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## Topical Corticosteroids: A Review Article on Its Adverse Effects and Abuse Leading to Local and Systemic Side Effects-Pharmacist Perspective



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### ABSTRACT

Topical corticosteroids are potent preferable drugs of choice in dermatology, but their abuse and misuse are increasing. People tend to use topical corticosteroids for instant relief from itching and rashes but it may cause other local side effects. There is a misuse of Topical corticosteroids due to number of reasons like easy availability as over the counter, available at an affordable price, faster relief and onset of action. Long-term use may cause systemic and topical side effects like skin atrophy, striae and telangiectasia. Prescribing these agents should be done cautiously and dermatologists should take time to explain patient on rational use of these agents, duration, dosage, frequency and side effects. Without any lesion or without any advice from dermatologist people use these agents Irrationally for skin lightening, skin pigmentation. These practices should not be promoted and strict regulations should be taken to reduce misuse of topical corticosteroids. There should be an evidence-based prescribing guideline to prevent further abuse of these agents.



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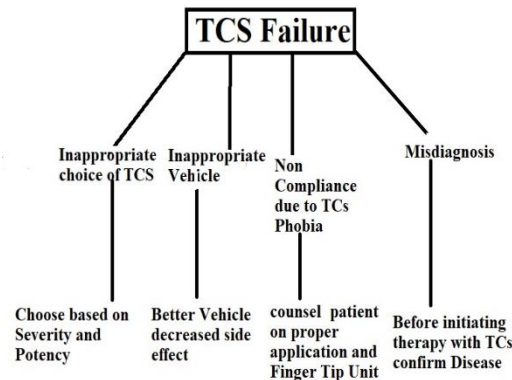
## INTRODUCTION

In Modern Practice, steroids are used in medicine, dermatology, cosmetology, rheumatology etc. and their use is increasing, we are aware of steroid-induced side effects. Increasing use of topical steroids is due to its unique impact on physiology that includes faster action and relief, multiple indication in a wide variety of dermatological conditions like Atopic dermatitis, Psoriasis, Lichen Planus, Immunobullous disorder etc. The side effects of these agents range from mild to very severe depending on body surface area being exposed, duration of exposure and frequency of usage. Eventually long-term exposure to these agents may cause side effects that are serious and unneglectable. It is found that soft, sensitive areas like face and genitals with a high rate of transcutaneous absorption and high vascularity will have more side effects. [1] Other leading cause for TCS abuse maybe due its easy availability of TCS in Indian market as OTC and poor access to dermatologist in rural communities [2]. Other causes for TCS may include its easy compatibility with other agents like antibiotics, antifungal and depigmenting agents. Recently, a study done at rural tertiary care teaching hospital in Maharashtra, India concluded that 28% of 500 prescriptions had TCs, out of which 98% were very potent corticosteroids; and in 85% of cases, the basis of prescribing TCs could not be established.[3] That was alarming situation where topical steroids are prescribed irrationally, inappropriately without FDA indication, and topical steroid therapy with potent class.

Drug based	Due to its potency and faster relief of inflammation, multiple indications, Drug availability and FDC with antimicrobials
Patient-based	Women use TCS for skin pigmentation and for beautification
Prescriber based	Prescribing of potent TCS for simple dermatoses

*Reasons for wide use of TCS in India* [4]

Two distinct ends of topical TCS are steroid phobia and steroid abuse both leading to treatment failure or under therapy. [5]



Corticosteroids from the time of discovery it is well known that they can cause systemic and topical side effects when they are administered by oral or parenteral route. Some of the systemic side effects include weight gain, hypertension, cushingoid habitus, osteopenia, hirsutism. Ocular side effects such as glaucoma and cataract commonly seen in pediatric [6] Locally it can cause immediate effects as burning and stinging and long-term use may cause Skin Atrophy, Hypo/Hyper pigmentation, Photosensitivity, Premature Ageing of skin due to loss of skin barriers. TCS withdrawal can be divided into 2 distinct morphologic syndromes: Papulopustular and Erythema oedematous. Erythematoedematous type is more frequent in patients who have chronic dermatoses such as atopic dermatitis and seborrheic dermatitis and it is characterized by redness, scaling, and wheal formation with or without burning sensation papulopustular type is more common in patients who are using TCS for pigmentary disorders or acneiform conditions. The papulopustular withdrawal subtype is more likely in patients who develop steroid rosacea. The papulopustular variant can be differentiated from the erythema oedematous subtype by the prominent features of pustules and papules, along with erythema, but less frequently swelling, oedema, burning, and stinging.[7] The adverse reactions are strongly associated potency of topical corticosteroids used and have increased in frequency of adverse reactions with the introduction of high-potency topical corticosteroids.[8]

To prevent the rebound, consider discontinuation of the treatment, with the use of a less potent preparation and/or the use of an emollient vehicle alternately.[9] if these agents are used appropriately and rationally, they are safe and seem to have fewer side effects and withdrawal symptoms.

According to recent guidelines, it is recommended to use high dose corticosteroids during the acute flares and continue with lowest possible dose of corticosteroid when the episode is

under control. Women are subjected to steroid abuse hence depending on severity of dermatoses one should use TCs of the least potency required and the duration and amount should be monitored judiciously. The risk of adverse events is more in area of application where there is high absorption including genitals, eyelids, skin fold, armpits and vulva. [10] In body sites with thin skin (face, eyelids, scrotum and flexures), milder corticosteroids should be used and also in dermatoses involving extensive body surface areas and in children; such practice is meant to reduce therapy-related side effects. [11]

#### Choosing the Potency of TCS

Patient: based on patient age (Infant child or adult)

Lesion location: less vascular or more vascular

Lesion type and severity: size and numbers of lesions

Topical medication: molecular structure, Percentage, formulation, and vehicle

TCS prescribing guideline:

1. **Prescribe the correct class:** The weakest steroid that controls the disease effectively should be chosen to reduce the risk of topical steroid withdrawal reactions. Initially, topical steroids should be applied once daily, if no benefit is seen after 7-10 days, change to twice daily for a further 7-10 days.

2. **Prescribe the correct amount:** Explain to the patient how to apply just a small amount and rub gently into the skin until it disappears. Prescriber/Pharmacist should educate patient on rational application of this topical agent and patient should be assured of specific fingertip unit (FTU) for each area of application.

3. **Reassure the patient response:**

Many patients fear TCS

### Steps In Prescribing TCS

**1. Make a diagnosis**

**2. Choose an appropriate Agent:** considering area of application, Severity, Go for least potent agent for short duration of time

**3. Plan a therapeutic goal:** Duration of application, appropriate vehicle, body surface area to be applied.

**4. Counsel patient:** rational use of these agents, Fingertip unit and dosage and frequency

**5. Monitor patient:** monitor whether treatment goal is achieved, look for both beneficial and harmful effects.

**6. Reassure:** switch to stronger agents if needed, if misdiagnosed-reassure diagnosis.

Incorrect diagnosis

Patient who keeps using the medication beyond the prescribed duration to prevent reoccurrence.

**4. Prefer non-steroidal cream whenever appropriate:** TCS + Moisturizing cream is found to be more efficient than single TCS.

**5. Minimize topical side effects in best possible way:** Acne and perioral dermatitis: Educate patient to avoid touching their face after applying their medication. Skin atrophy: The loss of the collagen that supports the arteries causes telangiectasia and easy bruising. [12, 13]

### Discussion

Misuse of TC, which is defined as inappropriate topical steroid usage on the skin due to improper formulation, frequency, duration, or indications applied for specific skin disorders.[14] Misuse of topical steroids are increasing with the occurrence of acute and chronic adverse effect, there should be stewardship and proper prescribing guidelines. Dermatologists, Physicians and pharmacists are mainly attributed for TCS abuse followed by friends, family members etc., to the extent that they ignored to inform the patients about the risks and proper dosage of topical corticosteroids.[15] An Australian survey found that 36% of pharmacists under-recognized nonadherence as a reason for treatment failure.[16] It was

observed that majority of patients were ignorant about side effects, dosage and mode of application. Another major issue happening in clinics and hospitals are use of potent TCS over mild and moderate anticipating faster outcome. In a study conducted in Kerala by Susan Merin et.al it was found more than 50.78% of total number of steroids prescribed belongs to the very potent category, followed by 4.32% were mild, 12.19% and 32.67% were moderate and potent steroids respectively.[17] Other trend seen in Indian population is using TCS without any dermatoses. There was a study in China that depicted that 28.5% used steroids on the face without any underlying dermatosis [18] and there was a similar study carried out in a rural tertiary hospital India where 74% people used topical corticosteroids without any indication. [19]

Educating patient about the indication of each prescription and duration is important in preventing adverse effects to a certain extent. Type of disease and area of application are two factors that decides dosage and fingertip Unit (FTU), so proper education should be made among patients on appropriate application of these topical agents. In the study by Merin Susan et.al they have also found that frequency and duration of treatment were also not mentioned in some of the prescriptions which can directly lead to an increase in the financial burden to the patients followed by therapeutic failure or toxicity. The doctor must select the best medication for the patient, at a price that is affordable and will provide relief to the patient. It is essential to spend more time with the patient in explaining the dosing and the adverse effects associated with self-medication of the same drug. However, physicians are more likely to prescribe more generic medications. It would however be encouraging to have more generic prescribing. Despite the increased likelihood that a fixed-dose combination (FDC) containing a corticosteroid would be prescribed, it is necessary to prescribe them as single preparations as the adverse effects associated with their use are more in fixed.[17] In another study by Niral K Seth et.al they found out that none of the patients were not aware of the dosage and how much of the drug should be applied to specific body surface area.[20]

Women population are more likely to get affected by adverse effects of TCS due to number of reasons like inappropriate use as cosmetics and beautifying agents. In a survey on 769 women in Saudi, 30.3% of the patients were in the age group of 31 to 40 years, most of them used topical steroids for skin lightening and to reduce skin wrinkles and ageing [21]. In a study by Vivek Kumar et.al on 6723 patients it was found that 379 (5.63%) had experienced an adverse effect due to misuse of these agents, 78.89% of them were women. Out of it More than 65% of the patients were grouped in the age group of 10-29 years. Only 3.43% of

patients were aware of topical corticosteroids' side effects. Patients are unaware of dose, dosage and frequency.[22] People seems to reuse the prescriptions for new lesion and rashes considering it similar to other chronic diseases like diabetics, epilepsy. And also, there is a malpractice that friends and relatives suggesting branded agents to treat similar-looking skin problems.[9] In a study by Santwana Mahar by et al 97.6% did not know the dosage i.e., how much amount of the drug(Fingertip Unit) should be applied to specific body area. One patient followed the pharmacist's advice and applied 5 tubes of topical steroid within a week. A total of 34% patients inappropriately used the TC in terms of incorrect frequency. In this study, it is found that dermatologists contributed only 4.45% to the prescription. Since they don't write the necessary recommendations for the exact duration, dose, and amount to be administered, dermatologists are therefore also responsible for the misuse of TC. Proper awareness should be raised among dermatologists regarding the rational use of topical steroids.

In rural areas of our country where dermatologist to patient ratio is very low, patients primary contact for any health-related problem is chemist and pharmacist. The central and state drug regulatory body should sensitize these personals on Topical corticosteroids, its rational use and adverse effects. Patient should be properly counselled on dose, frequency, site of application and duration. Initially TCs can bring a faster relief to patient as these agents reduces inflammation but in long term use can flare up rebound withdrawal symptoms. Finally, patient should be educated properly in the outpatient setting and over the counter on rational use of these agents. These issue, although reported from many places worldwide it has wide significant impact in our country where there are just a few dermatologists to treat such a huge population and there are no strict regulations for over-the-counter (OTC) prescription of these drugs.[14]

In a study by Vivek Kumar, it was found that pharmacists and paramedical personnel to be held accountable for the abuse of topical corticosteroids along with the patient, friends or family.

It is the role and responsibility of general physicians and dermatologists that they have to bring to the notice of patient the possible side effects and proper dosing of topical corticosteroids. [22]

Pharmacists tends to dispense these topical agents based on prior knowledge and experience which may be irrational. An evidence-based medical practice should be initiated in OPD and OTC. Pharmacists in chemist shop and medical shops, whose qualification is not known, they

play as doctors doling out advice about which TCs to use. These potent types of TCs are readily available at reasonable price, which has led to widespread usage that had several negative impacts. Despite being a severe problem, the misuse of TC products in India has only been the subject of a few numbers of research.[14]

Factors Decreasing TCS harm

PATIENT FACTORS	Early visits to physicians and treatment, Medication adherence, Life style, mental and social wellbeing.
PRESCRIBER FACTOR	Proper selection potency, appropriate vehicle, rational regimen.
PHARMACIST FACTOR	Patient education and awareness, methods to improve medication adherence.

Factors Increasing/Pre disposing to TCS harm

PATIENT FACTORS	Late visit to physicians, use of TCS beyond indication, using for new rashes or lesion without advice from dermatologist, using for non dermatoses reasons like fairness and beautifying, using TCS from OTC.
PRESCRIBER FACTOR	Lack of information on TCS, its potency, its vehicle, no proper guidelines for prescribing.
PHARMACIST FACTOR	Lack of Patient education and awareness, Unqualified person prescribing Topical agents like Chemist, Pharmacist, friends and relatives.

**CONCLUSION**

Topical corticosteroids are a drug of choice for many dermatologists for acute and chronic dermatoses. On long-term use these agents may bring some serious adverse effects ranging from systemically Hypothalamic pituitary adrenal axis suppression (HPAAS) to locally causing atrophy, striae rosea, telangiectasia, purpura erythroderma. Even though many serious systemic and topical adverse effects have been identified very few quality studies



have been done on safety and efficacy of these agents. Easy availability at affordable prices in Indian market is one of reasons for abuse. There is a trend seen that is women using these agents for skin lightening without any underlying rashes or lesions without any prescription from dermatologist. There is no proper guidelines or updates regarding rational use of TCs and even dermatologists are unaware of future harm of these agents. Patients should be advised properly on its use, dosage, and possible side effects before initiating therapy with agents. OTC drug use should be regulated with proper rules and regulations.

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