A Hospital-Based Observational Study on the Frequency of Different Skin Diseases and Patterns of Topical Steroid Misuse

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Abstract

Background: Over-the-counter (OTC), unlabeled steroids are widely available as cosmetics and have been a recent area of interest in research and clinical practice due to the side effects. However, less is known about OTC-labeled steroid misuse for various cutaneous diseases at a primary care or community level. Objective: The present study was aimed to assess the frequency of different skin diseases and patterns of topical steroid (TS) misuse in them. Materials and Methods: All new patients attending dermatology outpatient department (OPD) on 6 random OPD days in November 2016 for skin diseases were inquired about the use of any unsupervised steroid-containing medication on their skin lesions. The diagnosis and the prescription of the chief consultant/faculty for the disease were also screened in the context of steroid prescription. Data were presented in absolute number and percentage scale, and risk of misuse was analyzed using INSTAT software. Results: A total of 463 patients with a mean age of 27.01 ± 14.57 years (range 3 months to 92 years) were included. The majority (66.09%) were male. The most common disease was infectious in nature (933.19%) of which tinea infection was the most common (22.69%). A total of 119 (25.70%) patients had used unsupervised and OTC TSs; 4.20% presented with steroid dermatitis. Misuse was highest in photodermatitis and melasma (60 and 50%, respectively). TS misuse was more common in 15–40 years’ age group and in diseases affecting face (relative risk 1.64 and 1.70, respectively; \( P < 0.01 \)). Gender was not a risk factor. Conclusion: TS misuse is rampant (25.70%), and steroid dermatitis is a frequent complication. Patients aged 15–40 years and those with diseases affecting face are at risk of misusing it.

Keywords: Drug abuse, nonprescription drugs, self-medication, skin diseases, steroids

Introduction

Over-the-counter (OTC) sale of nonprescription drugs and self-medication are very much prevalent in India. Dyspigmentation and itching are common cutaneous complaints. Cosmesis is also a major concern. Corticosteroids have anti-inflammatory, immunosuppressive, and antipruritic actions. These actions have revolutionized the treatment of many dermatological conditions. However, incorrect and inappropriate use can lead to tachyphylaxis and many other adverse reactions. Steroid-containing medication misuse has been well reported in cosmetic purposes, especially on the face. However, self-medication and OTC sale of medicines are not only limited for cosmetic purposes. Therefore, it is also likely to be prevalent in other diseases affecting the skin and so is the misuse of steroids. The present study was conducted to know the frequency of different cutaneous diseases and misuse of topical steroid (TS) among them.

Materials and Methods

After obtaining permission from the institute and informed verbal consent from the patients, the present hospital-based observational study was conducted during November 2016. The present study was conducted in the outpatient department (OPD) of dermatology, venereology, and leprology of a tertiary care teaching hospital in northern part of India. Six random OPD days on which the fixed data collectors and chief consultant (faculty) were present in the OPD was chosen for data collection. New outpatients of all ages and either sex attending dermatology OPD for cutaneous diseases were included in this study. Disease affecting mucosae such as oral, vaginal, inner side of prepuce, and glans penis were...
excluded. Patients with hair-and-nail disorder were also not included. They were inquired/interviewed about the use of any medication on their diseased areas before attending the present OPD. The nature of the medicine (whether contains steroid) was noted, besides recording the clinical diagnosis, age, and sex. The prescriptions of the chief consultant/faculty for the disease were then examined in the context of steroid prescription and diagnosis. Any unsupervised use of medications containing TS was regarded as misuse in the present study even if TS was indicated for the disease. Our chiefs’ prescription of steroid for the disease was regarded as indicated. Collected data were then classified into different disease categories and then analyzed. Qualitative data/descriptive responses were expressed in absolute and percentage scale. Mean, median, standard deviation, and 95% lower and upper limit were also calculated for quantitative data. Risk of TS misuse was also calculated using Fisher’s exact test. INSTAT software (GraphPad Prism Software, La Jolla, CA, USA) was used for these purposes, and \( P < 0.05 \) was considered statistically significant for comparison.

**RESULTS**

A total of 500 patients were examined/attended by the data-collecting team on the 6 random OPD days during the study period, and 463 patients were found eligible. The majority (65.68%) of the patients were male. The patients were aged between 3 months and 92 years, with a mean (95% confidence interval) age of 26.88 (25.58–28.18) years. Nearly 60% of patients were between 18 and 40 years. The sex-age group-wise distribution of the cohort is presented in Table 1.

A total of 476 skin diseases were noted among 463 patients. Twelve (2.59%) patients had multiple (i.e., 11 had two diseases and one patient had three diseases) diseases on the day of attending our OPD. Infectious disease was the most common category followed by dermatitis [Figure 1].

Among the infectious diseases, fungal infection was the most common followed by scabies (arthropod) infestation [Table 2]. Tineasis was the most common disease (108 [22.69%]), while acne vulgaris and different types of dermatitis were the other common cutaneous diseases [Table 3]. The frequencies of different cutaneous diseases among the attended patients are presented in Tables 4 and 5.

One hundred and nineteen (25.70%) patients had misused TS-containing medication topicaly in 123 diseases. All misuses were self-mediated, and TS had been obtained either from OTC or from a pharmacist. In only 21 out of these 191 patients, steroid was actually indicated. TS misuse was found to be highest in hyperpigmented disease group (47.62%) followed by fungal infection group [Table 6]. In the disease category, the misuse was highest in photodermatitis (60%) followed by melasma (50%). The frequencies of TS misuses with regard to very common and frequent skin diseases encountered are presented in Table 6.

The risk of TS misuse was significantly higher in the 15–40 years’ age group and in patients with facial lesions. Although misuse was higher in males than females, gender was not significantly associated with the risk of TS misuse (\( P = 0.1778 \)). The relative risks and significance level are presented in Figure 2.

### Table 1: Age and sex distribution of the entire cohort (\(n = 463\))

| Parameters | \(n\) (%) |
|------------|-----------|
| Male       | 306 (66.09) |
| Female     | 157 (33.91) |
| Age of all patients (years), mean±SD | 27.01±14.57 |
| Age of males (years), mean±SD | 27.89±15.16 |
| Age of females (years), mean±SD | 25.28±13.21 |
| Age group (years) |           |
| Up to 1    | 5 (1.08) |
| ≥1–17      | 112 (24.19) |
| 18–40      | 274 (59.18) |
| 41–65      | 68 (14.69) |
| >65        | 4 (0.86) |

SD: Standard deviation

### Table 2: Category-wise distribution and frequency of skin diseases in dermatology outpatient department

| Disease name/group | \(n\) (%) | Male | Male:Female |
|--------------------|-----------|------|------------|
| Infections         | 158 (33.19) | 121  | 1:0.306    |
| Dermatitis         | 126 (26.47) | 66   | 1:0.91     |
| Acne vulgaris      | 50 (10.50)  | 36   | 1:0.39     |
| Infestations       | 35 (7.35)   | 22   | 1:0.59     |
| Pigmentary disorders | 28 (5.88) | 11   | 1:1.55     |
| Autoimmune disorders | 22 (4.62) | 17   | 1:0.29     |
| Urticaria          | 16 (3.63)   | 10   | 1:0.60     |
| Keratinization disorders | 11 (2.31) | 5    | 1:1.2      |
| Cysts and tumor    | 8 (1.68)    | 4    | 1:1        |
| Nutritional and metabolic disorder | 6 (1.26) | 5    | 1:0.2      |
| ADR, erythema multiforme | 4 (0.84) | 3    | 1:0.33     |
| Others             | 12 (2.52)   | 6    | 1:1        |
| Total              | 476        | 306  | 1:0.56     |

ADR: Adverse drug reaction

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Ahmed and Mishra: Steroid misuse in skin diseases

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**Figure 1:** Sex-wise column graph presentation of different skin diseases presented in the outpatient department
Dermatological diseases are very much prevalent. The prevalence of skin diseases in the community was 60%, and nearly one-tenth of the patients of a hospital attend dermatological OPD for consultation.[4,5] Dermatological diseases were found to be higher in females than in males and most common in young adults. Although in the present mini-prospective audit-type study the most common age group of the patients presenting in the OPD was the same (i.e., 18–40 years), the gender prevalence was, however, different (i.e., the number of males was higher than that of females).[6-8] The most common disease was infectious in nature in our study, which is similar to the findings of other studies.[5,6] These studies also showed that eczema was the second most common group, which is different from the present study. This is probably because we have not considered dermatitis and eczema as the same. Although “dermatitis” and “eczema” are generally regarded as synonymous, it is not universally agreed upon. *Rooks Textbook* indicates that “all eczema is dermatitis...”

**Table 3:** Category-wise distribution of skin infections (diseases) attended dermatology outpatient department

| Infections and category | n (%) | Male:female |
|-------------------------|-------|------------|
| Fungal infections (N)   | 118 (74.68) | 3.214 |
| Tinea                   | 108 (68.35) | 3.5 |
| Pityriasis versicolor   | 10 (6.33) | 1.5 |
| Bacterial infections (N)| 31 (19.62) | 6.75 |
| Leprosy                 | 20 (12.66) | 5.67 |
| Folliculitis            | 5 (3.165) | 4 |
| Impetigo contagiosum    | 5 (3.165) | >5 |
| Sycosis barbae          | 1 (0.63) | >1 |
| Viral infections (N)    | 9 (5.70) | 0.8 |
| Wart                    | 3 (1.90) | 2 |
| Herpes genitalis, labialis | 3 (1.90) | 0.5 |
| Chicken pox             | 2 (1.27) | <1 |
| Molluscum contagiosum   | 1 (0.63) | >1 |
| Grand total             | 158 (100.00) | 3.27 |

N: Total number

**Table 4:** Frequency-based distribution of skin diseases

| Disease name and class | n (%) |
|------------------------|-------|
| Very common            |       |
| Tinea                  | 108 (22.69) |
| Acne vulgaris          | 50 (10.50) |
| Frequent               |       |
| Seabties               | 35 (7.35) |
| ACD                    | 32 (6.72) |
| Atopic dermatitis      | 31 (6.51) |
| Seborrhoeic dermatitis | 28 (5.88) |
| Leprosy                | 20 (4.20) |
| Urticaria              | 16 (3.36) |
| Pityriasis versicolor  | 10 (2.10) |
| Psoriasis              | 9 (1.89) |
| PIH                    | 7 (1.47) |
| Irritant dermatitis    | 7 (1.47) |
| LSC                    | 6 (1.26) |
| Vitiligo               | 6 (1.26) |
| Melasma                | 6 (1.26) |
| Lichen planus          | 5 (1.05) |
| Folliculitis           | 5 (1.05) |
| Impetigo               | 5 (1.05) |
| Photodermatitis        | 5 (1.05) |
| Steroid dermatitis     | 5 (1.05) |
| Keratoderma            | 5 (1.05) |
| Infrequent             |       |
| Eczema                 | 4 (0.84) |
| Periorbital melanosis  | 4 (0.84) |
| Scrotal dermatitis     | 4 (0.84) |
| Ichthyosis             | 4 (0.84) |
| ADR                    | 4 (0.84) |
| Wart                   | 3 (0.63) |
| Herpes                 | 3 (0.63) |
| Pemphigus vulgaris     | 3 (0.63) |
| Freckles               | 2 (0.42) |
| Hypermelanosis face    | 2 (0.42) |
| Sebaceous cyst         | 2 (0.42) |
| Keratolysis exfoliativa | 2 (0.42) |
| Phrynoderma            | 2 (0.42) |
| Dermatosis papulosa nigra | 2 (0.42) |
| Meralgia paresthetica  | 2 (0.42) |
| Napkin dermatitis      | 2 (0.42) |
| DLE                    | 2 (0.42) |
| Chicken pox            | 2 (0.42) |
| Xerosis                | 2 (0.42) |
| Neurofibroma           | 2 (0.42) |
| Hyperkeratosis sole    | 2 (0.42) |
| Amyloidosis            | 2 (0.42) |
| Systemic sclerosis     | 2 (0.42) |
| Rosacea                | 2 (0.42) |
| Xanthelasma palpebrarum| 2 (0.42) |
| Nevus                  | 2 (0.42) |
| Striae distensae       | 1 (0.21) |
| Molluscum contagiosum  | 1 (0.21) |
| Pyogenic granuloma     | 1 (0.21) |
| Seborrhoeic keratosis  | 1 (0.21) |

**Figure 2:** Steroid misuse risk among the studied cohort

**DISCUSSION**

Dermatological diseases are very much prevalent. The prevalence of skin diseases in the community was 60%, and nearly one-tenth of the patients of a hospital attend dermatological OPD for consultation.[4,5] Dermatological diseases were found to be higher in females than in males and most common in young adults. Although in the present mini-prospective audit-type study the most common age group of the patients presenting in the OPD was the same (i.e., 18–40 years), the gender prevalence was, however, different (i.e., the number of males was higher than that of females).[6-8] The most common disease was infectious in nature in our study, which is similar to the findings of other studies.[5,6] These studies also showed that eczema was the second most common group, which is different from the present study. This is probably because we have not considered dermatitis and eczema as the same. Although “dermatitis” and “eczema” are generally regarded as synonymous, it is not universally agreed upon. *Rooks Textbook* indicates that “all eczema is dermatitis...”

*Contd...*
but not all dermatitis is eczema.\cite{[14,15]} Hence, if dermatitis and eczema are considered as the same, the present study also affirms the same (i.e., eczema as the second most common disease). However, the most commonly encountered disease was different in different studies and places.\cite{[16,17]} Our study found that the prevalence of infection, as well as dermatitis, was higher in males, whereas the community-level study brought a higher prevalence of eczema in females and fungal infection in males.\cite{[18]}

The use of TS in dermatological diseases was reported first in 1952.\cite{[19]} It has gained more and more popularity in clinical use and now, TS and their combinations are the most commonly prescribed topical drugs in dermatological practice.\cite{[20,21]} Although they are very useful, if misused or overused, it can harm the patient, thus making it a double-edged sword. A good number of creams, gels, or ointments of steroids are available in India either as a single agent or in combinations. Unfortunately, they are very easily available OTC drug. Therefore, abuse and misuse of this double-edged sword is a big concern. One study has shown that 5.63% of patients had presented with at least one adverse effect of topical corticosteroid misuse in the dermatological OPD; acne was noted as the most common adverse effect.\cite{[22]} In the present study, 4.20% of patients misusing TSs presented with steroid dermatitis; a good number of patients presented with multiple adverse events too [Figure 3].

A TS has been a cornerstone in the treatment of a few facial dermatoses and inflammatory dermatological problems due to its varied mode of action. It has also been commonly misused as skin-lightening (hypopigmented) agents in different cosmetic agents. The reason behind this is probably that TS is a fairness cream. Steroid use and misuse in the face had been noted in many studies in different countries.\cite{[23,24,25]} The present study was, however, not confined to the specific diseases or drugs used for dermatological diseases on the face. It was found that misuse of TS is not confined to face and for cosmetic purposes only. A study conducted among rural population showed that 96% of the people were using unsupervised steroid; 80% obtained products on OTC sale, 8% had followed the attractive advertisements, and 8% had started the application on the recommendation of friends/family.\cite{[26]} A study conducted in Iraq has shown that 7.9% of the dermatology clinic attendees had misused topical products/steroids.\cite{[27]} The finding of the present study in this context is alarming as more than a quarter of patients who attended dermatological OPD with the cutaneous problem had already misused steroid. Overall 83.25% of this misuse was actually done in nonindicated cases, which is far more alarming.

Although the use of TS in India has been reported nearly two and a half decades ago, the misuse of this drug has gained concern only a decade ago.\cite{[28,29,30]} This has even triggered an initiative from the Indian Association of Dermatology, Venereology and Leprology (IADVL), i.e. “TS misuse menace” and a delegation of IADVL submitted a memorandum on this issue to the then Union Minister of Health and to the Ministry of Chemicals and Fertilizers.\cite{[31,32]} However, the regulation for these drugs

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**Table 4: Contd...**

| Disease name and class          | n (%) |
|---------------------------------|-------|
| Fordyce spot                    | 1 (0.21) |
| IGH                             | 1 (0.21) |
| Fibrofolliculoma                | 1 (0.21) |
| Sycoysis barbae                 | 1 (0.21) |
| Hypertrophic scar               | 1 (0.21) |
| Bullous pemphigoid              | 1 (0.21) |

**Table 5: Frequency and sex ratio of few very common skin disease groups**

| Disease group/name                | n (%) | Male:female |
|-----------------------------------|-------|-------------|
| Dermatitis total                  | N=126 | 1.10        |
| ACD                               | 32 (25.39) | 1.46 |
| Atopic dermatitis                 | 31 (24.60) | 0.55 |
| Seborrhoeic dermatitis            | 28 (22.22) | 0.87 |
| Irritant dermatitis               | 7 (5.56) | 0.40 |
| LSC                               | 6 (4.76) | 5 |
| Photo dermatitis                  | 5 (3.97) | 0.25 |
| Steroid dermatitis                | 5 (3.97) | 4 |
| Eczema                            | 4 (3.17) | 3 |
| Scrotal dermatitis                | 4 (3.17) | >4 |
| Keratolysis exfoliativa           | 2 (1.59) | >2 |
| Napkin dermatitis                 | 2 (1.59) | >2 |
| Total pigmented disorder          | N=28  | 0.50        |
| Hyper pigmenting                  | 21 (75.0) | 0.75 |
| PIH                               | 7 (25.00) | 0.50 |
| Melasma                           | 6 (21.43) | 0.33 |
| Periortbeal melanosis             | 4 (14.29) | 1 |
| Hypermelanosis face               | 2 (7.14) | <1 |
| Freckles                          | 2 (7.14) | 1.33 |
| Hypo pigmenting                   | 7 (25) | 2 |
| Vitiligo                          | 6 (21.43) | <1 |
| IGH                              | 1 (3.57) | 0.647 |
| Total autoimmune                  | N=22  | 3.4        |
| Papulosquamous                    | 14 (63.64) | 13 |
| Psoriasis                         | 9 (40.91) | 8 |
| Lichen planus                     | 5 (22.73) | >5 |
| Connective tissue                 | 4 (18.18) | 0.33 |
| Systemic sclerosis                | 2 (9.09) | 1 |
| DLE                               | 2 (9.09) | <1 |
| Bullous                           | 4 (18.18) | 3 |
| Pemphigus vulgaris                | 3 (13.64) | 2 |
| Bullous pemphigoid                | 1 (4.54) | >1 |
| Keratization disorder             | N=11  | 0.833 |
| Keratoderma                       | 5 (45.45) | 0.25 |
| Ichthyosis                        | 4 (36.37) | 3 |
| Hyperkeratosis sole               | 2 (18.18) | 1 |

ACD: Allergic contact dermatitis; LSC: Lichen simplex chronicus; PIH: Postinflammatory hyperpigmentation; IGH: Idiopathic guttate hypomelanosis; DLE: Discoid lupus erythematosus
is very poor till date, and easy availability of the OTC drugs is prevalent almost everywhere. The present study findings indicate that the risk of TS misuse is significantly higher in facial lesions but not limited to cosmetic purposes only.

Therefore, the initiative which was mostly for facial steroid misuse should be broadened to include all the dermatological diseases.

The present study is, however, limited by the fact that it is a single-center study and was conducted on only those OPD days when both the authors were present in the OPD. Serial or consequent patients could not be assigned.

**Conclusion**

TS misuse is rampant (25.70%) and is happening in almost all the skin diseases. Steroid dermatitis is a frequent complication. Although statistically indifferent, misuse is more common in males than females. Patients aged 15–40 years and those with diseases affecting face are at significantly increased risk of misusing it.

**Declaration of patient consent**

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patients have given their consent for their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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**Conflicts of interest**

There are no conflicts of interest.

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