the patients were erythema in 86 (86%), hyperpigmentation in 85 (85%), and hypertrichosis in 60 (60%) followed by telangiectasia in 50 (50%) and wrinkles in 36 (36%). 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.

Discussion

Regarding the prevalence of using facial TCs among the 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. [10,11] At first, patients may initiate using TCS for some minor dermatosis such as acne or melasma upon suggestion by friends and relatives. [12] 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. [13]

Females (70%) constituted the majority as compared to males. Most of the patients belonged to the age group of 18–30 years (56%) with a mean age of 34.6 ± 8.2 years. Duration of TCS application ranged less than one year and 1-10 years was 45% patients each. 80 (80%) patients had received some form of formal education, while 20 (20%) patients were illiterate. Presenting complaints of the patients were redness in 75 (75%), itching in 70 (70%), pigmentation in 58 (58%), burning in 64 (64%) and acne in 42 (42%) patients. Clinical findings noted in the patients were erythema in 86 (86%), hyperpigmentation in 85 (85%), and hypertrichosis in 60 (60%) followed by telangiectasia in 50 (50%) and wrinkles in 36 (36%). 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. 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. [10,13,14]

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. [15]

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. [16] 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.

Conclusion

Therefore, the use of dermoscopy in TSDF may provide several benefits, including verifying the diagnosis, distinguishing it from other causes of facial redness, and estimating the length of TCS usage. Moreover, it may also aid in forecasting the severity of diseases and determining their prognosis. Another benefit might be providing counselling to patients and closely monitoring their reaction to medication. Effective therapy is anticipated to result in a reduction in vessels, scaling, hypertrichosis, white hair, and red diffuse patches. However, more study is needed to validate this expectation.

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