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Original Article

Appropriateness of Topical Corticosteroids Usage in Dermatology Patients of a Tertiary Care Hospital

Sreeraj Kandoth[1,3], Rompicherla Narayana Charyulu[2,*], Sarath Chandran Chadrashekar Shenoy[1], Uday Venkat Mateti[3], Juno Jerold Joel[3], Sarin S M[4]

[1]College of Pharmaceutical Sciences, Government Medical College Kannur, Kerala University of Health Sciences, Kannur, Kerala, INDIA.
[2]Department of Pharmaceutics, NGSM Institute of Pharmaceutical Sciences, NITTE (Deemed to be University), Mangaluru, Karnataka, INDIA.
[3]Department of Pharmacy Practice, NGSM Institute of Pharmaceutical Sciences, NITTE (Deemed to be University), Mangaluru, Karnataka, INDIA.
[4]Department of Medicine, Government Medical College Kannur, Kerala University of Health Sciences, Kannur, Kerala, INDIA.

ABSTRACT

Background: Topical Corticosteroids (TCs) have been a cornerstone in the management of various dermatological conditions. The dual nature of their widespread use and potential for misuse has emerged as a significant concern, particularly in resource-limited settings such as tertiary care government teaching hospitals. The aim of the study is to analyse the prescription patterns and appropriateness of TCs usage among the dermatology patients. **Materials and Methods:** A prospective observational study was carried out in the out-patient dermatology department of a tertiary care government teaching hospital. Adult patients (18-60 years) who consulted the dermatology department and prescribed TCs were included in the study. Patient's sociodemographic details, dosage form, strength, frequency and duration of TCs were documented. Depending on the strength of TCs, the potency of TCs were classified and their appropriateness was evaluated by validated questionnaire. **Results:** This study evaluated 160 dermatology patients prescribed TCs in a tertiary care hospital. Male patients (58.12%) predominated, with seborrheic dermatitis (55.62%) being the most common condition followed by eczema, lichen planus, lichen simplex chronicus. Potent TCs (33.75%) were frequently prescribed. Appropriateness scores averaged 68.4%, indicating suboptimal adherence to guidelines, particularly in allergic contact dermatitis (35%). Addressing improper usage through clinical education and standardized protocols is essential. **Conclusion:** This study highlights inappropriate topical corticosteroid use and suboptimal guideline adherence (68.4%) by the patients. Potent steroids were often prescribed, especially for seborrheic dermatitis. Improved prescribing practices, pharmacist involvement in dispensing, patient education and counselling are essential to ensure safe, effective, and rational use of TCs.

Keywords: Appropriateness, Dermatitis, Dermatology, Topical corticosteroids.

Correspondence:
Dr. Rompicherla Narayana Charyulu
Professor, Department of Pharmaceutics, NGSM Institute of Pharmaceutical Sciences, NITTE (Deemed to be University), Mangaluru, Karnataka, INDIA.
Email: narayana@nitte.edu.in

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INTRODUCTION

Topical Corticosteroids (TCs) have been a cornerstone in the management of various dermatological conditions since their introduction. Corticosteroids are widely utilized across the globe due to their exceptional ability to alleviate symptoms of various inflammatory, immune-related, and other medical conditions. Their efficacy in controlling inflammatory, pruritic, and hyperproliferative skin disorders has made them indispensable in dermatology. However, the dual nature of their widespread use and potential for misuse has emerged as a significant concern, particularly in resource-limited settings such as tertiary care government teaching hospitals (Tegegnie *et al.*, 2025). To address the current scenario of TCs usage, it is necessary to explore prescribing trends, misuse, and implications for safety and practice.

The increasing prevalence of TCs misuse is well-documented, with studies indicating that a significant proportion of patients use these agents without medical supervision. In India, the easy over-the-counter availability of TCs, often combined with antifungal and antibacterial agents, contributes to their inappropriate use (Rathi and D'Souza, 2012). This misuse is fuelled by their rapid symptomatic relief, often leading to dependence and a cascade of adverse effects, including tinea incognito, steroid-induced acne, and skin atrophy (Varshney *et al.*, 2019).

TCs are highly effective for treating inflammatory skin conditions but may result in serious adverse effects when used improperly or for extended periods. Localized side effects include skin atrophy,

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stretch marks (striae), telangiectasia, and a heightened risk of infections. Serious systemic complications, though less common, can involve adrenal suppression, Cushing's syndrome, and avascular necrosis. Misuse or overuse may lead to steroid rosacea or perioral dermatitis, while sudden withdrawal following prolonged use may cause intense redness and burning sensations. Proper prescribing practices, thorough patient education, and adherence to treatment guidelines are vital to mitigating these risks (Burshtein *et al.*, 2025). The interaction between skin physiology and Adverse Drug Reactions (ADRs) of TCs involves complex mechanisms influenced by the skin's structure and function. TCs exert their effects by binding to glucocorticoid and mineralocorticoid receptors in the skin, regulating inflammation and immune response (Pérez, 2022). Prolonged use of TCs can disrupt the skin barrier, leading to thinning, telangiectasia, delayed wound healing, and increased susceptibility to infections. Individual factors such as skin thickness, hydration levels, and enzyme activity modulate these effects, contributing to varied ADR profiles. Understanding these physiological interactions is essential for optimizing TCs therapy while minimizing skin-related complications (Afshari *et al.*, 2024).

The ethical and clinical challenges associated with TCs are manifold. Clinicians often face pressures to meet patient expectations for quick results, which can lead to overprescription or the use of inappropriate potencies (Saraswat, 2018). Moreover, the lack of patient education about the risks of prolonged or unsupervised use exacerbates these issues. Studies from Indian dermatology practices reveal that up to 30% of prescriptions include TCs, highlighting their pervasive role in dermatological care.

This study aims to analyse the appropriateness of TC prescriptions within the context of a tertiary care setting. By evaluating the prescribing patterns, patient usage and its appropriateness, the study underscores the importance of evidence-based guidelines and patient education in optimizing TC use (Bewley and Dermatology Working Group, 2008). Furthermore, the findings seek to inform policy changes that could mitigate the rampant misuse of these potent agents, thereby improving patient outcomes and reducing the burden of dermatological complications (Nafih *et al.*, 2022).

The exploration of TC usage in a tertiary care teaching hospital not only addresses a critical public health issue but also contributes to the broader discourse on rational drug use. This study aligns with the global efforts to enhance the safe and ethical use of TCs, advocating for a balanced approach that maximizes their therapeutic benefits while minimizing the risks.

MATERIALS AND METHODS

Study Design and Ethical Issues

A prospective observational study was carried out in the out-patient dermatology department of a tertiary care government teaching hospital. Prior to the initiation of study hospital ethics committee clearance was obtained (Letter number- IEC No.29/2022/GMCK) and the study was registered in the Clinical Trials Registry-India (Ref. No: CTRI/2023/05053287). Before the enrolment into the study, the patients were explained about the study and obtained written informed consent.

Inclusion Criteria

Adult patients (18-60 years) who consulted the dermatology department and prescribed topical corticosteroids were included in the study.

Exclusion Criteria

Patients taking any oral or inhaled steroidal or complementary and alternative medicines, unconscious or mentally delayed and pregnant, or lactating patients were excluded from the study.

Sample Size

The minimum sample size of 160 is required to conduct this study and was calculated using the below mentioned formula:

Sample size:

image1

Where Z1-α/2=1.96, corresponding to a 5% level of significance.

p=11.77%, prevalence of irrational use (Mahar *et al.*, 2016).

q=100-p=88.23%, proportion free from irrational use.

d=5% absolute error.

Data Collection

Patient's sociodemographic information such as age, gender, social habits, diet and comorbidities were collected. Further, the dose, dosage form, strength, frequency and duration of TCs are documented along with the indication for which it was prescribed. Depending on the strength of TCs, the potency of TCs were classified into very potent, potent, moderate and mild (Joint Formulary Committee, 2022). The appropriateness of topical steroids application was evaluated by validated questionnaire which consists of 5 questions. The appropriateness score was ranged from 0-20. A higher appropriateness score indicates better the adherence to the TCs. The evaluation was carried out among the patient during the last week of treatment.

Data Analysis

The data were analysed using descriptive statistics, and data were analysed using SPSS software version 20.

RESULTS

Sociodemographic details of the patients

Out of 160 patients, male patients outnumber the female. In the study, the most common dermatological condition observed was seborrheic dermatitis (55.62%), eczema (20%), lichen planus (8.13%), lichen simplex chronicus (3.12%), intertrigo (8.13%), and allergic contact dermatitis (5%). Majority of the patients were in the age group of 18-30(41.87%) followed by 31-40 (27.50%) and others. Most of the patients were from the socio-economic class of lower middle (74.38%) followed by upper lower (22.5%) and upper middle (3.12%). According to diet, 14.38% of the patients were vegetarian and 85.62% of the patients were non-vegetarian. In the study population, 21.7% of patients had hypertension, 56.5% had Diabetes Mellitus (DM), and 21.7% had both DM and hypertension as comorbidities. The detailed sociodemographic details of the patients are presented in the Table 1.

Prescription Patterns of Topical Corticosteroids

During the prescription analysis, it was observed that all the six different dermatological disease conditions for which TCs were prescribed. Most of the seborrheic dermatitis patients were prescribed with Fluticasone propionate 0.005% ointment and Clotrimazole+Beclomethasone dipropionate 0.025% ointment. Majority of the eczema patients were prescribed with Mometasone furoate 0.1% ointment and fluocinolone acetonide 0.025% ointment. For Lichen Planus patients, Clobetasol propionate 0.05% ointment and Betamethasone dipropionate 0.05% ointment was prescribed. Whereas for the Lichen Simplex Chronicus, Fluocinonide 0.05% ointment and halcinonide 0.1% ointment was prescribed. The most common TCs prescribed

Table 1: Socio-demographic details of the patients.

Variables		Number of patients (%) (*n*=160)
Gender	Male	93(58.12)
	Female	67(41.87)
Age	18-30	67(41.87)
	31-40	44(27.50)
	41-50	36(22.5)
	51-60	13(8.12)
Socio-economic class	Upper Middle	5(3.12)
	Lower Middle	119(74.37)
	Upper Lower	36(22.5)
Diet	Vegetarian	23(14.37)
	Non-Vegetarian	137(85.62)
Dermatological Condition	Seborrheic Dermatitis	89(55.62)
	Eczema	32(20)
	Lichen Planus	13(8.12)
	Lichen Simplex Chronicus	5(3.12)
	Intertrigo	13(8.12)
	Allergic Contact Dermatitis	8(5)
Comorbidities	Hypertension	5(3.12)
	Diabetes Mellitus	13(8.12)
	Hypertension and Diabetes Mellitus	5(3.12)

for intertrigo were fluocinolone acetonide 0.025% ointment and desonide 0.05% cream. Whereas, for the TCs prescribed for Allergic Contact Dermatitis were betamethasone dipropionate 0.05% ointment and hydrocortisone acetate 1% cream. The detailed prescription patterns of TCs for different dermatological conditions are presented in the Table 2. In the study, the treatment duration for eczema (14-21 days), lichen planus (14-21 days), seborrheic dermatitis (7-21 days), lichen simplex chronicus (21 days), intertrigo (7-14 days) and allergic contact dermatitis (7-14 days) was observed.

Potency class of topical corticosteroids prescribed to the patients

In the study, Miconazole+Clobetasol propionate 0.05% ointment (13.12%), Fluticasone propionate 0.005% ointment (25%), Clotrimazole+Beclomethasone dipropionate 0.025% ointment (16.87%), and Hydrocortisone acetate 1% cream (5.62%) were the most commonly prescribed very potent, potent, moderate and mild TCs respectively for the different dermatological conditions. the most of the patients were prescribed with potent (33.75%) class of TCs followed by moderate (31.25), very potent (29.37%) and mild (5.62%) class of TCs. The detailed Potency class of topical corticosteroids prescribed to the patients are presented in the Table 3.

Appropriateness of topical corticosteroids usage

The highest appropriateness score was observed for the lichen planus followed by eczema, seborrheic dermatitis and other dermatological conditions. The overall appropriateness score for the different dermatological conditions was 13.68 and this score accounts for 68.4%, which is low. There is not much difference in the appropriateness score among male (13.98) and female (13.26). The appropriateness of topical corticosteroids usage scores for the different dermatological conditions are presented in the Table 4.

DISCUSSION

TCs are essential for managing dermatological conditions but face misuse, inappropriate prescription, and patient non-adherence issues, particularly in resource-limited settings. This study explores patient demographics, prescription patterns, and TCs' appropriateness.

Of the 160 patients, 58.12% were male and 41.87% female, indicating a higher male tendency for dermatological consultations and TC use. This aligns with Meena S *et al.*'s study in India. Greater male exposure to occupational hazards and outdoor activities might contribute to this trend (Meena *et al.*, 2017). The majority of patients were in the age group of 18-30 (41.87%), followed by 31-40 (27.5%). This distribution may

Table 2: Prescription Patterns of Topical Corticosteroids for different Dermatological Conditions.

Topical corticosteroids	Seborrheic Dermatitis (*n*= 89)	Eczema (*n*= 32)	Lichen Planus (*n*=13)	Lichen Simplex Chronicus (*n*=5)	Intertrigo (*n*=13)	Allergic Contact Dermatitis (*n*=8)	Overall (*n*= 160)
Betamethasone dipropionate 0.05% ointment	2 (2.25)	5(15.62)	5(38.46)	-	-	4(50)	16(10)
Fluticasone propionate 0.005% ointment	27(30.34)	13(40.62)	-	-	-		40(25)
Fluocinolone acetonide 0.025% ointment	6(6.74)	5(15.62)	-	-	5(38.5)	-	16(10)
Desonide 0.05% cream	1(1.12)	-	-	-	4(30.8)	-	5(3.12)
Hydrocortisone acetate 1% cream	5(5.6)	-	-	-	2(15.38)	4(50)	11(6.87)
Clotrimazole + Beclomethasone dipropionate 0.025% ointment	27(30.34)	-	-	-	-	-	27(16.87)
Miconazole + Clobetasol propionate 0.05% ointment	21(23.6)	-	-	-	-	-	21(13.12)
Mometasone furoate 0.1% ointment	-	9(28.12)	-	-	-	-	
Clobetasol propionate 0.05% ointment	-	-	8(61.53)	-	-	-	8(5)
Fluocinonide 0.05% ointment	-	-	-	3(60)	-	-	3(1.87)
Halcinonide 0.1% ointment	-	-	-	2(40)	-	-	2(1.25)
Triamcinolone acetonide 0.025% cream		-	-	-	2(15.38)	-	2(1.25)

Table 3: **Potency class of topical corticosteroids prescribed to the patients.**

Drug	Potency class (*n*=160)			
	Very Potent	Potent	Moderate	Mild
Clobetasol propionate 0.05% ointment	8(5)	-	-	-
Betamethasone dipropionate 0.05% ointment	18(11.25)	-	-	-
Fluocinonide 0.05% ointment	-	3(1.87)	-	-
Halcinonide 0.1% ointment	-	2(1.25)	-	-
Mometasone furoate 0.1% ointment	-	9(5.62)	-	-
Fluticasone propionate 0.005% ointment	-	40(25)	-	-
Fluocinolone acetonide 0.025% ointment	-	-	16(10)	-
Desonide 0.05% cream	-	-	5(3.12)	-
Triamcinolone acetonide 0.025% cream	-	-	2(1.25)	-
Hydrocortisone acetate 1% cream	-	-	-	9(5.62)
Clotrimazole + Beclomethasone dipropionate 0.025% ointment	-	-	27(16.87)	-
Miconazole + Clobetasol propionate 0.05% ointment	21(13.12)	-	-	-
Total	47(29.37)	54(33.75)	50(31.25)	9(5.62)

Table 4: **Appropriateness of Topical Corticosteroids Usage.**

Dermatological Condition	Appropriateness Score, % (Maximum Score = 20)
Seborrheic Dermatitis	14.19 (70.95)
Eczema	14.37 (71.85)
Lichen Planus	15.07(75.35)
Lichen Simplex Chronicus	11.8 (59)
Intertrigo	12 (60)
Allergic Contact Dermatitis	7 (35)
Overall Appropriateness Score	13.68 (68.4)

reflect the higher incidence of dermatological conditions such as seborrheic dermatitis and eczema in younger adults. A study by Kirsten *et al.* also reported a similar age distribution, with most patients being young adults presenting with inflammatory skin conditions (Kirsten *et al.*, 2021). Younger populations may also have a greater willingness to seek medical advice for cosmetic concerns, which could explain their higher representation in this study.

The majority of patients were from the lower-middle class (74.38%) and upper-lower class (22.5%). Despite accessible healthcare systems, lower socioeconomic groups often self-medicate or purchase TCs OTC due to easy availability, as highlighted by Dey *et al.* in resource-limited settings (Dey, 2014). 85.62% of patients were non-vegetarians, but no diet-dermatological link was found. Diabetes mellitus (56.5%) and hypertension (21.7%) were common, necessitating cautious TC prescription due to increased infection risk in diabetic patients (Qureshi *et al.*, 2009).

Seborrheic dermatitis accounted for 55.62% of TC prescriptions, followed by eczema (20%) and other conditions. Fluticasone propionate and Clotrimazole+Beclomethasone ointments were most common. These combinations address inflammation and

fungal colonization, aligning with Mijaljica *et al.*'s findings on dual-action therapies (Mijaljica *et al.*, 2022).

Eczema patients were predominantly prescribed Mometasone furoate 0.1% ointment and Fluocinolone acetonide 0.025% ointment, both of which are mid-potency steroids effective for inflammatory dermatoses. A study by Kim *et al.*, reported similar prescription patterns, with Mometasone furoate being the preferred choice due to its favorable efficacy-safety profile (Kim *et al.*, 2013). For lichen planus, a chronic inflammatory condition, high-potency steroids such as Clobetasol propionate 0.05% ointment and Betamethasone dipropionate 0.05% ointment were commonly used. These findings are consistent with research by Usatine *et al.*, where potent corticosteroids were preferred to control inflammation in chronic dermatoses (Usatine and Tinitigan, 2011). However, prolonged use of these potent agents necessitates careful monitoring to prevent adverse effects.

The treatment duration varied across conditions, with seborrheic dermatitis patients receiving TCs for 7-21 days and eczema for 14-21 days. Chronic conditions such as lichen planus and lichen simplex chronicus required longer durations of up to 21 days, whereas intertrigo and allergic contact dermatitis were managed over 7-14 days. A similar trend was observed in the study by Stacey *et al.,* where treatment duration depended on the severity and chronicity of the condition (Stacey and McEleney, 2021). This variability underscores the importance of tailoring treatment plans while minimizing risks.

The potency classification of prescribed TCs revealed a predominance of potent (33.75%) and moderate (31.25%) steroids, followed by very potent (29.37%) and mild (5.62%) agents. The widespread use of potent TCs, such as Fluticasone propionate 0.005% and Betamethasone dipropionate 0.05%, underscores their effectiveness in managing moderate-to-severe inflammatory dermatoses. However, the frequent prescription of very potent agents like Clobetasol propionate 0.05% raises concerns about potential adverse effects, especially if used unsupervised or for extended durations. In comparison, study by Karekar *et al.*, reported similar findings, with potent and very potent corticosteroids accounting for over 60% of prescriptions (Karekar *et al.*, 2020). The preference for higher-potency steroids reflects clinical pressures for quick symptomatic relief but also highlights the need for caution to avoid misuse, particularly in chronic conditions.Moderate-potency TCs, including Fluocinolone acetonide 0.025% and Desonide 0.05%, were primarily prescribed for less severe conditions like intertrigo and mild eczema. The limited use of mild steroids, such as Hydrocortisone acetate 1%, suggests a tendency to favor more potent agents, which aligns with findings from Stern., and this preference may be driven by patient expectations for rapid relief (Stern, 1996).

The overall TC usage appropriateness score was 13.68 (68.4%), with lichen planus scoring highest (75.35%), followed by eczema (71.85%) and seborrheic dermatitis (70.95%). Lichen simplex chronicus (59%) and intertrigo (60%) scored lower, indicating guideline adherence issues. Similar findings by Sheth *et al.* linked this to inadequate training and education.(Sheth and Nair, 2021) The appropriateness score for allergic contact dermatitis was alarmingly low is 7 (35%), suggesting significant gaps in the rational use of TCs for this condition.

Factors such as lack of standardized treatment protocols, patient non-adherence, incomplete patient education, and insufficient physician and pharmacist training likely influenced the overall appropriateness. Studies by Kang *et al.*, emphasize the importance of patient counseling, clinician education, and pharmacist training to improve adherence to evidence-based guidelines (Kang *et al.*, 2020).

Alternatives to topical corticosteroids include topical JAK inhibitors, calcineurin inhibitors, and PDE-4 inhibitors, which have emerged as promising options in recent years (Ali *et al.*, 2024).

CONCLUSION

This study highlights the challenges of inappropriate Topical Corticosteroid (TC) use by the patients, emphasizing the need for targeted interventions. To reduce misuse, healthcare practitioners should develop condition-specific clinical guidelines and implement regular prescription audits to monitor adherence. Tailoring treatment plans based on socio-demographic factors and ensuring comprehensive patient education on proper TC application and potential side effects are crucial steps. These measures can promote the safe, effective, and rational use of TCs, minimizing risks and enhancing dermatological care outcomes.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

ABBREVIATIONS

TCs: Topical corticosteroids; **DM:** Diabetes mellitus; **OTC:** Over the counter; **IEC:** Institutional ethics committee; **CTRI:** Clinical trials registry India.

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