Original Research Article

Dermoscopic and Clinico-Epidemiological Profile in Patients with Facial Dermatosis using Fairness Creams: A Cross Sectional Study

Haibatti SS[1], Solanki Y[2], Miranda TL[3]

[1]MD Dermatology, Venereology and Leprology, Associate Professor, Department of Dermatology, MGM Medical College and Hospital, Aurangabad, Maharashtra, India
[2]MD Dermatology, Venereology and Leprology, Resident, MGM Medical College and Hospital, Aurangabad, Maharashtra, India
[3]MBBS, Resident in MD Dermatology, Venereology and Leprology, MGM Medical College and Hospital, Aurangabad, Maharashtra, India

Abstract:

Background: Over-the-counter creams are misused to improve skin tone and for skin lightening. Some of these are steroid based which are not meant to be applied as fairness creams while the others are non-steroid based creams. These can both aid and incite facial dermatoses.

Objectives: To study the clinico-epidemiological profile of patients with facial dermatoses induced by application of fairness creams, clinical effect of fairness creams and the dermoscopic findings associated with its use.

Methodology: A single-center, observational, cross-sectional study was conducted on 88 patients with facial dermatoses that developed after using fairness creams. Mucocutaneous and dermoscopic examination was done to study the association of fairness creams with facial dermatosis.

Results: Average age of our patients was 35.8±5.7 years with female predominance. Majority, 59.1% used steroid-based cream alone, 25% used creams with both steroidal and non-steroidal components and 15.9% used only non-steroidal creams. Photosensitivity (15.9%) and burning sensation (13.6%) were the commonest symptoms. Globular structure (84%) and telangiectasias (55.7%) were the commonest dermoscopic findings. The commonest cutaneous adverse effects were uneven patchy pigmentation (58%), followed by acneiform eruptions (17%) and facial erythema (11.4%). There was a significant association between patients using steroidal creams and the incidence of dermatosis (p-value=0.031).

Conclusions: Females are more prone to developing fairness creams-induced dermatoses. Minute changes following its use like telangiectasias which may not be seen by the naked eye are better visualised by dermoscopy. Steroid-containing creams are commonly exploited for attaining fairness due to their relative inexpensiveness and familiarity as compared to other commercially available fairness creams.

Keywords: Skin lightening, Fairness creams, Facial dermatoses, Dermoscopy.

Introduction

Skin receives attention in the current youth-oriented society.[1] A survey showed that an adult uses about nine cosmetic products daily. Over 25% of the women use 15 or more cosmetics daily of which facial creams are a part.[2]

Itching, dryness, pricking, facial disfiguration may occur. The entity facial discoid dermatosis (FDD) has been given for this. [3,4] Timely care restores the skin barrier and biofilm while diminishing erythema. [5,6] These products remove lipids and must be eliminated before causing redness. Thus cosmetics can aid or challenge skin.[7] We conducted this study to analyse the relationship between fairness creams use and the resultant dermatosis.

Aims and Objectives:

1) To record the clinico-epidemiological profile of patients with facial dermatosis induced by fairness creams.

2) To study the dermatosis associated with use of fairness creams.

3) To study the dermoscopic findings in facial dermatosis induced using fairness creams.

Materials and Methods

Study design: We conducted the present single center, prospective, observational, cross-sectional study by including 88 patients diagnosed with facial dermatoses following use of fairness creams coming to the out-patient department of Dermatology at our institute.

Ethics

The detailed protocol had been explained to the patients. Institutional ethical committee approval was acquired and written informed consent was obtained from all the patients in accordance with the principles of the Declaration of Helsinki as revisited in 2013.

Inclusion criteria

- Patients using fairness creams for the purpose of fairness.
- Patients of either gender aged more than 18 years and above.

Exclusion criteria

- Patients below 18 years of age.
- Patients not willing for enrolment in the study.

Sample size

Formula used to calculate sample size is:

$n = Z^2 \{P(1-P)\}/d^2$

P: Your guess of population P (any value<1): 0.35

1-α: Confidence level set by you: 0.95

Z: Z value associated with confidence: 1.96

d: Absolute precision (value less than P): 0.1

n: Minimum sample size: 88

Source of formula-Lwanga SK, Lameshaw S.

Sample size determination in health studies, 1st edition WHO, Geneva, 1991.

Thus we included 88 patients that came to OPD between 1st Feb 2022 to 30th April 2023.

Methodology:

A sample size of 88 patients was taken into the study after obtaining the institutional ethics committee clearance. Patients coming to the Skin OPD with the above-mentioned inclusion and exclusion criteria were taken in the study. Clinico-epidemiological data was obtained by face-to-face interview method using a predesigned proforma. All of them were subjected to general examination, mucocutaneous examination, dermoscopic examination and systemic examination. For dermoscopic examination, we used ILLUCO IDS series dermoscope with a magnification of 10X. Polarised mode was used in both contact and non-contact dermoscopy. For visualising minute vascular changes in the skin we used non-contact dermoscopy to avoid compression of blood vessels to provide greater prominence of the vessels.

Statistical analysis

The collected data was compiled in MS Excel sheet 2007. For analysis, SPSS version 20.0 was utilized. The qualitative data was represented in the form of frequency, percentage, bar diagram and pie diagrams. The quantitative data was represented in the form of mean ± standard deviation (SD). Comparisons were made using various statistical tests. The test used to check for significant differences between the variables was the chi-square test. A p-value (probability value) of <0.05 was considered statistically significant.

Results

The average age of the study participants was 35.8±5.7 years with the most common age group being 28 - 37 years. Majority of the patients, eighty-one (92.04%) patients were females. Sixty-five (73.9%) of the patients who presented for treatment were housewives.

Larger number of patients used fairness creams for a duration of 1-3 months before becoming symptomatic. Of those with associated symptoms, majority 14 (15.9%) patients had complaints of photosensitivity. This was followed by burning sensation, redness, and itching in decreasing frequencies. These demographic data are shown in Table 1.

Table 1: Demographic details of the patients

Age at presentation	(45.5 %) 28 to 37 years (28.4%) 38 to 47 years
Sex distribution (M:F)	81:7
Occupation	73.9% (Housewives) 10.2 % (Company employees) 4.5 % (Healthcare professionals) 4.5 % (Students) 4.5 % (Farmers) 2.3 % (Teachers)
Fitzpatrick skin type	69.3% (Fitzpatrick skin type IV)
Duration of use of creams	29% (1 to 3 months)

Associated symptoms	15.9%- photosensitivity
	13.6%-Burning sensation
	12.5%-Itching
	5.7%-Redness

The popular cream brands used by the patients are mentioned in **Table 2** below. The different formulations of creams used by the patients are shown in **Table 3** below**.**

Table 2: Different brands of creams used by the patients (n=88)

Trade name with main fairness ingredient	N(%)
Betnovate® cream (Betamethasone Valerate)	19 (21.6%)
Panderm®+ cream(Clobetasol propionate)	11 (12.5%)
Cosvate®-GM cream (Clobetasol propionate)	10 (11.3%)
Momate® cream (Momatasone furoate)	8 (9%)
Lobate® cream (Clobetasol propionate)	4(4.5%)
Skinshine cream (Triple combination cream-Momatasone furoate,Tretinoin and Hydroquinone)	6 (6.8%)
MelametTM cream(Triple combination cream- Momatasone furoate,Tretinoin and Hydroquinone)	16 (18.8%)
Eukroma® cream (4% Hydroquinone)	2 (2.27%)
Melalite®15 cream (2% Hydroquinone)	1 (1.1%)
Fair and Lovely® cream (Niacinamide)	7 (7.9%)
PONDs white beautyTM spot-less fairness cream (Niacinamide)	2 (2.2%)
ElementsTM multi-action fairness cream(Herbal ingredients and multivitamins) and Kudos® ayurvedic skin whitening Gel(Ayurvedic ingredients)	1 (1.1%)
Goree® beauty cream (Kojic acid,Niacinamide) Saffron fairness® cream (Saffron extract and Vitamin E) Soundarya radianceTM cream(Saffron extract and pure cow ghee)	1(1.1%)

We observed that the most exploited creams for the purpose of fairness were steroid-containing creams. Amongst these steroid-containing creams, the most common cream misused for fairness was Betnovate® cream used by 19 (21.6%) patients, followed by MelametTM cream(Triple combination cream) used by 16 (18.8%). Amongst the non-steroidal creams, the most used fairness cream was Fair and Lovely® cream 7 (7.9%).

Table 3: Type of cream used by patients (n=88)

Type	N	%	P value
Steroid content	52	59.1%	0.031
Only non-steroidal content	14	15.9%	
Non-steroid + Steroid combination	22	25%	

Also, we had observed the ratio and significance of steroidal as well as non-steroidal creams associated with dermatosis among the study population. Out of 88 cases majority patient used steroid-only containing creams . There was significant association between the patients using steroid based creams and the incidence of dermatosis, with the p value of 0.031.

Table 4: Adverse cutaneous effects seen clinically after application of fairness creams

Adverse cutaneous effects	Steroid/steroid with non-steroid combination creams	Non steroid Fairness creams	Total
Uneven patchy pigmentation	38.6%	19.3%	58.0%
Acneiform eruptions	14.7%	2.2%	17%
Facial erythema	2.3%	9.1%	11.4%
Atrophy	6.8%	0	6.8%
Telangiectasia or rosacea	5.7%	1.1%	6.8%

On thorough clinical examination of the lesions, we found that a total 51 (58%) patients after using various fairness creams had developed uneven patchy pigmentation. Other adverse effects seen clinically are shown in the table above. Uneven patchy pigmentation was the most common dermatosis seen with long term use of both steroid-containing creams and non-steroid creams. Acneiform eruptions was the second most common cutaneous side effect seen with steroidal creams as

observed in 14.7% of the patients, whereas facial erythema was the second most common side effect

seen with non-steroidal creams as observed in 9.1% of the patients.

**Table 5: Dermoscopic findings associated with use of fairness creams (n=88)**

Parameter	N	%
Brown globular structure	74	84%
Vascular patterns -Telangiectasia	49	55.7%
Peri follicular globules	46	52.3%
Annular pattern	44	50.0%
Multiple foci of erythema	43	48.9%
Reticuloglobular patterns	39	44.3%
Granules/Dots	28	31.8%
Dilated hair follicles	22	25.0%
Reticular pattern with sparing of hair follicles	21	23.9%
Arciform structure	18	20.5%
Pseudoreticular pattern	9	10.2%
Discrete pigmentation	7	8.0%
Granular pigmentation	6	6.8%
Caviar like pattern or honeycomb pattern	6	6.8%
Atrophic changes	6	6.8%
Unpattered patchy pigmentation	4	4.5%
Accentuated Pigmented Network	3	3.4%

Majority of the study participants had multiple skin changes as per the dermoscopic examination. Brown globular structures (Figure 1) were the commonest skin change observed on dermoscopy with the incidence of 74 (84%) followed by 49 (55.7%) with vascular patterns such as telangiectasia (Figure 1). Perifollicular globules (Figure 2), multiple foci of erythema (Figure 3), annular and arciform structures (Figure 4) and reticuloglobular patterns respectively were the other commonest findings. Granular pigmentation (Figure 5), caviar-like pattern or honeycomb pattern (Figure 6), atrophy (Figure 7) and accentuated pigment network were among the less common findings observed among 3 to 6 patients. Incidence of rest of the dermoscopic skin changes are tabulated above.On further dermoscopic analysis, we were able to identify minute changes and other specific findings which were linked to the use of long-term steroid-containing creams and long-term non-steroidal creams. In those applying steroid-containing creams, the most common dermoscopic finding was found to be brown globular structures seen in 54 (61.3%) patients followed by telangiectasias seen in 38 (43.1%). In those applying non-steroidal fairness creams, the most common finding also was the presence of brown globular structures seen in 20 (22.7%) followed by multiple foci of erythema seen in 18(20.4%) of the patients. Below are various dermoscopic findings observed in subjects using long term fairness creams.
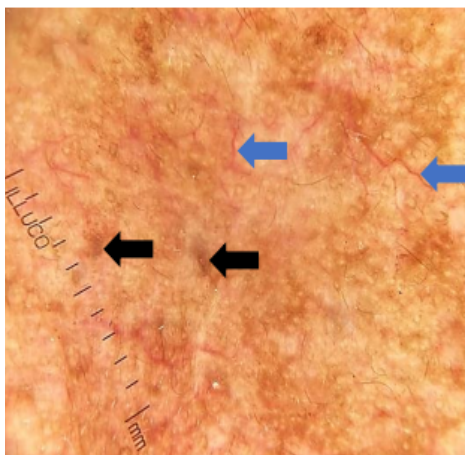
Figure 1: Brown blotches and globules (black arrows) in reticuloglobular pattern and telangiectasias (blue arrows)
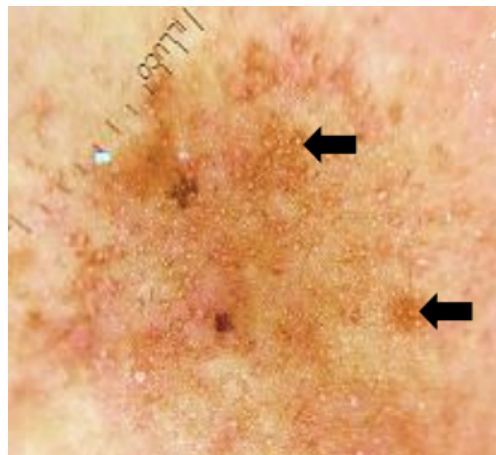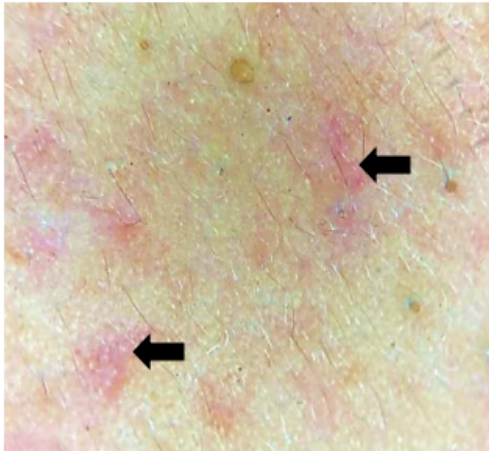

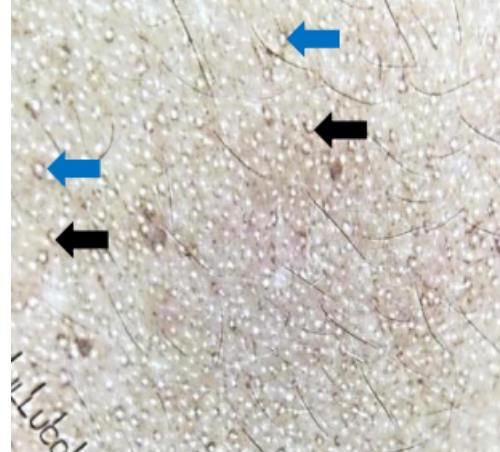**Figure 2: Perifollicular globules**

Figure 3: Multiple foci of erythema

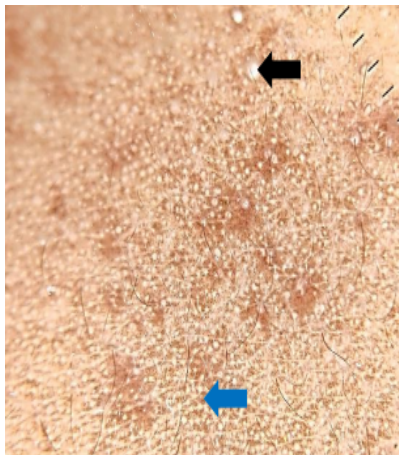**Figure 4: Annular structures (blue arrows) and arciform structures (black arrows)**

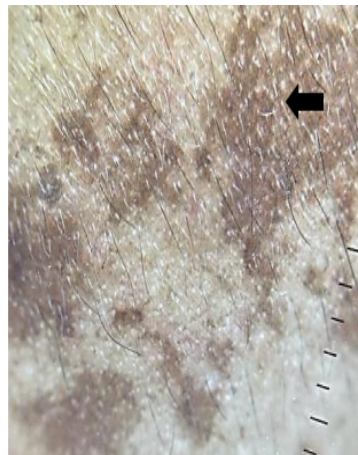**Figure 5: Dilated follicles (black arrow) and granular pigmentation (blue arrow)**

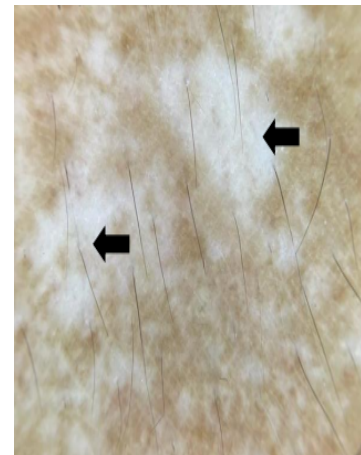**Figure 6: Caviar- like or honeycomb pattern (blue arrow)**

Figure 7: White structureless areas representing atrophy

Discussion

As per the available data, fairness creams used commonly for various conditions could be steroidal or non-steroidal-containing cosmetic agents. The use of these either aid or challenge facial skin health. Also, these products are known to cause many adverse effects of which dermatoses is one such finding. We did not come across many clinical studies that have considered analysing the incidence and type of facial dermatosis resulting from the use of fairness creams.

Hence, we had conducted the present study to analyse the clinico-epidemiological profile, the resultant dermatosis and the dermatoscopic findings associated with the use of fairness creams. Average age of the study participants was 35.8±5.7 years. 45.5% (40/88) were aged between 28 to 37 years. Out of 88 patients, 81 (92.04%) patients were females and 7 (7.96%) were males. Consistent with our study, Manchanda K et al also observed that 70% of the patients using facial creams in their

study were females and the commonest age group was between 11 to 20 years.[8] Females outnumbering the males in using facial cream was reported by Bhat YJ et al and Saraswat Y et al as well.[9,10] Hameed et al, Bhat YJ et al, and Saraswat Y et al had reported maximum number of patients in the age group of 21–30 years.[9-11]

We found in our study, majority of the patients used only steroid-containing creams 52(59.1%), followed by non-steroid with steroid combination creams 22/(25%), and lastly non-steroidal fairness creams 14(15.9%) in order to achieve an improvement in their skin tone. Contrary to our study, Manchanda K et al had observed that majority of the patients in their study were using a combination of non-steroidal with steroid preparation for a variety of skin conditions, of which acne was the commonest.[8]

Sharada VG et al had observed melasma as the commonest condition for which their patients started using fairness cream.[12] In our study,

globular structure was the commonest skin change observed on dermoscopy with the incidence of 74 (84 %), followed by 49 (55.7%) with vascular patterns -telangiectasia. Similarly, Ankad et al in his study of over-the-counter cosmetic creams found the commonest two findings as diffuse red dots(94%) followed by brown globules (84%).[13] In a study conducted by Sethi et al in topical steroid dependent/damaged face, they found the most common findings to be brown globules(96.2%) followed by diffuse erythematous areas (92.4%).[14] Our study findings were also consistent with the observations made by Isidore KY et al where they had found that pigmentary lesions were the most common. Contrary to our study, Bhagwat PV et al had reported that pigmentary lesions were the least common among their patients with dermatoses. Hence, we observe that the skin changes might vary based on the type of cream used.[15,16] After thorough clinical examination, we observed 51 (58%) of the patients had uneven patchy hyperpigmentation which was the most common cutaneous side effect. Also,15(17%) of the patients developed acneiform eruptions and 10(11.4%) of the patients developed facial erythema. Atrophy, telangiectasias and rosacea were other side effects.

Atophy was seen only in patients using steroid based fairness creams. It was seen in 6.8% of our patients. Lahiri K et al, had discussed that severe cutaneous damage characterized by erythema, monomorphic acne, steroid atrophy, steroid rosacea, telangiectasia, perioral dermatitis, striae and other dermatoses were common among the patients using topical steroids. Further they explained that as face is the most common and most severely affected site, steroid dependence resulting in skin changes on face, could be labelled as "Topical steroid-damaged/dependent face (TSDF).[17]

Among the various creams used by patients, we found that the most commonly used were Betnovate® cream (Betamethasone valerate) used by 19 (21.6%), followed by MelametTM cream (Triple combination cream- Momatasone furoate, Tretinoin and Hydroquinone) used by 16 (18.8%), followed by Panderm®+ cream(Clobetasol propionate) 11(12.5%),owing to their relatively low cost and familiarity as compared to other triple combination creams or commercial fairness creams like Fair and lovely® cream.

This was similar to the study conducted by Chohan SN et al where the most preferred cream brands used in their study were Betnovate® cream (Betamethasone valerate) followed by Dermovate®/ Clobevate® cream (clobetasol propionate).[18] We found the association between the patients using steroidal cream being strongly significant with facial dermatoses than those that used non-steroidal creams alone. Similar to our study, Saraswat A et al also had observed the significant association between steroid cream usage and facial dermatosis.[10]

This was also consistent with the findings by Stop OTC supply of potent topical steroids study, in which 14.33% of the patients using topical steroids had developed facial dermatoses.[19] We also observed that on dermatoscopy of the facial lesions, minute changes in skin after the use of fairness creams like telangiectasias which may not be seen by naked eye can be better visualised by the dermatoscope. With the above discussion, we would like to mention the need for more clinical studies in this aspect to analyze the incidence and the associated dermatoses induced by fairness creams.

Limitations: The single-center, OPD based study may not accurately replicate the findings of the entire community.

Conclusion

The present study concludes that compared to males, females are more prone to developing fairness cream-induced dermatoses as the incidence of skin-lightening cream usage is more among them.

Also, we would like to suggest that a similar multicentric study with a larger population is necessary to understand the epidemiology and the associated parameters in facial creams-induced facial dermatoses.

References

1. Rastogi MK, Gupta A, Soodan PS, Mishra N, Gahalaut P. Evaluation of suspected cosmetic induced facial dermatoses with the use of Indian standard series and cosmetic series patch test. J Clin Diagn Res. 2015 Mar;9(3): WC07-10.
2. B Linda, BS Sedlewicz. Cosmetic preservatives: Friend or foe? Skin Med. 2005; 4(2):98–100.
3. Available from: https:// www.fda. gov/cosmetics/cosmetics-laws-regulations/it-cosmetic-drug-or-both-or-it-soap.
4. SS Mehta, BSN Reddy. Cosmetic dermatitis-current perspectives. Int J Dermatol. 2003; 42(7):533–42.
5. Gandhi J, Agrawal S, Gupta S, Verma K, Mohite A. Pattern of Papulosquamous Disorders in Children: A Clinico-Epidemiological Study. Cureus. 2022 Jan 13; 14(1):e21194.
6. Lehmann P, Schwarz T. Photodermatoses: diagnosis and treatment. Dtsch Arztebl Int. 2011 Mar; 108(9):135-41.

7. Draelos ZD. Facial skin care products and cosmetics. Clin Dermatol. 2014 Nov-Dec; 32(6):809-12.

8. Manchanda K, Mohanty S, Rohatgi PC. Misuse of Topical Corticosteroids over Face: A Clinical Study. Indian Dermatol Online J. 2017 May-Jun;8(3):186-191.

9. Bhat YJ, Manzoor S, Qayoom S. Steroid-induced rosacea. A clinical study of 200 patients. Indian J Dermatol. 2011;56(1):30–2

10. Saraswat A, Lahiri K, Chatterjee M, Barua S, Coondoo A, Mittal A, et al. Topical corticosteroid abuse on the face: A prospective, multicenter study of dermatology outpatients. Indian J Dermatol Venereol Leprol. 2011; 77(2):160–6.

11. Hameed AF. Steroid Dermatitis Resembling Rosacea: A Clinical Evaluation of 75 Patients. ISRN Dermatol. 2013 Apr; 2013: 491376.

12. Sharada V G, Ashok S H. A Clinical Study of Facial Dermatoses in A Tertiary Care Hospital. Int J Recent Sci Res. 2020;11(07): pg. 39077-39079

13. Ankad BS, Anusha HL, Raghuveer C, Nikam BP, Rangappa M. Skin Changes on the Face Caused by Over-thecounter Cosmetic Creams: An Observational Study of Clinical and Dermoscopy Features. Indian Journal of Pharmacy Practice. 2023;16(1):13-19

14. Sethi S, Chauhan P, Jindal R, Bisht YS. Dermoscopy of topical steroid-dependent or damaged face: A cross-sectional study. Indian J Dermatol Venereol Leprol 2021 Jan-Feb;88(1):40-46

15. Isidore KY, Sarah KH, Alexandre KK. Clinical and epidemiological aspect of black African adult women with facial dermatoses. Dermatol Open J. 2017; 2(2):31-5.

16. Bhagwat PV, Chhangte MZ, Kudligi C. A clinical study of facial dermatoses. Int J Res Dermatol 2019;5(1):40-4

17. Lahiri K, Coondoo A. Topical Steroid Damaged/Dependent Face (TSDF): An Entity of Cutaneous Pharmacodependence. Indian J Dermatol. 2016 May-Jun; 61(3):265-72.

18. Chohan SN, Suhail M, Salman S, Bajwa UM, Saeed M, Kausar S, Suhail T. Facial abuse of topical steroids and fairness creams: a clinical study of 200 patients. J Pak Assoc Dermatol. 2016 Dec.2 ;24(3):204-11

19. Coondoo A. Topical corticosteroid misuse: the Indian scenario. Indian J Dermatol. 2014 Sep; 59(5):451-5.