



## Dermatology

## CLINICAL, DEMOGRAPHIC AND DERMATOSCOPIC PROFILING OF TOPICAL STEROID DAMAGED FACIES: PATTERNS AND INTERPRETATIONS.

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**ABSTRACT** **Background** Recently, easy availability and over the counter distribution of Topical Corticosteroid creams has led to increase in inappropriate use. Many ointments for cosmetic purpose are utilized by people without knowing their effect, side effects, of these steroids rank first. This not only leads to direct damage to the skin by topical corticosteroid-delete but also leads to dependance on the drug. Many signs and symptoms observed in Topical Corticosteroid damaged facies are similar in various other dermatoses. Dermoscopy offers a means to detection of early signs and proper diagnosis. Early and prompt treatment can lead to reversal and prevents further damage to the skin. **Aims & Objectives** To analyze the various features observed in TDSF and correlate with socioeconomic data, potency and duration of Topical corticosteroid cream used. **Methods** All patients with history of Topical Corticosteroid cream use over the face or signs and symptoms suggestive of TSDF were included. Sample size-n=40 Detailed history was taken. Dermoscopic examination was done. **Results** Majority of the patients (92.5%) are females. Most of the patients belonged to 31-40 years of age group and belonged to upper & lower age group. Mometasone was the most commonly used TCS cream used. in 35% of the patient, the TCS were prescribed by Quacks. Brown globules (Hyperpigmentation) was observed in 97.5% of the patients under dermoscope. Most common clinical sign observed was hyperpigmentation

## KEYWORDS :

## INTRODUCTION

The availability of the over-the-counter products of TCs and increase in quackery as well as spread of misinformation by social media has increased the number of patients with TSDF. Increased use of social media has also raised the beauty standards and expectations of the people especially in topic of skin colour and fairness.

TDSF is a condition which was first described in 1952(1). TDSF is defined as reversible or irreversible damage to the skin caused by irrational use of corticosteroid. This results in plethora of sign and symptoms that occur due to either prolonged use of corticosteroids or increased potency of steroid (1).

As such Topical corticosteroids are one the most important drug in treating many of the dermatological conditions. It is used in acute dermatological emergencies giving magical results & found to be lifesaving (1,3,5,6) As well its effectively used in many dermatological disorders if used judiciously under dermatologist's observation (2,9).

Since percutaneous absorption and cutaneous toxicity of TCs are directly correlated, factors affecting percutaneous absorption also affect systemic side effects. These factors are age of the patient, body site and area treated, amount of topical steroid used, structure and potency of the drug, vehicle of the drug, frequency of application, duration of therapy, nature of the diseased skin and application of keratolytic agents(6)

However, it can cause several side effects if used non judiciously. These side effects include severe cutaneous damage characterized by erythema, monomorphic acne, steroid induced atrophy, steroid rosacea, telangiectasia, striae, and severe dependance to the TC(2). The frequency of side effects after TS application depends on various factors like indication for the use, duration and frequency of use, amount of application and patient related factors(2). TCs are helpful in hyperproliferative, inflammatory, and immunologic illnesses because of their anti-inflammatory, anti-proliferative, immunosuppressive, anti-pruritic effects on the skin.

compromised barrier -A barrier to the percutaneous absorption of drugs into the systemic circulation is the stratum corneum.(3) A compromised barrier in diseased skin leads to increased percutaneous absorption. Even after a single application, the horny layer acts as a reservoir for drug absorption into the body(4). Thus, systemic side effects such as iatrogenic Cushing's syndrome, growth retardation in children, and suppression of the hypothalamic-pituitary-adrenal axis

can result from even small doses of potent TCs. (3,4) Compared to most other regions of the body, the skin on the face is thinner. As a result, medication is absorbed via the skin at a greater rate. The face has larger sebaceous glands than other regions of the body, therefore sweating is more common, especially in hot, muggy climes like those found in most of India(1). As such, it is more vulnerable to the negative effects of external elements including pollution and sunshine, friction from cleaning and rubbing, and the use of medications and cosmetics.

By the identification of distinctive features including polygonal vessels and telangiectasias, structureless white regions (atrophy), hypertrichosis, scales, and erythema, dermoscopy can serve as the current tool for the early detection of preclinical indications of TSDF(5). The goal of this study is to describe the dermoscopic characteristics of TSDF and establish a correlation between them and the TCS's efficacy and duration of application.

## CLINICAL FEATURES

## ERYTHEMA-

According to Rapaport and Rapaport's abstract, chronic vasoconstriction results from the repeated application of TC, which inhibits the action of nitrous oxide (NO).(7) Withdrawing the TC causes endothelial Nitric Oxide to be released, which dilates blood vessels and results in erythema.TC-induced dermal atrophy and subsequent lack of support for the vasculature exacerbate the erythema.(8).



Figure 1. Erythema, hyperpigmentation and hypertrichosis.

## PAPULES AND PUSTULES-

It has been suggested that the overgrowth of microorganisms is a result of the chronic immunosuppression caused by TC. These small organisms function as superantigens. When TC is stopped, its immunosuppressive effect is also eliminated. This causes a superantigen-induced inflammatory response that shows up clinically as pustules and papules.(9)



**Figure 2.** Papules, Comedones and hypertrichosis in a patient after 2 years of Topical Corticosteroid misuse.



**Figure3.** Acneiform eruptions and pustules, hyperpigmentation.

### ACNEIFORM ERUPTIONS

Acneiform eruptions are a group of disorders characterized by papules and pustules resembling acne vulgaris(10). Distinguishing between acne-like dermatoses and real acne can be difficult in clinical settings.

It has been stated that, the pathophysiology of acne caused on by TCs can be attributed to the follicular epithelium's breakdown, which leads to the extrusion of follicular content.(11) Monomorphic papules typically develop following systemic corticosteroid administration. In addition, topical corticosteroids can result in acneiform eruptions over the skin where the topical preparation is applied or, in the case of inhaled steroids, around the mouth and nose.(10)

### HIRSUTISM

The presence of terminal coarse hairs distributed in a male-like pattern in females is known as hirsutism. Glucocorticosteroid, minoxidil, cyclosporine, danazol, diazoxide, phenytoin, D-penicillamine, and interferon are among the many medications that can induce hirsutism.(12).

### TELANGIECTASIA:

Steroid-induced telangiectasia is the stimulation of nitric oxide release from dermal vessel endothelial cells, which results in aberrant capillary dilatation. (11)

### CUTANEOUS INFECTIONS:

TCs can cause common cutaneous infections such as pityriasis versicolor, onychomycosis, dermatophytosis, and tinea incognito.

### HYPO AND HYPERPIGMENTATION:

Smaller melanocytes are blocked from synthesizing melanin by steroids, which causes patchy hypopigmented areas that can be reversed when the steroids are stopped(13).

### PERIORAL DERMATITIS

In comparison to common perioral dermatitis, steroid-induced dermatitis exhibits more erythema, inflammation, and scaling. Squeezed steroid tubes that the patient misused in an attempt to treat their dermatitis are present in patients with steroid-induced dermatitis which is also known as "tortured tube sign"

### ROSACEALIKE FEATURES.

Tcs increase the growth of *Demodex folliculorum* and *Propionibacterium acnes*, which, within six months, results in a condition similar to acne rosacea. It is also known as "iatrosacea". Although mometasone furoate is considered safe for topical application, it is actually a medium-potency steroid that causes "mometasone-induced steroid rosacea."

### PHOTOSENSITIVITY

Sun exposure to a thin topical corticosteroid damaged skin leads to darkening of superficial layer of skin, hence patients present with hyper-pigmented patches on sun exposed skin areas.

### ALLERGIC CONTACT DERMATITIS

The symptoms of allergic contact dermatitis to TCs can include worsening of the dermatitis or no response to treatment at all. It typically affects children with atopic dermatitis. Additionally, due to their structural instability, mildly potent steroids like hydrocortisone butyrate and budesonide, which are frequently used in children, have an allergic property. Rare allergens, such as mometasone, betamethasone dipropionate, clobetasol propionate, and fluorinated corticosteroids, are among the frequently used strong steroids (9,11).



**Figure 4.** Hyperpigmentation along with atrophy of the skin due to prolonged use.

### ATROPHY AND STRIAE

Prolonged uses of TCs leads to epidermal atrophy, degeneration of dermal stricture and collagen deterioration after several months(15).

Pathophysiology of topical corticosteroid-induced skin atrophy (16)

1. The epidermis's inhibitory effect on keratinocyte proliferation
2. Inhibition of the dermal synthesis of collagen 1 and 3.
3. The reduction of hyaluronic acid in the extracellular matrix as a result of fibroblast and hyaluronan synthase 3 enzyme inhibition causes dermal atrophy.



**Figure 5.** Erythema and rosacea-like rash



**Figure 6.** Acne Vulgaris as advised by a Quack

### METHODS

All patients with history of application of TC over the face for different etiologies and have signs or symptoms suggestive of TC abuse are included in this study. Patients that presented with redness, photosensitivity, itching, acne, swelling, pigmentation or atrophy to the Out Patient Department of Mahatma Gandhi Memorial Hospital, Warangal were included after a written consent from the patient or the guardian in case of minors.

The sample size for this study is 40 patients.

Patients on corticosteroids therapy, cushing's syndrome, history of rosacea were excluded. Dermoscopy was done using Motorola edge 30 pro phone and DermLite DL4 in both polarized as well as non-polarized light. Various features noted in Dermoscopy were noted along with symptoms.

Other details like age, sex, socioeconomic class, TC cream applied, TC cream suggested/prescribed, duration of use by are mentioned.

### OBSERVATIONS

Of the 40 patients, 37 patients were females and only 3 males were diagnosed with TCDamaged facies.

**Table 1.** Sex wise distribution

N=40	Frequency (n)	Percentage
Females	37	92.5%
Males	3	7.5%
Total	40	

Most of the patients belonged to 31-40 years of age group followed by 21-30 years of age group.

**Table 2.** Age wise distribution

N=40	Females	Males
0-10	0	0
11-20	1	0
21-30	8	0
31-40	27	3
41-50	4	0
51-60	0	0

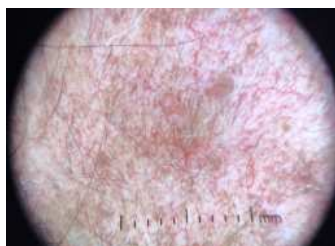
Socioeconomic status was calculate using Modified Kuppuswamy Scale. In which, the majority of the patients belonged to upper lower and Lower middle group of Modified Kuppuswamy Scale. Few patients that did not want to mention their income and those who did not know are not included in the table.

**Table 3.** Socioeconomic data of the observed patients

Class	Females	Males
Upper	0	0
Upper Middle	1	0
Lower Middle	12	2
Upper Lower	18	1
Lower	2	0
Not Sure/ Do not want to mention	4	0
Total	37	3

**Table 4.** The choice of TC used

TC Used	Frequency (n)	Percentage
Mometasone	26	65%
Betamethasone	5	12.5%
Clobetasol	9	22.5%
Total	40	



**Figure 7.** Telangiectasia, hypertrichosis and brown globules.

**Table 5.** List of TC Advised by

Recommended by	Frequency (n)	Percentage
Friend	9	22.5%
Quacks	14	35%
Registered Medical Practitioner (Non-dermatologist)	1	2.5%
Self	12	30%
Over the counter/ Pharmacist	3	7.5%

Dermatologist	1	2.5%
Total	40	

**Table 6.** Duration of application of Topical corticosteroid

Duration	Frequency (n)	Percentage
0-6 months	4	10%
6-12 months	5	12.5%
1-2 years	10	25%
2-3 years	18	45%
>3 years	3	7.5%
Total	40	

**Table 7.** Clinical findings with frequency

Clinical Findings	Frequency (n)	Percentage
Erythema	19	47.5%
Hyperpigmentation	39	97.5%
Hypopigmentation or Depigmentation	11	27.5%
White hair	26	65%
Hypertrichosis	31	77.5%
Pustules	3	7.5%
Papules	13	32.5%
Atrophy	21	52.5%

**Table 8.** Observed Dermoscopic features

Dermoscopy features	Frequency (n)	Percentage
Telangiectasia	16	40%
Structureless White Areas	19	47.5%
Hypertrichosis	35	87.5%
Leukotrichia	37	92.5%
Hyperpigmentation	39	97.5%
Hypopigmentation	8	20%
Follicular Plugging	11	27.5%
Demodex Tails	8	20%
Pustules	3	7.5%
Comedones	2	5%
Exaggerated Skin Marking	8	20%



**Figure 8.** Follicular plugging in the background of Atrophy, telangiectasia and brown globules



**Figure 9.** Erythema, telangiectasia, Atrophy, perifollicular hypopigmentation, Leukotrichia and Hypertrichosis.





**Figure 10.** Hyperpigmentation with perifollicular sparing, hypertrichosis, follicular plugging



**Figure 12.** Pustules, Hyperpigmentation and hypertrichosis in the same patient.



**Figure 13.** Telangiectasia, hyperpigmentation, Depigmentation and hypertrichosis



**Figure 14.** Hyperpigmentation, follicular plugging seen after 1 year of Topical Mometasone furoate cream use

## RESULTS & DISCUSSION

1. It was observed that 92.5% of the observed patients were females and only 3 male patients were seen.

2. Majority of the patients belonged to 31-40 years of age group. All the males observed in this study also belong to 31-40 years of age group.

3. 82.5% of the observed patients belonged to upper lower or lower middle socioeconomic class according to the Modified Kuppuswamy scale.

4. In 65% of the patients, Mometasone was the primary ingredient to be abused followed by Clobetasol and Betamethasone. Mometasone was most commonly observed in the triple combination regimen along with Hydroquinone and Tretinoin. Mometasone was also observed to be the cheapest of the three.

5. 35% of the patients were prescribed TC by Quacks. Self-medication was the observed to be the second most common cause. Increased availability of information over the internet and ease of access through sites like google and YouTube is one of the reasons for self-medication.

6. 45% of the patients had used TC cream for a duration of 2-3 years. Whereas 7.5% of the patients had used the medication for more than 3 years.

7. Hyperpigmentation was the most commonly observed clinical sign followed by Leukotrichia, hypertrichosis and structureless white areas.

8. Under dermoscope, brown globules were the most common finding.

9. Limitations of the study is a small data size. coexistence of other pathology like melasma, acne vulgaris or Post inflammatory Hyperpigmentation can also confuse the dermoscopic appearance. Since the TC usually comes in combination with Hydroquinone and a

retinoid, it is difficult to pinpoint the dermoscopy finding to the Topical Corticosteroid. Lack of histopathological correlation is also one of the limitations of the study.

## DECLARATION OF PATIENT CONSENT

The authors certify that they have obtained all appropriate patient consent.

## FINANCIAL SUPPORT AND SPONSORSHIP

Nil.

## CONFLICTS OF INTEREST

There are no conflicts of interest.

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