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Original Research Article

A study on the clinical profile of dermatoses induced by topical corticosteroids

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ABSTRACT

Background: Topical corticosteroids (TC), commonly used for a wide range of skin disorders, are associated with many side effects with their overuse, abuse and over-the-counter use as a cosmetic. This article aims to study clinical presentation of various dermatoses induced by abuse of TC in order to bring awareness among patients and practitioners to use topical corticosteroids with utmost caution.
Methods: This study was conducted at DVL department of a tertiary care teaching hospital over 23 consecutive months. A total of 200 consecutive patients of all ages and both genders with topical steroid induced dermatoses were included in the study. A detailed clinical evaluation was undertaken, data was then recorded and analysed.
Results: Majority of the patients were females (56%). Most common age group was 20-29 years (42%). Majority used TC as a remedy for dermatophytosis (38%), followed by use as a fairness/cosmetic cream (20%). Most of patients (29.5%) used TC for 6 months duration. Most commonly used TC formulation was 0.05% clobetasol propionate (37.5%). Majority patients (62%) did not have a valid prescription of which 47% used TC on Quacks's advice. The most common side effects encountered were tinea incognito (33%), steroid-induced acne (20.5%), hyperpigmentation (14.5%), and hypopigmentation in 22 (11%).
Conclusions: Present study highlights irrational prescription of TC by non-dermatologists for dermatophytosis which are very common in this particular study region and emphasizes the need to educate patients about serious adverse effects of TC abuse.

Keywords: Topical corticosteroids, Steroid abuse, Adverse effects

INTRODUCTION

The introduction of topical corticosteroids (TC) by Sulzberger and Witten in 1952 is considered a landmark in the treatment therapy in dermatology.[1] Subsequently, various other topical steroids were introduced with varying potencies and formulations.

In the US system of classification, topical corticosteroids are ranked using a scale from class 1 (super potent) to class 7 (mild). Class 1 (super potent) includes betamethasone dipropionate 0.05% optimized vehicle, clobetasol propionate 0.05%, halobetasol propionate 0.05%; class 2 (potent) includes betamethasone dipropionate 0.05%, desoximetasone 0.25%; class 3 (potent, upper mid strength) includes fluticasone propionate 0.005%, triamcinolone acetonide 0.5%; class 4 (mid strength) includes fluocinolone acetonide 0.025%, mometasone furoate 0.1%; class 5 (lower mid strength) includes fluticasone propionate 0.05%, hydrocortisone butyrate 0.1%; class 6 (mild strength) includes desonide 0.05%, fluocinolone acetonide 0.01% and class 7 (least potent) dexamethasone, flumethasone.[2] The availability of these drugs revolutionized the treatment of various steroid

responsive dermatoses. Topical steroids have greatly contributed to the dermatologist's ability to effectively treat several difficult dermatoses. Topical corticosteroids were hailed as a panacea for all ills by physicians and patients and gained rapid popularity. However, the dramatic symptomatic relief from these medications led to misuse and abuse of these drugs by both non-dermatologists and patients.

Topical steroids are misused for varied indications such as acne, pigmentation, fungal infection, pruritus, and many a times as a fairness or cosmetic cream or as skin cream for any type of rash. The main reason for such misuse in our country is its free availability as an over-the-counter (OTC) medication. Furthermore, topical steroids are available in various irrational combinations which cause more damage to the skin. The rampant misuse and abuse of these medicines led to the development of various adverse effects, both cutaneous and systemic.

Cutaneous adverse effects occur regularly with prolonged treatment and are dependent on chemical nature of drug, the vehicle, location of application.[3] The most common are atrophic changes, telangectasias, striae, purpura, bruising, erythema, ulceration, impaired wound healing, exacerbation of infections like tinea incognito, aggravation of cutaneous candidiasis, demodex, crusted scabies, reactivation of Kaposi sarcoma, miscellaneous effects like perioral deramatitis, hypertrichosis, hyperpigmentation, hypopigmentation, photosensitization, contact dermatitis, rebound flare-up (psoriasis).[4]

Vehicle of TC can potentiate the side effects of TC and cause local side effects of its own. The vehicle is a highly engineered balance of numerous chemicals, each serving a separate or overlapping purpose. Various vehicles are emollients, emulsifying agents, solvents and humectants. The vehicle can indirectly alter a given preparation's therapeutic and adverse actions by altering the pharma-cokinetics of the TC molecule.[5] The components of the vehicle cause various side effects. For example stinging due to components like lactic acid, urea, formaldehyde, benzoic acid, sorbic acid, cinnamic acid compound. Irritation due to propylene glycol, alcohol, acetone. Contact urticaria due to formaldehyde, benzoic acid, sorbic acid, acetic acid, balsam of Peru, alcohol. Allergic contact dermatitis due to proply gallate, sorbic acid, parabens, formaldehyde.[6]

Systemic adverse effects are more likely to develop when highly potent TS are used for prolonged periods on thin skin (e.g. face) or on raw/inflamed surfaces. They are hypothalamus-pituitary-adrenal axis suppression, Cushing's disease, femoral head osteonecrosis, cataracts, glaucoma, hyperglycemia, hypertension, hypocalcemia, peripheral edema, etc.[4] These side effects occur more with TC of higher potency and on particular areas of the body like face and genitalia. Of more concern is the mass use of TC as fairness creams due to the craze of beautification prevalent among vast sections of Indian society leading to a virtual epidemic of monomorphic acne, steroid atrophy, steroid rosacea, telangiectasia and other manifestations which have been collectively described as topical steroid damaged facies (TSDF).[7] The main reason for the misuse of topical corticosteroids could be attributed to pharmacists. In spite of the fact that these drugs can cause such serious adverse effects, they are sold without medical prescription or control and there is little awareness about the adverse effects among the general public.

In spite of being a common problem, there are many previous studies stressing only on facial dermatoses due to topical steroid abuse. Thus this study focuses on the unwarranted use of topical corticosteroids and its combinations anywhere on the body resulting in adverse effects and highlights the rampant usage of TC for dermatophytic infections, which have high frequency in this locality. This study emphasizes the need to spread awareness regarding the adverse effects of topical steroid abuse among patients and practitioners.

METHODS

This was a cross sectional study carried out on patients of all ages and both genders presenting to the department of dermatology, venereology and leprosy, Chalmeda Anand Rao Institute of Medical Sciences, Karimnagar from January 2018 to November 2019. By consecutive sampling technique, a total of 200 consecutive cases presenting with dermatoses resulting secondary to application of a topical corticosteroid during the mentioned time period were included in the study. In each case, the contents of the topical application used was ascertained as a corticosteroid. We excluded patients not consenting to the study, patients with pre-existing comorbidities that can resemble or could cause changes similar to topical corticosteroid side effects and cases where the topical application cannot be confirmed as a corticosteroid.

After receiving informed consent from the patient (or guardian in case of a minor) a detailed history including characteristics of topical corticosteroid use, prescription source and adverse effects were evaluated. A thorough examination of the patient, detailed cutaneous examination including skin biopsies was performed when necessary. Wood's lamp examination, patch testing, potassium hydroxide (KOH) test, fungal culture and bacterial pus culture were done whenever necessary. Blood investigations like complete haemogram, blood sugars, liver function tests, renal function tests, thyroid profile, serum cortisol, serum adrenocorticotrophic hormone (ACTH), luteinizing hormone (LH), follicle stimulating hormone (FSH), ultrasonogram were done if required to rule out other comorbidities.

Photographs of the patient were taken on the first visit and subsequent visits for comparative evaluation. Data collected was analyzed using descriptive statistical methods like mean, standard deviation, and percentage analysis and depicted in the form of graphs and pie charts

wherever necessary. Results were generated through statistical package for social statistics (SPSS 20).

RESULTS

A total of 200 consecutive cases satisfying the inclusion and exclusion criteria were included from among the patients presenting to the department of dermatology, venereology and leprology at the Chalmeda Anand Rao Institute of Medical Sciences, Karimnagar. In the study, females 112 (56%) outnumbered males 88 (44%) with male to female ratio of 1:1.3.

The age of patients ranged from 3-58 years. The maximum number of patients 84 (42%) were found to be in the age group 20-29 years, among which majority 43 were females and 41 males, followed by 48 patients (24%) in the age group 10-19 years among which there were 18 males and 30 females, followed by 34 patients (17%) in the age group 30-39 years among which there were 11 males and 23 females, followed by 21 patients (10.5%) in the age group 40-49 years among which there were 10 males and 11 females. There were 8 patients (4%) in the age group 50-60 years, 2 females and 6 males and 5 patients (2.5%) in the age group 0-9 years, 3 females and 2 males.

Majority of the patients used topical steroid applications for the treatment of dermatophytosis (76 patients), followed by use as a fairness/cosmetic cream (40 patients), hyperpigmentation (33), melasma (29), acne (18), Polymorphic light eruptions (1), eczema (1), undiagnosed rash (1), urticaria (1) (Figure 1). Some of them had more than one indication. The commonest site of application was the thighs 76 patients (38%), followed by face 75 (37.5%), lower limbs 26 (13%), upper limbs 14 (7%), trunk 7 (3.5%), and back 2 (1.5%) (Figure 2).

Most of the patients had applied the topical corticosteroids twice a day 121 (60.5), rest only at night 64 patients (32%) and 15 patients (7.5%) applied only in the morning. The duration of topical corticosteroid use ranged from 2 weeks to 3 years with majority patients 59 (29.5%) presenting to us with 6 months of use, followed by 4 months of use in 47 patients (23.5%), 1 month of use in 33 patients (16.5%), 2 months of use in 27 patients (13.5%), less than 1 month of use in 17 patients (8.5%), 12 months of use in 11 patients (5.5%). Prolonged use for more than a year in 6 patients (3%).

The topical corticosteroid formulation most used was found to be clobetasol propionate 0.05% in 75 patients (37.5%), followed by betamethasone valerate 0.1% in 51 patients (25.5%), triple combination containing either mometasone furoate 0.1% or fluocinolone acetonide 0.01% in 35 patients (17.5%), mometasone furoate 0.1% in 22 patients (11%) and other formulations like fluticasone propionate 0.05% in 14 patients (7%) and hydrocortisone acetate 1% in 3 patients (1.5%) (Figure 3).

An analysis of the source of prescriptions for topical corticosteroid use showed that majority of the patients 124 (62%) did not have a valid prescription, among which 58 patients (46.8%) purchased the TC as per Quack's advice, 30 patients on the recommendation of the pharmacist, 26 patients over the counter and 10 patients (8%) used TC as per advise of a friend or relative. Among the 76 physician prescriptions 40 patients (52.6%) were from general practitioners, dermatologists prescriptions were validated in 22 patients (29%), 14 patients (18.4%) had prescriptions from alternative medicine practioners like ayurveda and homeopathy.

Evaluation of the cutaneous adverse effects (Figure 4) on application of TC revealed tinea incognito (Figure 5) to be the commonest adverse effect encountered, which was seen in 66 patients (33%), steroid induced acne (Figure 6) in 41 patients (20.5%), followed by hyperpigmentation (Figure 7) in 29 patients (14.5%), hypopigmentation in 22 patients (11%), steroid induced rosacea (Figure 8) in 15 patients (7.5%), striae (Figure 9) in 10 patients (5%), cutaneous atrophy in 9 patients (4.5%), hypertrichosis in 5 patients (2.5%), telangiectasia (Figure 10) in 2 patients (1%) and contact allergy in 1 patient (0.5%). 10 patients had more than one adverse effect at the time of evaluation.

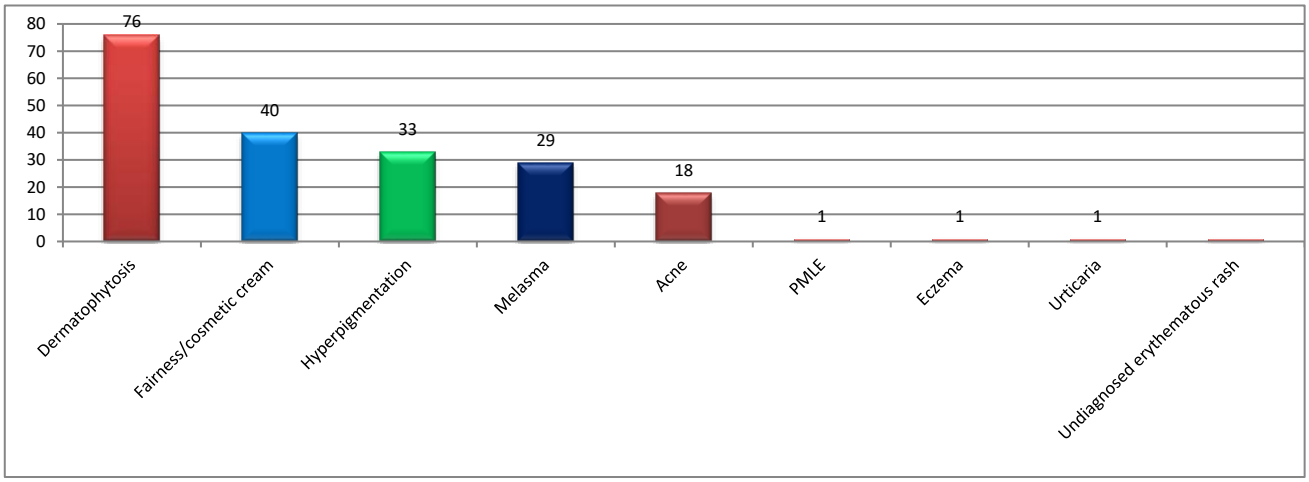

Figure 1: Indications for TC use.

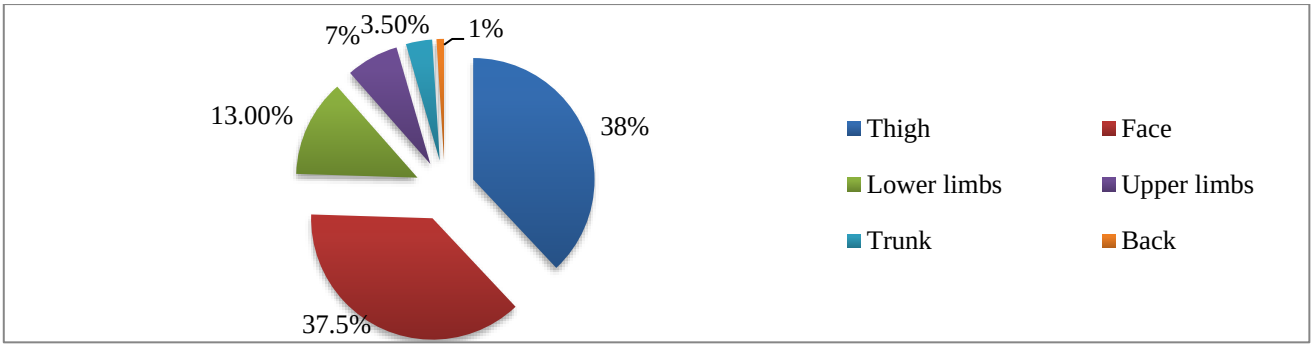

Figure 2: Site of application of TC.

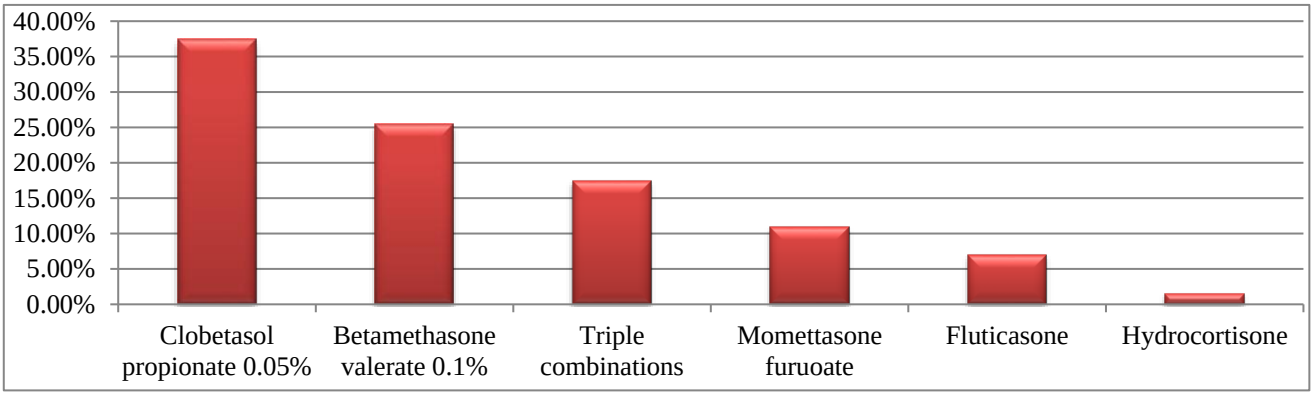

Figure 3: TC formulation used.

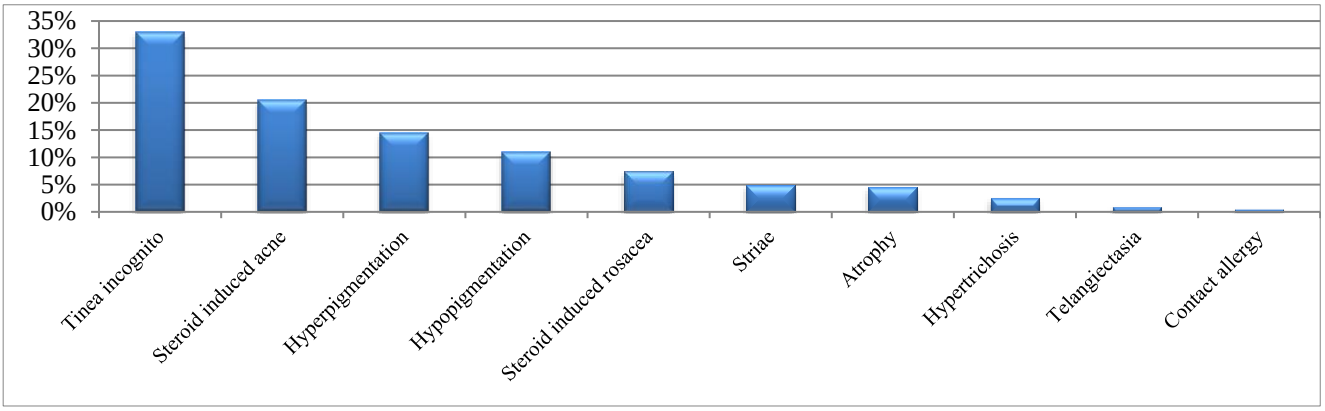

Figure 4: Cutaneous adverse effects of TC.

KOH mount was done from skin scrapings of 7 suspected of tinea incognito, out of which 5 were positive for fungal elements.

Wood's lamp examination was done for 2 patients with pityriasis versicolor which showed yellowish fluorescence and 4 patients with tinea incognito showed greenish fluorescence.

Punch biopsy was done in one case of hypopigmentation which revealed thinned out epidermis with decreased dermal thickness.

Figure 5: Tinea incognito (topical steroid modified tinea corporis).

Figure 6: Steroid-induced acne.

Figure 7: Hyperpigmentation due to topical steroid abuse.

Figure 8: Steroid-induced rosacea.

Figure 9: Striae due to topical steroid abuse.

Figure 10: Telangiectasia due to topical steroid abuse.

DISCUSSION

The introduction of TC by Sulzberger and Witten in 1952 is considered to be the most significant landmark in the history of therapy of dermatological disorders.[1] This historical event was gradually, followed by the introduction of a large number of newer TC molecules of varying potency rendering the therapy of various inflammatory cutaneous disorders more effective and less time consuming. It is this very usefulness of the drug which has become a double edged sword and made it vulnerable to an alarming proportion of instances of abuse and misuse leading to serious local, systemic, and psychological side effects.[8] Present study clearly points out that adverse effects related with TC is predominantly due to its misuse or abuse.

In present study more than half of the patients 62% (124 patients) did not have a physician prescription for TC. Many people with dermatophytic infections and majority of females belonging to the younger age group between 20-29 years who were in need of skin fairness were given TC by non-physicians which point towards the misconception of TC as treatment for dermatophytic infections and fairness or skin lightening creams probably due to over enthusiastic marketing, easy over the counter availability or general lack of awareness about TC.

In our study, the main indication for TC use was dermatophytosis in 76 patients probably due to more frequent occurrence of dermatophytosis in this region, followed by fairness/cosmetic cream in 40 patients, as a treatment for hyperpigmentation in 33 patients, melasma in 29 patients. Whereas in study conducted by Dey et al, most common indication was as a fairness cream (50%) followed by melisma (26%).[9] In the study by Saraswat et al most common indication for TC use was as a fairness cream or after shave cream (29%) followed by acne (24%).[7] In study by Hameed et al most common indication for TC was as a fairness cream (41%) followed by melisma (33%).[10]

The present study showed female predominance (56%) as compared to males (44%) which was consistent with the findings in study by Dey et al (78.89%) and Hameed et al (82.6%).[9,10]

In the present study, 200 patients of age group 3-60 years were divided into 6 groups while maximum number of cases were seen in 20-29 years age group (42%) similar to findings in studies by Dey et al and Saraswat et al depicting the vulnerability of this age group.[7,9]

The formulation of TC used in present study was ultrapotent clobetasol propionate 0.05% in 75 patients (37.5%) and betamethasone valerate 0.1% in 51 patients (25.5%). A meta-analysis revealed that majority (81%) of this was in the form of combinations and among that 85% were found to be irrational combinations containing an antibiotic, antifungal and corticosteroid. Triple combination containing either mometasone furoate 0.1% or fluocinolone acetonide 0.01% in 35 patients (17.5%), mometasone furoate 0.1% in 22 (11%) patients. Whereas in study by Saraswat et al., steroid combinations were used by 59.6% patients.[7] In a study by Hameed et al clobetasol propionate (9%), betamethasone valerate (6%), combination of both (20%), combined with fairness creams (64%) were used.[10]

The commonest site of application was found to be the thighs in 76 patients (38%) which clearly throws light on rampant dermatophytic infections in this locality, followed by face in 75 patients (37.5%) which is in fact commonest site as per many studies done in recent past, lower limbs 26 (13%) and upper limbs 14 (7%). trunk 7 (3.5%), and back 2 (1.5%). In study done by Saraswat et al most common site of application was face.[7]

Evaluation of the cutaneous adverse effects on application of TCS revealed tinea incognito to be the commonest adverse effect encountered which was seen in 66 patients (33%), followed by steroid induced acne in 41 patients (20.5%), hyperpigmentation in 29 patients (14.5%). Whereas in study by Dey et al acne followed by telangiectasia were the most common side effects and in another study by Saraswat et al acne/exacerbation of acne was commonest side effect.[7,9]

In this present study, most common source of prescription of TC is non-physician prescription accounting for 124 patients (62%), among which 58 patients (46.8%) purchased the TC as per Quack's advice, 30 patients (24.2%) on the recommendation of the pharmacist, 26 patients (20.1%) over the counter and 10 patients (8%) used TC as per advise of a friend or relative. Among physician prescriptions of 76 patients (38%), 40 patients (52.6%) were from general practitioners, dermatologists prescriptions were validated in 22 patients (29%), 14 patients (18.4%) had prescriptions from alternative medicine practitioners like Ayurveda and homeopathy. In Saraswat et al study, non-physician prescription accounted for 59.3%.[7]

Among physicians, non-dermatology prescription accounted for 44.3%. In a study by Hameed et al following were reported as source of prescriptions: beauty centres, self-prescription, pharmacist advice.[10]

Few of the patients (less than fifty) included in present study visited the hospital with tubes of locally available steroid combination creams. Some of the brand names as mentioned by the patients or their attendants were betnovate, skinlite, melacare, panderm plus, fourderm etc.

In a study by Abraham et al on topical steroid-damaged skin, skin atrophy was the most common adverse effect observed and factors associated with it are extremities of age, intertrigenous sites application, high potency topical corticosteroids, occlusion and moisture.[11] But in our study, due to high prevalence of dermatophytoses in this region, and patients misusing or abusing TC for treating dermatophytoses, tinea incognito was the most common adverse effect observed.

In this study, we found that most of the topical corticosteroids used were classed as potent or very potent. In spite of the fact that these drugs can cause such serious adverse effects, they are sold without medical prescription or control and there is little awareness about the adverse effects among the general public. High potency steroids should not be administered for longer than two weeks, and after this period, should be tapered to avoid adverse effects.[12]

The main reason for the misuse of topical corticosteroids could be attributed to pharmacists, paramedical personnel, the patient, friends or family. Responsibility should also be shared by general physicians and even some dermatologists to the extent that they did not emphasize the adverse effects and proper dosing of topical corticosteroids to the patients. This may also bring into focus the insufficient knowledge among medical/paramedical personnel about the proper use of TC. During last few years a number of articles focusing on this issue have been published from India.[13-19]

Our study was an outpatient-based study, and further larger multicentric community studies across the country will capture the true picture of magnitude of the multifaceted problem of topical corticosteroid abuse.

CONCLUSION

The misuse of topical corticosteroids for dermatophytosis and other infective dermatoses poses a diagnostic dilemma and therapeutic challenge to dermatologists and other practitioners. It is a multi-faceted problem that needs multi-dimensional interventions, involving educational, legal and managerial approaches to overcome it. Education of the general public through media programs and introduction of continuing medical education programs for medical, paramedical personnel and pharmacists are probably the most important steps to be taken to create awareness about the hazards of misuse of topical corticosteroids. Secondly, legal approaches should include the enforcement of the existing legislation that potent topical corticosteroids cannot be sold over-the-counter and without the prescription of a qualified doctor.

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Ethical approval: The study was approved by the institutional ethics committee

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