Corticosteroid-induced cutaneous changes: A cross-sectional study

Sir,

Corticosteroids are one of the most commonly prescribed drugs for systemic as well as topical use. From the time of their discovery in 1940’s, steroids have been found to be beneficial in many auto-immune and inflammatory conditions. The adverse effects attributed to their use include osteoporosis, adrenal suppression, hyperglycemia, cardiovascular diseases, psychiatric disturbances, immunosuppression and dermatologic changes.[1] Of these, changes in skin and its allied structures were so rampant that in 2005, American Contact Dermatitis Society designated steroids as the allergen of the year. Reported dermatological changes include rosacea, erythema, telangiectasia, acneiform eruptions, pruritus, atrophy, hirsutism and dermatitis.[2] Instead of the paucity of data on Indian population evaluating the cutaneous adverse drug reactions (ADRs) of corticosteroid use following systemic as well as local application, this study was undertaken.

The present study was a cross-sectional study conducted in the dermatology outpatient clinic located in a tertiary care hospital between January and September 2014 after obtaining Institutional Ethics Committee Approval and written informed consent from the study participants. Patients receiving or using corticosteroids in any form (topical/oral/inhalational) and who developed cutaneous reactions were included in the study. The following details such as demographics (age and sex), drug-related details (name, formulation, strength [if topical], duration, and frequency of corticosteroid used), type of ADRs (erythema, rebound phenomenon, telangiectasia, xerosis, flushing, photosensitization, pruritus, acneiform eruptions, acne, atrophy, wrinkles, hirsutism, striae, ochronosis, perioral dermatitis, tinea, pyoderma), and the site of occurrence of these reactions were collected. Corticosteroids were classified into different categories (ultra-high, high, medium to high, medium, low, and least) based on their potency.[3] Causality assessments of the ADRs were evaluated by Naranjo algorithm. Descriptive statistics was used to represent the various categories in proportions.

A total of 100 consecutive patients with suspected steroid induced skin changes were recruited in the study.
Mean (standard deviation) of the age of the study participants was 27.8 (13.2) years, and 44 (44%) were females and the rest, males. Betamethasone (n = 56) was the predominant corticosteroid used by the study participants (0.1% in 49 and 0.05% topical preparations in six and 500 μg per puff through inhalation in one patient) followed by clobetasol 0.05% (n = 22). Triamcinolone 10 mg/ml was administered intrasessionally in four patients, and dexamethasone 0.75 mg tablet was used in one patient. With regards to the fixed dose combination of corticosteroid use, majority of them used betamethasone in combination with neomycin (n = 5) and gentamicin and tolunaftate (n = 5) cream followed by preparations with combination one each of clobetasol with gentamicin, terbinafine, ofloxacn, ornidazole, and terbinafine cream. In addition, beclomethasone (0.03%) with clotrimazole was administered to two patients. All except two (one each with tablet dexamethasone and inhalational betamethasone) were taking topical steroid preparations in the form of cream. Majority of the used corticosteroids fell into medium potency (n = 59) followed by ultra-high (n = 26) and medium to high potency (n = 13). The median (range) duration of corticosteroid use in the study population was 37.5 range of (7–1825) days, and the average period of use of potent ultra-high corticosteroid was 73 days. Patients were using steroids (either self-use or prescribed by a general practitioner) for the following conditions: acne (n = 48), tinea (n = 41), body building (n = 1), bronchial asthma (n = 1), melasma (n = 2), psoriasis (n = 1), and facial rash (n = 6). The list of ADRs observed with the use of corticosteroids is represented in Table 1. A total of 41 ADRs were classified as “possible” and the remaining were associated as “probable” as per the causality assessment tool. Majority of the lesions occurred in face (n = 60) followed by groin (n = 34), arm, limbs and chest (n = 34 each), back of the trunk (n = 6), and one each in the neck and shoulder. None of the individuals were diagnosed to have any systemic conditions such as diabetes mellitus or hypertension.

Corticosteroids, in both systemic and topical form, have to be used with great caution. Unless clear indication exists, steroids should not be administered considering the risks involved. Factors to be considered while prescribing steroids include steroid potency, delivery formulation, frequency and duration of treatment, and potential side effects. Dermatological indications for their use include alopecia areata, atopic dermatitis, discoid lupus, eczema, lichen planus, lichen sclerosus, lichen simplex chronicus, psoriasis, complicated scabies, severe intertrigo, and perianal inflammation. The anti-inflammatory effect of steroid act as a double-edged sword causing both therapeutic as well as adverse effects. In the present study, nearly two-third of the patients used topical steroids on the face for conditions such as acne and tinea albeit not being approved for these conditions, indicating its irrational use. Previous studies have also assessed that steroids were more commonly misused agents, especially on the face. Furthermore, we found that considerable numbers of individuals were using fixed dose combinations of corticosteroids and antifungal agents and that also of, ultra high potent steroids in 26% of the study participants. The average duration of use of such high potent steroids was also 11 weeks. Corticosteroids rapidly relieve the symptoms in fungal diseases but ultimately suppress the local immunity leading to recurrences of the infection. Evidences indicate that combinations of topical corticosteroid and antifungals should be avoided due to the relapse of fungal infections, and the ultra-high topical steroids should be restricted only to severe dermatoses and not to be used for more than 3 weeks.[5] None of the individuals in the present study had any systemic adverse effects. This can be explained by the fact that the participants in the present study were applying corticosteroids on a limited area of the body. Systemic adverse effects have been observed only with the extensive use of topical corticosteroids. Furthermore, studies have assessed dermatological ADRs following systemic use of corticosteroids; we had only one case in the present study limiting any interpretation of the same.

The study limitation, as there was no follow-up in the present study, moreover, the other concomitant drugs prescribed were also not assessed of. Details regarding whether steroids were prescribed or were bought as over the counter was not known. Nevertheless, the present study did assess the overall spectrum of various cutaneous ADRs observed with the use of different corticosteroids. Considering the irrational use of corticosteroids, we recommend limiting the dispensability of corticosteroids, only following prescription by registered medical practitioners, and also to constantly sensitize the prescribers and the general public in not using corticosteroids just for quick relief of symptoms and signs. Education of the prescribers as well as public regarding the use and ADRs of corticosteroids on limit such health hazards.

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**Conflicts of Interest**

There are no conflicts of interest.

**Sridharan Kannan, Wasse Khan, Abhishek Bharadwari, Bhagirath Singh Rathore, Prem Prakash Khosla**

Department of Health Sciences, College of Medicine, Nursing and Health Sciences, Fiji National University, Suva, Fiji, 1Departments of Pharmacology and 2Dermatology, Subharti Medical College and Hospital, Meerut, India

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**Table 1:**

| Type of adverse drug reactions | Number of patients* |
|--------------------------------|---------------------|
| Erythema                        | 3                   |
| Telangiectasia                  | 2                   |
| Acneiform eruptions             | 56                  |
| Epidermal atrophy               | 3                   |
| Hirsutism                       | 5                   |
| Striae                          | 5                   |
| Tinea                           | 41                  |
| Perioral dermatitis             | 1                   |

*Total number exceeds 100 as more than one adverse reactions were observed in 16 study participants*
was in response to the alarming failure of disease control and rise both pharmacologic and phytochemical researchers in 1967. This appointed the head of a key malaria research team incorporating pharmacy who also trained in Chinese herbal medicine; she was than the seminal work of Prof. Youyou Tu, a graduate of allopathic traditional and modern medicine can have no better example a compelling reminder to medical professionals of the untapped the discoverer of artemisinin is a landmark in phytomedicine and of a share of the 2016 Nobel Prize in Physiology or medicine to 1920s. With the development of chloroquine resistance, quinine is be in use until the advent of semi-synthetic antimalarial in the back to Europe in 1638. Quinine was isolated and continued to and the Spanish conquistadors later brought this knowledge Quechua Indians of Peru for febrile illness. Jesuit missionaries lymphoma. are vital agents in the chemotherapy of leukemia and Hodgkin's are shown to be an effective antihelminthic against and its adoption as first-line treatment in acute promyelocytic texts have recently contributed to the discovery of arsenic trioxide carcinoma models. Apart from phytotherapy, ancient Chinese have also been shown to be a effective antihelminthic against 1800-year-old manuscript. Aided by the text, Tu rightly surmised formulation for qinghao used to cure malaria symptoms in Ge Hong's-Handbook of Prescriptions for Emergencies, an intensive search of Chinese literature revealed a simple parasitic growth inhibition that were not consistently reproducible. extract of qinghao (Artemisia annua) showed initial results in 2004;6:107-15. 2. Rathi SK, Kumrah L. Topical corticosteroid-induced rosacea-like dermatitis: A clinical study of 110 cases. Indian J Dermatol Venereol Leprol 2011;77:42-6. 3. Ference JD, Last AR. Choosing topical corticosteroids. Am Fam Physician 2009;79:135-40. 4. Ambika H, Vinod CS, Yadalla H, Nithya R, Babu AR. Topical corticosteroid abuse on the face: A prospective, study on outpatients of dermatology. Our Dermatol Online 2014;5:5-8. 5. Alston SJ, Cohen BA, Braun M. Persistent and recurrent tinea corporis in children treated with combination antifungal/corticosteroid agents. Pediatrics 2003;111:201-3.