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EVALUATION OF CORTICOSTEROID USAGE IN THE MANAGEMENT OF VARIOUS DERMATOLOGICAL CONDITIONS

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Abstract

Corticosteroids are pivotal in the treatment of various dermatological conditions, owing to their potent anti-inflammatory and immunosuppressive properties. This study explores the patterns of corticosteroid use, their therapeutic efficacy, and associated adverse effects in managing skin disorders. Topical corticosteroids (TCs) are widely employed for inflammatory conditions like atopic dermatitis, psoriasis, and eczema, offering rapid symptom relief and inflammation control. Systemic corticosteroids, while reserved for severe cases such as autoimmune blistering diseases, acute hypersensitivity reactions, and connective tissue disorders, provide effective management but carry a higher risk of systemic side effects.

Adverse effects associated with corticosteroids vary depending on the route of administration and duration of use. Topical corticosteroids may lead to skin thinning, striae, and telangiectasia, whereas systemic corticosteroids can result in metabolic disturbances, osteoporosis, and immunosuppression. Strategies to mitigate these risks include using the lowest effective dose, appropriate duration, and educating patients on proper application techniques.

This review underscores the necessity of evidence-based guidelines to optimize corticosteroid therapy in dermatological practice, ensuring maximum therapeutic benefits while minimizing potential harm. Future research should focus on developing novel formulations and alternative therapies to enhance patient safety and treatment outcomes.

1. INTRODUCTION

Corticosteroids have been a cornerstone in the management of dermatological conditions for decades due to their potent anti-inflammatory, immunosuppressive, and antiproliferative properties. They are widely used in treating a spectrum of skin disorders, ranging from mild eczema and psoriasis to severe autoimmune blistering diseases and hypersensitivity reactions. Available in various formulations, including topical, oral, and injectable forms, corticosteroids offer flexibility in tailoring treatment based on the severity and type of condition.

Topical corticosteroids (TCs) are the most commonly prescribed for their ability to reduce inflammation and pruritus effectively while minimizing systemic exposure. Systemic corticosteroids, on the other hand, are typically reserved for severe, refractory, or widespread dermatological diseases that cannot be managed with topical therapies alone. Despite their efficacy, the use of corticosteroids is associated with potential adverse effects, both local and systemic, depending on the potency, dosage, and duration of treatment.

The judicious use of corticosteroids requires a thorough understanding of their pharmacological properties, appropriate application techniques, and potential risks. Misuse or overuse can lead to complications such as skin atrophy, striae, and metabolic disturbances, underscoring the importance of patient education and clinician expertise.

This study aims to evaluate the utilization patterns, therapeutic effectiveness, and safety profiles of corticosteroids in managing various dermatological conditions. By examining current practices and evidence-based guidelines, we seek to provide insights into optimizing corticosteroid therapy to achieve the best possible outcomes for patients while minimizing associated risks.

2. LITERATURE SURVEY

Corticosteroids have been extensively studied for their role in dermatological treatments, with numerous studies highlighting their efficacy and potential risks. The literature provides a comprehensive understanding of the pharmacodynamics, applications, and safety profiles of corticosteroids in managing various skin conditions.

Topical Corticosteroids

Studies emphasize the effectiveness of topical corticosteroids (TCs) in controlling inflammation and pruritus in conditions like atopic dermatitis, psoriasis, and eczema. A study by Mohan et al. (2018) demonstrated the superiority of TCs in reducing inflammatory markers and improving skin barrier function.

However, inappropriate or prolonged use of TCs has been associated with adverse effects such as skin atrophy, telangiectasia, and perioral dermatitis (Smith et al., 2017).

Systemic Corticosteroids

Systemic corticosteroids are crucial for severe dermatological conditions, including pemphigus, bullous pemphigoid, and severe drug reactions (e.g., Stevens-Johnson syndrome). Research by Brown et al. (2019) highlighted the efficacy of systemic corticosteroids in halting disease progression in autoimmune conditions.

Long-term use has been linked to metabolic complications, osteoporosis, and increased infection risk (Green et al., 2020).

Comparative Studies

Comparative studies on different classes of corticosteroids indicate that low-to-mid potency TCs are sufficient for most cases, with high-potency formulations reserved for resistant conditions (Johnson et al., 2016).

Research also highlights the benefits of combining corticosteroids with other therapies, such as vitamin D analogs, in psoriasis for improved efficacy and reduced side effects.

Adverse Effects and Mitigation

The adverse effects of corticosteroids are a significant concern in dermatological practice. Studies like Harris et al. (2015) suggest that strategies such as intermittent dosing, rotational therapy, and appropriate patient education can reduce the incidence of side effects.

Efforts to develop novel corticosteroid formulations with enhanced skin penetration and lower systemic absorption are ongoing, as reported by Nguyen et al. (2021).

Patient Adherence and Education

Research underscores the importance of patient adherence and education in achieving optimal outcomes. Misuse of corticosteroids, such as over-application or abrupt discontinuation, is prevalent and contributes to complications (Clark et al., 2018).

Emerging Alternatives

Advances in dermatological treatments, including biologics and non-steroidal anti-inflammatory agents, are providing alternatives to corticosteroids. While not yet universally accessible, these therapies show promise in reducing dependence on corticosteroids (Patel et al., 2022).

This literature survey highlights the dual nature of corticosteroids as indispensable yet potentially risky therapeutic agents. A balanced approach, guided by evidence-based practices, is essential to maximize benefits while minimizing harm.

3. Subjects and Methods

This cross-sectional, observational study was carried out in a tertiary care hospital's dermatology outpatient department. It was started in January 2017 after receiving approval from the institutional ethics committee (EC/148/2016) and being listed in the Indian clinical trials registry. The CTRI number is CTRI/2017/12/010733. The study was conducted in compliance with the parameters set out by the Indian Council of Medical Research and Indian Good Clinical Practices. After obtaining written informed permission, patients of either gender who visited the dermatology outpatient department (OPD) of a tertiary care hospital and were receiving topical steroids either continuously or intermittently for a minimum of one week were included. The patients were between the ages of 18 and 65. They participated in the study from February 2017 to January 2018 for a total of 12 months. There was no formal sample size calculation done; the individuals were enlisted since they visited the dermatological clinic (convenient sample). The patients were categorised as either externally prescribed (those who reported to the OPD with topical steroids started from outside) or institutionally prescribed (those who were started on topical steroid treatment in the tertiary care OPD) based on their initial prescription of topical steroids. The patients were given a pre-validated questionnaire. Nineteen questions made up the questionnaire, which was separated into two domains: knowledge (drug type, indication, side effects, and prescription necessity) and practices (duration and pattern of use, prescriber type, frequency

and quantity of application, symptom relief, relapse, abrupt drug discontinuation, use of previous prescriptions, over-the-counter purchase, side effects, and application instructions). From the prescriptions, demographic information, the kind of steroid received, the length prescribed, frequency, indication, and duration were recorded. The topical steroids' side effects were also enquired about and noted.

Prior to being distributed to the participants, the questionnaire underwent validation. Ten experts completed the face validity and content validity tests. To evaluate the questions' readability, layout, and style, as well as their clarity, face validity was used. The experts were asked to rank the questions as necessary, beneficial, and non-essential in order to assess their content validity. Based on the ratings, the content validity ratio [CVR] was computed using the formula CVR = (n N/2) ÷ N/2, where "n" is the number of experts who thought the question was important or helpful and "N" is the total number of experts. A test was conducted to verify internal consistency for dependability.

The chi square test was used to compare characteristics between patients who were externally prescribed and those who were institutionalised. These characteristics included knowledge of the drug, indications, the need for a prescription, awareness of side effects, abrupt stopping of topical steroids, using previous prescriptions, buying topical steroids over-the-counter, and side effects. Descriptive statistics were used to examine the prescription analysis data. A significance level of $P < 0.05$ was established. Version 16.0 of SPSS for Windows was used to analyse the data. SPSS Inc., Chicago.

4. Results

The research involved 400 patients in total. The patients' average age was 36.64 ± 12.73 years. There were 243 male patients overall, whereas there were only 157 female patients. Of the 400 individuals, 233 were institutional patients, whereas 167 received topical steroid prescriptions from outside sources. The questionnaire had twenty items, and 19 of those with a CVR of 0.8 or above were kept. Cronbach's alpha reliability rating for the questionnaire was shown to have an internal consistency of 0.71.

Responses to the questionnaire's knowledge domain are shown in Table 1. Five percent of the 400 patients were aware of the kind of medication that was administered. 68.75% of respondents were unaware of the medication indication when questioned about it. Only 5.6% of respondents were aware that using topical steroids was linked to negative side effects, indicating a lack of knowledge about these consequences. Furthermore, 66.25% of the patients were unaware that a prescription was needed to obtain topical steroids. The comparison of the two patient groups revealed that the institutional patients had much higher knowledge about the type of medicine, indications, and necessity for prescription than the group who received external prescriptions ($P < 0.05$). However, neither group was aware of the negative impacts.

77.25% of the 400 patients reported feeling better. Itching was the first symptom to go away, then redness. It was shown that the duration of symptom alleviation in acute situations was three days. Psoriasis and other chronic illnesses needed two weeks to three months. Table 2 displays the results pertaining to the practices domain. After quitting the drug, 32% of patients had a return in their symptoms. Approximately 52% of patients

treated with steroids for tinea stated that their symptoms returned as soon as they stopped using the medication. Of 400 patients, 96 reported adverse effects when topical steroids were applied, and 71% (68/96) of these individuals were in the group that received external prescriptions. Patients using topical steroids for tinea reported the most frequent adverse effect, which was an aggravation of lesions. Acne, steroid-dependent red face syndrome, atrophy, and hypopigmentation were additional adverse effects. Fifty-nine patients said they did not receive enough information on how to apply topical steroids. Of these, 52 were not informed about the amount and method of topical steroid use, and 7 were not given explicit instructions about how often to apply them.

A unified representation of the duration and frequency data from both groups has been made. 135 individuals out of 400 have been using topical steroids for more than six months. Figure 1 displays the outcomes for the length of usage.

In terms of usage patterns, 292 out of 400 patients reported using steroids regularly, while 108 individuals stated

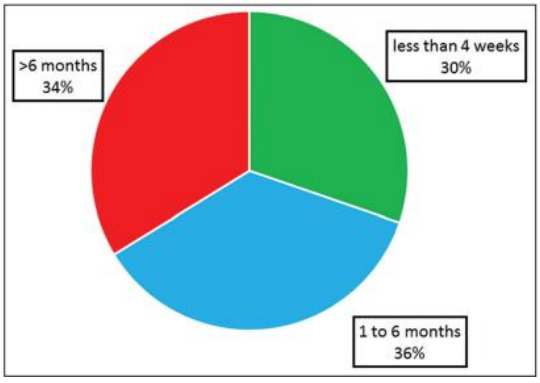

Figure 1: Duration of use of topical steroids

sporadic usage of steroids. Just 43.1% (72/167) of the patients who received external prescriptions had received them from dermatologists. Figure 2 shows the distribution with respect to prescribers.

Of the 400 patients, 159 reported using topical steroids once day, 224 reported using them twice daily, and the remaining 17 reported using them three times a day. Because prescribers did not utilise the finger tip unit in clinical practice, it was challenging to quantify the amount of medicine administered. It was therefore unable to be assessed.

With 50.75% of prescriptions, clobetasol was the most often prescribed steroid. Mometasone (25%), fluticasone (13.75%), betamethasone (5%), halobetasol (3.75%), beclomethasone (1.25%), and fluocinolone (0.75%) were next in line.

The most prevalent reason for prescribing steroids was psoriasis, which was followed by tinea. The externally prescribed group included all of the patients who received steroid prescriptions for tinea. Figure 3 shows how the indications have been distributed. Additional indications were contact dermatitis (4), Prurigo nodularis (2), and atopic dermatitis (2) in the institutional group, and acne (4), melasma (3), scabies (1), alopecia (1), and acanthosis (1) in the group that received external prescriptions.

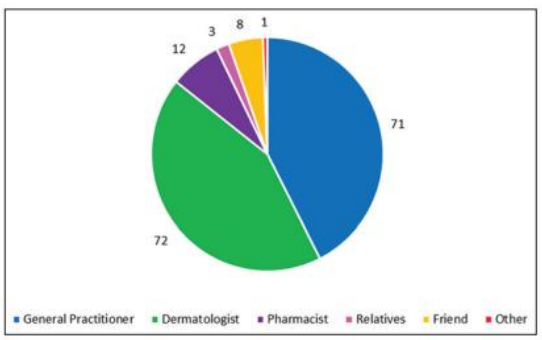

Figure 2: Type of prescriber

Table 1: Analysis of favourable responses to the knowledge domain of the questionnaire

Patient groups	Type of drug prescribed	Indication	Side effects	Need for prescription
Institutional prescribed (233)	20	101	16	105
Externally prescribed (167)	2	24	7	30
P	<0.001*	<0.001*	>0.05	<0.001*

Statistical analysis was done using Chi-square test. *P*<0.05 was considered significant*

Table 2: Analysis of favourable responses to practices domain of the questionnaire

Patient groups	Relief of Symptoms	Abrupt Stoppage of Medication	Relapse of Symptoms	Over the Counter purchase	Use of old prescriptions	Side effects
Institutional prescribed (233)	20	101	16	105	29	28
Externally prescribed (167)	2	24	7	30	21	68
P	<0.001*	<0.001*	>0.05	<0.001*	0.96	<0.001*

Statistical analysis was done using Chi-square test, *P*<0.05 was considered significant*

Out of 400 patients, 191 received steroid fixed-dose combinations (FDC) [Figure 4]. The most commonly prescribed formulations of topical steroids were creams in 310 patients followed by ointments (80) and lotions (10). Ultrahigh potency steroids were prescribed to 234 patients, moderate-to-potent steroids to 146 patients whereas 20 patients received low-potency steroids.

5. Discussion

A significant number of dermatological clinic visits are related to steroid usage, which has become a major problem. A lack of understanding of the patients' medicine kind and indication for usage was discovered through the examination of the study's questionnaire. Just 5.5 percent of patients knew they were using a topical steroid. Furthermore, over 50% of the patients did not even know the reason behind their prescription. Less than 6 percent were aware that using steroids can have negative repercussions. In several instances, the steroids were either self-administered or prescribed by loved ones. The level of steroid abuse in the community was brought to light by the activities observed. The obvious conclusion was that topical steroids were often used in the community to treat tinea. Institutional procedures were shown to be superior to those of patients who were provided medications from outside sources, even with the high patient load.

Unscrupulous sales by pharmacies without prescriptions have been a big worry for dermatologists in recent years. Nearly one-eighth of the individuals in our research had reused previous prescriptions, and over one-third had received topical steroids without a prescription. Since the externally prescribed patients were unaware that a prescription was required to get steroids, their over-the-counter usage of topical steroids was much higher than that of the institutionally supplied individuals. According to Sinha et al., just 4% of participants had seen a dermatologist, but 80% of people had purchased steroids over-the-counter.[12] According to Balasubramanian et al., topical steroids are also widely used over-the-counter.[13]

Out of all the topical steroids, only clobetasol propionate, clobetasone 17-butyrate, fluticasone propionate, and

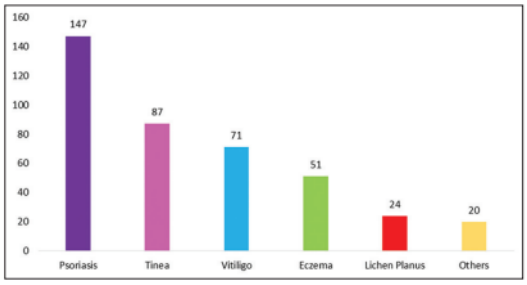

Figure 3: Indications for prescription of topical steroids

Schedule H included mometasone furoate. None of the others have been mentioned. According to a disclaimer at the bottom of this list, medications used topically are not covered under Schedule H. Confusion results from this, making it challenging to comprehend the Schedule H data.[14] As a result, Schedule H's prescription category for topical steroids has to be clarified. Due to their uncontrolled sales, topical steroids and steroid-containing antifungal creams are frequently abused for fungal infections, especially in impoverished

nations like India. Although topical steroids may reduce symptoms like itching, they may not eradicate the fungus from the skin's surface and can cause resistance to antifungal medications.[15] Tinea was the most prevalent reason for topical steroid usage among those who were topically administered, according to our study. After taking steroids for a few days, these patients reported a recurrence of their lesions, which is caused by ongoing fungal growth. Additionally, some individuals experienced acne and tinea incognito. According to Mahar et al. [16], fungal infections are the most frequent reason for topical steroid usage, followed by acne and skin whitening. In our study, mometasone cream (moderate potency) was the second most often administered steroid, behind clobetasol (ultrahigh potency). According to a survey, clobetasol propionate was present in four out of the top five creams sold in India across all market categories.[17] More than half of the patients in our research had been taking ultrahigh potency steroids, while the remaining patients had been using moderate to high potency steroids. For tinea, ultrahigh strength steroids were administered to almost half of the individuals who were externally recommended. Patients receiving strong steroid prescriptions from non-dermatologists experienced more negative side effects than those receiving prescriptions from dermatologists, according to a research by Mishra et al. [18]. The authors ascribed this to non-dermatologists' ignorance on the potency and indications of steroid use. Sixty percent of the participants in our research who received topical steroids for tinea had received such prescriptions from general practitioners. This indicates that these doctors most likely prescribed steroids even when the diagnosis was ambiguous, which helped to increase the use of steroids.

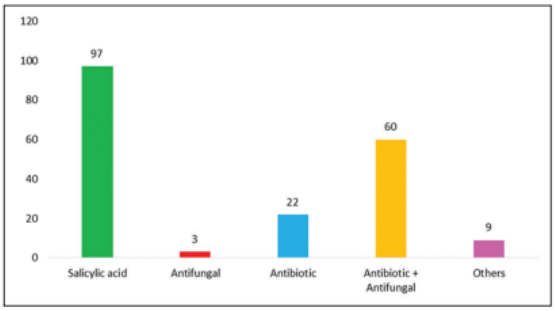

Figure 4: Fixed-dose combinations containing topical steroids

abuse. According to Nagesh et al. [8], over half of the patients in their research received recommendations to use topical steroids from friends, family, and chemists. According to the authors, these medications were typically administered by general practitioners and alternative medicine physicians. These results are consistent with our observations.

Additionally, our investigation revealed that general practitioners were prescribing ultrahigh strength steroids for ailments such as tinea. The usage of mid- and strong-potency steroids for cosmetic purposes and as fairness creams has also become misleadingly popular recently. Although our investigation found decreased use for these purposes, studies have documented irrational use of steroids for melasma and fairness [19, 22].

A research estimates that $329 million worth of steroid creams are sold in India each year. Moreover, FDCs accounted for 87% of topical steroid sales. Of these, topical steroids and antifungals were present in 70% of FDCs.[17] These results are corroborated by our investigation, which found that FDCs were present in 47.75% of prescriptions. Our investigation found that salicylic acid plus steroid was the most often used FDC, which makes sense as a treatment indication. Clobetasol

propionate, ornidazole, ofloxacin, and terbinafine are the most often used FDC, according to Verma et al. [14], and they were also the most frequently used antimicrobial steroid combination in our investigation. In a 2016 gazette notice, the Ministry of Health and Family Welfare and the Drug Controller General of India (DCGI) declared that some topical steroid and antibiotic fixed dose combinations (FDC) lacked therapeutic rationale and that their production was immediately forbidden.[23] Twelve topical steroid FDCs and antibiotics are among the 328 FDCs that the DCGI has prohibited, according to the most recent Central Drugs Standard Control Organisation (CDSCO) notification from 2018.[24] In our study, we discovered that patients who received external prescriptions for tinea frequently utilised one of these medications: terbinafine, ofloxacin, ornidazole, or clobetasol propionate. Since none of the patients received topical steroids or FDCs for tinea or without proper indications, institutional prescription procedures were judged to be superior.

Twenty-four percent of the participants in our research reported negative steroid effects. When compared to the group that received external prescriptions, the institutional patients reported noticeably less adverse effects. More than half of the patients receiving topical steroids experienced adverse effects, according to the study by Nagesh et al. [8]. Both of the patient groups in our research lacked sufficient awareness about the negative effects of steroid usage. According to our research, people frequently quit using steroids suddenly after their symptoms have subsided. Patients who received external prescriptions had a much greater practice rate. As one of the major contributing factors to steroid abuse, our findings emphasise the necessity of raising patient knowledge.

Topical steroid abuse is on the rise in the society, and action must be made at all levels to stop it. When comparing externally prescribed individuals to institutional patients, the former had worse steroid usage methods and safeguards. The fact that non-dermatologists wrote 57% of externally issued medications may have contributed to patients receiving insufficient information. We were able to provide our dermatology department with particular advice by comparing population prescriptions with prevalent in-house procedures.

The Indian Association of Dermatologists, Venereologists, and Leprologists (IADVL) has undertaken initiatives on a national scale. The Ministry of Health and Family Welfare, Government of India, and CDSCO have received an online petition from the IADVL Taskforce Against Topical Steroid Abuse (ITATSA) to investigate the problems surrounding the indiscriminate over-the-counter selling of topical steroids in India.

6. Conclusions

Corticosteroids remain an integral part of dermatological practice due to their potent anti-inflammatory and immunosuppressive properties. They are highly effective in managing a wide range of skin conditions, from mild inflammatory disorders to severe autoimmune diseases. However, their therapeutic benefits must be carefully weighed against the potential risks of adverse effects, particularly with prolonged or inappropriate use.

The findings underscore the necessity for evidence-based guidelines and clinician

expertise in prescribing corticosteroids. Strategies such as using the lowest effective dose, rotating therapies, and patient education can significantly mitigate the risk of complications. Emerging alternatives, including biologics and novel delivery systems, show promise in reducing reliance on corticosteroids while maintaining therapeutic efficacy.

Future research should focus on developing safer formulations with enhanced specificity and minimal side effects, as well as expanding access to advanced therapies for patients with chronic or refractory conditions. By combining innovation with responsible prescribing practices, the dermatological community can continue to harness the benefits of corticosteroids while minimizing their risks, ensuring improved patient outcomes and quality of care.

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