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Original Research Article

## Clinico-epidemiological study of topical steroid dependent face in a tertiary care hospital at Mysore

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### ABSTRACT

**Background:** Topical steroids are the most commonly prescribed drugs in dermatology. The adverse effects of steroid misuse are noticeable 3 to 4 weeks after application. Steroid rosacea, hypertrichosis and acneiform eruptions are few of them. A new entity known as topical steroid dependent face, topical steroid dependent face (TSDF) has been recently coined to encompass symptoms such as erythema, burning sensation on attempted cessation of topical steroid application.

**Methods:** A questionnaire-based analysis was done among patients attending dermatology outpatient department of government medical college hospital, Mysore between November 2018 to May 2019. Prior approval of the institutional ethics committee, and consent of patients were obtained. A total of 200 outpatients with facial dermatosis using topical steroids on face for a period greater than one month were taken up for study.

**Results:** The results included population across different age groups, between 16 to 60 years. 56% belonged to the age group of 16 to 30 years. Most common steroid abused was mometasone cream 0.1% (50%), betamethasone valerate cream 0.1% (24.5%) followed by clobetasol ointment 0.05% (21.5%). The major adverse effect with steroid abuse, were acne 72% facial redness 67%. Hyperpigmentation 51%, hypertrichosis 32.5% and skin atrophy 21%.

**Conclusions:** The present study highlights and creates awareness on the burden of facial topical steroid abuse and the poor attitude towards them.

**Keywords:** Topical steroid, Steroid abuse, Acneiform eruptions

### INTRODUCTION

Topical steroid (TCs) are the most commonly used drugs in dermatology.<sup>1</sup> They have been in use for treating skin diseases since ages and its use began following the introduction of the compound, hydrocortisone in 1952.<sup>2</sup> Corticosteroids mediate clinical effects, due to their anti-inflammatory, vasoconstrictive, antiproliferative and immunosuppressive properties.<sup>3</sup> With the introduction of higher potent topical steroids, side effects have become more prevalent.<sup>1</sup> The general side effects are noticeable 3

to 4 weeks after steroid application and are usually reversible.<sup>1</sup>

Use of TCS over the face produces numerous adverse effects such as steroid rosacea, acneiform eruption, hypertrichosis, and demodicidosis.<sup>4</sup> Steroid-induced rosacea is characteristically seen on centro-facial, perioral, and periocular regions.<sup>1</sup> A new entity known as topical steroid dependent face (TSDF) has recently been coined to describe the various symptoms such as erythema or burning sensation on attempted withdrawal and stoppage of topical steroid application.<sup>5</sup> The other

ways of TCs misuse is its cosmetic application particularly in combination with bleaching creams to lighten skin among dark complexioned people.<sup>6</sup>

This cosmetic misuse of TCs is globally prevalent and has been the subject of studies mainly from Africa, Asia and even in developed countries like the USA.<sup>8-10</sup> The abuse of TCs is associated with fairness creams in our colour conscious society where people are obsessed with lighter complexion due to social and historical reasons.<sup>6</sup> The present study was undertaken at a government medical college hospital, Mysore to assess the epidemiological aspects of the abuse of steroids and various clinical adverse effects related to their misuse.

**METHODS**

**Study design**

A questionnaire-based analysis was done among patients attending dermatology outpatient Department of Krishna Rajendra Hospital, Mysore between November 2018 to May 2019 prior approval of the Institutional Ethics Committee was obtained. A total of 200 subjects were assessed with a questionnaire, consisting of socio-demographic information and details on type duration, indication, source of prescription and adverse effects of chronic steroid application. Prior consent was taken from the subjects to ensure their voluntary participation in the study and to photograph their images in case of need to use them in scientific discussion.

**Inclusion criteria**

Inclusion criteria were patients who have used topical steroid for greater than a month presenting with features of steroid dependent face.

**Exclusion criteria**

Exclusion criteria were patients having polycystic ovarian disease, pregnant women, Cushing’s syndrome patients, those unable to give consent were not taken up for the study, and patients with retroviral positive status were excluded.

**Study tools**

An assessment questionnaire was prepared with thorough literature search. This questionnaire was used to make an assessment of the study and collect the data to meet the objectives.

**Statistical analysis**

The sample size was calculated using the formula,  $S = Z^2 pq/d^2$ , considering the prevalence of steroid abuse to be 85% according to previous studies, a sample size of approximately 200 was calculated. The study design is a cross sectional study. The descriptive statistics used were

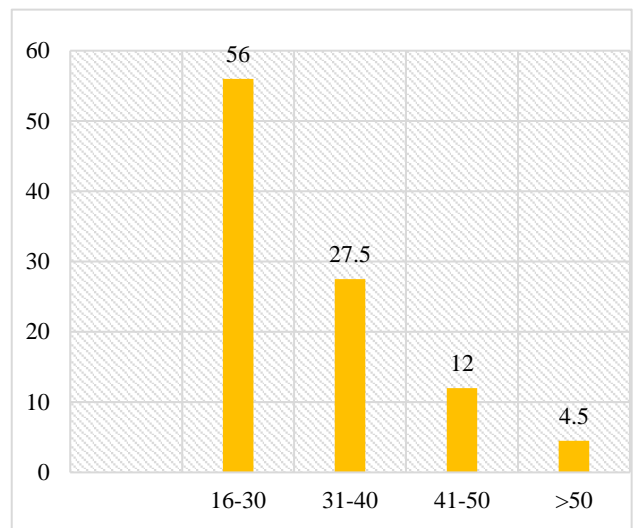
mean, standard deviation, frequency and percent. The inferential statistics were sample ‘t’ test, chi-square test and Kramer’s V test.

**Ethical approval**

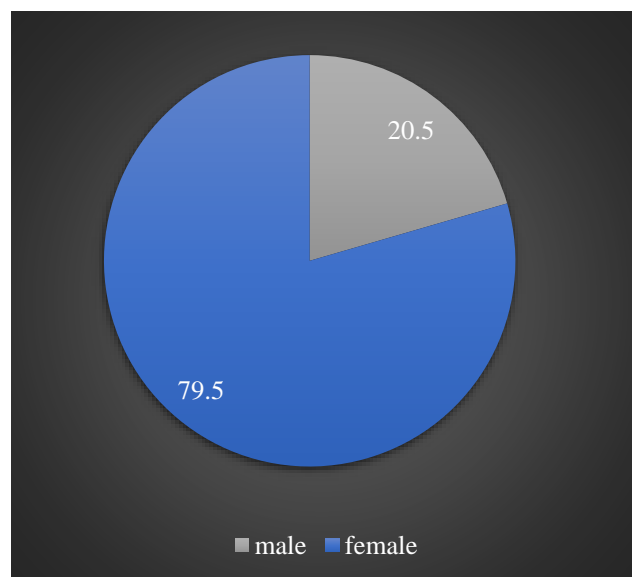
The study was approved by Institutional Ethics Committee Mysore Medical College and Research Institute.

**RESULTS**

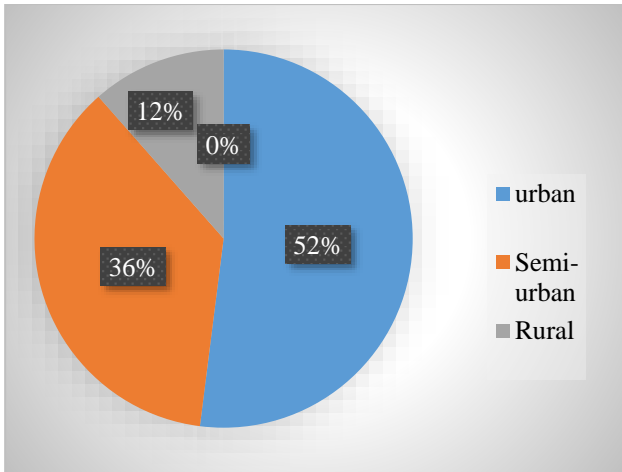
The results included population across different age groups, between 16 to 60 years. 56% belonged to the age group of 16 to 30 years. In the gender distribution, 79.5% were females compared to males 20.5%. The duration of steroid abuse, ranged from less than 6 months (63%), 6 months to 1 year (22.5%) and more than 2 years (6%).



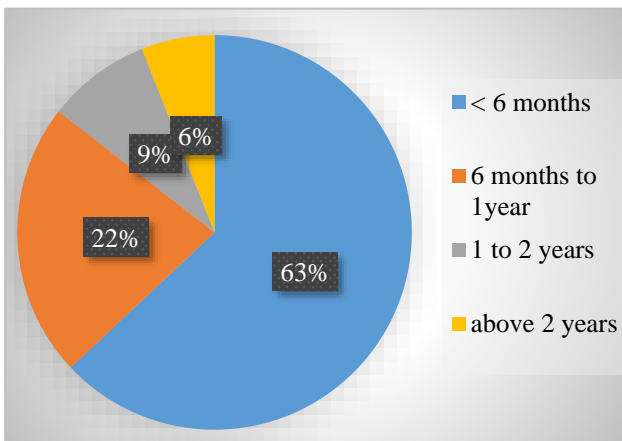
**Figure 1: The age distribution of TSDF cases.**



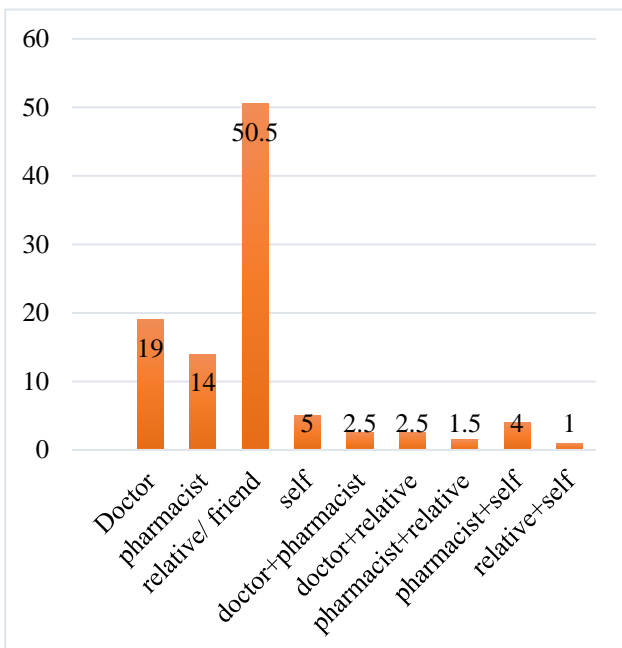
**Figure 2: Gender distribution of TSDF cases.**



**Figure 3: Geographical distribution pattern and duration of usage.**

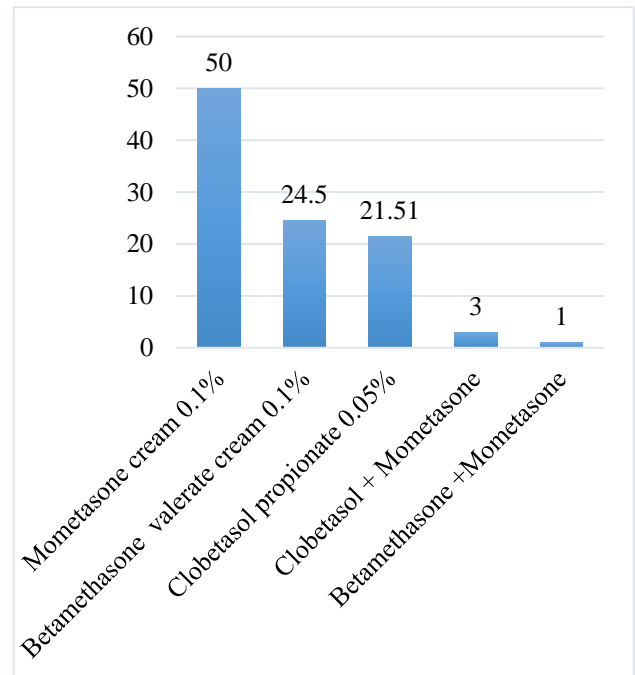


**Figure 4: Duration of steroid usage in subjects.**

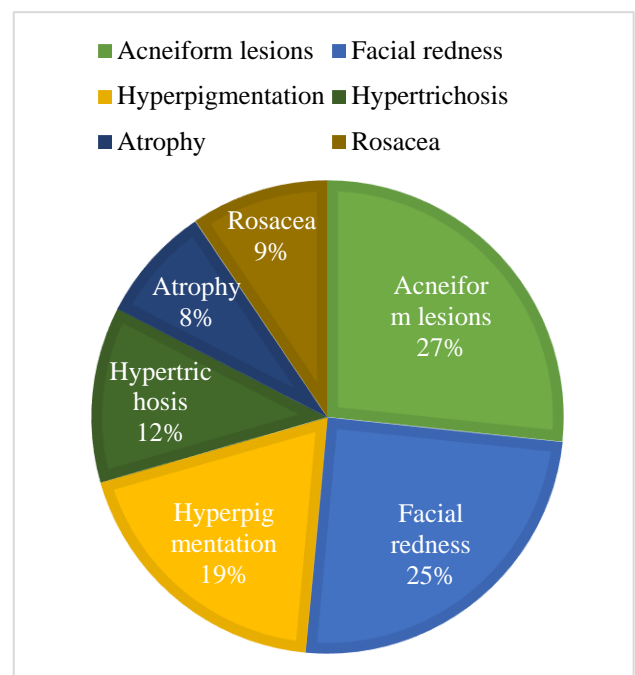


**Figure 5: Source of prescription.**

Most common steroid abused was mometasone cream 0.1% (50%), betamethasone valerate cream 0.1% (24.5%) followed by clobetasol ointment 0.05% (21.5%). The most common indication for which steroid was used was pigmentation 38%, acne 30% followed by improvement of complexion 17.5% were the other reasons. The major adverse effect with steroid abuse, were acne (72%), facial redness (67%), hyperpigmentation (51%), hypertrichosis (32.5%) and skin atrophy (21%).



**Figure 6: Composition of commonly used steroids.**



**Figure 7: Common adverse effects of chronic steroid application.**

## DISCUSSION

In the age distribution pattern of this study, most of the subjects 56% belonged to the age group of 16-30 years, followed by 27.5% in the age group 31 to 40 years. These findings were reflected in a study conducted by Ambika et al.<sup>11</sup> The reasons for maximum representation of the age group 16-30 years may have been their consciousness towards their appearance. Misuse of topical corticosteroids appears to be a common problem in India, as indicated by the proportion of patients visiting the Department of Dermatology with adverse effects of these drugs. The real problem may probably be of a greater magnitude as, many subjects who may have used these drugs may not always present to the dermatologist.<sup>12</sup>



**Figure 8: 45 years old female presented with 20 years of abuse of betamethasone, presented with features of photo ageing.**



**Figure 9: 20 years old male presented with use of mometasone for 1 year. The patient presented with acneiform lesions and hyperpigmentation.**

Majority of the subjects were found to be females in the gender distribution 79.5% and males 20.5%. This finding was also reflected in studies conducted by Ambika et al and Manchanda et al.<sup>1,11</sup> Topical corticosteroids are used as skin lighteners due to their potent bleaching action, and also their anti-inflammatory activity, which can reduce the risk of dermatitis when used along with other irritating skin lightening agents.<sup>12,13</sup> Skin lightening in this study was one of the primary reasons for the use of these drugs. This may also explain the female predominance in this study. This attitude is prevalent across the globe with minor variations in other countries as evidenced by various population-based studies.<sup>14-16</sup>

In terms of occupation, homemakers were the maximum subjects abusing steroids 38%, followed by students or the studying community 25.5%. Similar findings were reported in a study conducted in Northern India by Dey et al. Most adult patients considered topical corticosteroids to be acceptable but were not well educated about the preparations and their side effects. Various studies on facial abuse of topical steroids done in India and across the globe showed the representative sample of adults to be mostly young female as evidenced in our study where young homemakers were a major representation in the study. The use of topical steroids in this particular section being due to intention of obtaining lighter complexion at same time being ignorant of their adverse effects.<sup>13-15</sup>

The maximum duration of use of steroid in the study was found to be less than 6 months 63%, 6 months to 1 year 22% and more than 2 years 6%. Similar findings were noted in a study conducted by Sharma et al and Ambika et al.<sup>11,5</sup>

The most commonly abused steroids were found to be mometasone cream 0.1% (50%), beta-methasone valerate cream 0.1% (24.5%) followed by clobetasol propionate 0.1% (21.5%). These findings were similar in a study conducted by Sharma et al and Dey et al.<sup>5,17</sup> These preparations are easily available and cheap and are sold without medical prescription. In our study (Betnovate®), Panderm plus®) and Skin shine®) were the preferred brands. Some of these preparations had hydroquinone in addition to steroid hydroquinone is a known inhibitor of melanin synthesis by suppressing tyrosinase activity.<sup>18,19</sup> Percutaneous absorption of this brand increases with long-term use particularly in hot and humid conditions resulting in plethora of adverse cutaneous reactions and systemic complications. Most important adverse effect of hydroquinone is exogenous ochronosis, while contact dermatitis, discoloration of nails and post-inflammatory hyperpigmentation are categorized as acute and higher concentrations of hydroquinone lead to irreversible hyperpigmentation leading to leukoderma.<sup>18</sup>

The most common indication of steroid use was pigmentation 38%, followed by acne 30% and to improve



complexion 17.5%. These findings were coherent with a study conducted by Manchanda et al.<sup>1</sup> TC have emerged in recent years as major skin lighteners owing to their potent bleaching power and perhaps also their anti-inflammatory activity, which can reduce the risk for dermatitis.<sup>12</sup>

The source of prescription in the study was maximum by relatives/friends 50.5%, doctor 19% and pharmacist 14%. These findings were also reflected in a study conducted by Dey et al, Balasubramanian et al.<sup>5,20</sup> It has been observed that, in various skin conditions like primary bacterial and fungal infections, undiagnosed skin rash, acne and as fairness cream, irrational use of TC just for initial relief of the symptoms by pharmacists at chemist shops or non-qualified practitioners or by advise of friends and relative are serious area of concern.<sup>21,22</sup> According to drugs and cosmetics (D and C) act 1940, the TCs fall under the category of schedule H drugs and these drugs should be sold in chemist shops only on the prescription of a registered doctor, which is hardly ever practiced in India.<sup>12</sup>

The most common adverse effects with steroid abuse was found to be acneiform lesions 27%, facial redness 25%, hyperpigmentation 19%, hypertrichosis 12% and atrophy 8%. Similar findings were observed in a study done by Ambika et al and Dey et al.<sup>11,17</sup> The damage produced by steroid containing creams included skin atrophy, thinning and breaking of the skin giving rise to acne form eruptions, hypertrichosis, telangiectasias, and fungal/bacterial infections.<sup>23</sup> Saraswat et al observed the use of potent and super potent steroids in majority and evidenced in the present study as well.<sup>4</sup> The facial skin is vulnerable by TC because the facial skin is thinner compared to other body parts. This results in increased percutaneous absorption of drugs.<sup>24</sup> The effect of steroid with continued usage reduces due to tachyphylaxis.<sup>25</sup> The patient is thus forced to continue using potent steroid creating a vicious cycle. On an attempt to stop the medication there is rebound erythema and scaling which occur due to release of cytokines and accumulation of nitric oxide causing vasodilatation.<sup>26</sup>

## CONCLUSION

The present study highlights the burden of facial topical steroid abuse and the factors contributing to the poor attitude towards steroids. There is a large misuse of topical steroid cream on face to treat medical conditions such as acne, hyperpigmentation and even as a purpose of a general fairness cream or bleaching agent. The easy access to procure steroids as over the counter preparation has largely contributed to its misuse. Misguidance by pharmacists, relatives/friends have played a major role in creating TSDF cases. Doctors/physicians have also played a minor role in prescribing steroids without educating the patients on the after effects observed with their chronic use. The central and state drug regulatory authorities need to be active in sensitizing chemists about

the deleterious effects of TC abuse and to physicians, dermatologists regarding the right use of TC including dose, frequency, site and duration. Also, they should understand that TC's should never be used to bring about an initial relief in conditions where they are not indicated just to make the patient happy as it eventually would cause more harm.

This study creates an awareness and educates the public and medical fraternity on the adverse effects of steroids, with their chronic use and thus the measures that can be applied to stop steroid abuse.

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*Ethical approval: The study was approved by the Institutional Ethics Committee*

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