



Ramification of Topical Steroid Abuse- An Observational Study

Dr Nagaraju Naveen ¹, Dr Puneetha B², Dr Sukanya S K³, Dr Ravi M R ^{4*}

1 Associate Professor, Department of Dermatology, Chamarajanagar Institute of Medical Sciences, Chamarajanagar, Karnataka, India

2 Consultant Pediatric Dermatologist, Kangaroo care Hospital, Mysore, Karnataka, India

3 Lady Medical officer, Department of Community Medicine, Chamarajanagar Institute of Medical Sciences, Chamarajanagar, Karnataka, India

4 Assistant Professor, Department of Community Medicine, Chamarajanagar Institute of Medical Sciences, Chamarajanagar, Karnataka, India

*Correspondence

Dr Ravi M R

Assistant Professor, Department of Community Medicine, Chamarajanagar Institute of Medical Sciences, Chamarajanagar, Karnataka, India

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KEYWORDS

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Abstract

Topical steroids are the most commonly prescribed medications in dermatology. Topical corticosteroids (TCs). There is an imperative to evaluate the practices associated with the utilization of topical steroids. Research on steroid misuse has been documented in several countries, including China, Iraq and the USA, yet the evidence remains limited within Indian studies. This study was undertaken with the objective to examine the factors associated with the misuse of topical corticosteroids and its implications among patients attending the dermatology outpatient department (OPD)

Methodology: It is an observational study, conducted over a period of 12 months. A minimum sample size of 93 was determined based on an assumed prevalence of topical steroid misuse at 0.4 and a total of 115 patients were included in the study. Statistical analysis was done using Student's t-test and Chi-Square test. The significance level was taken as P value < 0.05. logrank test was used to compare the mean duration to visit OPD.

Results: Source of prescription for topical steroids, 65 (56.5%) of them were prescribed by other than doctors. In majority of patients more than one side effects were observed. Most common side effects experienced was Hyperpigmentation 56 (48.7%). the overall duration from initiating the use of topical steroids to the occurrence of side effects and subsequent visit to the dermatology outpatient department (OPD) was 10.03 months for those prescribed by other than doctors, whereas for those who received advice from doctors, the average duration was 4.79 months

Conclusions: These studies underline the necessity for public health interventions to improve awareness among individuals about the potential risks associated with topical steroid misuse

Introduction

Topical steroids are the most commonly prescribed medications in dermatology. Topical corticosteroids (TCs) made their debut in dermatology back in 1952^[1] and have since become one of the most extensively employed therapeutic formulations in the field. Topical steroids are frequently utilized to address various skin conditions including psoriasis, atopic dermatitis, seborrheic dermatitis, intertrigo, eczema, and

lichen simplex chronicus. Their usage is grounded in their notable anti-inflammatory, immunosuppressive, and anti-mitogenic effects^[2]. However, extended use of topical steroids has been associated with a wide array of localized and systemic side effects. At the local level, they may induce skin alterations such as atrophy, striae, telangiectasia, stellate pseudoscars, hypopigmentation, fragile skin, ulceration, purpura, and facial hypertrichosis^[3]. Moreover, topical steroids can



heighten susceptibility to bacterial, fungal, and viral infections at the site of application. To mitigate these adverse effects of topical steroids, it's important to consider factors such as potency, delivery method, administration frequency, and application site should be considered.^[4]

A study revealed that over half of the prescribed topical steroid medications were actually intended for fungal infections. The ease of obtaining them without a prescription, self-administration by individuals, affordability, and inadequate healthcare infrastructure contribute to making topical steroids one of the most commonly misused medications within the general population. This misuse has become so widespread that a significant proportion of patients visits to dermatologists are due to complaints related to the adverse effects resulting from excessive use of topical steroids^[5].

There is an imperative to evaluate the practices associated with the utilization of topical steroids. Research on steroid misuse has been documented in several countries, including China,^[6] Iraq^[7] and the USA^[8], yet the evidence remains limited within Indian studies^[9]. With the escalating issue of topical steroid misuse, it is crucial to gauge the level of awareness among the general population regarding the proper use of topical steroids. In India, no studies have been conducted to assess the public's knowledge concerning the use of topical steroids. Furthermore, on a global scale, there have been very few studies delving into this particular aspect^[10-12].

Consequently, this study was undertaken with the objective to examine the factors associated with the misuse of topical corticosteroids and its implications among patients attending the dermatology outpatient department (OPD).

Methodology

It is a Prospective observational study conducted at Department of Dermatology, Chamarajanagar Institute

of Medical Sciences, Chamarajanagar, over a period of 12 months (July 2022 - June 2023). Individuals who purchased both nonprescription and prescription packs of topical steroids were invited to participate in the study after obtaining ethical committee approval. Inclusion criteria encompassed patients of all genders and age groups who had used topical corticosteroids for various conditions at least 5 days a week for a minimum of 28 days. Those who used topical corticosteroids for less than 5 days a week, less than 28 days, or without evidence were excluded from the study.

A minimum sample size of 93 was determined based on an assumed prevalence¹³ of topical steroid misuse at 0.4 and a total of 115 patients were included in the study. Data collection involved face-to-face interviews utilizing a structured, validated questionnaire in the local language. Clinical diagnosis was established, and formal consent was obtained from each patient. The dermatologist conducted direct interviews with the patients, recording demographic details, steroid type, prescribed duration, frequency of use, indication, and treatment duration. Any side effects attributed to the topical steroids were also inquired about and documented.

Statistical analysis was done using Student's t-test and Chi-Square test was used for statistical evaluation. The significance level was taken as P value < 0.05. logrank test was used to compare the mean duration of opd visit.

Results

The study encompassed a cohort of 115 patients, with an average age of 36.24 ± 14.87 years. Among these, there were 53(46.1) male patients and 62(53.9) female patients.

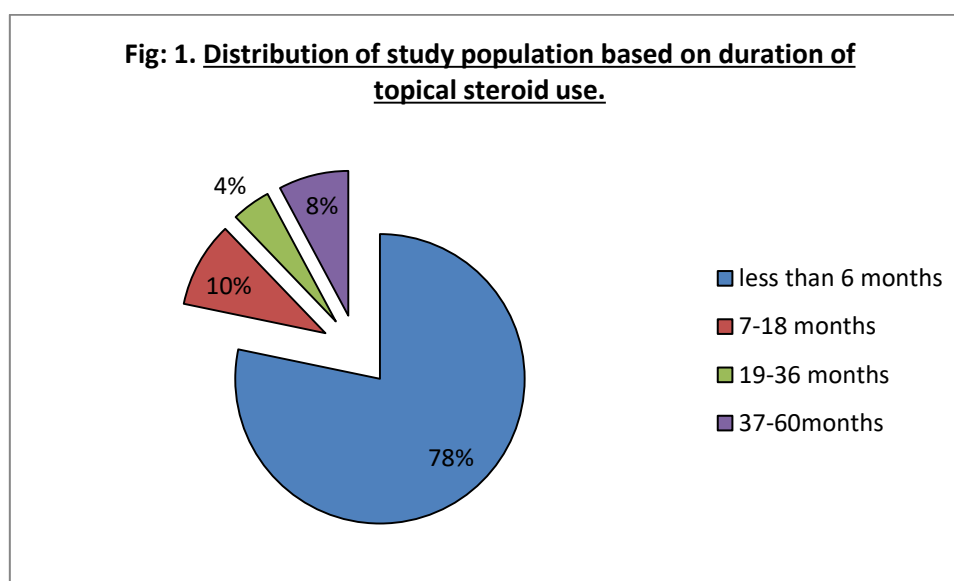
Table 1 shows the frequency of different steroids used based on the potency with majority 62(53.9%) of them using moderately potent steroids. **Table 2** shows purpose of use of topical steroids with majority 45 (39.1) using for the complaints of itching.

Table 1: Type of topical formulations used by patients (n=115)

Topical formulations	Frequency (%)
Very potent	6 (5.2)
Potent	27 (23.5)
Moderately potent	62 (53.9)
Mild potent	20 (17.4)
Total	115 (100)

**Table 2: Purpose of topical steroids usage**

Purpose of use	Frequency (%)
FAIRNESS	23 (20)
REDUCTION OF BLEMISH	24 (20.9)
ACNE	10 (8.7)
Itching	45 (39.1)
OTHERS	13 (11.3)
Total	115 (100.0)

Fig. 1. Distribution of study population based on duration of topical steroid use.

Symptom relapse after stopping the medication was observed in 28% of patients. Around 41% of patients receiving steroids for itching reported relapse of symptoms within 5 days after stopping the use of the steroid.

Fig 1 shows the duration of topical steroid use among the study population.

Regarding the source of prescription, 65 (56.5%) of them were prescribed by other than doctors and 50 (43.47%) received recommendations from physicians or dermatologists. Among those who received recommendation from other than Doctors majority 31 (26.9%), received a recommendation for the use of topical corticosteroids from a pharmacist. Following

that, 24 (20.87%) received recommendations from a friend or relative, Additionally, 10 (8.7%) patients engaged in self-medication.

Among the 115 patients, 45(39.13%) reported once-daily application, 64(55.65%) reported twice daily application whereas the remaining 6(5.21%) reported thrice daily application of topical steroids.

Table 3 shows the Comparison of the study population using topical steroid's those prescribed by doctors with those prescribed by other than doctors. There was statistically significant difference in experience of side effects ($P<0.005$) among these two groups. Similarly there was statistically significant difference in mean duration of use among these patients.

Table 3: characteristics of study population based on source of prescription

	Experiences Side effects (N=115)		Mean duration of Use (Months)	Awareness Regarding Side effects (N=115)	
	No(%)	Yes(%)		No (%)	Yes (%)
Other than	3(4.6)	62(95.4)	9.8	59(90.8)	6(9.2)



Doctors					
Doctors	8(16)	42(84)	4.2	47 (94)	3(6)
Significance value	4.234 [#]		2.362 ^{\$}		
P	<0.05*		<0.05*		0.729 [^]
Value					

*Significant. [#]Chisquare Test. ^{\$} Independent t test. [^]Fischers exact test

In majority of patients more than one side effects were observed. Most common side effects experienced was Hyperpigmentation 56 (48.7%) followed by erythema 36 (31.3%) (Table 4) (Figure 1-4)

Table 4: Distribution of side effects and their association with duration of use

Side effects	Frequencies (%)		Mean duration of use in months	P value [#]	95% CI	
					Lower limit	Upper limit
Hypopigmentation	Yes	19 (16.5)	1.94	<0.001*	3.07	9.93
	No	96(83.5)	8.45			
Hyperpigmentation	Yes	56 (48.7)	7.43	0.97	-5.58	5.39
	No	59 (51.3)	7.33			
Erythema	Yes	36 (31.3)	11.43	0.09	-12.92	1.12
	No	79 (68.7)	5.53			
Acneiform eruptions	Yes	37 (32.2)	13.60	0.01*	-16.17	-2.19
	No	78 (67.8)	4.42			
Hairgrowth	Yes	9 (7.8)	19.88	0.14	-33.07	5.92
	No	106 (92.2)	6.33			
Atrophy (N=105)	Yes	23 (20)	13.95	0.13	-17.32	1.69
	No	92 (80)	5.73			

independent t test * Significant

Examining the group of individuals who encountered side effects, the overall duration from initiating the use of topical steroids to the occurrence of side effects and subsequent visit to the dermatology outpatient department (OPD) was analyzed. The average duration

for those who received topical steroid advice from sources other than doctors was 10.03 months, whereas for those who received advice from doctors, the average duration was 4.79 months. This variance was found to be statistically significant, as indicated in **Table 4**.

Table: 5 Mean duration in months take by study population to visit dermatology OPD from start of topical steroid use and after development of side effect (N=104)

	Mean duration to visit dermatology OPD after development of side effect	95% Confidence Interval		Significance Value	P
		Lower Bound	Upper Bound		
other than Doctors	10.032	5.810	14.254	5.510 [#]	<0.019*



Doctors	4.798	.993	8.602		
Overall	7.918	4.941	10.896		

#Logrank test. *Significant

Discussion

In a world shaped within the intricate web of healthcare regulations by law and cosmetic concern, a backdrop of widespread public ignorance, lack of awareness leaves them vulnerable, concerning misuse of pharmaceuticals by both public and doctors, this article explores the critical challenges into the intricate interplay between regulation, knowledge, awareness and ethical practices in the realm of healthcare.

Since their inception, amid society's growing cosmetic concern for personal appearance and well-being topical steroids and their combination have been frequently misused, largely due to the immediate relief they yield. This misuse of steroids has increasingly become a prominent issue, accounting for a substantial portion of visits to dermatology clinics, the intersection of public's cosmetic concern with the regulatory framework by Drugs and Cosmetic Act by Health ministry and Central Drugs Standard Control Organisation (CDSCO) is of paramount importance.

The findings reported by Sinha et al^[14]. and Balasubramanian et al^[15]. highlight a concerning trend of self-medication and over-the-counter use of topical steroids without consulting healthcare professionals, particularly dermatologists. This practice can pose risks such as inappropriate usage, incorrect dosages, and potential adverse effects. The reported statistic of 80% obtaining steroids over the counter and only 4% consulting dermatologists emphasizes the widespread availability and accessibility of these medications without proper medical guidance.

In a study by Nagesh et al^[9]. found that nearly half of the patients in their study received recommendations to use topical steroids from pharmacists, friends, and family members. Similarly in our study, 65 individuals (56.5%) received their prescriptions from sources other than doctors. A significant portion, 34 patients (29.8%), obtained their topical steroids based on the recommendations of pharmacists.

In a study by Karekar SR et al^[16] revealed that over 50% of the patients had been using ultrahigh potency steroids, while the remaining individuals utilized moderate-to-high potency steroids. Our study

demonstrated that the majority, with 62 individuals (53.9%), were using moderately potent steroids.

Topical steroids or creams containing steroids and antifungal agents are frequently misused to address fungal infections, particularly in developing nations like India, primarily due to the lack of regulation in their sales. While these topical steroids might provide temporary relief by easing symptoms like itching, they do not effectively eradicate the fungal presence on the skin's surface and can contribute to the development of resistance^[17] to antifungal drugs. In our investigation, tinea emerged as the most prevalent reason for externally prescribed topical steroid usage. However, individuals treated with these steroids reported a recurrence of skin lesions shortly after application, attributable to the ongoing proliferation of the fungus. Similar findings were observed by Mahar et al^[18]., where fungal infections were found to be the leading cause for employing topical steroids, followed by acne and skin lightening purposes. Similarly in our study Symptom relapse after stopping the medication was observed in 28% of patients. Around 41% (Table 2) of patients receiving steroids for itching reported relapse of symptoms within 5 days after stopping the use of the steroid.

Our study showed that majority of patients exhibited multiple side effects, with hyperpigmentation being the most common, affecting 56 individuals (48.7%), followed by erythema, which was observed in 36 patients (31.3%). In a study conducted by Chhabra N et al^[19], the most prevalent side effect observed in our patients was the exacerbation of underlying fungal infections (25.5%), followed closely by acneiform eruptions (23.3%), which is consistent with findings reported by Meena et al^[5]. In a study by Karekar SR et al^[16] Adverse effects attributed to steroids were reported by 24% of the patients. Notably, the institutional patients experienced significantly fewer side effects compared to the group that received external prescriptions. Similarly our study showed that, patients who received prescriptions from doctors encountered significantly fewer side effects compared



to those who received prescriptions from sources other than doctors

Upon analyzing the subgroup of individuals who experienced untoward effects, we found that the time elapsed from the initiation of topical steroid use to the occurrence of adverse effects and their subsequent visit to the dermatology outpatient department (OPD). On average, for those who received topical steroid advice from sources other than doctors, the duration was 10.03 months, whereas for those who received advice from doctors, the average duration was 4.79 months. This disparity was found to be statistically significant. It is worth noting that there was limited existing literature available to support these findings.

Conclusions

These studies underline the necessity for public health interventions to improve awareness among individuals about the potential risks associated with self-medication and the importance of consulting qualified healthcare practitioners, especially dermatologists, for skin-related issues.

Limitations

- There was no patient follow-up after discontinuing steroid use, and if there was any follow-up, it was of short duration.
- The study did not consider the frequency of steroid application.
- The quantity of the applied drug was not taken into consideration.

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Pictures



Figure 1 – Well defined hyper pigmented atrophic scaly patch over right cheek with hypertrichosis and acneiform eruptions.



Figure 2 - Erythema and atrophic changes over both cheeks and exaggerated wrinkling over both lower eyelids.



Figure 3 – Facial hypertrichosis



Figure 4 – Dermoscopic picture showing Linear and Y-shaped vessels, white structureless areas and hypertrichosis.