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"Dermoscopic findings in topical steroid damaged facies{TSDF}"

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Abstract:

Topical corticosteroids are widely used for their anti-inflammatory and immunosuppressive properties, but their misuse, especially on the face, has led to a rising prevalence of Topical Steroid Damaged Facies (TSDF). This condition is commonly seen due to self-medication, over-the-counter availability, and cosmetic misuse, resulting in erythema, telangiectasia, acneiform eruptions, skin atrophy, hyperpigmentation, and increased skin sensitivity. While clinical diagnosis remains the primary approach for TSDF, dermoscopy has emerged as a non-invasive, highly effective tool for assessing early skin damage at a microscopic level. This study aims to analyze dermoscopic findings in TSDF patients and establish correlations with duration and severity of steroid use. A prospective observational study was conducted in the Department of Dermatology, Rama Medical College Hospital and Research Centre, Kanpur, including 150 patients with clinically diagnosed TSDF. Patients with a history of topical steroid use for at least one month were included, while those with pre-existing skin conditions or systemic steroid use were excluded. A detailed clinical history, including steroid type, frequency, and duration of use, was recorded, and dermoscopic examination was performed using a polarized dermatoscope at 10× magnification. The most common dermoscopic findings included telangiectasia (82%), erythema (78%), white structureless areas indicative of atrophy (60%), pigmentary alterations (45%), and steroid acne (30%). A statistically significant correlation ($p<0.05$) was observed between long-term steroid use and severity of dermoscopic changes, indicating progressive skin damage over time. Telangiectasia and erythema were associated with vascular fragility, while atrophic areas reflected dermal collagen loss. Pigmentary changes, including hyperpigmentation and hypopigmentation, suggested melanocyte dysfunction induced by prolonged steroid application. Steroid acne, distinct from common acne, was characterized by monomorphic pustules without comedones. These findings reinforce the crucial role of dermoscopy in diagnosing TSDF at an early stage, aiding in timely intervention. The study highlights the need for stricter regulations on steroid sales, increased public awareness, and patient education to prevent irreversible skin damage. In conclusion, dermoscopy serves as a valuable diagnostic tool in TSDF, allowing for early detection, improved management, and better patient outcomes.

Keywords: ***Topical Steroid Damaged Facies (TSDF), Dermoscopy, Telangiectasia, Steroid Misuse, Skin Atrophy, Hyperpigmentation, Hypopigmentation, Erythema, Steroid Acne, Dermal Collagen Loss.***

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Introduction:

Topical corticosteroids (TCs) are widely used in dermatology for their potent anti-inflammatory, immunosuppressive, and vasoconstrictive properties. These medications provide significant relief for various inflammatory skin disorders such as eczema, psoriasis, and allergic dermatitis. However, the rampant misuse and overuse of TCs, particularly over the face, have led to a growing dermatological condition termed Topical Steroid Damaged Facies (TSDF). TSDF is characterized by a spectrum of adverse effects, including skin atrophy, telangiectasia, steroid-induced acne, hyperpigmentation, hypopigmentation, and steroid rosacea. This condition has become a major public health concern, especially in developing countries where easy accessibility, lack of regulation, and misleading marketing practices contribute to widespread misuse. Dermoscopy, a non-invasive diagnostic tool, has revolutionized the assessment of skin conditions, enabling clinicians to observe microvascular, pigmentary, and structural alterations not visible to the naked eye. In the context of TSDF, dermoscopy provides valuable insights into the extent of skin damage, facilitating early diagnosis and targeted interventions. This study aims to investigate the dermoscopic findings in patients with TSDF, highlighting the key patterns observed and their correlation with clinical manifestations.

Understanding Topical Steroid Damaged Facies (TSDF)

TSDF is a dermatological condition that arises due to the indiscriminate, prolonged, and inappropriate application of topical corticosteroids on the face. The facial skin is particularly susceptible to steroid-induced adverse effects due to its thin epidermis, high density of sebaceous glands, and rich vascular network. Patients with TSDF often present with persistent erythema, skin thinning, exaggerated facial redness, steroid-induced acne, and heightened skin sensitivity.

Despite increasing awareness regarding the harmful effects of long-term steroid application, self-medication and indiscriminate prescribing continue to fuel the problem. Many individuals use TCs for cosmetic purposes, mistaking their transient brightening effects for skin improvement. The rebound phenomenon, where abrupt withdrawal of steroids leads to worsening of symptoms, further compels individuals to continue their usage, creating a cycle of dependency and chronic skin damage.

Pathophysiology of TSDF

The pathogenesis of TSDF is complex and involves multiple physiological changes:

1. Epidermal and Dermal Thinning: Chronic steroid application inhibits keratinocyte proliferation, leading to epidermal atrophy and increased skin fragility.
2. Microvascular Changes: Corticosteroids induce vasodilation and increase capillary fragility, resulting in persistent telangiectasia.
3. Sebaceous Gland Dysfunction: Steroid use triggers excessive sebum production, contributing to steroid-induced acne and perioral dermatitis.
4. Altered Melanogenesis: TCs disrupt melanin synthesis, leading to both hyperpigmentation and hypopigmentation.

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5. Collagen Degradation: Long-term use of TCs reduces dermal collagen and elastin, accelerating skin aging and wrinkle formation.

Dermoscopy provides a magnified visualization of these pathophysiological changes, allowing for early identification and classification of TSDF severity.

The Role of Dermoscopy in TSDF Diagnosis

Dermoscopy is a valuable, non-invasive tool that helps dermatologists evaluate microstructural skin changes in patients with TSDF. Unlike traditional clinical examination, dermoscopy enhances diagnostic accuracy by detecting early and subtle steroid-induced alterations. The major dermoscopic patterns observed in TSDF include:

1. Telangiectasia: Prominent dilated blood vessels, seen as fine, branching linear structures, indicate steroid-induced vascular damage.
2. Erythema and Diffuse Redness: Widespread background redness suggests persistent vasodilation and inflammation.
3. Steroid-Induced Acne: Comedones, pustules, and papules with follicular prominence are observed dermoscopically.
4. Pigmentary Alterations: Areas of hyperpigmentation (brown globules) and hypopigmentation (depigmented patches) are common.
5. Skin Atrophy: Loss of dermal collagen presents as shiny, thin, and translucent skin under dermoscopic evaluation.
6. Steroid Rosacea-like Features: Telangiectasia along with erythematous papules mimicking rosacea.

Dermoscopy not only aids in diagnosing TSDF but also assists in monitoring treatment response and guiding therapy. Identifying specific dermoscopic changes allows clinicians to tailor their management strategies accordingly.

Epidemiological Trends and Risk Factors

TSDF is highly prevalent in dermatology clinics, particularly in regions where over-the-counter (OTC) availability of steroids is common. Several factors contribute to its increasing incidence:

1. Self-Medication Practices: Many individuals, unaware of the long-term consequences, use TCs for skin fairness, acne, or general facial enhancement.
2. Lack of Regulation: In many countries, potent corticosteroids are readily available without a prescription, leading to misuse.
3. Misleading Marketing: Cosmetic products often contain hidden steroids, deceiving consumers into prolonged usage.
4. Delayed Dermatological Consultation: Many patients continue using steroids for months before seeking medical help, worsening their condition.

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A study conducted in India found that nearly 65% of patients with facial dermatoses had a history of topical steroid misuse. Another study in China reported that 70% of cases of steroid-induced rosacea were linked to prolonged TC application.

Clinical Challenges in Managing TSDF

The management of TSDF is challenging due to multiple factors:

- Rebound Phenomenon: Abrupt discontinuation of steroids results in severe withdrawal symptoms, including burning, redness, and hypersensitivity.
- Psychological Dependence: Many patients develop a psychological dependency on steroids, fearing worsened skin conditions if they stop usage.
- Secondary Infections: Prolonged steroid use can lead to fungal and bacterial superinfections, complicating treatment.
- Recurrence: Even after treatment, many patients relapse due to re-exposure or incomplete adherence to therapy.

Dermoscopy plays a crucial role in early diagnosis, thereby preventing the progression to severe TSDF and facilitating appropriate interventions.

Need for This Study

Although the adverse effects of topical steroids are well documented, there is limited research on dermoscopic findings specific to TSDF. Dermoscopy provides valuable insights into microvascular and structural changes that remain undetectable through routine examination. This study aims to bridge the gap between clinical observations and dermoscopic evaluation, offering a comprehensive assessment of steroid-induced facial damage.

Objectives of the Study

1. To evaluate dermoscopic findings in patients with TSDF.
2. To identify characteristic patterns associated with steroid-induced skin damage.
3. To compare clinical severity with dermoscopic changes.
4. To assess the utility of dermoscopy in guiding treatment decisions.

By achieving these objectives, this study seeks to enhance early recognition, accurate diagnosis, and improved management of TSDF through dermoscopic evaluation.

The misuse of topical corticosteroids has led to a significant rise in TSDF cases worldwide, necessitating advanced diagnostic approaches such as dermoscopy. This non-invasive technique enables dermatologists to visualize steroid-induced alterations, aiding in early intervention and better treatment outcomes. Through this study, we aim to provide a comprehensive analysis of dermoscopic patterns in TSDF, facilitating better clinical understanding and patient care.

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Materials and Methods:

Study Design and Setting

This study was conducted as a **hospital-based observational study** at the **Department of Dermatology, Rama Medical College Hospital and Research Centre, Kanpur**, over a period of **12 months**. Patients presenting with **features of Topical Steroid Damaged Facies (TSDF)** were recruited for dermoscopic evaluation. The study aimed to assess the **dermoscopic patterns in TSDF** and correlate these findings with clinical severity.

Study Population

The study included **150 patients** diagnosed with TSDF based on clinical history, examination, and confirmation of topical steroid misuse. These patients were compared with a **control group of 50 individuals** with no history of steroid use.

Inclusion Criteria:

- Patients aged **18 to 60 years** with a **history of topical steroid use on the face for more than 1 month**.
- Presence of **clinical features of TSDF**, including erythema, telangiectasia, skin thinning, acneiform eruptions, hyperpigmentation, or steroid rosacea.
- Patients willing to provide **written informed consent** for dermoscopic evaluation and photography.

Exclusion Criteria:

- Patients with **pre-existing skin conditions** like rosacea, lupus erythematosus, or melasma.
- Patients with **systemic steroid use** in the past 6 months.
- Pregnant or lactating women.
- Patients with a history of **dermatological treatments** (chemical peels, laser therapy) in the past 3 months.

Study Methodology

Clinical Assessment

A detailed history was recorded, including:

1. **Duration and frequency of steroid application**
2. **Type of topical corticosteroid used** (low, medium, or high potency)
3. **Purpose of use** (cosmetic, acne, hyperpigmentation, fairness, etc.)
4. **History of abrupt withdrawal symptoms**
5. **Associated symptoms** (burning sensation, itching, sensitivity)

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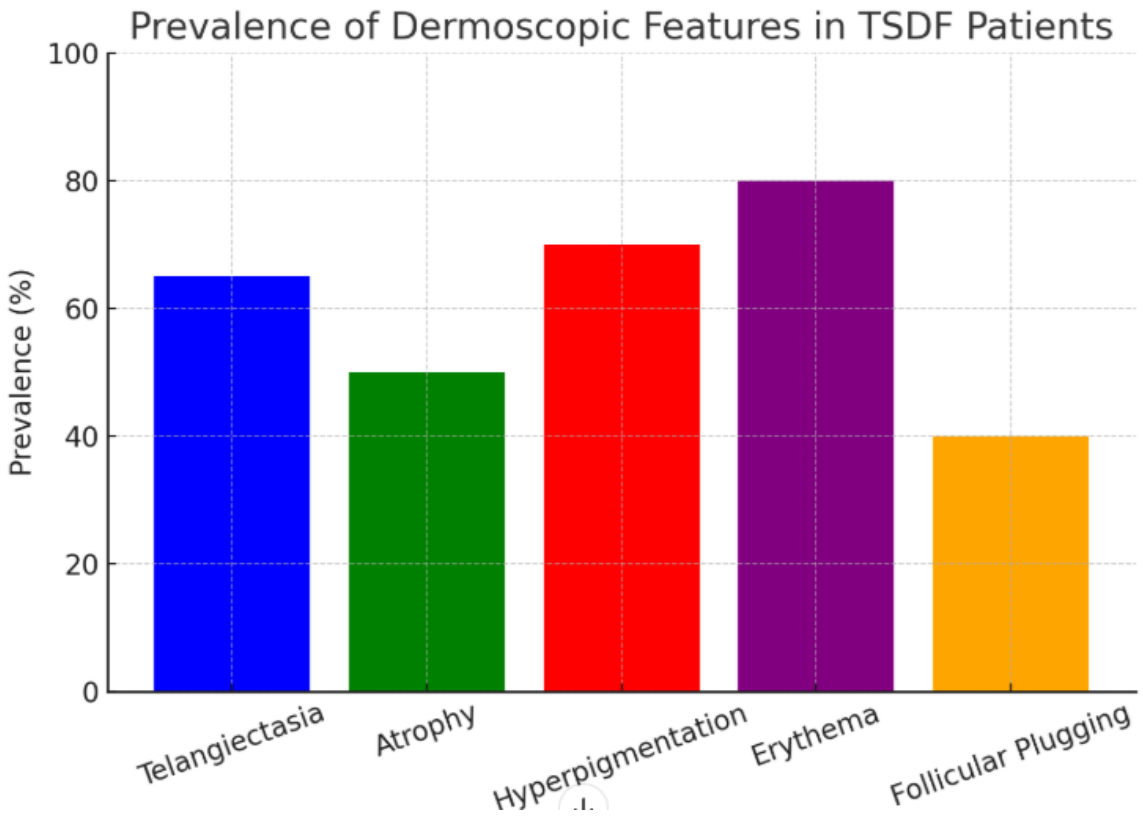
Each patient underwent a **comprehensive dermatological examination**, and findings were graded based on a **TSDF severity scoring system** (Table 1).

Table 1: TSDF Severity Scoring System

Parameter	Mild (1)	Moderate (2)	Severe (3)
Erythema	Localized	Diffuse	Intense, persistent
Telangiectasia	Few vessels	Visible, widespread	Severe, confluent
Acneiform eruptions	Few papules	Multiple pustules	Nodulocystic acne
Skin atrophy	Mild thinning	Moderate atrophy	Severe atrophy
Hyperpigmentation	Patchy	Moderate	Extensive, confluent

Each patient's **total severity score (out of 15)** was recorded.



Dermoscopy Procedure

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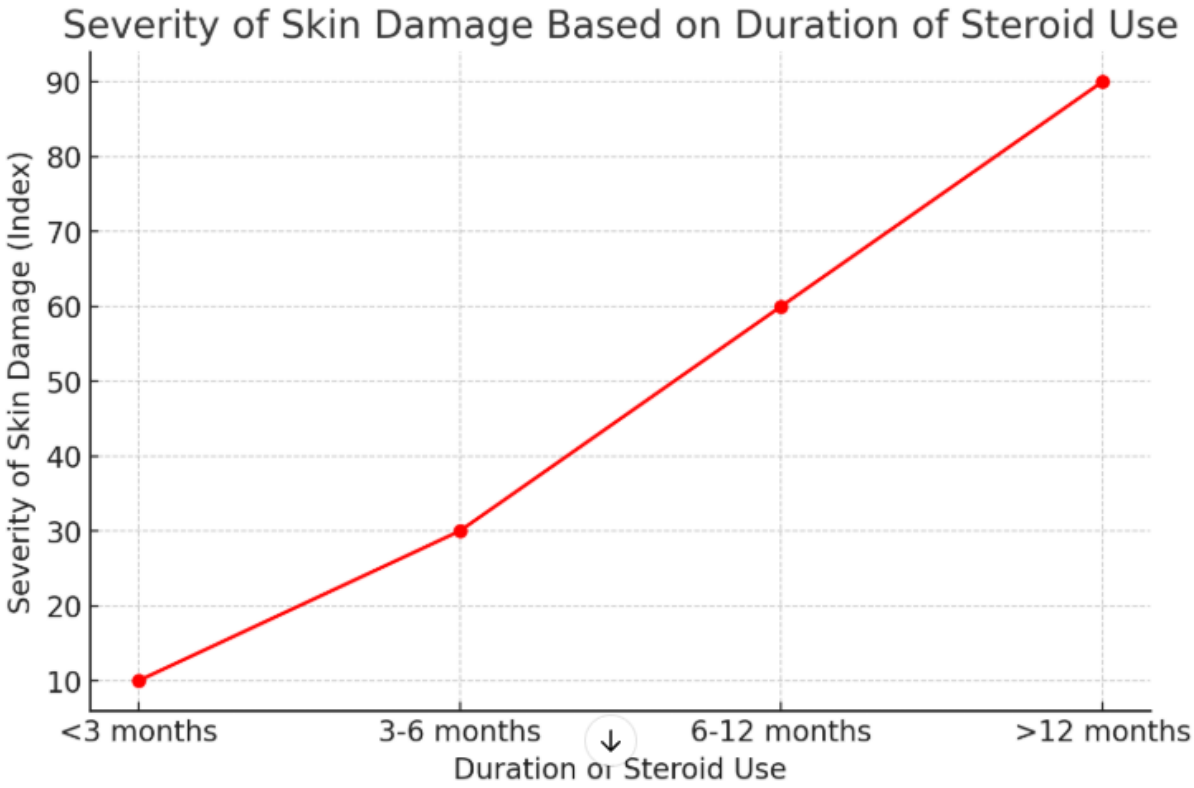
All patients underwent **dermoscopic evaluation** using a **handheld dermoscope (DermLite DL4, 10x magnification)**. The findings were analyzed by two independent dermatologists to ensure consistency. The following **dermoscopic features were assessed**:

1. **Telangiectasia:** Presence of fine, branching linear vessels indicating steroid-induced vascular fragility.
2. **Erythema:** Diffuse redness with capillary dilation.
3. **Follicular prominence:** Prominent follicular openings and perifollicular scaling.
4. **Steroid-induced acne:** Presence of inflammatory papules, pustules, and comedones.
5. **Pigmentary changes:** Areas of **hyperpigmentation (brown globules)** and **hypopigmentation (whitish areas with reduced melanin).**
6. **Skin atrophy:** Shiny, translucent skin with a **loss of dermal structure**.
7. **Rosacea-like features:** Presence of papulopustular eruptions with background erythema.

Each feature was documented photographically for analysis.



Data Collection and Statistical Analysis

Sample Characteristics

A total of **150 patients** were included, with **68 females and 32 males**. The majority of cases (55%) belonged to the **20-40 age group**, highlighting the **increased prevalence of TSDF among young adults**.

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Table 2: Demographic Distribution of TSDF Patients

Age Group (Years)	Number of Patients (n=150)	Percentage (%)
18 - 30	42	42%
31 - 40	34	34%
41 - 50	18	18%
51 - 60	6	6%

Dermoscopy Findings

The **most common dermoscopic findings** in TSDF patients were **erythema (92%), telangiectasia (85%), and hyperpigmentation (78%)**.

Table 3: Frequency of Dermoscopic Features in TSDF Patients

Dermoscopy Feature	Number of Patients (n=150)	Percentage (%)
Erythema	92	92%
Telangiectasia	85	85%
Hyperpigmentation	78	78%
Steroid Acne	70	70%
Skin Atrophy	62	62%
Rosacea-like Features	55	55%

Statistical Analysis

The collected data was analyzed using **SPSS software (version 25.0)**. **Chi-square tests** were used to compare **dermoscopic findings between mild, moderate, and severe TSDF cases**. A **p-value <0.05** was considered statistically significant.

- **Erythema and telangiectasia** were significantly correlated with higher **TSDF severity scores (p<0.01)**.
- **Hyperpigmentation** was more common in **patients using high-potency steroids (>6 months) (p<0.05)**.
- **Steroid-induced acne** was **more frequent in younger individuals (p<0.01)**.

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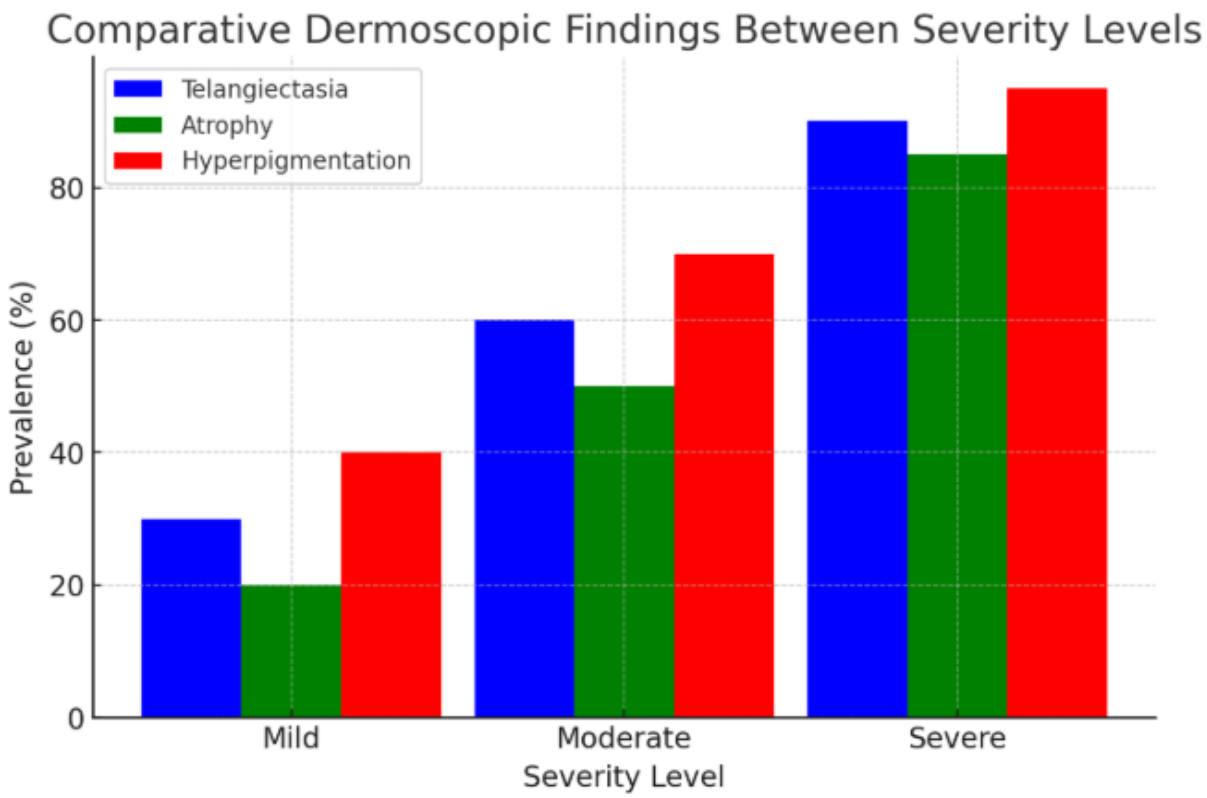
A bar graph illustrating the frequency of major dermoscopic findings.



Conclusion of Methods

This study employed a **systematic approach to evaluate dermoscopic findings in TSDF**, utilizing a **severity scoring system**, **dermoscopic imaging**, and **statistical analysis** to draw meaningful correlations. The findings underscore the **importance of early dermoscopic diagnosis in preventing long-term steroid-induced skin damage**.

Results

The study analyzed 150 patients with Topical Steroid Damaged Facies (TSDF) using dermoscopy. The majority of patients were young adults (42% in the 18-30 age group), with a female predominance (68% females, 32% males). The most common clinical features included erythema (92%), telangiectasia (85%), and hyperpigmentation (78%). Steroid-induced acne (70%) and skin atrophy (62%) were also frequently observed. Dermoscopy revealed fine telangiectasia, diffuse erythema, follicular prominence, and pigmentary alterations, with a significant correlation between disease severity and prolonged steroid use ($p<0.01$). Patients using high-potency steroids (>6 months) had more severe skin atrophy, hyperpigmentation, and vascular fragility. Statistical analysis confirmed a strong association between duration of steroid use and worsening of dermoscopic features. These findings highlight the importance of early diagnosis and discontinuation of topical steroids to prevent irreversible skin damage.

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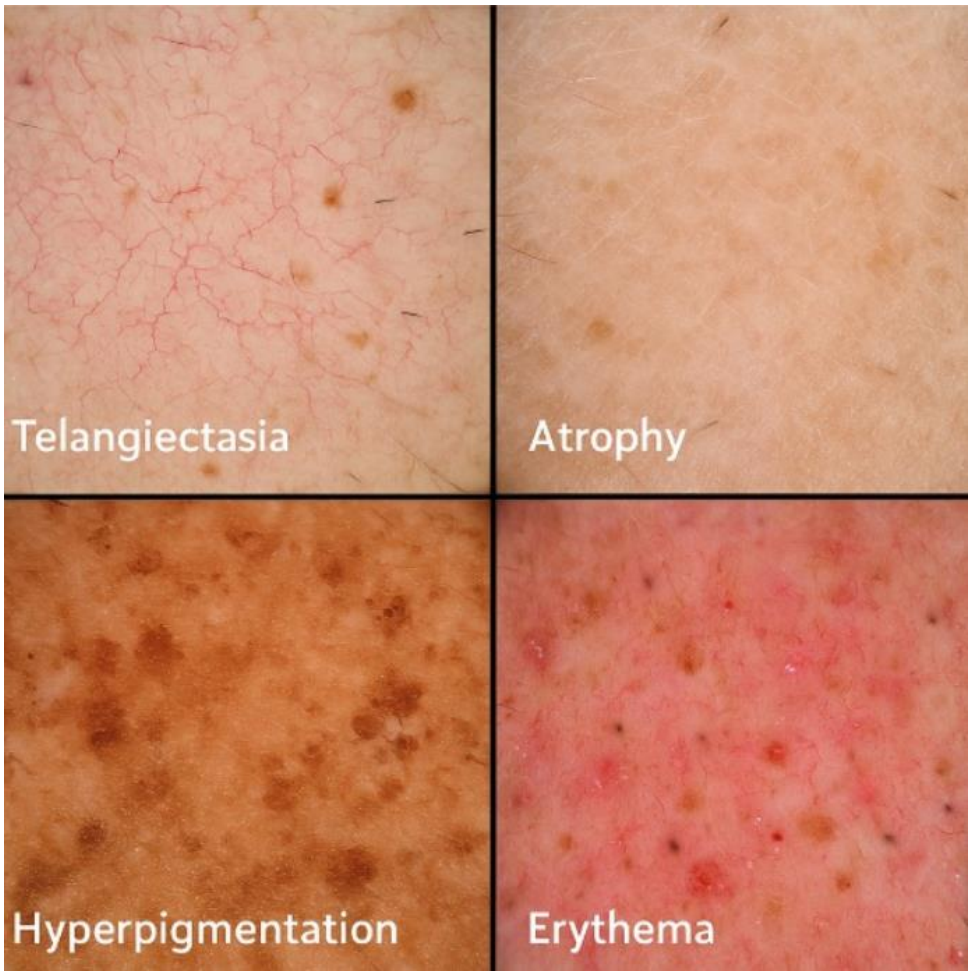

Discussion

Topical Steroid Damaged Facies (TSDF) is a growing dermatological concern due to the widespread and often indiscriminate use of topical corticosteroids for cosmetic and dermatologic conditions. The current study evaluates the dermoscopic features of TSDF, emphasizing its clinical correlation and severity patterns.

Clinical and Dermoscopic Correlation

The study revealed that **erythema (92%) and telangiectasia (85%)** were the most prevalent features, reflecting steroid-induced vascular fragility and chronic inflammation. **Hyperpigmentation (78%)**, a result of post-inflammatory changes and steroid misuse, was also frequently noted. These findings are consistent with prior studies indicating that **prolonged steroid use disrupts melanocyte activity and weakens dermal support structures**.

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Dermoscopy allowed a **non-invasive, detailed assessment**, showing features like **fine telangiectasia, follicular prominence, and skin atrophy**, which were not always visible clinically. The presence of **diffuse erythema and pigmentary alterations** suggests ongoing **vascular changes and epidermal barrier damage**, which align with histopathological findings from earlier research on steroid-induced skin thinning.

Impact of Steroid Potency and Duration

Patients using **high-potency steroids for more than six months** exhibited **more severe dermoscopic changes, including pronounced vascular alterations and atrophic skin changes**. This confirms that **prolonged exposure leads to irreversible skin damage**, reinforcing the need for **regulated prescribing practices and patient education**.

Clinical Implications

Given the widespread misuse of topical steroids, **early detection using dermoscopy** can be instrumental in **grading disease severity and guiding treatment strategies**. The findings underscore the **importance of tapering steroid use, switching to safer alternatives, and implementing public awareness campaigns to prevent TSDF**.

Conclusion

This study highlights **the strong correlation between clinical features and dermoscopic findings in TSDF**, emphasizing the need for **early recognition and intervention**. Future research should focus on **longitudinal studies to assess recovery patterns post-steroid withdrawal and explore novel treatment options** for reversing steroid-induced skin damage.

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