

Prescribing Pattern of Corticosteroid in Dermatologic Disorder at Tertiary Care Teaching Hospital in Western Indian

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Abstract

Based on their potent immunosuppressive and anti-inflammatory properties, corticosteroids are essential for treating several skin disorders. Due to their lesser systemic toxicity, topical treatments are recommended. The use of corticosteroids in Indian dermatology practice, however, is not well documented. This study aims to analyze the prescribing patterns of corticosteroids for dermatologic disorders. In the outpatient dermatology department of GCS Hospital, Ahmedabad, a cross-sectional, observational study was conducted for six months, from March 2021 to August 2021. We looked at prevalent skin problems and prescribing patterns in 500 prescriptions. A descriptive statistical analysis was done following the compilation of all the data into Microsoft Office Excel. 169 patients (out of 500) received corticosteroids. There were 53% men and 47% women, respectively. The Papulosquamous illness affected 33% of them. The average number of corticosteroids per prescription was 1.17. Out of 198 prescribed corticosteroids, 163 (82.32%) were topical formulations, and 35 (17.67%) were oral. Among the nine different corticosteroids prescribed, clobetasol was given to 29% of patients. Additionally, 39% of patients received a fixed-dose combination (FDC) of corticosteroids, with clobetasol and salicylic acid being the most commonly used FDC. The average cost of corticosteroids per prescription was 135.18 INR, ranging from 4 INR to 468 INR for 15 days of treatment. The mean cost of corticosteroids was significant compared to other concomitant drugs ($P < 0.05$). Topical corticosteroids were more commonly prescribed than oral ones, with psoriasis being the most common indication for topical corticosteroids. Clobetasol and mometasone were the most frequently used topical corticosteroids.

Keywords: Corticosteroids; Dermatology; Prescribing pattern.

Introduction

Skin disorders, affecting all age groups and genders, are a prevalent concern in society, presenting a wide range of symptoms and severity. These conditions can be minor or life-threatening, acute or chronic, painless or painful. Due to their chronic nature, they significantly impact patients' quality of life, financial stability, and social interactions¹. Common dermatological conditions include fungal infections, dermatitis, psoriasis, urticaria, eczema, and vitiligo². In India, prescribing medications for skin conditions poses challenges, such as inappropriate drug combinations and the overuse of antimicrobial treatments and their combinations with corticosteroids³. Due to their potent immunosuppressive and anti-inflammatory properties, corticosteroids are widely prescribed and frequently overprescribed, which can increase the risk of adverse drug reactions. Despite this, corticosteroids remain essential in treating many skin diseases⁴.

Glucocorticoids can be administered systemically via intramuscular, intravenous, and oral methods, or locally through topical and intralesional means. Topical corticosteroids come in various forms, including creams, ointments, lotions, and gels⁵. Topical applications are preferred as they allow direct medication delivery to the target organ, dose adjustment based on response, and reduced systemic toxicity⁶. However, adverse effects of topical preparations can include hypertrichosis, purpura, striae, steroid-induced rosacea, and epidermal and dermal thinning⁷. Systemic administration of corticosteroids may lead to serious adverse effects such as immunosuppression, cataracts, glaucoma, hypertension, hyperglycemia, cushingoid characteristics, and suppression of the hypothalamic-pituitary-adrenal (HPA) axis. Therefore, this study aims to examine the prescribing patterns of corticosteroids

in dermatological practice, along with other relevant factors.

Methods

The outpatient dermatology department at GCS Medical College, Hospital and Research Center in Ahmedabad, a tertiary care teaching hospital, served as the site for an observational, cross-sectional study. Over six months, from March to August 2021, 500 patients' prescriptions were randomly collected through a bi-weekly survey. Data on patients of all ages and genders who provided written informed consent were gathered and analyzed. The study received prior approval from the Department of Dermatology and the Institutional Ethics Committee. Patients were informed about the study and given a brief explanation following their dermatologist visits. The investigator enrolled each patient by visiting the dermatology outpatient department. A case record form (CRF) was used to document patients' personal information after enrolment. Prescription data were analyzed for demographics, drug usage trends, and the proportion of medications prescribed as corticosteroids, including their specific formulations. The compiled data was entered into Microsoft Office Excel 2010 for descriptive statistical analysis. An independent t-test was applied to compare the costs of corticosteroids and concurrent medications.

Results and Discussion

Skin conditions significantly impact the quality of life, particularly in a country like India, where there are regional variations in climate, social standing, and religious customs. Certain disorders may worsen with seasonal changes; for example, psoriasis and dermatitis often worsen in the winter, while scabies and fungal skin infections are more prevalent in the summer⁸. The prescribing physician gains valuable feedback regarding the sensible use of prescription patterns. Studies like these

are useful for identifying current trends in treatment adherence and usage⁹. In India, corticosteroids are very popular, and their use has increased over time. Even though their rational use is not always apparent, they are continuously produced and sold.

In our study, out of 500 patients, 169 (33.80%) were prescribed corticosteroids. Of these, 142 (84.02%) received one corticosteroid, 25 (14.79%) received two, and only 2 (1.18%) were prescribed three corticosteroids. Each prescription was written using brand names. Out of the 169 patients, 82% received a prescription for topical corticosteroids, while 18% received an oral prescription. Our findings were similar to those of Javsen C et al¹⁰, and Narwane SP et al¹¹, who also showed that topical corticosteroids were prescribed more frequently than oral ones. In our study, the majority of patients (46.74%) were between the ages of 21 and 40. Among these, there were slightly more male patients (50.63%) compared to female patients (49.37%). These results were consistent with studies by Ankit et al¹² and Bylappa et al¹³.

According to the WHO ICD-10¹⁴ classification, the most prevalent dermatological condition observed was papulosquamous disease of the skin (33.13%), followed by dermatitis and eczema (20.71%), both of which required the prescription of corticosteroids. Our findings aligned with those of Gupta R et al⁴, Mukherjee S¹⁵, Sarvanakumar RT, et al¹⁶, and Mirshad PV et al¹⁷. According to the current study, 33.72% of corticosteroid prescriptions included clobetasol as the most frequently prescribed medication. This finding differs from the study by Javsen C et al¹⁰, where 55% of prescriptions were for betamethasone. In our study, salicylic acid was most commonly combined with topical corticosteroids due to its keratolytic activity and ability to enhance penetration. This is

similar to the findings by Khan et al¹⁸ and Sarkar et al.¹⁹, who also reported the use of fusidic acid and clotrimazole in conjunction with topical corticosteroids.

The average total cost per prescription was INR 640, which is slightly higher than the INR 487.50 recorded in a study by Pathak et al²⁰. However, some prescriptions had significantly higher costs due to the inclusion of expensive medications such as immunomodulators (tacrolimus) and decapeptide-containing melgain lotion, which raised the overall average cost. Other factors contributing to the high cost include the generally high prices of dermatological products, polypharmacy, and the limited availability of generic medications.

Conclusion

The current study concludes that dermatitis and eczema, which often require corticosteroids, are the most prevalent dermatological disorders, followed by papulosquamous skin diseases. Topical corticosteroids were prescribed more frequently than oral ones, with the highest usage for psoriasis. Mometasone and clobetasol were the most commonly prescribed topical corticosteroids. There were fewer prescriptions for injections listed in the essential medications list and prescribed by their generic names, which may not be a positive indicator. Further research on the safety profile of corticosteroids is necessary.

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Conflict of Interest

None declared.

References

1. Mate VH, Gonarkar SB, Dhamani AM. Drug utilization for common skin diseases: an outpatient-based study. *International Journal of Basic & Clinical Pharmacology* 2019; 8:2604-8
2. Parvathy G, Sudha MJ, Pillai RT, Ramani PT. A study on the prescription pattern of antifungal drugs in the Dermatology Department of a tertiary care teaching hospital in Southern Kerala. *International Journal of Basic & Clinical Pharmacology* 2019;8:100-3.
3. Kushwaha A. Study the trends in dermatological disease and pattern of prescription in the dermatology department of a tertiary care hospital. *World journal of pharmacy and pharmaceutical science*. 2017; 6(8):1785-99.
4. Gupta R, Malhotra P. Prescribing pattern of corticosteroids among the dermatology inpatients in a tertiary care teaching hospital of north India - A retrospective, observational study. *National Journal Physiology Pharmacy and Pharmacology* 2018;8(2):158-162
5. Burkhart C, Morrell D, Goldsmith L. *Dermatological Pharmacology*. In: Brunton LL, Chabner BA, Knollmann BC, editors. *Goodman & Gilman's the Pharmacological basis of therapeutics*. 12th ed. New Delhi: Mc Graw-Hill Publishers; 2011.1803-32.
6. Dr. Laxmi Bhagunde et al. Prescribing Pattern of Corticosteroids in Dermatology OPD in Tertiary Care Hospital *Journal of Medical science and clinical research* 2019;7(6)
7. Hengge UR, Ruziicka T, Schwartz RA, Cork MJ. Adverse effects of topical glucocorticosteroid. *Journal of the American Academy of Dermatology*. 2006;54(1):1-15; quiz 16-8.
8. Wahane PA, Jagtap RP, Ghongane BB. Evaluation of corticosteroid use pattern in steroid-responsive dermatological conditions. *International Journal of Medical Research and Health*, 2016; 5(1): 82-86
9. S. Jain, P. Upadhyay, et al. A systemic review of prescription pattern monitoring studies and their effectiveness in promoting rational use of medicines. *Perspectives in Clinical Research*. 2015; 6(2):86-90. DOI: 10.4103/2229-3485.154005
10. Chetan Javsén. Rajesh Kumar Suman, Vithal G. Patil, Y A Deshmukh, To Study Prescription Pattern of Corticosteroids in Skin OPD in Tertiary Care Teaching Hospital. *Asian Journal of Pharmacology and Toxicology* 02 (04); 2014; 23-26
11. Narwane SP, Patel TC, Shetty YC, Chikhalkar SB. Drug utilization and cost analysis for common skin diseases in dermatology OPD of an Indian tertiary care hospital-a prescription survey. *British Journal of Pharmaceutical Research*. 2011;1(1):9-18
12. Ankit P, Bharat G. Study of drug utilization pattern of glucocorticosteroid drugs with special emphasis on their immediate adverse effects in a tertiary care teaching rural hospital. *Indian Journal of Pharmacy Practice*. 2010;3(4):18-23
13. Bylappa BK, Patil RT, Pillai RT. Drug prescribing pattern of topical corticosteroids in a dermatology unit of a tertiary-care hospital. *International Journal of Medical Science and Public Health*. 2015;4(12):1702
14. World Health Organization (WHO). 10th revision of the International Statistical Classification of Diseases and Related Health Problems (ICD – 10). Chapter 12. L00-L99
15. Mukherjee S. Assessment of corticosteroid utilization pattern among dermatology

- outpatients in a tertiary care teaching hospital in Eastern India. *International Journal of Green Pharmacy (IJGP)*. 2017 Jan 9;10(04):178-82
16. Sarvanakumar RT, Prasad GS, Ragul G, Mohanta GP, Manna PK, Moorthi C. Study of prescribing pattern of topical corticosteroids in the department of dermatology of multispeciality tertiary care teaching hospital in South India. *International Journal of Research in Pharmaceutical Science*. 2012;3(4):685-7
 17. Mirshad PV, Khan AK, Rahiman OM, Muneersha TK. Prescription audit of corticosteroid usage in the department of dermatology at a tertiary care teaching hospital. *International Journal of Basic & Clinical Pharmacology*. 2013;2(4):411-3.
 18. Khan NA, Abid M, Maheshwari KK, Kaviarasan PK, Mohanta GP. Antibiotic prescribing pattern in the department of dermatology of a teaching hospital in Tamil Nadu. *Indian Journal of Pharmacy Practice*. 2010;3(3):18-21
 19. Sarkar C, Das B, Sripathi H. Drug prescribing pattern in dermatology in a teaching hospital Western Nepal. *Journal of Nepal Medical Association*. 2001; 41:241-6.
 20. Pathak AK, Kumar S, Kumar M, Mohan L, Dikshit H. Study of Drug Utilization Pattern for Skin Diseases in Dermatology OPD of an Indian Tertiary Care Hospital - A Prescription Survey. *Journal of Clinical and Diagnostic Research*. 2016; 10(2):FC01-FC

Table 1. Demographic Characteristics of Patients

Characteristic	Number (%)
Gender	
Male	90 (53.25%)
Female	79 (46.74%)
Age	
0-20 years	26 (15.38%)
21-40 years	79 (46.74%)
41-60 years	48 (28.40%)
>61 years	16(9.46%)

Table 2. Different Types of Topical Formulations

Formulation	Prescribed number n (%)
Oral	35(17.67)
Tablet	35(17.67)
Topical	163(82.32)
Ointment	39(23.92)
Cream	68(41.71)
Lotion	48(29.44)
Paste	8(4.90)

Table 3. Steroid-Containing Topical Formulations Fixed Dosage Combinations (FDCs)

Topical steroid	Salicylic acid	Clotrimazole	Calcipotriol	Fusidic acid	Total
Clobetasol	34	0	5	1	40
Betamethasone	0	8	0	11	19
Mometasone	0	0	0	2	2
Hydrocortisone	0	0	0	2	2
Total					63

Table 4. Cost Analysis of the Research Participants Prescription

Cost of Variable	Result (INR)	P value*
1. Total cost/prescription (Mean $\pm$ SD)	640.00 $\pm$ 397.03	
2. Corticosteroids/prescription (Mean $\pm$ SD)	135.18 $\pm$ 88.07	<0.0001
3. Concomitant medicine cost/prescription (Mean $\pm$ SD)	504.65 $\pm$ 411.15	
* P value < 0.05, that is, statistically significant		

Table 5. Cost of Corticosteroids by Subgroup Analysis

Type of prescription	1- Corticosteroids (N=142)	2- Corticosteroids (N=25)	3- Corticosteroids (N=2)
Corticosteroids			
/prescription			
Cost in INR (Mean $\pm$ SD)	118.73 $\pm$ 77.70	226.20 $\pm$ 92.34	165.00 $\pm$ 0.0
Concomitant			
medicine			
cost/prescription			
Cost in INR (Mean $\pm$ SD)	531.36 $\pm$ 424.42	383.08 $\pm$ 305.51	128 $\pm$ 0.0
P value	<0.0001	0.020	-

P value < 0.05 for 1&2 corticosteroids/prescription, that is, statistically significant

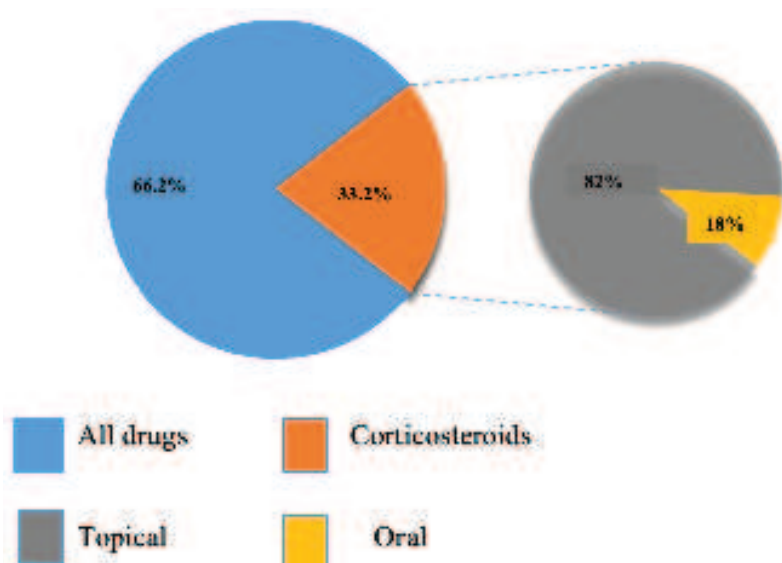


Figure 1. Frequency of Corticosteroid Prescribing

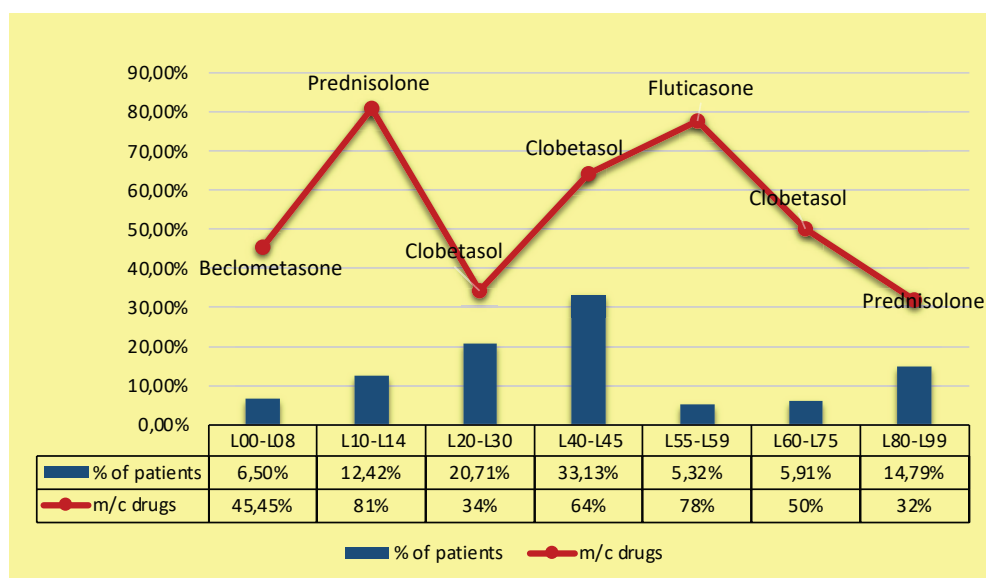


Figure 2. Patient Distribution Based on Diagnosis with the Most Widely Used Corticosteroids Indicated.

- L00-L08 – Infectious disease (Pyoderma ,candidiasis, scabies, herpes zoster)
- L10-L14 – Bullous disorder (pemphigus)
- L20-L30 – Dermatitis and eczema (prurigo, pityriasis alba)
- L40-L45 – Papulosquamous disease (Psoriasis and lichen planus)
- L55-L59 – Radiation related disorder (PMLE)
- L60-L75 – Skin appendages disease (Acne hair loss, alopecia areata, keloid)
- L80-L99 – Other (pigmentation disorder, SLE, insect bite, nutritional deficiency)

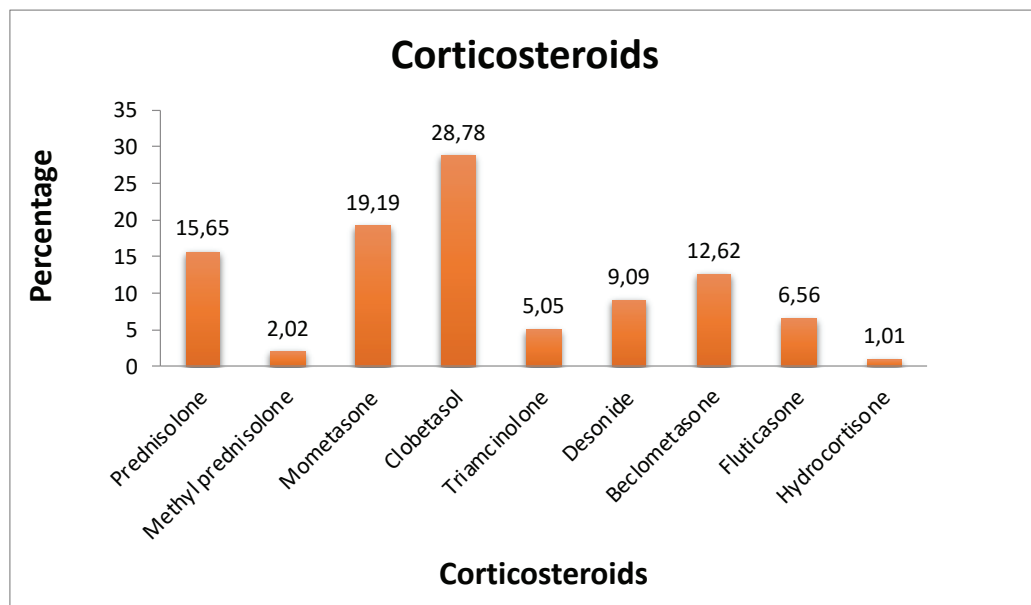


Figure 3. Pattern of Corticosteroid Prescription